Package ‘ngsReports’

March 12, 2024

Version 2.4.0
Date 2023/10/11
Title Load FastqQC reports and other NGS related files
Description This package provides methods and object classes for parsing
FastQC reports and output summaries from other NGS tools into R.
As well as parsing files, multiple plotting methods have been implemented
for visualising the parsed data.
Plots can be generated as static ggplot objects or interactive plotly
objects.

URL https://github.com/smped/ngsReports

BugReports https://github.com/smped/ngsReports/issues

License file LICENSE

Encoding UTF-8

Depends R (>= 4.2.0), BiocGenerics, ggplot2 (>= 3.4.0), patchwork (>=
1.1.1), tibble (>= 1.3.1)

Imports Biostrings, checkmate, dplyr (>= 1.1.0), DT, forcats,
ggdendro, grDevices (>= 3.6.0), grid, jsonlite, lifecycle,
lubridate, methods, pander, plotly (>= 4.9.4), readr, reshape2,
rlang, rmarkdown, scales, stats, stringr, tidyr, tidyselect (>=
0.2.3), utils, zoo

LazyData true

RoxygenNote 7.2.3

‘importSJ.R’ ‘isCompressed.R’ ‘maxAdapterContent.R’
‘plotAdapterContent.R’ ‘plotAlignmentSummary.R’
‘plotAssemblyStats.R’ ‘plotBaseQuals.R’ ‘plotDupLevels.R’
VignetteBuilder  knitr
Suggests  BiocStyle, Cairo, knitr, testthat, truncnorm
biocViews  QualityControl, ReportWriting
RdMacros  lifecycle
Roxygen  list(markdown = TRUE)
git_url  https://git.bioconductor.org/packages/ngsReports
git_branch  RELEASE_3_18
git_last_commit  bdb00bd
git_last_commit_date  2023-10-24
Repository  Bioconductor 3.18
Date/Publication  2024-03-11
Author  Stevie Pederson [aut, cre] (<https://orcid.org/0000-0001-8197-3303>),
        Christopher Ward [aut],
        Thu-Hien To [aut]
Maintainer  Stevie Pederson <stephen.pederson.au@gmail.com>

R topics documented:

- .addPercent ................................................................. 4
- .emptyPlot ................................................................. 5
- .FastpFile-class .......................................................... 5
- .FastqcFile-class ......................................................... 6
- .getToolName ............................................................. 7
- .hidePWFRects ............................................................ 7
- .isValidAdapterRemovalLog .............................................. 8
- .isValidBowtieLog ........................................................ 8
- .isValidBuscoLog .......................................................... 9
- .isValidCutadaptLog ....................................................... 9
- .isValidDedupLog .......................................................... 9
- .isValidDuplicationMetricsLog ......................................... 10
- .isValidFlagstatLog ....................................................... 10
- .isValidHisat2Log .......................................................... 11
- .isValidMacs2CallpeakLog ............................................... 11
- .isValidQuastLog .......................................................... 12
- .isValidRnaseqcMetricsLog ............................................... 12
- .isValidStarLog ........................................................... 13
- .isValidTrimmomaticLog ................................................ 13
- .isValidUmitoolsDedupLog ............................................... 14
- .makeDendro ............................................................... 15
R topics documented:

.. makeLabels .......................................................... 15
.. makePwfGradient .................................................... 16
.. makeSidebar .......................................................... 17
.. parseAdapterRemovalLogs .......................................... 18
.. parseBowtieLogs ..................................................... 18
.. parseBuscoLogs ...................................................... 19
.. parseCutadaptLogs .................................................. 19
.. parseDuplicationMetricsLogs ..................................... 20
.. parseFeatureCountsLogs .......................................... 20
.. parseFlagstatLogs .................................................. 21
.. parseHisat2Logs .................................................... 22
.. parseMacs2CallpeakLogs .......................................... 22
.. parseQuastLogs ..................................................... 23
.. parseRnaseqcMetricsLogs ......................................... 23
.. parseStarLogs ....................................................... 24
.. parseTrimmomaticLogs ............................................. 24
.. parseUmitoolsDedupLogs .......................................... 25
.. prepHeatmap ........................................................ 25
.. renderDendro ........................................................ 26
.. splitByTab .......................................................... 26
.. updateThemeFromDots .............................................. 27
.. estGcDistn .......................................................... 27
.. FastpData-class .................................................... 28
.. FastpDataList-class ............................................... 29
.. FastqcData-class ................................................... 30
.. FastqcDataList-class ............................................. 31
.. fqName .............................................................. 32
.. gcAvail .............................................................. 33
.. gcTheoretical ....................................................... 34
.. getColours ........................................................ 35
.. getGC ................................................................. 36
.. getModule,FastqcData-method ................................... 37
.. getSummary,.FastqcFile-method ................................ 39
.. importNgsLogs ...................................................... 40
.. importSJ ............................................................ 41
.. isCompressed ....................................................... 42
.. maxAdapterContent ............................................... 43
.. mData ............................................................... 44
.. overRep2Fasta ..................................................... 44
.. path ................................................................. 45
.. plotAdapterContent .............................................. 46
.. plotAlignmentSummary ........................................... 50
.. plotAssemblyStats ............................................... 51
.. plotBaseQuals ...................................................... 52
.. plotDupLevels ...................................................... 55
.. plotFastqcPCA ..................................................... 59
.. plotGcContent ..................................................... 61
.addPercent

Description

Add a percentage sign to the end of a string

Usage

.addPercent(x)

Arguments

x Any vector

Value

character vector

Examples

x <- 1:10
ngsReports:::.addPercent(x)
Create an empty plot with supplied text

Description
Create an empty plot with supplied text

Usage
emptyPlot(x)

Details
Create plot using theme_void and only with the supplied text

Value
A ggplot2 object

Examples
ngsReports::emptyPlot("This is an empty plot")

.FastpFile-class

The .FastpFile Object Class

Description
The .FastpFile Object Class defines a path to the output from the standalone tool fastp. [Experimental]

Arguments

x character(1) denoting a file.path

Details
This class simply refers to a fastp output file after checking for existence and validity (i.e. the correct internal structure). Underlying files are expected to be in json format.

The helper function .FastpFile() is a simple constructor which checks validity and enables construction of other dependent classes.

Value
An object of class .FastqcFile
Slots

path Character vector of length 1 which contains a valid file path.

Description

The .FastqcFile Object Class defines a path to the output from the standalone tool FastQC. [Stable]

Arguments

x character(1) denoting a file.path

Details

This class simply refers to a fastqc output file after checking for existence and validity (i.e. the correct internal structure). Underlying files can be zipped (*.fastqc.zip) or extracted directories

The helper function .FastqcFile() is a simple constructor which checks validity and enables construction of other dependent classes.

Value

An object of class .FastqcFile

Slots

path Character vector of length 1 which contains a valid file path.

Examples

# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)[1]

# As this is the root structure, we can only call this
# function with an individual file
ff <- ngsReports:::.FastqcFile(fl)
Identify tool name

Description
Identify tool name for log files after reading in using readLines.

Usage
.getToolName(x, possTypes)

Arguments
x
Character vector as output when readLines to a supplied log file

Details
Checks for all the required fields in the lines provided

Value
logical(1)

Hide PWF tooltips from line plots

Description
Hide tooltips from PWF rectangles in line plots

Usage
.hidePWFRects(x)

Arguments
x
plotlyObject$x$data

Value
plotlyObject$x$data
.isValidAdapterRemovalLog

*Check for a valid AdapterRemoval log*

**Description**
Checks internal structure of the parsed log file

**Usage**
```
.isValidAdapterRemovalLog(x)
```

**Arguments**
- `x` Character vector containing parsed log file using the function readLines

**Value**
logical(1)

---

.isValidBowtieLog

*Check for correct structure of supplied Bowtie log files*

**Description**
Check for correct structure of supplied Bowtie log files after reading in using readLines.

**Usage**
```
.isValidBowtieLog(x)
```

**Arguments**
- `x` Character vector as output when readLines to a supplied log file

**Details**
Checks for all the required fields in the lines provided

**Value**
logical(1)
.isValidBuscoLog

---

Description

Check for correct structure of supplied BUSCO log files after reading in using readLines.

Usage

```r
.isValidBuscoLog(x)
```

Arguments

- `x` Character vector as output when readLines to a supplied log file

Details

Checks for all the required fields in the lines provided

Value

`logical(1)`

---

.isValidCutadaptLog

---

Description

Check for a valid cutadapt log

Usage

```r
.isValidCutadaptLog(x)
```

Arguments

- `x` Character vector containing parsed log file using the function readLines

Value

`logical(1)`
isValidDuplicationMetricsLog

Check for a valid Duplication Metrics log

Description
Checks internal structure of the parsed log file

Usage
.isValidDuplicationMetricsLog(x)

Arguments
x       Character vector containing parsed log file using the function readLines

Value
logical(1)

isValidFeatureCountsLog

Check for a valid featureCounts Summary

Description
Checks internal structure of the parsed file

Usage
.isValidFeatureCountsLog(x)

Arguments
x       Character vector containing parsed log file using the function readLines

Value
logical(1)
isValidFlagstatLog  
*Check for correct structure of supplied flagstat*

**Description**
Check for correct structure of supplied flagstat files

**Usage**
```
.isValidFlagstatLog(x)
```

**Arguments**
- `x`  
  Character vector as output when readLines to a supplied file

**Details**
Checks for all the required fields in the lines provided

**Value**

```
logical(1)
```

isValidHisat2Log  
*Check for a valid Hisat2 log*

**Description**
Checks internal structure of the parsed log file

**Usage**
```
.isValidHisat2Log(x)
```

**Arguments**
- `x`  
  Character vector containing parsed log file using the function readLines

**Value**

```
logical(1)
```
.isValidMacs2CallpeakLog

---

**Description**

Check for correct structure of macs2 callpeak log

**Usage**

`.isValidMacs2CallpeakLog(x)`

**Arguments**

- `x`: Character vector as output when `readLines` to a supplied file

**Details**

Checks for all the required fields in the lines provided

**Value**

`logical(1)`

---

.isValidQuastLog

---

**Description**

Check for correct structure of supplied Quast log files after reading in using `readLines`.

**Usage**

`.isValidQuastLog(x)`

**Arguments**

- `x`: Character vector as output when `readLines` to a supplied log file

**Details**

Checks for all the required fields in the lines provided

**Value**

`logical(1)`
.isValidRnaseqcMetricsLog

Check for correct structure of rnaseqc metrics

Description
Check for correct structure of rnaseqc metrics files

Usage
.isValidRnaseqcMetricsLog(x)

Arguments
x Character vector as output when readLines to a supplied file

Details
Checks for all the required fields in the lines provided

Value
logical(1)

.isValidStarLog

Check for a valid Star Alignment log

Description
Checks internal structure of the parsed log file

Usage
.isValidStarLog(x)

Arguments
x Character vector containing parsed log file using the function readLines

Value
logical(1)
.isValidTrimmomaticLog

*Check for correct structure of supplied Trimmomatic log files*

**Description**
Check for correct structure of supplied Trimmomatic log files after reading in using readLines.

**Usage**
```
.isValidTrimmomaticLog(x)
```

**Arguments**
- `x` Character vector as output when readLines to a supplied log file

**Details**
Checks for all the required fields in the lines provided

**Value**
logical(1)

---

.isValidUmitoolsDedupLog

*Check for correct structure of umi_tools –dedup log*

**Description**
Check for correct structure of umi_tools –dedup log

**Usage**
```
.isValidUmitoolsDedupLog(x)
```

**Arguments**
- `x` Character vector as output when readLines to a supplied file

**Details**
Checks for all the required fields in the lines provided

**Value**
logical(1)
.makeDendro

Make the dendrogram for heatmap-style plots

Description

Set the clusters for heatmap-style interactive plots

Usage

.makeDendro(df, rowVal, colVal, value)

Arguments

df              The data frame to be clustered
rowVal          The rows to be clustered
colVal          The value which will become column names
value            The value to use for the clustering

Value

A dendrogram

Examples

# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fileList <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)
cols <- c("Filename", "Position", "Illumina_Universal_Adapter")
ac <- getModule(fileList, "Adapter_Content")[cols]
ngsReports::.makeDendro(df = ac,
                        rowVal = "Filename",
                        colVal = "Position",
                        value = "Illumina_Universal_Adapter")

.makeLabels

Perform the checks and return the labels

Description

Checks for the presence of labels and returns defaults
Usage

```
.makeLabels(
    x, 
    labels, 
    pattern = "\.(fastq|bam|sam|cram).*", 
    col = "Filename", 
    ...
)
```

Arguments

- **x**: A data.frame with a column titled "Filename"
- **labels**: Named vector of labels for plotting
- **pattern**: character Regular expression to remove from filenames
- **col**: character Column to use for generating labels
- **...**: Not used

Details

Takes a named vector of labels and checks for the correct fields. If no vector is supplied, returns the file names missing the specified pattern, which defaults to removing the suffixes fastq(.gz), fq(.gz), bam, sam or cram.

