

compare_3_groups

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Repo location

This function is contained within basic_stats https://gitlab.com/Fair_lab/basic_stats

Intro

This function provides a quick way to run a statistical analysis on 3 groups and visualize results. It runs an anova test and posthocs comparing each group-pair using a Kolmogorov test.

Usage

This function makes 3 things:

- compares 3 groups using an anova test
- compare each pair of groups using a Kolmogorov-Smirnov (KS) test. It also compares the first group versus the other 2 groups combined also using a KS test. The order of the groups is determined alphabetically
- visualize the results.

For the anova test, data is normalized using z-scores. For plotting an KS test, data is used as provided in the local_table.

Input variables (mandatory):

- **local_table**: The last element of the table should be the variable to be compared. The end-1 element is the grouping variable. Extra-columns are ignored

Input variables (optional):

- **tit**, text to be used as title for the figure
- **save_figure_flag**, "1" or "0", default "0". If set to one, figure is saved
- **my_color**: a RGB colormap to be used to display the histograms. If not provided, default colors are black, cyan, and blue.

Output variables:

- **p**, a vector with 5 p-values, one for the anova test and the remaining four for each KS test
- **labels**, cell array with 5 elements, where each entry corresponds to the p value reported on the first output, respectively
- **labels_**, similar to previous one but spaces are replaced with underscores (useful for combining data in tables)

Example

First, let's make fake data with 3 groups and combine the data to make a table

define the number of groups

```

N=3;
% define how many participants per groups
n=[20 21 25];
%
% Name the groups
unique_labels{1}='Group A';
unique_labels{2}='Group B';
unique_labels{3}='Group C';
% Make random noise adding an offset per group
offset=[0 5.1 5.2]; %
y=[];
labels=[];
for i=1:N
    y=[y; randn(n(i),1)+offset(i)];
    labels=[labels; repmat(unique_labels{i},n(i),1)];
end
%
% Combine results and make a table
T=table(labels,y);
%
% Run the test
[p, labels, labels_]=compare_3_groups(T)

```

p =

```

0.0000
0.0000
0.0000
0.4004
0.0000

```

labels =

5x1 cell array

```

{'ANOVA on outcome' }
{'Group A vs Group B'}
{'Group A vs Group C'}
{'Group B vs Group C'}
{'Group A vs both' }

```

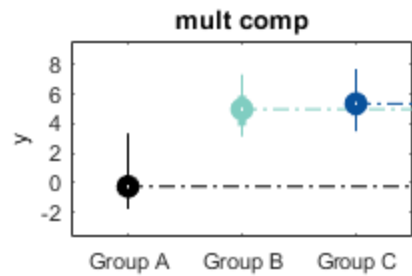
labels_ =

5x1 cell array

```

{'ANOVA_on_outcome' }
{'Group_A_vs_Group_B'}
{'Group_A_vs_Group_C'}
{'Group_B_vs_Group_C'}
{'Group_A_vs_both' }

```



ANOVA on outcome, $p = 1.54e-25$
Group A vs Group B, $p = 3.00e-09$
Group A vs Group C, $p = 5.54e-11$
Group B vs Group C, $p = 0.40$
Group A vs both, $p = 3.03e-12$

Credits

Credits: Oscar Miranda-Dominguez | Jan 2019

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