Adapt an Example Script

The BRAPH 2 Developers

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This is the developer tutorial for adapting a script for calculating different graph measures. In this tutorial, we will explain how to edit an example script to calculate different graph measures in braph2genesis. Here, we use. `EXAMPLE_ST_MP_WU` as an example to show how to edit this script to calculate different graph measures for structural data using a multiplex weighted undirected graph.

Contents

Atlas Loading

We started with implementing the ImporterBrainAtlasXLS. The function allows users to import the atlas.

Code 1: **Brain Atlas Importer.** The `header` section of the pipeline `EXAMPLE_ST_MP_WU`. It defines the importer for Atlas loading.

```
%% !header!
% EXAMPLE_ST_MP_WU
% Script example pipeline ST MP WU

clear variables %#ok<*NASGU>

%% Load BrainAtlas
im_ba = ImporterBrainAtlasXLS( ... (1)
    'FILE', [fileparts(which('example_ST_MP_WU')) filesep 'Example data
     ST_MP XLS' filesep 'atlas.xlsx'], ...
    'WAITBAR', true ...
    );

ba = im_ba.get('BA');
```

(1) First, the script loads the brain atlas from the excel file atlas.xlsx

Data Loading

The next step is to load the data of two groups.

Code 2: **Group Subject Data Importer.** The group data importer section provides the code for loading group subject data.

```
im_gr1 = ImporterGroupSubjectST_MP_XLS( ...(1)
    'DIRECTORY', [fileparts(which('SubjectST_MP')) filesep 'Example data
     ST_MP XLS' filesep 'ST_MP_Group_1_XLS'], ...
    'BA', ba, ...
    'WAITBAR', true ...
    );

gr1 = im_gr1.get('GR');

im_gr2 = ImporterGroupSubjectST_MP_XLS( ...(2)
    'DIRECTORY', [fileparts(which('SubjectST_MP')) filesep 'Example data
     ST_MP XLS' filesep 'ST_MP_Group_2_XLS'], ...
    'BA', ba, ...
    'WAITBAR', true ...
    );

gr2 = im_gr2.get('GR');
```

(1) ImporterGroupSubjectST_MP_XLS imports a group of subjects with structural data and their covariates (optional) from another XLS/XLSX file.

(2) imports a second group of subjects with structural data and their covariates (optional) from another XLS/XLSX file.

Group Analysis

This section is to initialize the group data analysis.

Code 3: **Group Subject Data Analysis.** The group data analysis provides code for initialization of group data analysis.

```
a_WU1 = AnalyzeGroup_ST_MP_WU( ...(1)
    'GR', gr1, ...
    'CORRELATION_RULE', Correlation.PEARSON ...
    );

a_WU2 = AnalyzeGroup_ST_MP_WU( ...(1)
    'TEMPLATE', a_WU1, ...
    'GR', gr2 ...
    );
```

(1) creation of the group analysis with the loaded atlas and groups data.

Measure Calculation

The last step is to calculate graph measures with data loaded in previous step. Here we use `degree` as an example.

Code 4: **Group Subject Data Analysis.** The group data analysis provides code for initialization of group data analysis.

```

g_WU1 = a_WU1.memorize('G');(1)
degree_WU1 = g_WU1.get('MEASURE', 'Degree').get('M');(2)

g_WU2 = a_WU2.get('G');
degree_WU2 = g_WU2.get('MEASURE', 'Degree').get('M');(2)
```

(1) memorize in case there are measures with non-default rules.
(2) The function calculates graph measure. In this case, `degree` is calculated.

Other measures can also be calculated by changing the measure name