Value

Named character vector

Examples

```
f <- paste0(c("File1", "File2"), ".fastq")
df <- data.frame(Filename = f, stringsAsFactors = FALSE)
ngsReports:::.makeLabels(df)
```

Description

Construct a gradient using PwfCols
Usage

```r
.makePWFGradient(
  vals,
  pwfCols,
  breaks = c(0, 5, 10, 100),
  passLow = TRUE,
  na.value = "white"
)
```

Arguments

- **vals**: The values which need to have the scale generated
- **pwfCols**: An object of class PwfCols
- **breaks**: The breaks for the PWF bins
- **passLow**: Is the PASS category at the low or high end of the numeric range
- **na.value**: The colour to plot for missing values

Details

This constructs a list of arguments for passing to `scale_fill_gradientn()` using the values contained in the fill aesthetic and the supplied breaks for PASS/WARN/FAIL criteria.

Value

Returns a ggplot list

---

### .makeSidebar

*Shortcut for making the status sidebar*

Description

Shortcut for making the status sidebar

Usage

```
.makeSidebar(status, key, pwfCols, usePlotly = TRUE)
```

Arguments

- **status**: A data.frame with columns 'Filename' & 'Status'
- **key**: A vector of values corresponding to the Filename column
- **pwfCols**: An object of class PwfCols
- **usePlotly**: If TRUE, output is a plotly panel
Value

if usePlotly = TRUE, a plotly object. The sidebar for an interactive plot showing PASS/WARN/FAIL status for each file. If usePlotly = FALSE the underlying ggplot object will be returned.

---

parseAdapterRemovalLogs

*Parse data from Adapter Removal log files*

Description

Parse data from Adapter Removal log files

Usage

`.parseAdapterRemovalLogs(data, which = 3)`

Arguments

data: List of lines read using readLines on one or more files

which: which element of the log file to return. Can be 1:4, "sequences", "settings", "statistics" or "distribution"

Details

Checks for structure will have been performed

Value

tibble

---

parseBowtieLogs

*Parse data from Bowtie log files*

Description

Parse data from Bowtie log files

Usage

`.parseBowtieLogs(data, ...)`

Arguments

data: List of lines read using readLines on one or more files

... Not used
.parseBuscoLogs

Details
  Checks for structure will have been performed

Value
  data.frame

--

.parseBuscoLogs  Parse data from BUSCO log files

Description
  Parse data from BUSCO log files

Usage
  .parseBuscoLogs(data, ...)

Arguments
  data  List of lines read using readLines on one or more files
  ...  Not used

Details
  Checks for structure will have been performed

Value
  data.frame

--

.parseCutadaptLogs  Parse data from cutadapt log files

Description
  Parse data from cutadapt log files

Usage
  .parseCutadaptLogs(data, which = 1)

Arguments
  data  List of lines read using readLines on one or more files
  which  which element of the log file to return. Can be summary, adapter1, adapter2, adapter3 or overview, or any integer in 1:5
.parseFeatureCountsLogs

Parse data from featureCounts summary files

Description
Parse data from featureCounts summary files

Usage
.parseFeatureCountsLogs(data, …)

Arguments
- `data` List of lines read using readLines on one or more files
- `which` which element of the log file to return. Can be 1:2, "metrics" or "histogram"

Details
Checks for structure will have been performed

Value
tibble

---

.parseDuplicationMetricsLogs

Parse data from Picard duplicationMetrics log files

Description
Parse data from Picard duplicationMetrics log files

Usage
.parseDuplicationMetricsLogs(data, which = 1)

Arguments
- `data` List of lines read using readLines on one or more files
- `which` which element of the log file to return. Can be 1:2, "metrics" or "histogram"

Details
Checks for structure will have been performed

Value
tibble
.parseFlagstatLogs

Arguments

- **data**
  - List of lines read using readLines on one or more files

- **...**
  - Not used

Details

Checks for structure will have been performed

Value

tibble

---

**.parseFlagstatLogs**  
*Parse data from samtools flagstat files*

Description

Parse data from samtools flagstat files

Usage

```
.parseFlagstatLogs(data, ...)
```

Arguments

- **data**
  - List of lines read using readLines on one or more files

- **...**
  - Not used

Details

Checks for structure will have been performed

Value

data.frame
.parseMacs2CallpeakLogs

Parse data from Macs2 callpeak log files

Description
Parse data from Macs2 callpeak log files

Usage
.parseMacs2CallpeakLogs(data, ...)

Arguments
  data List of lines read using readLines on one or more files
  ... Not used

Details
Checks for structure will have been performed

Value
data.frame

.parseHisat2Logs

Parse data from HISAT2 log files

Description
Parse data from HISAT2 log files

Usage
.parseHisat2Logs(data, ...)

Arguments
  data List of lines read using readLines on one or more files
  ... Not used

Details
Checks for structure will have been performed

Value
data.frame
.parseQuastLogs

Parse data from BUSCO log files

Description
Parse data from BUSCO log files

Usage
.parseQuastLogs(data, ...)

Arguments
  data          List of lines read using readLines on one or more files
  ...          Not used

Details
Checks for structure will have been performed

Value
data.frame

.parseRnaseqcMetricsLogs

Parse data from rnaseqc metrics files

Description
Parse data from rnaseqc metrics files

Usage
.parseRnaseqcMetricsLogs(data, ...)

Arguments
  data          List of lines read using readLines on one or more files
  ...          Not used

Details
Checks for structure will have been performed

Value
data.frame
.parseStarLogs  Parse data from STAR log files

Description
Parse data from STAR log files

Usage
.parseStarLogs(data, ...)

Arguments
data  List of lines read using readLines on one or more files
...  Not used

Details
Checks for structure will have been performed

Value
tibble

.parseTrimmomaticLogs  Parse data from trimmomatic log files

Description
Parse data from trimmomatic log files

Usage
.parseTrimmomaticLogs(data, ...)

Arguments
data  List of lines read using readLines on one or more files
...  Not used

Details
Checks for structure will have been performed

Value
tibble
.parseUmitoolsDedupLogs

Parse data from umi_tools dedup files

Description
Parse data from umi_tools dedup files

Usage
.parseUmitoolsDedupLogs(data, ...)

Arguments
- data: List of lines read using readLines on one or more files
- ...: Not used

Details
Checks for structure will have been performed

Value
data.frame

.prepHeatmap
Prepare the final heatmap for plotting

Description
Add dendrogram & status bar to ggplot2 heatmap

Usage
.prepHeatmap(x, status, segments, usePlotly, heat_w = 8, p wf, hv = NULL)

Arguments
- x: a ggplot2 heatmap produced by ngsReports
- status: a tibble with the columns Filename and Status
- segments: a dendrogram produced during clustering of samples
- usePlotly: logical(1)
- hv: character vector of fields to include in hoverinfo

Value
Either a ggplot2 object assembled using patchwork, or an interactive plotly object
.renderDendro

Set up dendrograms for interactive plots

Description
A commonly used (hidden) function for setting up dendrograms for interactive plots. based on code found at https://plot.ly/ggplot2/ggdendro-dendrograms/

Usage
.

Arguments
df A data.frame as required

Details
Create plot using theme_dendro

Value
A plotly object

.splitByTab

Split elements of a vector into a data.frame

Description
Split elements of a character vector by the tab separator

Usage
.

Arguments
x A character vector
firstRowToNames logical Should the first element be used for column names
tab character The string used to represent the tab symbol

Details
This will split a vector into a data.frame checking that every line has the same number of separators. By default the first element will be set as the column names. This is designed to take input from readLines()
Value

A data frame

Examples

```r
x <- c("ColA\tColB", "Value1\tValue2")
ngsReports:::.splitByTab(x, firstRowToNames = TRUE)
ngsReports:::.splitByTab(x, firstRowToNames = FALSE)
```

Description

Add custom theme elements from dotArgs

Usage

```r
.updateThemeFromDots(p, ...)
```

Arguments

- **p**
  - ggplot object

- **...**
  - Standard dot arguments

Value

- ggplot2 object

estGcDistn

**Estimate a GC Content Distribution From Sequences**

Description

Generate a GC content distribution from sequences for a given read length and fragment length

Usage

```r
estGcDistn(x, n = 1e+06, rl = 100, fl = 200, fragSd = 30, bins = 101, ...)
```

# S4 method for signature 'ANY'
```r
estGcDistn(x, n = 1e+06, rl = 100, fl = 200, fragSd = 30, bins = 101, ...)
```

# S4 method for signature 'character'
```r
estGcDistn(x, n = 1e+06, rl = 100, fl = 200, fragSd = 30, bins = 101, ...)
```

# S4 method for signature 'DNAStringSet'
```r
estGcDistn(x, n = 1e+06, rl = 100, fl = 200, fragSd = 30, bins = 101, ...)
```
**Arguments**

- **x**: DNAStringSet or path to a fasta file
- **n**: The number of reads to sample
- **rl**: Read Lengths to sample
- **fl**: The mean of the fragment lengths sequenced
- **fragSd**: The standard deviation of the fragment lengths being sequenced
- **bins**: The number of bins to estimate
- **...**: Not used

**Details**

The function takes the supplied object and returns the theoretical GC content distribution. Using a fixed read length essentially leads to a discrete distribution so the bins argument is used to define the number of bins returned. This defaults to 101 for 0 to 100% inclusive.

The returned values are obtained by interpolating the values obtained during sampling. This avoids returned distributions with gaps and jumps as would be obtained setting readLengths at values not in multiples of 100.

Based heavily on https://github.com/mikelove/fastqcTheoreticalGC

**Value**

A tibble with two columns: `GC_Content` and `Freq` denoting the proportion of GC and frequency of occurrence respectively

**Examples**

```r
faDir <- system.file("extdata", package = "ngsReports")
faFile <- list.files(faDir, pattern = "fasta", full.names = TRUE)
df <- estGcDistn(faFile, n = 200)
```

---

**FastpData-class**

*The FastpData Object Class*

**Description**

The FastpData Object Class [Experimental]

**Usage**

```r
FastpData(x)
```

**Arguments**

- **x**: Path to a single zip archive or extracted folder for a individual fastp report.
Details
This object class is the main object required for generating plots and tables. Instantiation will first check for a .json file with the correct data structure, and will then parse all the data into R as a FastpData object. Fastp modules are contained as individual slots, which can be viewed using slotNames. Sub-modules are also contained within many larger modules with modules being based on the sections within a fastp html report. Individual modules can be returned using the function getModule() and specifying which module/sub-module is required. See getModule() for more details.

Value
An object of class FastpData

Slots
Summary Contains three submodules 1) Before_filtering, 2) After_filtering and 3) Filtering_result. All values presented in the initial table for individual fastp reports are contained in other sections of the report.
Adapters Contains a tibble with all data from this module.
Duplication Contains a tibble with all duplication results.
Insert_size Contains a tibble with all insert size estimates.
Before_filtering, After_filtering The modules can be selected for either Read1 or Read2 paired logical(1) indicating whether the file is from paired-end sequencing.
command character(1) with the executed command.
version character(1) with the fastp version being used.
path Path to the Fastp report.

FastpDataList-class  The FastpDataList Object Class

Description
The FastpDataList Object Class [Stable]

Usage
FastpDataList(x)

Arguments
x Character vector of file paths specifying paths to fastp.json.gz output

Value
An object of class FastpDataList
FastqcData-class

Slots

... this can either be a single character vector of paths to fastp files, or several instances of .Fastp-
File objects

---

FastqcData-class  The FastqcData Object Class

Description

The FastqcData Object Class [Stable]

Usage

FastqcData(x)

Arguments

x  Path to a single zip archive or extracted folder for a individual FastQC report.

Details

This object class is the main object required for generating plots and tables. Instantiation will first
test for a compressed file (or extracted directory) with the correct data structure, and will then parse
all the data into R as a FastqcData object. FastQC modules are contained as individual slots, which
can be viewed using slotNames.

Individual modules can be returned using the function getModule() and specifying which module
is required. See getModule() for more details.

