Penn Course Helper User Manual:

1) Run the program through the main function. Be sure to include all files in the "json" and "apache" folder in the build path of the eclipse project.

2) When the program is run, it will prompt you to enter in a search for the area of study you are interested in. (Eg: Machine Learning)

```
Welcome to Penn Course Helper! Please wait while we update our database of courses.
Fetching course data...
Done!

Please enter what you are interest in learning at Penn (e.g. "Machine Learning"):
```

3) The program will then output 9 courses (course name with course title) with the largest cosine similarity to your initial query. These are all actual Upenn courses that are offered in Fall 2020.

```
Please enter what you are interest in learning at Penn (e.g. "Machine Learning"):
Fintech
Searching...
Here are the most relevant courses to your query:
1) FNCE 885: Fin-Tech

2) FNCE 385: ASP - Fin-Tech

3) FNCE 202: Consumer Financial Decision Making

4) BEPP 202: Consumer Financial Decision Making

5) FNCE 237: Data Science for Finance

6) LGST 213: Legal Aspect of Entrepreneurship

7) LGST 243: Other People's Money: The Law, Politics, and History of Financial Institutions

8) LGST 643: Other People's Money: The Law, Politics, and History of Financial Institutions

9) COML 753: Victorian British Literature

Now, please type the number of the course you want to learn more about (e.g. '1'):
```

4) Now, you have an option of selecting one of these courses in order to get a more in-depth view on its description and the prerequisites it requires.

```
You have selected CIS 320

CIS 320 - Introduction to Algorithms
Description: How do you optimally encode a text file? How do you find shortest paths in a map? How do you design a communication network?
How do you route data in a network? What are the limits of efficient computation? This course gives a comprehensive introduction
to design and analysis of algorithms, and answers along the way to these and many other interesting computational questions.
You will learn about problem-solving; advanced data structures such as universal hashing and red-black trees; advanced design
and analysis techniques such as dynamic programming and amortized analysis; graph algorithms such as minimum spanning trees
and network flows; NP-completeness theory; and approximation algorithms.
Order of pre-requisites to take before taking this course: CIS 120 -> CIS 160 -> CIS 121 -> CIS 262 -> CIS 320
Thanks for using our program! Made by Henrique, Pranav and Kit.
```

5) Notice how the prerequisites listed are in a topological order of the natural way you should be taking these courses. This is achieved through creating a graph with each course as a node and running a BFS traversal of this graph starting at the target node.

NOTE: To run this program, you must ensure that you include the JSON and Apache libraries in the build path for Eclipse. These are 3rd party software needed to run the program.

**There are no restrictions to the search buzzword
**Each time you search, you will be allowed to only pick 1 course. If you do want to pick another course, you will have to run the program again.