eucgvuts_notebook

June 30, 2023

1 eucgvuts Examples

This notebook illustrates the J eucgvuts script. `eucgvuts` extracts web links from HTML code found here and formats graphviz digraph code.

To run this notebook you must install a J jupyter kernel. See Martin Saurer's GitHub repository for instructions.

1.1 Download Files from: https://mathcs.clarku.edu/~djoyce/elements/aboutText.html

To simplify and speed up working with many HTML files download the files from David Joyce's online elements to local working directories. On Windows system this can be down with `wget`. `wget` is distributed with J.

Navigate to your working directory and run the following commands in the command prompt or windows terminal.

```
C:\>cd \temp
C:\j64\j9.5\tools\ftp\wget --recursive --no-parent --no-check-certificate https://mathcs.clarku
```

This will download the site preserving directory structure. After running the command you will have a directory stucture like:

```
\---mathcs.clarku.edu
    \----~djoyce
        \---elements
            +---bookI
            +---bookII
            +---bookIII
            +---bookIV
            +---bookIX
            +---bookV
            +---bookVI
            +---bookVII
            +---bookVIII
            +---bookX
            +---bookXI
            +---bookXII
            \---bookXIII
```

Copy the tree with root `elements` to the `~temp` directory.

1.2 Download the files at https://github.com/bakerjd99/jacks/tree/master/eucgvuts

Download the files above and save them to a local configured J folder `~JACKS`. Configured folders are easily set with J's `Edit/Configure/Folders` menu in JQT or by editing the `~user/config/folders.cfg` file.

Add a line like the following to `~user/config/folders.cfg` and restart J.

```
JACKS c:/jod/jacks
```

[1]:
```
NB. contents of configured folder
smoutput dir '~JACKS/eucgvuts/'
```

```
eucgvuts.ijs                                27875 30-Jun-23 11:42:58
eucgvuts.pdf                               122834 23-Jun-23 13:41:10
eucgvuts_notebook.ipynb                     10381 30-Jun-23 11:42:58
eucgvuts_notebook.pdf                       18023 27-Jun-23 10:05:44
euclid_digraph_books_1_6.gv                 38096 30-Jun-23 11:42:58
euclid_digraph_books_1_6.pdf               434289 30-Jun-23 11:11:47
euclid_digraph_books_1_6.svg               478221 30-Jun-23 11:42:58
euclid_digraph_books_1_6_dependencies.gv    16870 30-Jun-23 11:42:58
euclid_i_47_dependencies.gv                  7864 30-Jun-23 11:42:58
euclid_i_47_dependencies.pdf               113707 28-Jun-23 14:09:43
euclid_i_47_dependencies.svg                71007 30-Jun-23 11:42:58
```

1.3 load eucgvuts

The script `eucgvuts` requires a current version of J.

[2]:
```
load '~JACKS/eucgvuts/eucgvuts.ijs'
```

```
NB. (eucgvuts) interface word(s): 20230630j114258
NB. --------------------------
NB. eucjoycebkdeps  NB. justifications from Joyce book html files
NB. eucjoycecncts   NB. format Joyce node connections
NB. eucjoycehtml    NB. html from David Joyce's online Elements
NB. eucjoycetabs    NB. extract dependency tables from Joyce html
NB. eucpropback     NB. generate reverse proposition digraph
NB. eucsixbookdeps  NB. justifications from Euclid books I-VI
NB. eucsortBgv      NB. second sort and format euclid book digraphs
NB. gvclustoff      NB. dot code marked cluster(s) off
NB. gvcluston       NB. dot code marked cluster(s) on
```

1.4 Generate graphviz code for first six *Elements* books.

[3]:
```
NB. requires HTML code in ~temp/elements
smoutput dir '~temp/elements/book*'
```

```
bookI      <dir>     29-Jun-23 14:17:42
bookII     <dir>     29-Jun-23 14:17:42
bookIII    <dir>     29-Jun-23 14:17:42
bookIV     <dir>     29-Jun-23 14:17:42
bookIX     <dir>     29-Jun-23 14:17:42
bookV      <dir>     29-Jun-23 14:17:42
bookVI     <dir>     29-Jun-23 14:17:43
bookVII    <dir>     29-Jun-23 14:17:43
bookVIII   <dir>     29-Jun-23 14:17:43
bookX      <dir>     29-Jun-23 14:17:43
bookXI     <dir>     29-Jun-23 14:17:43
bookXII    <dir>     29-Jun-23 14:17:43
bookXIII   <dir>     29-Jun-23 14:17:43
```

[4]:
```
NB. make graphviz code
gv=: eucsixbookdeps 0
```

[5]:
```
NB. write to J ~temp
(toHOST gv) write gf=: jpath '~temp/euclid_digraph_books_1_6.gv'
```

[6]:
```
NB. generate graphviz digraph - graphviz addon only runs within JQT environment
NB. graphview gf
```

1.5 Generate `I.47` dependencies

`I.47` is Euclid's vesion of the *Pythagorean Theorem*.

[7]:
```
NB. load books I-VI dependencies
path=: jpath '~JACKS/eucgvuts/'
gv=. read path,'euclid_digraph_books_1_6_dependencies.gv'
```

[8]:
```
NB. compute I.47 dependencies
gt=. 'I.47' eucpropback gv
```

[9]:
```
NB. write graphviz code
gf=. jpath '~temp/euclid_i_47_dependencies.gv'
(toHOST gt) write gf
```

[10]:
```
NB. generate digraph - run in JQT
NB. graphview gf
```

[11]:
```
NB. generated code
dir '~temp/*.gv'
```

```
euclid_digraph_books_1_6.gv       38096 30-Jun-23 11:50:04
euclid_i_47_dependencies.gv        7884 30-Jun-23 11:50:14
```