Value

An object of class FastqcData

Slots

Summary        Summary of PASS/WARN/FAIL status for each module
Basic_Statistics The Basic_Statistics table from the top of a FastQC html report
Per_base_sequence_quality The underlying data from the Per_base_sequence_quality module
Per_sequence_quality_scores The underlying data from the Per_sequence_quality_scores mod-
ule
Per_base_sequence_content The underlying data from the Per_base_sequence_content module
Per_sequence_GC_content The underlying data from the Per_sequence_GC_content module
Per_base_N_content The underlying data from the Per_base_N_content module
Sequence_Length_Distribution The underlying data from the Sequence_Length_Distribution
module
Sequence_Duplication_Levels  The underlying data from the Sequence_Duplication_Levels module
Overrepresented_sequences  The underlying data from the Overrepresented_sequences module
Adapter_Content     The underlying data from the Adapter_Content module
Kmer_Content       The underlying data from the Kmer_Content module
Total_Deduplicated_Percentage  Estimate taken from the plot data for Sequence_Duplication_Levels.
                            Only included in later versions of FastQC
version      The version of FastQC used for generation of the report (if available)
path      Path to the FastQC report

Examples

# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)[1]

# Load the FASTQC data as a FastqcData object
fd <- FastqcData(fl)
fd

---

FastqcDataList-class  The FastqcDataList Object Class

Description

The FastqcDataList Object Class [Stable]

Usage

FastqcDataList(x)

Arguments

x  Character vector of file paths specifying paths to FastQC reports

Value

An object of class FastqcDataList

Slots

... this can either be a single character vector of paths to FASTQC files, or several instances of .FastqcFile objects
Examples

# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)
fdl

---

fqcVersion,FastqcData-method

*Get the FASTQC version*

Description

Get the FASTQC version used to generate the initial files

Usage

```r
## S4 method for signature 'FastqcData'
fqcVersion(object)

## S4 method for signature 'FastqcDataList'
fqcVersion(object)

## S4 method for signature 'ANY'
fqcVersion(object)
```

Arguments

- `object`: An object of class `FastqcData` or `FastqcDataList`

Value

A character vector (FastqcData), or tibble (FastqcDataList)

Examples

# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)

# Get the FASTQC version
fqcVersion(fdl)
fqName

Return the Underlying Fastq File Names from Fastqc/Fastp Objects

Description

Return the Underlying Fastq File Names from Fastqc/Fastp Objects

Usage

fqName(object)

## S4 method for signature 'ANY'
fqName(object)

## S4 method for signature 'FastqcData'
fqName(object)

## S4 method for signature 'FastqcDataList'
fqName(object)

fqName(object) <- value

## S4 replacement method for signature 'FastqcData'
fqName(object) <- value

## S4 replacement method for signature 'FastqcDataList'
fqName(object) <- value

## S4 method for signature 'FastpData'
fqName(object)

## S4 method for signature 'FastpDataList'
fqName(object)

Arguments

object An object able to extract an Fastq name from
value Replacement value for fqName

Value

Returns the names of the Fastq files the FastQC report was generated from, without any preceding directories.
Examples

# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)
fqName(fdl)

mm <- paste0(letters[seq_along(fdl)], ".fq")
fqName(fdl) <- mm
fqName(fdl)

---

**gcAvail**  
*List Genomes or Transcriptomes with Theoretical GC Content*

**Description**

List available genomes or transcriptomes in a TheoreticalGC object

**Usage**

gcAvail(object, type)

## S4 method for signature 'TheoreticalGC'

gcAvail(object, type)

**Arguments**

- **object** An object of class TheoreticalGC
- **type** character indicating either Genome or Transcriptome

**Details**

An object of class TheoreticalGC can hold the theoretical GC content for one or more species, for either the genome or transcriptome. This function checks which species are available in the given object, for either the genome or transcriptome, as supplied to the parameter type.

**Value**

A tibble object

**Examples**

gcAvail(gcTheoretical, "Genome")
Theoretical GC content

Description

This object contains the theoretical GC content for each provided species, for both the genome and transcriptome, where available.

Usage

gcTheoretical

Format

An object of class TheoreticalGC of length 1.

Details

The object is defined with the S4 class TheoreticalGC. Species for which information is available can be found using the command gcAvail(gcTheoretical) and selecting the appropriate type.

Metadata is accessible using mData(gcTheoretical).

All GC content was calculated using code from https://github.com/mikelove/fastqcTheoreticalGC using BSgenome packages. This provides a default set of GC content data for common organisms generated using 100bp reads/fragments and 1e6 reads.

See Also

gcAvail

Examples

## Check which genomes are included
gcAvail(gcTheoretical, "Genome")

## Check which transcriptomes are included
gcAvail(gcTheoretical, "Transcriptome")
getColours

Description

Get and modify colours from objects of class PwfCols

Usage

```r
## S4 method for signature 'PwfCols'
getColours(object)
## S4 method for signature 'PwfCols'
setColours(object, PASS, WARN, FAIL, MAX)
## S4 method for signature 'PwfCols'
setAlpha(object, alpha)
```

Arguments

- `object`: An object of class PwfCols
- `PASS`: The colour denoting PASS on all plots, in rgb format
- `WARN`: The colour denoting WARN on all plots, in rgb format
- `FAIL`: The colour denoting FAIL on all plots, in rgb format
- `MAX`: The colour denoting the limit of values in rgb format
- `alpha`: Numeric(1). Ranges from 0 to 1 by default, but can also be on the range 0 to 255.

Details

Use `getColours` to obtain the colours in an object of class PwfCols. These can be modified using the functions `setColours` and `setAlpha`.

Value

- `getColours` will return a character vector of colours corresponding to PASS/WARN/FAIL
- `setColours` will return an object of class PwfCols
- `setAlpha` will return an object of class PwfCols

Examples

```r
getColours(pwf)

# How to add transparency
pwf2 <- setAlpha(pwf, 0.1)
getColours(pwf2)
```
getGC

Get Theoretical GC content

Description
Get the GC content data from a TheoreticalGC object

Usage
getGC(object, name, type)

## S4 method for signature 'ANY'
getGC(object, type)

## S4 method for signature 'TheoreticalGC'
getGC(object, name, type)

Arguments
- **object**: An object of class Theoretical GC
- **name**: The Name of the species in 'Gspecies' format, e.g. Hsapiens
- **type**: The type of GC content. Can only be either "Genome" or "Transcriptome"

Value
A tibble object

Examples
getGC(gcTheoretical, name = "Hsapiens", type = "Genome")

getModule,FastqcData-method
Retrieve a given module from a Fastqc* Object

Description
Retrieve a specific module from a Fastqc* object as a data.frame
Usage

```r
## S4 method for signature 'FastqcData'
getModule(object, module)

## S4 method for signature 'FastqcDataList'
getModule(object, module)

## S4 method for signature 'ANY'
getModule(object, module)

## S4 method for signature 'FastpData'
getModule(object, module)

## S4 method for signature 'FastpDataList'
getModule(object, module)
```

Arguments

- **object**
  - Can be a `FastqcData`, `fastqcDataList`, or simply a character vector of paths.

- **module**
  - The requested module as contained in a FastQC report. Possible values are:
    - `Summary`
    - `Basic_Statistics`
    - `Per_base_sequence_quality`
    - `Per_tile_sequence_quality`
    - `Per_sequence_quality_scores`
    - `Per_base_sequence_content`
    - `Per_sequence_GC_content`
    - `Per_base_N_content`
    - `Sequence_Length_Distribution`
    - `Sequence_Duplication_Levels`
    - `Overrepresented_sequences`
    - `Adapter_Content`
    - `Kmer_Content`
    - `Total_Deduplicated_Percentage`

Note that spelling and capitalisation is exactly as contained within a FastQC report. Partial matching is implemented for this argument.

Details

This function will return a given module from a Fastqc* object as a data.frame. Note that each module will be it's own unique structure, although all will return a data.frame.

Value

A single tibble containing module-level information from all FastQC reports contained in the Fastqc* object.

Examples

```r
# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)

# Extract the Summary module, which corresponds to the PASS/WARN/FAIL flags
getModule(fdl, "Summary")
```
getSummary,.FastqcFile-method

Get the summary information from Fastqc Files

Description

Read the information from the summary.txt files in each .FastqcFile

Usage

```r
## S4 method for signature '.FastqcFile'
getSummary(object)

## S4 method for signature 'ANY'
getSummary(object)

## S4 method for signature 'FastqcData'
getSummary(object)

## S4 method for signature 'FastqcDataList'
getSummary(object)
```

Arguments

- `object` Can be a FastqcData, FastqcDataList object or a vector of paths to unparsed FastQC reports.

Details

This simply extracts the summary of PASS/WARN/FAIL status for every module as defined by the tool FastQC for each supplied file.

Value

A tibble containing the PASS/WARN/FAIL status for each module, as defined in a FastQC report.

Examples

```r
# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)
```
# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)

# Return a tibble/tibble with the raw information
getSummary(fdl)

---

**importNgsLogs**  
Import Various NGS-related log files

**Description**

[Maturing] Imports NGS-related log files such as those generated from stderr.

**Usage**

```r
importNgsLogs(x, type = "auto", which, stripPaths = TRUE)
```

**Arguments**

- **x** character. Vector of filenames. All log files must be of the same type. Duplicate file paths will be silently ignored.
- **type** character. The type of file being imported. Can be one of bowtie, bowtie2, hisat2, star, flagstat, featureCounts, duplicationMetrics, cutadapt, umitoolsDedup, macs2Callpeak, adapterRemoval, rnaseqcMetrics, quast or busco. Defaults to type = "auto" which will automatically detect the file type for all implemented types.
- **which** Which element of the parsed object to return. Ignored in all file types except when type is set to duplicationMetrics, cutadapt or adapterRemoval. See details for possible values. To return all elements, set this value to 'all'
- **stripPaths** logical(1). Remove paths from the Filename column

**Details**

Imports one or more log files as output by tools such as: bowtie, bowtie2, featureCounts, hisat2, STAR, picard MarkDuplicates, cutadapt, flagstat, macs2Callpeak Adapter Removal, trimmomatic, rnaseqcMetrics, quast or busco. autoDetect can be used to detect the log type by parsing the file.

The featureCounts log file corresponds to the counts.out.summary, not the main counts.out file. Whilst most log files return a single tibble, some are more complex with multiple modules.

adapterRemoval can return one of four modules (which = 1:4). When calling by name, the possible values are sequences, settings, statistics or distribution. Partial matching is implemented.

cutadapt can return one of five modules (which = 1:5). When calling by name the possible modules are summary, adapter1, adapter2, adapter3 or overview. Note that adapter2/3 may be missing from these files depending on the nature of your data. If cutadapt log files are obtained using report=minimal, all supplied log files must be of this format and no modules can be returned.
duplicationMetrics will return either the metrics of histogram. These can be requested by setting which as 1 or 2, or naming either module.

**Value**

A tibble. Column names are broadly similar to the text in supplied files, but have been modified for easier handling under R naming conventions.

**Examples**

```r
f <- c("bowtiePE.txt", "bowtieSE.txt")
bowtieLogs <- system.file("extdata", f, package = "ngsReports")
df <- importNgsLogs(bowtieLogs, type = "bowtie")
```

---

importSJ

**Import STAR Splice Junctions**

**Description**

Import the SJ.out.tab files produced by STAR

**Usage**

```r
importSJ(x, stripPaths = TRUE)
```

**Arguments**

- `x` vector of file paths to SJ.out.tab files
- `stripPaths` logical(1) Remove directory prefixes from the file paths in `x`

**Details**

Imports one or more splice-junction output files as produced by STAR. If all are located in separated directories with identical names, be sure to set the argument `stripPaths = FALSE`

All co-ordinates are 1-based, in keeping with the STAR manual

**Value**

A tibble

**Author(s)**

Stephen Pederson stephen.pederson@adelaide.edu.au
isCompressed

Examples

```r
sjFiles <- system.file("extdata", "SJ.out.tab", package = "ngsReports")
# Import leaving the complete file path in the column Filename
# The argument stripPaths is set as TRUE by default
df <- importSJ(sjFiles, stripPaths = FALSE)
```

---

isCompressed Check to see if a file is compressed

Description

Check to see if a file, or vector of files is compressed

Usage

```r
isCompressed(path, type = c("zip", "gzip"), verbose = FALSE)
```

Arguments

- `path` The path to one or more files
- `type` The type of compression to check for. Currently only ZIP/GZIP files have been implemented.
- `verbose` logical/integer Determine the level of output to show as messages

Details

Reads the first four bytes from the local file header. If the file is a .ZIP file, this should match the magic number `PK\003\004`.

