Package 'plotGMM'

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Type Package

Title Tools for Visualizing Gaussian Mixture Models

Version 0.2.2

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Description The main function, plot_GMM, is used for plotting output from Gaussian mixture models (GMMs),
including both densities and overlaying mixture weight component curves from the fit GMM. The package
also include the function, plot_cut_point, which plots the cut-point (mu) from the GMM over a histogram
of the distribution with several color options. Finally, the package includes the function, plot_mix_comps,
which is used in the plot_GMM function, and can be used to create a custom plot for overlaying mixture
component curves from GMMs. For the plot_mix_comps function, usage most often will be specifying
the ``fun'' argument within ``stat_function'' in a ggplot2 object.

Imports methods, wesanderson, amerika, ggplot2

Suggests mixtools, testthat, graphics

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R topics documented:

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plot_cut_point   *Plots Cut Point from Gaussian Mixture Models*

Description

Returns a plot of the data density (histogram) with an overlaid cut point generated by a Gaussian mixture model

Usage

```
plot_cut_point(m, plot = TRUE, color = c("grayscale", "amerika", "wesanderson"))
```

Arguments

m	An object of class `mixEM` corresponding with the fit GMM
plot	A logical argument for generating the plot. If FALSE, only the cut point value from the GMM is returned. If TRUE, histogram with the overlaid cut point is returned. Default is set to TRUE.
color	A vector of color options including "amerika" (from package `amerika`), "wesanderson" (from package `wesanderson`), and "grayscale", which is the default option.

Details

Gaussian mixture models are often used to derive cut points, or lines of separation between clusters in feature space (See Benaglia et al. 2009 for more). The `plot_cut_point` function plots data densities with the overlaid cut point (the mean of the calculated `mu`) from `mixEM` objects, which are GMM's fit using the `mixtools` package.

References

Benaglia, T., Chauveau, D., Hunter, D. and Young, D. 2009. mixtools: An R package for analyzing finite mixture models. Journal of Statistical Software, 32(6), pp.1-29.

Ram, K., and Wickham, H. 2015. wesanderson: a Wes Anderson palette generator. R package version 0.3.

Examples

```
mixmdl <- mixtools::normalmixEM(faithful$waiting, k = 2)

plot_cut_point(mixmdl, plot = TRUE, color = "amerika") # returns plot, amerika
plot_cut_point(mixmdl, plot = TRUE, color = "wesanderson") # returns plot, wesanderson
plot_cut_point(mixmdl, plot = FALSE) # returns only the cut point value from the GMM
```

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plot_GMM   *Plots Mixture Components from Gaussian Mixture Models*

Description

Generates a plot of data densities with overlaid mixture components from a Gaussian mixture model (GMM)

Usage

```
plot_GMM(m, k=NULL)
```

Arguments

m	An object of class mixEM corresponding with the fit GMM
k	The number of components specified in the GMM, m

Details

Uses ggplot2 graphics to plot data densities with overlaid components from mixEM objects, which are GMM's fit using the mixtools package.

Note: Users must enter the same component value, k, in the plot_GMM function, as that which was specified in the original GMM specification (also k in mixtools).

References

Benaglia, T., Chauveau, D., Hunter, D. and Young, D., 2009. mixtools: An R package for analyzing finite mixture models. Journal of Statistical Software, 32(6), pp.1-29.

Wickham, H., 2016. ggplot2: elegant graphics for data analysis. Springer.

Examples

```
set.seed(235)
mixmdl <- mixtools::normalmixEM(faithful$waiting, k = 2)

plot_GMM(mixmdl, 2)
```

plot_mix_comps   *Custom Function for Overlaying Mixture Components*

Description

Plots a mixture component conditioned on a superimposed function

Usage

```
plot_mix_comps(x, mu, sigma, lam)
```

Arguments

x	Input data
mu	Mean of component
sigma	Variance of component
lam	Mixture weight of component

Details

Allows for specifying a custom function to be superimposed when plotting a mixture component

Examples

```
set.seed(1)
mixmdl <- mixtools::normalmixEM(faithful$waiting, k = 2)
x <- mixmdl$x
x <- data.frame(x)
ggplot2::ggplot(data.frame(x)) +
  ggplot2::geom_density(ggplot2::aes(x), color="black", fill="black") +
  ggplot2::stat_function(geom = "line", fun = plot_mix_comps,
                args = list(mixmdl$mu[1], mixmdl$sigma[1], lam = mixmdl$lambda[1]),
                colour = "red") +
  ggplot2::stat_function(geom = "line", fun = plot_mix_comps,
                args = list(mixmdl$mu[2], mixmdl$sigma[2], lam = mixmdl$lambda[2]),
               colour = "blue")
```

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