This function assumes that the first thing in a zip archive is the .ZIP entry with the local file header signature. ZIP files containing a self-extracting archive may not exhibit this structure and will return FALSE

Value

A logical vector

Examples

```r
# Get the files included with the package
fileDir <- system.file("extdata", package = "ngsReports")
allFiles <- list.files(fileDir, pattern = "zip\$", full.names = TRUE)
isCompressed(allFiles)
```
maxAdapterContent

Get the maximum Adapter Content

Description

Get the maximum Adapter Content across one or more FASTQC reports

Usage

maxAdapterContent(x, asPercent = TRUE)

Arguments

x Can be a .FastqcFile, FastqcData, FastqcDataList or path
asPercent logical. Format the values as percentages with the added % symbol

Details

This will extract the Adapter_Content module from the supplied object, and provide a tibble with the final value for each file.

Value

A tibble object containing the percent of reads with each adapter type at the final position

Examples

# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)

# Get the maxAdapterContent
maxAdapterContent(fdl)
**mData**

*Extract Metadata for TheoreticalGC objects*

**Description**

Extract Metadata for TheoreticalGC objects

**Usage**

```r
mData(object)
```

### S4 method for signature 'TheoreticalGC'

```r
mData(object)
```

**Arguments**

- **object**
  
  An object of class Theoretical GC

**Value**

A tibble object

**Examples**

```r
mData(gcTheoretical)
```

---

**overRep2Fasta**

*Write fasta of Over-Represented sequences.*

**Description**

Output overrepresented sequences to disk in fasta format.

**Usage**

```r
overRep2Fasta(x, path, n = 10, labels, noAdapters = TRUE, ...)
```

### S4 method for signature 'ANY'

```r
overRep2Fasta(x, path, n = 10, labels, noAdapters = TRUE, ...)
```

### S4 method for signature 'FastqcData'

```r
overRep2Fasta(x, path, n = 10, labels, noAdapters = TRUE, ...)
```

### S4 method for signature 'FastqcDataList'

```r
overRep2Fasta(x, path, n = 10, labels, noAdapters = TRUE, ...)
```
Arguments

- **x**: Can be a `FastqcData` or `FastqcDataList`.
- **path**: Path to export the fasta file to. Reverts to a default in the working directory if not supplied.
- **n**: The number of sequences to output.
- **labels**: An optional named factor of labels for the file names. All filenames must be present in the names. File extensions are dropped by default.
- **noAdapters**: logical. Remove any sequences identified as possible adapters or primers by FastQC.
- **...**: Used to pass any alternative patterns to remove from the end of filenames.

Details

Fasta will contain `Filename, Possible Source, Percent of total reads`.

Value

Exports to a fasta file, and returns the fasta information invisibly.

Examples

```r
# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)

# Export the top10 Overrepresented Sequences as a single fasta file
faOut <- file.path(tempdir(), "top10.fa")
overRep2Fasta(fdl, path = faOut)
```

---

**path**

*Return the File Paths from an object*

Description

Return the File Paths from an object.
plotAdapterContent

**Draw an Adapter Content Plot**

**Description**

Draw an Adapter Content Plot across one or more FASTQC reports
Usage

plotAdapterContent(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).*",
  ...
)

## S4 method for signature 'ANY'
plotAdapterContent(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).*",
  ...
)

## S4 method for signature 'FastqcData'
plotAdapterContent(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).*",
  pwfCols,
  showPwf = TRUE,
  warn = 5,
  fail = 10,
  scaleColour = NULL,
  plotlyLegend = FALSE,
  ...
)

## S4 method for signature 'FastqcDataList'
plotAdapterContent(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).*",
  pwfCols,
  showPwf = TRUE,
  warn = 5,
  fail = 10,
  plotType = c("heatmap", "line"),
  adapterType = "Total",
  cluster = FALSE,
  dendrogram = FALSE,
  heat_w = 8L,
plotAdapterContent

## S4 method for signature 'FastpData'
plotAdapterContent(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).*",
  scaleFill = NULL,
  plotlyLegend = FALSE,
  plotTheme = theme(),
  ...
)

## S4 method for signature 'FastpDataList'
plotAdapterContent(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).*",
  pwfCols,
  showPwf = FALSE,
  warn = 5,
  fail = 10,
  cluster = FALSE,
  dendrogram = FALSE,
  scaleFill = NULL,
  plotTheme = theme(),
  heat_w = 8L,
  ...
)

### Arguments

- **x**: Can be a `FastqcData`, a `FastqcDataList` or character vector of file paths
- **usePlotly**: logical. Output as ggplot2 (default) or plotly object.
- **labels**: An optional named vector of labels for the file names. All filenames must be present in the names.
- **pattern**: regex used to trim the ends of all filenames for plotting
- **...**: Used to pass additional attributes to `theme()` for FastQC objects and geoms for Fastp objects
- **pwfCols**: Object of class `PwfCols()` containing the colours for PASS/WARN/FAIL
- **showPwf**: logical(1) Show PASS/WARN/FAIL status as would be included in a standard FastQC report
warn, fail
plotlyLegend
plotType
adapterType
cluster
dendrogram
heat_w
scaleFill, scaleColour
plotTheme

**Details**

This extracts the Adapter_Content module from the supplied object and generates a ggplot2 object, with a set of minimal defaults. The output of this function can be further modified using the standard ggplot2 methods.

When `x` is a single or FastqcData object line plots will always be drawn for all adapters. Otherwise, users can select line plots or heatmaps. When plotting more than one fastqc file, any undetected adapters will not be shown.

An interactive version of the plot can be made by setting `usePlotly` as TRUE.

**Value**

A standard ggplot2 object, or an interactive plotly object

**Examples**

```r
# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)

# The default plot
plotAdapterContent(fdl)

# Also subset the reads to just the R1 files
r1 <- grep("R1", fqName(fdl))
plotAdapterContent(fdl[r1])

# Plot just the Universal Adapter
# and change the y-axis using ggplot2::scale_y_continuous
plotAdapterContent(fdl, adapterType = "Illumina_Universal", plotType = "line") +
```
facet_wrap(~Filename) +
guides(colour = "none")

# For FastpData object, the plots are slightly different
fp <- FastpData(system.file("extdata/fastp.json.gz", package = "ngsReports"))
plotAdapterContent(fp, scaleFill = scale_fill_brewer(palette = "Set1"))

---

plotAlignmentSummary  Plot a summary of alignments

Description

Plot a summary of alignments from a set of log files

Usage

plotAlignmentSummary(
  x,
  type = c("star", "bowtie", "bowtie2", "hisat2"),
  usePlotly = FALSE,
  stripPaths = TRUE,
  asPercent = FALSE,
  ...
  fill = c("red", "yellow", "blue", rgb(0, 0.5, 1))
)

Arguments

  x  Paths to one or more alignment log files
  type  The aligner used. Can be one of star, bowtie, bowtie2 or hisat2
  usePlotly  logical. If TRUE an interactive plot will be generated.
  stripPaths  logical(1). Remove paths from the Filename column
  asPercent  Show alignments as percentages, with the alternative (FALSE) being the total
              number of reads If FALSE a ggplot object will be output
  ...  Used to pass additional attributes to theme() and between methods
  fill  Colours used to fill the bars. Passed to scale_fill_manual.

Details

Loads a set of alignment log files and creates a default plot. Implemented aligners are bowtie,
bowtie2, Hisat2 and STAR.

Value

A ggplot2 object, or a plotly object
plotAssemblyStats

Examples

```r
f <- c("bowtie2PE.txt", "bowtie2SE.txt")
bowtie2logs <- system.file("extdata", f, package = "ngsReports")
plotAlignmentSummary(bowtie2logs, "bowtie2")
```

Description

Plot a summary of assembly stats from a set of log files

Usage

```r
plotAssemblyStats(
  x,
  type = c("quast", "busco"),
  usePlotly = FALSE,
  plotType = c("bar", "paracoord"),
  ...
)
```

Arguments

- **x**: Paths to one or more log files
- **type**: The tool used. Can be one of quast or busco
- **usePlotly**: logical. If TRUE an interactive plot will be generated. If FALSE a ggplot object will be output
- **plotType**: character. Plot type to output, one of bar or paracoord.
- **...**: Used to pass additional attributes to theme() and between methods

Details

Loads a set of assembly log files and creates a default plot. Implemented tools are quast and BUSCO. quast will plot a parralel coordinate plot of some assembly statistics BUSCO will plot a stacked barplot of completeness statistics

Value

A ggplot2 object, or a plotly object
Examples

```r
# get quast log filenames
quastFiles <- system.file("extdata",
c("quast1.tsv", "quast2.tsv"), package = "ngsReports")

# The default plot
plotAssemblyStats(quastFiles)
```

---

**plotBaseQuals**

*Plot the Base Qualities for each file*

Description

Plot the Base Qualities for each file as separate plots

Usage

```r
plotBaseQuals(x, usePlotly = FALSE, labels, pattern = ".(fast\|fq\|bam).*", ...)
```

## S4 method for signature 'ANY'
```r
plotBaseQuals(x, usePlotly = FALSE, labels, pattern = ".(fast\|fq\|bam).*", ...)
```

## S4 method for signature 'FastqcData'
```r
plotBaseQuals( 
  x, 
  usePlotly = FALSE, 
  labels, 
  pattern = ".(fast\|fq\|bam).*", 
  pwfCols, 
  warn = 25, 
  fail = 20, 
  boxWidth = 0.8, 
  showPwf = TRUE, 
  plotlyLegend = FALSE, 
  ... 
)
```

## S4 method for signature 'FastqcDataList'
```r
plotBaseQuals( 
  x, 
  usePlotly = FALSE, 
  labels, 
  pattern = ".(fast\|fq\|bam).*", 
  pwfCols, 
  warn = 25, 
  fail = 20, 
  ... 
)
```
plotBaseQuals

showPwf = TRUE,
boxWidth = 0.8,
plotType = c("heatmap", "boxplot"),
plotValue = "Mean",
cluster = FALSE,
dendrogram = FALSE,
nc = 2,
heat_w = BL,
...

## S4 method for signature 'FastpData'
plotBaseQuals(
x,
usePlotly = FALSE,
labels,
pattern = ".(fast|fq|bam).*",
pwfCols,
warn = 25,
fail = 20,
showPwf = FALSE,
module = c("Before_filtering", "After_filtering"),
reads = c("read1", "read2"),
readsBy = c("facet", "linetype"),
bases = c("A", "T", "C", "G", "mean"),
scaleColour = NULL,
plotTheme = theme(),
plotlyLegend = FALSE,
...

## S4 method for signature 'FastpDataList'
plotBaseQuals(
x,
usePlotly = FALSE,
labels,
pattern = ".(fast|fq|bam).*",
pwfCols,
warn = 25,
fail = 20,
showPwf = FALSE,
module = c("Before_filtering", "After_filtering"),
plotType = "heatmap",
plotValue = c("mean", "A", "T", "C", "G"),
scaleFill = NULL,
plotTheme = theme(),
cluster = FALSE,
dendrogram = FALSE,
heat_w = 8L, 
... 
)

Arguments

x Can be a FastqcData, FastqcDataList or character vector of file paths
usePlotly logical Default FALSE will render using ggplot. If TRUE plot will be rendered with plotly
labels An optional named vector of labels for the file names. All filenames must be present in the names.
pattern Regex to remove from the end of the Fastp report and Fastq file names
... Used to pass additional attributes to theme() and between methods
pwfCols Object of class PwfCols() to give colours for pass, warning, and fail values in plot
warn, fail The default values for warn and fail are 30 and 20 respectively (i.e. percentages)
boxWidth set the width of boxes when using a boxplot
showPwf Include the Pwf status colours
plotlyLegend logical(1) Show legend for interactive plots. Only called when drawing line plots
plotType character Can be either "boxplot" or "heatmap"
plotValue character Type of data to be presented. Can be any of the columns returned by the appropriate call to getModule()
cluster logical default FALSE. If set to TRUE, fastqc data will be clustered using hierarchical clustering
dendrogram logical redundant if cluster is FALSE if both cluster and dendrogram are specified as TRUE then the dendrogram will be displayed.
nc numeric. The number of columns to create in the plot layout. Only used if drawing boxplots for multiple files in a FastqcDataList
heat_w Relative width of any heatmap plot components
module Select Before and After filtering when using a FastpDataList
reads Create plots for read1, read2 or all when using a FastpDataList
readsBy If paired reads are present, separate using either linetype or by facet
bases Which bases to include on the plot
scaleColour ggplot discrete colour scale, passed to lines
plotTheme theme object
scaleFill ggplot2 continuous scale. Passed to heatmap cells
plotDupLevels

Details

When acting on a FastqcDataList, this defaults to a heatmap using the mean Per_base_sequence_quality score. A set of plots which replicate those obtained through a standard FastQC html report can be obtained by setting plotType = "boxplot", which uses facet_wrap to provide the layout as a single ggplot object.

When acting an a FastqcData object, this replicates the Per_base_sequence_quality plots from FastQC with no faceting.

For large datasets, subsetting by R1 or R2 reads may be helpful.

An interactive plot can be obtained by setting usePlotly = TRUE.

Value

A standard ggplot2 object or an interactive plotly object

Examples

# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)

# The default plot for multiple libraries is a heatmap
plotBaseQuals(fdl)

# The default plot for a single library is the standard boxplot
plotBaseQuals(fdl[[1]])

# FastpData objects have qualities by base
fp <- FastpData(system.file("extdata/fastp.json.gz", package = "ngsReports"))
plotBaseQuals(
  fp, plotTheme = theme(plot.title = element_text(hjust = 0.5))
)

<table>
<thead>
<tr>
<th>plotDupLevels</th>
<th>Plot the combined Sequence_Duplication_Levels information</th>
</tr>
</thead>
</table>

Description

Plot the Sequence_Duplication_Levels information for a set of FASTQC reports
Usage

plotDupLevels(x, usePlotly = FALSE, labels, pattern = ".(fast|fq|bam).*", ...)

## S4 method for signature 'ANY'
plotDupLevels(x, usePlotly = FALSE, labels, pattern = "(fast|fq|bam).*", ...)

## S4 method for signature 'FastqcData'
plotDupLevels(
  x,
  usePlotly = FALSE,
  labels,
  pattern = "(fast|fq|bam).*",
  pwfCols,
  warn = 20,
  fail = 50,
  showPwf = TRUE,
  plotlyLegend = FALSE,
  lineCol = c("red", "blue"),
  lineWidth = 1,
  ...
)

## S4 method for signature 'FastqcDataList'
plotDupLevels(
  x,
  usePlotly = FALSE,
  labels,
  pattern = "(fast|fq|bam).*",
  pwfCols,
  warn = 20,
  fail = 50,
  showPwf = TRUE,
  plotlyLegend = FALSE,
  lineCol = c("red", "blue"),
  lineWidth = 1,
  ...
)

## S4 method for signature 'FastpData'
plotDupLevels(
  x,
  usePlotly = FALSE,
  labels,
  pattern = "(fast|fq|bam).*",
Arguments

x Can be a FastqcData, FastqcDataList or file path

usePlotly logical Default FALSE will render using ggplot. If TRUE plot will be rendered with plotly

labels An optional named vector of labels for the file names. All filenames must be present in the names. File extensions are dropped by default.

pattern regex to remove from the end of fastp & fastq file names

... Used to pass additional attributes to theme() and between methods

pwfCols Object of class PwfCols() to give colours for pass, warning, and fail values in the plot
The default values for warn and fail are 20 and 50 respectively (i.e. percentages)

The default values for warn and fail are 20 and 50 respectively (i.e. percentages)

logical(1) Show PWF rectangles in the background

logical(1) Show legend for line plots when using interactive plots

Colours and width of lines drawn

Plot Duplication levels 'pre' or 'post' deduplication. Can only take values "pre" and "post"

Choose between "heatmap" and "line"

logical default FALSE. If set to TRUE, fastqc data will be clustered using hierarchical clustering

logical Plot will automatically be clustered if TRUE.

Colour palette used for the heatmap

Relative width of the heatmap relative to other plot components

The maximum duplication level to plot. Beyond this level, all values will be summed

Colours for bars when calling geom_col()

theme object. Applied after a call to theme_bw()

Discrete scale used to fill heatmap cells

Details

This extracts the Sequence_Duplication_Levels from the supplied object and generates a ggplot2 object, with a set of minimal defaults. For multiple reports, this defaults to a heatmap with block sizes proportional to the percentage of reads belonging to that duplication category.

If setting usePlotly = FALSE, the output of this function can be further modified using standard ggplot2 syntax. If setting usePlotly = TRUE an interactive plotly object will be produced.

Value

A standard ggplot2 or plotly object

Examples

# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)

# Draw the default plot for a single file
plotDupLevels(fdl[[1]])

plotDupLevels(fdl)
plotFastqcPCA

**plotFastqcPCA**  
*Draw a PCA plot for Fast QC modules*

### Description

Draw a PCA plot for Fast QC modules across multiple samples [**Experimental**]

### Usage

```r
plotFastqcPCA(
  x,  
  module = "Per_sequence_GC_content",  
  usePlotly = FALSE,  
  labels,  
  pattern = ".(fast|fq|bam).*",  
  sz = 4,  
  groups,  
  ...
)
```

---

```r
## S4 method for signature 'ANY'
plotFastqcPCA(
  x,  
  module = "Per_sequence_GC_content",  
  usePlotly = FALSE,  
  labels,  
  pattern = ".(fast|fq|bam).*",  
  sz = 4,  
  groups,  
  ...
)
```

```r
## S4 method for signature 'character'
plotFastqcPCA(
  x,  
  module = "Per_sequence_GC_content",  
  usePlotly = FALSE,  
  labels,  
  pattern = ".(fast|fq|bam).*",  
  sz = 4,  
  groups,  
  ...
)
```

```r
## S4 method for signature 'FastqcDataList'
plotFastqcPCA(  
  x,
  ...
)
```
module = "Per_sequence_GC_content",
usePlotly = FALSE,
labels,
pattern = ".(fast|fq|bam).\*",
sz = 4,
groups,
pc = 1:2,
...)

Arguments

x Can be a FastqcDataList or character vector of file paths
module character vector containing the desired FastQC module (eg. c("Per_base_sequence_quality", "Per_base_sequence_content"))
usePlotly logical. Output as ggplot2 (default) or plotly object.
labels An optional named vector of labels for the file names. All file names must be present in the names of the vector.
pattern Regex to remove from the end of any filenames
sz The size of the text labels
groups Optional factor of the same length as x. If provided, the plot will be coloured using this factor as the defined groups. Ellipses will also be added to the final plot.
... Used to pass additional attributes to theme() and between methods
pc The two components to be plotted

Details

This carries out PCA on a single FastQC module and plots the output using either ggplot or plotly. Current modules for PCA are Per_base_sequence_quality, Per_sequence_quality_scores, Per_sequence_GC_content, Per_base_sequence_content, and Sequence_Length_Distribution.

If a factor is provided in the groups argument, this will be applied to the plotting colours and ellipses will be drawn using these groups. Only the labels will be plotted using geom_text()

Value

A standard ggplot2 object, or an interactive plotly object

Examples

# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)
grp <- as.factor(gsub(".+\(R\[12\]).\*", "\"\", fqName(fdl)))
**plotGcContent**

Plot the Per Sequence GC Content for a set of FASTQC files

**Usage**

```r
plotGcContent(x, usePlotly = FALSE, labels, pattern = ".(fast|fq|bam).*", ...)
```

## S4 method for signature 'ANY'

```r
plotGcContent(x, usePlotly = FALSE, labels, pattern = ".(fast|fq|bam).*", ...)
```

## S4 method for signature 'FastqcData'

```r
plotGcContent(x, usePlotly = FALSE, labels, pattern = ".(fast|fq|bam).*", ...)
```

## S4 method for signature 'FastqcDataList'

```r
plotGcContent(x, usePlotly = FALSE, labels, pattern = ".(fast|fq|bam).*", ...)
```

**Description**

Plot the Per Sequence GC Content for a set of FASTQC files.
species = "Hsapiens",
GObject,
Fastafile,
n = 1e+06,
plotType = c("heatmap", "line", "cdf"),
cluster = FALSE,
dendrogram = FALSE,
heat_w = 8,
pwfCols,
showPwf = TRUE,
scaleFill = NULL,
scaleColour = NULL,
plotlyLegend = FALSE,
lineCols = RColorBrewer::brewer.pal(12, "Paired"),
linetype = 1,
linewidth = 0.5,
...
)

## S4 method for signature 'FastpData'
plotGcContent(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).*",
  theoreticalGC = TRUE,
gcType = c("Genome", "Transcriptome"),
  species = "Hsapiens",
  GObject,
  Fastafile,
  n = 1e+06,
  plotType = "bar",
  scaleFill = NULL,
  plotlyLegend = FALSE,
  plotTheme = theme(),
  ...
)

## S4 method for signature 'FastpDataList'
plotGcContent(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).*",
  theoreticalGC = TRUE,
gcType = c("Genome", "Transcriptome"),
  species = "Hsapiens",
  GObject,
Arguments

- **x** Can be a `FastqcData`, `FastqcDataList` or character vector of file paths.
- **usePlotly** logical. Default FALSE will render using ggplot. If TRUE plot will be rendered with plotly.
- **labels** An optional named vector of labels for the file names.
- **pattern** Pattern to remove from the end of filenames.
- **...** Used to pass various potting parameters to themes and geoms.
- **theoreticalGC** logical. default is FALSE to give the true GC content, set to TRUE to normalize values of GC_Content by the theoretical values using `gcTheoretical()`. species must be specified. For Fastqc* objects, the entire distributions will be used, whereas for the Fastp* objects, only the expected mean value is shown as a horizontal line.
- **gcType** character. Select type of data to normalize GC content against. Accepts either "Genome" (default) or "Transcriptome".
- **species** character. if theoreticalGC is TRUE it must be accompanied by a species. Species currently supported can be obtained using `mData(gcTheoretical)`.
- **GCObject** an object of class GCTheoretical. Defaults to the gcTheoretical object supplied with the package.
- **plotlyLegend** logical(1). Show legend on interactive line plots.
- **Fastafile** a fasta file contains DNA sequences to generate theoretical GC content.
- **n** number of simulated reads to generate theoretical GC content from Fastafile.
- **counts** logical. Plot the counts from each file if counts = TRUE, otherwise frequencies will be plotted. Ignored if calling the function on a FastqcDataList.
- **scaleColour** ggplot2 scale for line colours.
- **lineCols**, **linetype**, **linewidth** Line colour type and width for observed and theoretical GC lines.
- **plotType** Takes values "line", "heatmap" or "cdf".
- **cluster** logical. default FALSE. If set to TRUE, fastqc data will be clustered using hierarchical clustering.
- **dendrogram** logical. redundant if cluster is FALSE if both cluster and dendrogram are specified as TRUE then the dendrogram will be displayed.
- **heat_w** Relative width of any heatmap plot components.
plotInsertSize

plotInsertSize

Description

Plot the insert size distribution from one of Fastp reports

Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pwfCols</td>
<td>Object of class PwfCols() to give colours for pass, warning, and fail values in plot</td>
</tr>
<tr>
<td>showPwf</td>
<td>logical(1) Show Pwf Status on the plot</td>
</tr>
<tr>
<td>scaleFill</td>
<td>ggplot2 scale for filling heatmap cells or bars</td>
</tr>
<tr>
<td>plotTheme</td>
<td>theme object</td>
</tr>
</tbody>
</table>

Details

Makes plots for GC_Content. When applied to a single FastqcData object a simple line plot will be drawn, with Theoretical GC content overlaid if desired.

When applied to multiple FastQC reports, the density at each GC content bin can be shown as a heatmap by setting theoreticalGC = FALSE. By default the difference in observed and expected theoretical GC is shown. Species and genome/transcriptome should also be set if utilising the theoretical GC content.

As an alternative to a heatmap, a series of overlaid distributions can be shown by setting plotType = "line".

Can produce a static ggplot2 object or an interactive plotly object.

Value

A ggplot2 or plotly object

Examples

```r
# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)

# The default plot for a FastqcDataList
plotGcContent(fdl)

# Plot a single FastqcData object
plotGcContent(fdl[[1]])
```

```r
# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)

# The default plot for a FastqcDataList
plotGcContent(fdl)

# Plot a single FastqcData object
plotGcContent(fdl[[1]])
```
plotInsertSize

Usage

plotInsertSize(x, usePlotly = FALSE, labels, pattern = ".(fast|fq|bam).*", ...)  

## S4 method for signature 'FastpData'
plotInsertSize(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).*",
  plotType = c("histogram", "cumulative"),
  counts = FALSE,
  plotTheme = theme(),
  expand.x = 0.01,
  expand.y = c(0, 0.05),
  ...
)

## S4 method for signature 'FastpDataList'
plotInsertSize(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).*",
  plotType = c("heatmap"),
  plotTheme = theme(),
  scaleFill = NULL,
  cluster = FALSE,
  dendrogram = FALSE,
  heat_w = 8,
  ...
)

Arguments

x                     A FastpData or FastpDataList object
usePlotly             logical. Generate an interactive plot using plotly
labels                An optional named vector of labels for the file names. All file names must be
                        present in the names of the vector.
pattern               Regex to remove from the end of any filenames
...                   Passed to geom* functions during plotting
plotType              Determine the plot type. Options vary with the input structure
counts                logical(1) Plot read counts, or percentages (default)
plotTheme             a theme object
expand.x, expand.y    Axis expansions
scaleFill             Continuous scale used to fill heatmap cells. Defaults to the "inferno" palette
cluster logical default FALSE. If set to TRUE, data will be clustered using hierarchical clustering

dendrogram logical redundant if cluster is FALSE if both cluster and dendrogram are specified as TRUE the dendrogram will be displayed.

heat_w Width of the heatmap relative to other plot components

Details
Takes a Fastp os as a set of Fastp reports and plot insert size distributions. Plots can be drawn as cumulative totals or the default histograms for a single report, and as boxplots or heatmaps for a set of reports

Value
A ggplot or plotly object

Examples
# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastp.json.gz", full.names = TRUE)
fp <- FastpData(fl)
plotInsertSize(
  fp, counts = TRUE, fill = "steelblue4",
  plotTheme = theme(plot.title = element_text(hjust = 0.5))
)
plotInsertSize(fp, plotType = "cumulative")

plotKmers

Plot Overrepresented Kmers

Description
Plot Overrepresented Kmers

Usage

plotKmers(x, usePlotly = FALSE, labels, pattern = ".(fast|fq|bam).*", ...)

## S4 method for signature 'ANY'
plotKmers(x, usePlotly = FALSE, labels, pattern = ".(fast|fq|bam).*", ...)

## S4 method for signature 'FastqcData'
plotKmers(
x,
  usePlotly = FALSE,
  labels,
pattern = ".(fast|fq|bam).\*", n = 6,
linewidth = 0.5,
plotlyLegend = FALSE,
scaleColour = NULL,
pal = c("red", "blue", "green", "black", "magenta", "yellow"), ...
)

## S4 method for signature 'FastqcDataList'
plotKmers(
x,
usePlotly = FALSE,
labels,
pattern = ".(fast|fq|bam).\*",
cluster = FALSE,
dendrogram = FALSE,
pwfCols,
showPwf = TRUE,
scaleFill = NULL,
heatCol = hcl.colors(50, "inferno"),
heat_w = 8,
...
)

## S4 method for signature 'FastpData'
plotKmers(
x,
usePlotly = FALSE,
labels,
pattern = ".(fast|fq|bam).\*",
module = c("Before\_filtering", "After\_filtering"),
reads = c("read1", "read2"),
readsBy = c("facet", "mean", "diff"),
trans = "log2",
scaleFill = NULL,
plotTheme = theme(),
plotlyLegend = FALSE,
...
)

### Arguments

**x**
Can be a FastqcData, FastqcDataList or file paths

**usePlotly**
logical Default FALSE will render using ggplot. If TRUE plot will be rendered with plotly

**labels**
An optional named vector of labels for the file names. All filenames must be present in the names.
pattern

regex to drop from the end of filenames

... Used to pass parameters to theme for FastqData objects and to geoms for FastpData objects

n numeric. The number of Kmers to show.

linewidth Passed to geom_line()

plotlyLegend Show legend for interactive plots

pal The colour palette. If the vector supplied is less than n, grDevices::colorRampPalette() will be used

cluster logical default FALSE. If set to TRUE, fastqc data will be clustered using hierarchical clustering

dendrogram logical redundant if cluster is FALSE if both cluster and dendrogram are specified as TRUE then the dendrogram will be displayed.

pwfCols Object of class PwfCols() to give colours for pass, warning, and fail values in the plot

showPwf Show the PASS/WARN/FAIL status

scaleFill, scaleColour ggplot2 scales to be used for colour palettes

heatCol Colour palette used for the heatmap. Default is inferno from the viridis set of palettes

heat_w Relative width of any heatmap plot components

module The module to obtain data from when using a FastpData object

reads Either read1 or read2. Only used when using a FastpData object

readsBy Strategy for visualising both read1 and read2. Can be set to show each set of reads by facet, or within the same plot taking the mean of the enrichment above mean, or the difference in the enrichment above mean

trans Function for transforming the count/mean ratio. Set as NULL to use the ratio without transformation

plotTheme theme object

Details

As the Kmer Content module present in FastQC reports is relatively uninformative, and omitted by default in later versions of FastQC, these are rudimentary plots.

Plots for FastqData objects replicate those contained in a FastQC report, whilst the heatmap generated from FastqDataList objects simply show the location and abundance of over-represented Kmers.

Value

A standard ggplot2 object or an interactive plotly object
Examples

# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)
plotKmers(fdl[[1]])

# Use a FastpData object
fl <- system.file("extdata", "fastp.json.gz", package = "ngsReports")
fp <- FastpData(fl)
plotKmers(fp, size = 2)
plotKmers(fp, reads = "read1", size = 2, trans = NULL,
          scaleFill = scale_fill_gradient(low = "white", high = "black")
)

plotNContent

Draw an N Content Plot

Description

Draw an N Content Plot across one or more FastQC reports

Usage

plotNContent(x, usePlotly = FALSE, labels, pattern = ".(fast|fq|bam).*", ...)

## S4 method for signature 'ANY'
plotNContent(x, usePlotly = FALSE, labels, pattern = ".(fast|fq|bam).*", ...)

## S4 method for signature 'FastqcData'
plotNContent(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).*",
  pwfCols,
  warn = 5,
  fail = 20,
  showPwf = TRUE,
  ...,
  lineCol = "red"
)

## S4 method for signature 'FastqcDataList'
plotNContent(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).\*",
  pwfCols,
  warn = 5,
  fail = 20,
  showPwf = TRUE,
  cluster = FALSE,
  dendrogram = FALSE,
  heat_w = 8,
  scaleFill = NULL,
  ...
)

## S4 method for signature 'FastpData'
plotNContent(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).\*",
  module = c("Before_filtering", "After_filtering"),
  moduleBy = c("facet", "colour", "linetype"),
  reads = c("read1", "read2"),
  readsBy = c("facet", "colour", "linetype"),
  scaleColour = NULL,
  scaleLine = NULL,
  plotTheme = theme(),
  plotlyLegend = FALSE,
  ...
)

## S4 method for signature 'FastpDataList'
plotNContent(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).\*",
  module = c("Before_filtering", "After_filtering"),
  reads = c("read1", "read2"),
  scaleFill = NULL,
  plotTheme = theme(),
  cluster = FALSE,
  dendrogram = FALSE,
  heat_w = 8,
  ...
)
plotNContent

Arguments

x Can be a FastqcData, FastqcDataList or file paths
usePlotly logical. Output as ggplot2 (default) or plotly object.
labels An optional named vector of labels for the file names. All filenames must be present in the names.
pattern Regex used to trim the end of filenames
... Used to pass additional attributes to theme() for FastqcData objects and to geom* calls for FastpData-based objects
pwfCols Object of class PwfCols() containing the colours for PASS/WARN/FAIL
warn, fail The default values for warn and fail are 5 and 10 respectively (i.e. percentages)
showPwf logical(1) Show the PASS/WARN/FAIL status
lineCol Line colours
cluster logical default FALSE. If set to TRUE, fastqc data will be clustered using hierarchical clustering
dendrogram logical redundant if cluster is FALSE if both cluster and dendrogram are specified as TRUE then the dendrogram will be displayed.
heat_w Relative width of any heatmap plot components
scaleFill, scaleColour, scaleLine ggplot2 scale objects
module Used for Fastp* structures to show results before or after filtering
moduleBy, readsBy How to show each module or set of reads on the plot
reads Show plots for read1, read2 or both.
plotTheme theme object
plotlyLegend logical(1) Show legend on interactive plots

Details

This extracts the N_Content from the supplied object and generates a ggplot2 object, with a set of minimal defaults. The output of this function can be further modified using the standard ggplot2 methods.

When x is a single FastqcData object line plots will always be drawn for all Ns. Otherwise, users can select line plots or heatmaps.

Value

A standard ggplot2 object, or an interactive plotly object
Examples

```r
## Using a Fastp Data object
fl <- system.file("extdata/fastp.json.gz", package = "ngsReports")
fp <- FastpData(fl)
plotNContent(fp)
plotNContent(
  fp, pattern = "_001.+",
  moduleBy = "colour", scaleColour = scale_colour_brewer(palette = "Set1"),
  plotTheme = theme(
    legend.position = c(0.99, 0.99), legend.justification = c(1, 1),
    plot.title = element_text(hjust = 0.5)
  )
)
```

plotOverrep  
*Plot a summary of Over-represented Sequences*

Description

Plot a summary of Over-represented Sequences for a set of FASTQC reports

Usage

```r
plotOverrep(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).+",
  pwfCols,
  ...
)
```

```r
## S4 method for signature 'ANY'
plotOverrep(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).+",
  pwfCols,
  ...
)

## S4 method for signature 'character'
plotOverrep(
  x,
  usePlotly = FALSE,
```
plotOverrep

labels,
pattern = ".(fast|fq|bam).*",
pwfCols,
...
)

## S4 method for signature 'FastqcData'
plotOverrep(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).*",
pwfCols,
  n = 10,
  expand.x = c(0, 0, 0.05, 0),
  expand.y = c(0, 0.6, 0, 0.6),
  plotlyLegend = FALSE,
  ...
)

## S4 method for signature 'FastqcDataList'
plotOverrep(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).*",
pwfCols,
  showPwf = TRUE,
  cluster = FALSE,
  dendrogram = FALSE,
  scaleFill = NULL,
  paletteName = "Set1",
  panel_w = 8,
  expand.x = c(0, 0, 0.05, 0),
  expand.y = rep(0, 4),
  ...
)

Arguments

x Can be a FastqcData, FastqcDataList or file paths
usePlotly logical Default FALSE will render using ggplot. If TRUE plot will be rendered with plotly
labels An optional named factor of labels for the file names. All filenames must be present in the names.
pattern Regex to remove from the end of any filenames
pwfCols Object of class PwfCols() containing the colours for PASS/WARN/FAIL
... Used to pass additional attributes to theme() and between methods
n The number of sequences to plot from an individual file
expand.x, expand.y Output from expansion() or numeric vectors of length 4. Passed to scale_*_continuous()
plotlyLegend Show legend on interactive plots
showPwf Show PASS/WARN/FAIL status on the plot
cluster logical default FALSE. If set to TRUE, fastqc data will be clustered using hierarchical clustering
dendrogram logical redundant if cluster is FALSE if both cluster and dendrogram are specified as TRUE then the dendrogram will be displayed.
scaleFill ggplot scale object
paletteName Name of the palette for colouring the possible sources of the overrepresented sequences. Must be a palette name from RColorBrewer. Ignored if specifying the scaleFill separately
panel_w Width of main panel on output

Details
Percentages are obtained by simply summing those within a report. Any possible double counting by FastQC is ignored for the purposes of a simple approximation.

Plots generated from a FastqcData object will show the top \( n \) sequences grouped by their predicted source & coloured by whether the individual sequence would cause a WARN/FAIL.

Plots generated from a FastqcDataList group sequences by predicted source and summarise as a percentage of the total reads.

Value
A standard ggplot2 object

Examples
# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)

# A brief summary across all FastQC reports
plotOverrep(fdl)
**plotReadTotals**  

_Draw a barplot of read totals_

**Description**

Draw a barplot of read totals

**Usage**

```r
plotReadTotals(x, usePlotly = FALSE, labels, pattern = ".*(fast|fq|bam).*", ...)
```

---

## S4 method for signature 'ANY'

```r
plotReadTotals(x, usePlotly = FALSE, labels, pattern = ".*(fast|fq|bam).*", ...)
```

---

## S4 method for signature 'FastqcDataList'

```r
plotReadTotals(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".*(fast|fq|bam).*",
  duplicated = TRUE,
  bars = c("stacked", "adjacent"),
  vertBars = TRUE,
  divBy = 1,
  barCols = c("red", "blue"),
  expand.y = c(0, 0.02),
  plotlyLegend = FALSE,
  ...
)
```

---

## S4 method for signature 'FastpDataList'

```r
plotReadTotals(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".*(fast|fq|bam).*",
  adjPaired = TRUE,
  divBy = 1e+06,
  scaleFill = NULL,
  labMin = 0.05,
  status = TRUE,
  labelVJ = 0.5,
  labelFill = "white",
  plotTheme = theme(),
  vertBars = FALSE,
  plotlyLegend = FALSE,
  expand.y = c(0, 0.05),
)
Arguments

- **x**: Can be a `FastqcData`, `FastqcDataList` or file paths
- **usePlotly**: logical. Default FALSE will render using ggplot. If TRUE plot will be rendered with plotly
- **labels**: An optional named vector of labels for the file names. All filenames must be present in the names.
- **pattern**: Regex used to trim the end of filenames
- **...**: Used to pass additional attributes to theme()
- **duplicated**: logical(1). Include deduplicated read total estimates to plot charts
- **bars**: If duplicated = TRUE, show unique and deduplicated reads as "stacked" or "adjacent".
- **vertBars**: logical(1) Show bars as vertical or horizontal
- **divBy**: Scale read totals by this value. The default shows the y-axis in millions for FastpDataList objects, but does not scale FastQC objects, for the sake of backwards compatility
- **barCols**: Colours for duplicated and unique reads.
- **expand.y**: Passed to `ggplot2::expansion` for the axis showing totals
- **plotlyLegend**: logical(1) Show legend on interactive plots
- **adjPaired**: Scale read totals by 0.5 when paired
- **scaleFill**: ScaleDiscrete function to be applied to the plot
- **labMin**: Only show labels for filtering categories higher than this values as a proportion of reads. Set to any number > 1 to turn off labels
- **status**: logical(1) Include read status in the plot
- **labelVJ**: Relative vertical position to labels within each bar.
- **labelFill**: Passed to `geom_label`
- **plotTheme**: `theme` to be added to the plot

Details

Draw a barplot of read totals using the standard ggplot2 syntax. The raw data from `readTotals()` can otherwise be used to manually create a plot.

Duplication levels are based on the value shown on FASTQC reports at the top of the DeDuplicated-Totals plot, which is known to be inaccurate. As it still gives a good guide as to sequence diversity it is included as the default. This can be turned off by setting duplicated = FALSE.

For FastpDataList objects, duplication statistics are not part of the default module containing ReadTotals. However, the status of reads and the reason for being retained or filtered is, and as such these are shown instead of duplication statistics.
Value

Returns a ggplot or plotly object

Examples

# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)

# Plot the Read Totals showing estimated duplicates
plotReadTotals(fdl)

# Plot the Read Totals without estimated duplicates
plotReadTotals(fdl, duplicated = FALSE)

plotSeqContent

Plot the per base content as a heatmap

Description

Plot the Per Base content for a set of FASTQC files.

Usage

plotSeqContent(x, usePlotly = FALSE, labels, pattern = ".(fast|fq|bam).*", ...)

## S4 method for signature 'ANY'
plotSeqContent(x, usePlotly = FALSE, labels, pattern = ".(fast|fq|bam).*", ...)

## S4 method for signature 'FastqcData'
plotSeqContent(
x,
usePlotly = FALSE,
labels,
pattern = ".(fast|fq|bam).*",
bases = c("A", "T", "C", "G"),
scaleColour = NULL,
plotTheme = theme(),
plotlyLegend = FALSE,
expand.x = 0.02,
expand.y = c(0, 0.05),
...)

## S4 method for signature 'FastqcDataList'

```
plotSeqContent(
  x,
  usePlotly = FALSE,
  labels,
  pattern = "\.(fast|fq|bam)\.*",
  pwfCols,
  showPwf = TRUE,
  plotType = c("heatmap", "line", "residuals"),
  scaleColour = NULL,
  plotTheme = theme(),
  cluster = FALSE,
  dendrogram = FALSE,
  heat_w = 8,
  plotlyLegend = FALSE,
  nc = 2,
  ...
)
```

## S4 method for signature 'FastpData'

```
plotSeqContent(
  x,
  usePlotly = FALSE,
  labels,
  pattern = "\.(fast|fq|bam)\.*",
  module = c("Before_filtering", "After_filtering"),
  reads = c("read1", "read2"),
  readsBy = c("facet", "linetype"),
  moduleBy = c("facet", "linetype"),
  bases = c("A", "T", "C", "G", "N", "GC"),
  scaleColour = NULL,
  scaleLine = NULL,
  plotlyLegend = FALSE,
  plotTheme = theme(),
  expand.x = 0.02,
  expand.y = c(0, 0.05),
  ...
)
```

## S4 method for signature 'FastpDataList'

```
plotSeqContent(
  x,
  usePlotly = FALSE,
  labels,
  pattern = "\.(fast|fq|bam)\.*",
  module = c("Before_filtering", "After_filtering"),
  moduleBy = c("facet", "linetype"),
  reads = c("read1", "read2"),
  ...)
plotSeqContent

readsBy = c("facet", "linetype"),
bases = c("A", "T", "C", "G", "N", "GC"),
showPwf = FALSE,
pwfCols,
warn = 10,
fail = 20,
plotType = c("heatmap", "line", "residuals"),
plotlyLegend = FALSE,
scaleColour = NULL,
scaleLine = NULL,
plotTheme = theme(),
cluster = FALSE,
dendrogram = FALSE,
heat_w = 8,
expand.x = c(0.01),
expand.y = c(0, 0.05),
nc = 2,
...
)

Arguments

x Can be a FastqcData, FastqcDataList or file paths

usePlotly logical. Generate an interactive plot using plotly

labels An optional named vector of labels for the file names. All file names must be present in the names of the vector.

pattern Regex to remove from the end of any filenames

... Used to pass additional attributes to plotting geoms

bases Which bases to draw on the plot. Also becomes the default plotting order by setting these as factor levels

scaleColour Discrete colour scale as a ggplot ScaleDiscrete object. If not provided, will default to scale_colour_manual

plotTheme theme object to be applied. Note that all plots will have theme_bw theme applied by default, as well as any additional themes supplied here

plotlyLegend logical(1) Show legends for interactive plots. Ignored for heatmaps

expand.x, expand.y Passed to expansion in the x- and y-axis scales respectively

pwfCols Object of class PwfCols() to give colours for pass, warning, and fail values in plot

showPwf Show PASS/WARN/FAIL categories as would be defined in a FastQC report

plotType character. Type of plot to generate. Must be "line", "heatmap" or "residuals"

cluster logical default FALSE. If set to TRUE, fastqc data will be clustered using hierarchical clustering

dendrogram logical redundant if cluster is FALSE if both cluster and dendrogram are specified as TRUE then the dendrogram will be displayed.
plotSeqContent

heat_w  Relative width of any heatmap plot components
nc  Specify the number of columns if plotting a FastqcDataList as line plots. Passed to facet_wrap.
module  Fastp Module to show. Can only be Before/After_filtering
reads  Which set of reads to show
readsBy, moduleBy  When plotting both R1 & R2 and both modules, separate by either linetype or linetype
scaleLine  Discrete scale_linetype object. Only relevant if plotting values by linetype
warn, fail  Default values for WARN and FAIL based on FastQC reports. Only applied to heatmaps for FastpDataList objects

Details

Per base sequence content (%A, %T, %G, %C), is shown as four overlaid heatmap colours when plotting from multiple reports. The individual line plots are able to be generated by setting plotType = "line", and the layout is determined by facet_wrap from ggplot2.

Individual line plots are also generated when plotting from a single FastqcData object.

If setting usePlotly = TRUE for a large number of reports, the plot can be slow to render. An alternative may be to produce a plot of residuals for each base, produced by taking the position-specific mean for each base.

Value

A ggplot2 object or an interactive plotly object

Examples

# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)

# The default plot
plotSeqContent(fdl)

fp <- FastpData(system.file("extdata/fastp.json.gz", package = "ngsReports"))
plotSeqContent(fp)
plotSeqContent(fp, moduleBy = "linetype", bases = c("A", "C", "G", "T"))
plotSeqLengthDistn

Plot the Sequence Length Distribution

Description

Plot the Sequence Length Distribution across one or more FASTQC reports

Usage

plotSeqLengthDistn(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast\|fq\|bam)\.*",
  ...
)

## S4 method for signature 'ANY'
plotSeqLengthDistn(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast\|fq\|bam)\.*",
  ...
)

## S4 method for signature 'character'
plotSeqLengthDistn(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast\|fq\|bam)\.*",
  ...
)

## S4 method for signature 'FastqcData'
plotSeqLengthDistn(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast\|fq\|bam)\.*",
  counts = TRUE,
  plotType = c("line", "cdf"),
  expand.x = c(0, 0.2, 0, 0.2),
  plotlyLegend = FALSE,
  colour = "red",
  ...
plotSeqLengthDistn

## S4 method for signature 'FastqcDataList'

```
plotSeqLengthDistn(x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).*",
  counts = FALSE,
  plotType = c("heatmap", "line", "cdf"),
  cluster = FALSE,
  dendrogram = FALSE,
  heat_w = 8,
  pwfCols,
  showPwf = TRUE,
  scaleFill = NULL,
  scaleColour = NULL,
  heatCol = hcl.colors(50, "inferno"),
  plotlyLegend = FALSE,
  ...
)
```

### Arguments

- **x**: Can be a `FastqcData`, `FastqcDataList` or file paths
- **usePlotly**: logical. Output as ggplot2 or plotly object.
- **labels**: An optional named vector of labels for the file names. All filenames must be present in the names.
- **pattern**: Regex to remove from the end of any filenames
- **...**: Used to pass additional attributes to `theme()`
- **counts**: logical. Should distributions be shown as counts or frequencies (percentages)
- **plotType**: character. Can only take the values plotType = "heatmap" plotType = "line" or plotType = "cdf"
- **expand.x**: Output from `expansion()` or numeric vector of length 4. Passed to `scale_x_discrete`
- **plotlyLegend**: logical(1) Show legend for interactive line plots
- **colour**: Line colour
- **cluster**: logical default FALSE. If set to TRUE, fastqc data will be clustered using hierarchical clustering
- **dendrogram**: logical redundant if cluster and usePlotly are FALSE. If both cluster and dendrogram are specified as TRUE then the dendrogram will be displayed.
- **heat_w**: Relative width of any heatmap plot components
- **pwfCols**: Object of class `PwfCols()` to give colours for pass, warning, and fail values in plot
- **showPwf**: logical(1) Show PASS/WARN/FAIL status
plotSeqQuals

scaleFill, scaleColour
Optional ggplot scale objects
heatCol The colour scheme for the heatmap

Details
This extracts the Sequence Length Distribution from the supplied object and generates a ggplot2 object, with a set of minimal defaults. The output of this function can be further modified using the standard ggplot2 methods.

A cdf plot can also be generated to provide guidance for minimum read length in some NGS workflows, by setting `plotType = "cdf"`. If all libraries have reads of identical lengths, these plots may be less informative.

An alternative interactive plot is available by setting the argument `usePlotly = TRUE`.

Value
A standard ggplot2 object, or an interactive plotly object

Examples

```r
# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(f1)

# Plot as a frequency plot using lines
plotSeqLengthDistn(fdl)

# Or plot the cdf
plotSeqLengthDistn(fdl, plotType = "cdf")
```

plotSeqQuals

Plot the Per Sequence Quality Scores

Description
Plot the Per Sequence Quality Scores for a set of FASTQC reports

Usage

```r
plotSeqQuals(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).*",
```

## S4 method for signature 'ANY'
plotSeqQuals(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).\*",
  pwfCols,
  ...
)

## S4 method for signature 'character'
plotSeqQuals(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).\*",
  pwfCols,
  ...
)

## S4 method for signature 'FastqcData'
plotSeqQuals(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).\*",
  pwfCols,
  showPwf = TRUE,
  counts = FALSE,
  alpha = 0.1,
  warn = 30,
  fail = 20,
  colour = "red",
  plotlyLegend = FALSE,
  ...
)

## S4 method for signature 'FastqcDataList'
plotSeqQuals(
  x,
  usePlotly = FALSE,
  labels,
  pattern = ".(fast|fq|bam).\*",
  pwfCols,
counts = FALSE,
alpha = 0.1,
warn = 30,
fail = 20,
showPwf = TRUE,
plotType = c("heatmap", "line"),
dendrogram = FALSE,
cluster = FALSE,
scaleFill = NULL,
heatCols = hcl.colors(100, "inferno"),
heat_w = 8,
scaleColour = NULL,
plotlyLegend = FALSE,
...)

Arguments

x    Can be a FastqcData, FastqcDataList or path
usePlotly logical Default FALSE will render using ggplot. If TRUE plot will be rendered with plotly
labels An optional named vector of labels for the file names. All file names must be present in the names of the vector.
pattern Regex to remove from the end of any filenames
pwfCols Object of class PwfCols() containing the colours for PASS/WARN/FAIL
... Used to pass various potting parameters to theme. Can also be used to set size and colour for box outlines.
showPwf logical(1) Show PASS/WARN/FAIL status
counts logical. Plot the counts from each file if counts = TRUE, otherwise the frequencies will be plotted
alpha set alpha for line graph bounds
warn, fail The default values for warn and fail are 5 and 10 respectively (i.e. percentages)
colour Colour for single line plots
plotlyLegend logical(1) Show legend for interactive line plots
plotType character. Can only take the values plotType = "heatmap" or plotType = "line"
dendrogram logical redundant if cluster is FALSE if both cluster and dendrogram are specified as TRUE then the dendrogram will be displayed.
cluster logical default FALSE. If set to TRUE, fastqc data will be clustered using hierarchical clustering
scaleFill, scaleColour ggplot2 scales
heatCols Colour palette for the heatmap
heat_w Relative width of any heatmap plot components
Details

Plots the distribution of average sequence quality scores across the set of files. Values can be plotted either as counts (counts = TRUE) or as frequencies (counts = FALSE).

Any faceting or scale adjustment can be performed after generation of the initial plot, using the standard methods of ggplot2 as desired.

Value

A standard ggplot2 object, or an interactive plotly object

Examples

# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)

# The default plot
plotSeqQuals(fdl)

# Also subset the reads to just the R1 files
r1 <- grepl("R1", fqName(fdl))
plotSeqQuals(fdl[r1])

plotSummary

Plot the PASS/WARN/FAIL information

Description

Extract the PASS/WARN/FAIL summaries and plot them

Usage

plotSummary(
  x,
  usePlotly = FALSE,
  labels,
  pwfCols,
  cluster = FALSE,
  dendrogram = FALSE,
  ...
)

## S4 method for signature 'ANY'
plotSummary(
plotSummary

### S4 method for signature 'character'

```r
plotSummary(
  x,
  usePlotly = FALSE,
  labels,
  pwfCols,
  cluster = FALSE,
  dendrogram = FALSE,
  ...
)
```

### S4 method for signature 'FastqcDataList'

```r
plotSummary(
  x,
  usePlotly = FALSE,
  labels,
  pwfCols,
  cluster = FALSE,
  dendrogram = FALSE,
  ...

  gridlineWidth = 0.2,
  gridlineCol = "grey20"
)
```

**Arguments**

- `x` Can be a `FastqcData`, `FastqcDataList` or character vector of file paths
- `usePlotly` logical. Generate an interactive plot using plotly
- `labels` An optional named vector of labels for the file names. All filenames must be present in the names. File extensions are dropped by default.
- `pwfCols` Object of class `PwfCols()` containing the colours for PASS/WARN/FAIL
- `cluster` logical default FALSE. If set to TRUE, fastqc data will be clustered using hierarchical clustering
- `dendrogram` logical redundant if cluster is FALSE if both cluster and dendrogram are specified as TRUE then the dendrogram will be displayed.
- `...` Used to pass various potting parameters to theme.
- `gridlineWidth`, `gridlineCol` Passed to geom_hline and geom_vline to determine width and colour of gridlines
Details

This uses the standard ggplot2 syntax to create a three colour plot. The output of this function can be further modified using the standard ggplot2 methods if required.

Value

A ggplot2 object (usePlotly = FALSE) or an interactive plotly object (usePlotly = TRUE)

Examples

# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)

# Check the overall PASS/WARN/FAIL status
plotSummary(fdl)

```
pwf
Colours for PASS/WARN/FAIL
```

Description

Default colours for PASS/WARN/FAIL

Usage

pwf

Format

An object of class PwfCols of length 1.

Details

pwf is an object of class PwfCols supplied with the package and used as the default colouring. Colours correspond approximately to PASS, WARN and FAIL from the FASTQC reports, with the additional colour (MAX) included to indicate an extreme FAIL. In order, these colours in the default vector are green (rgb(0, 0.8, 0)), yellow (rgb(0.9, 0.9, 0.2)), red (rgb(0.8, 0.2, 0.2)) and white (rgb(1, 1, 1))

Examples

# Make a pie chart showing the default colours
pie(rep(1,4), labels = names(pwf), col = getColours(pwf))
PwfCols-class

The PwfCols class and associated methods

Description

Define the PwfCols class and associated methods

Details

This is an object of with four colours in components named PASS, WARN, FAIL and MAX. Used to indicate these categories as defined on the standard plots from fastqc.

Slots

PASS A vector of length 1, defining the colour for PASS in rgb format. Defaults to rgb(0, 0.8, 0)

WARN A vector of length 1, defining the colour for WARN in rgb format. Defaults to rgb(0.9, 0.9, 0.2)

FAIL A vector of length 1, defining the colour for FAIL in rgb format. Defaults to rgb(0.8, 0.2, 0.2)

MAX A vector of length 1, defining the colour for an extreme FAIL or NA in rgb format. Defaults to rgb(1, 1, 1)

readTotals

Get the read totals

Description

Get the read totals from one or more FASTQC reports

Usage

readTotals(x)

Arguments

x Can be a FastqcData, FastqcDataList, FastpData, FastpDataList or file paths

Value

A tibble with the columns Filename and Total_Sequences
### TheoreticalGC-class

#### Description

Contains Theoretical GC content for a selection of species

#### Details

Estimates are able to be retained for genomic and transcriptomic sequences. Values are stored as frequencies.

#### Value

An object of class TheoreticalGC

#### Slots

- **Genome** A data.frame containing theoretical GC content for genomic sequences
- **Transcriptome** A data.frame containing theoretical GC content for transcriptomic sequences
- **mData** A data.frame containing metadata about all species in the object

#### Examples

```r
## How to form an object using your own fasta file
faDir <- system.file("extdata", package = "ngsReports")
faFile <- list.files(faDir, pattern = "fasta", full.names = TRUE)
gen_df <- estGcDistn(faFile, n = 200)
gen_df <- dplyr::rename(gen_df, Athaliana = Freq)
mData_df <-
data.frame(Name = "Athaliana", Genome = TRUE, Transcriptome = FALSE)
tr_df <- data.frame()
myGC <- new("TheoreticalGC", Genome = gen_df, Transcriptome = tr_df, mData = mData_df)
```
writeHtmlReport

Write an HTML Summary Report

Description

Compiles an HTML report using a supplied template

Usage

```r
writeHtmlReport(
    fastqcDir,
    template,
    outDir,
    usePlotly = TRUE,
    species = "Hsapiens",
    gcType = c("Genome", "Transcriptome"),
    nOver = 30,
    targetsDF,
    overwrite = FALSE,
    quiet = TRUE
)
```

Arguments

- `fastqcDir`: A directory containing zipped, or extracted FastQC reports
- `template`: The template file which will be copied into `fastqcDir`
- `outDir`: The directory to write the compiled document to
- `usePlotly`: Generate interactive plots?
- `species`: Species/closely related species of sequenced samples
- `gcType`: Is the data "Transcriptomic" or "Genomic" in nature?
- `nOver`: The maximum number of Overrepresented Sequences to show
- `targetsDF`: A data.frame with at least two columns named `Filename` and `Label`. The filenames should match the original fastq files, and the labels should be simply alternative labels for these files for convenience.
- `overwrite`: logical. Overwrite any previous copies of the template file in the destination directory
- `quiet`: logical. Show or hide markdown output in the Console.

Details

This will take a user supplied template, or the file supplied with the package and create an HTML summary of all standard FASTQC plots for all files in the supplied directory.
Value

Silently returns TRUE and will output a compiled HTML file from the supplied Rmarkdown template file.

Examples

```r
# Not run:
packageDir <- system.file("extdata", package = "ngsReports")
fileList <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)
# Copy these files to tempdir() to avoid overwriting
# any files in the package directory
file.copy(fileList, tempdir(), overwrite = TRUE)
writeHtmlReport(fastqcDir = tempdir())
```

## End(Not run)

### Description

Extract elements from FastqcDataList Object

### Usage

```r
# S4 method for signature 'FastqcDataList,numeric,missing'
x[i, j, ..., drop = TRUE]

# S4 method for signature 'FastqcDataList,character,missing'
x[i, j, ..., drop = TRUE]

# S4 method for signature 'FastqcDataList,logical,missing'
x[i, j, ..., drop = TRUE]

# S4 method for signature 'FastqcDataList,ANY,missing'
x[i, j, ..., drop = TRUE]

# S4 method for signature 'FastqDataList,numeric,missing'
x[i, j, ..., drop = TRUE]

# S4 method for signature 'FastqDataList,character,missing'
x[i, j, ..., drop = TRUE]

# S4 method for signature 'FastqDataList,logical,missing'
x[i, j, ..., drop = TRUE]

# S4 method for signature 'FastqDataList,ANY,missing'
x[i, j, ..., drop = TRUE]

# Extract Elements

# FastqcDataList,numeric,missing-method

## Extract Elements
```r
## S4 method for signature 'FastqcDataList,ANY,missing'
x[i, j, ..., drop = TRUE]

Arguments

- **x**: A FastqcDataList or FastpDataList
- **i**: character, logical or integer vector
- **j**: not used
- **...**: not used
- **drop**: not used

Details

Extract elements in a consistent manner with R conventions

Value

Will return a subset of the original object following the standard rules for subsetting objects

Examples

```r
# Get the files included with the package
packageDir <- system.file("extdata", package = "ngsReports")
fl <- list.files(packageDir, pattern = "fastqc.zip", full.names = TRUE)

# Load the FASTQC data as a FastqcDataList object
fdl <- FastqcDataList(fl)

# Subsetting using the standard methods
fdl[[1]]
fdl[[1]]
```
INDEX

罂粟解码工具

\[\text{parseMacs2CallpeakLogs}, 22\]
\[\text{parseQuastLogs}, 23\]
\[\text{parseRnaseqcMetricsLogs}, 23\]
\[\text{parseStarLogs}, 24\]
\[\text{parseTrimmomaticLogs}, 24\]
\[\text{parseUmitoolsDedupLogs}, 25\]
\[\text{prepHeatmap}, 25\]
\[\text{renderDendro}, 26\]
\[\text{splitByTab}, 26\]
\[\text{updateThemeFromDots}, 27\]
\[\text{[,FastpDataList,ANY,missing-method}\]
\[\text{[,Fast pDataList,character,missing-method}\]
\[\text{[,Fast pDataList,logical,missing-method}\]
\[\text{[,Fast pDataList,numeric,missing-method}\]
\[\text{[,FastqcDataList,ANY,missing-method}\]
\[\text{[,FastqcDataList,character,missing-method}\]
\[\text{[,FastqcDataList,logical,missing-method}\]
\[\text{[,FastqcDataList,numeric,missing-method}\]
\[\text{[,FastqcDataList,ANY,missing-method}\]
\[\text{[,FastqcDataList,character,missing-method}\]
\[\text{[,FastqcDataList,logical,missing-method}\]
\[\text{[,FastqcDataList,numeric,missing-method}\]
\[\text{[,FastqcDataList,numeric,missing-method}\]
\[\text{[,FastqcDataList,ANY,missing-method}\]
\[\text{[,FastqcDataList,character,missing-method}\]
\[\text{[,FastqcDataList,logical,missing-method}\]
\[\text{[,FastqcDataList,numeric,missing-method}\]
\[\text{[,FastqcDataList,numeric,missing-method}\]
\[\text{estGcDistn}, 27\]
\[\text{estGcDistn,ANY-method (estGcDistn)}, 27\]
\[\text{estGcDistn,character-method}\]
\[\text{estGcDistn,numeric-method}\]
\[\text{estGcDistn,DNAStringSet-method}\]
\[\text{expansion}, 79\]
\[\text{facet_wrap}, 80\]
\[\text{FastpData (FastpData-class), 28}\]
\[\text{FastpData-class}, 28\]
\[\text{FastpDataList (FastpDataList-class), 29}\]
\[\text{FastpDataList-class}, 29\]
\[\text{fccVersion}\]
\[\text{fccVersion,ANY-method}\]
\[\text{fccVersion,FastqcData-method}, 32\]
\[\text{fccVersion,FastqcDataList-method}\]
\[\text{fqName}, 33\]
\[\text{fqName,FastpData-method}\]
\[\text{fqName,FastpDataList-method}\]
\[\text{fqName<-,FastqcData-method}\]
\[\text{fqName<-,FastqcDataList-method}\]
\[\text{gcAvail}, 34\]
\[\text{gcAvail,TheoreticalGC-method (gcAvail)}, 34\]
\[\text{gcTheoretical}, 35\]
\[\text{geom_label}, 76\]
\[\text{getColours, PwfCols-method (getColours)}, 36\]
\[\text{getGC}, 37\]
\[\text{getGC,ANY-method (getGC)}, 37\]
\[\text{getGC,TheoreticalGC-method (getGC)}, 37\]
\[\text{getModule}\]
\[\text{getModule()}, 29, 30\]
\[\text{getModule,ANY-method}\]
\[\text{getModule,FastpData-method}\]
\[\text{getModule,FastpDataList-method}\]
\[\text{getModule,FastqcData-method}\]
\[\text{getModule,FastqcDataList-method}\]