Homework 3 Instructions

The goal of this homework is to implement the topological ordering algorithm in the *Algorithm Design* book presented on page 102. The pseudo code is as follows:

Topological Ordering

no cycle is DAG

```
To compute a topological ordering of G:
Find a node v with no incoming edges and order it first
Delete v from G
Recursively compute a topological ordering of G−{v}
  and append this order after v
```

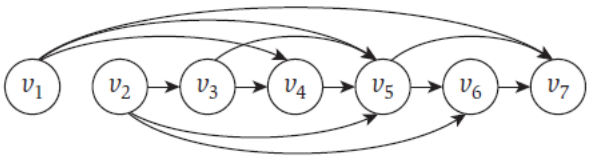
1. Create a python file named "top_order_id", with id corresponding to your student id number. For example, if my student id number is 1234567, I would create a python file named "top_order_1234567"

2. Your program should be able to run from the console using the command

   python top_order _1234567.py input.txt > output.txt

   where the arguments are your program and the input file. ***Your program should be able to write to an output file.*** However, while testing, you may print to stdout to check your results for debugging purposes. I will be using Python 3.6 to grade your assignments.

3. Your program should read in an input text file that contains a list of vertices for the edges on the directed acyclic graph. For example, for the graph below, the input file should have the following format:

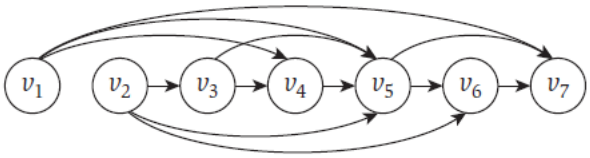


1,4
1,5
1,7
2,3
2,5
2,6

3,4
3,5
4,5
5,6
5,7
6,7

The input *1,7* means that node 1 points to node 7. However, since this is a directed acyclic graph, node 7 does not point to node 1.

4. The program **top_order** should take in the edges between nodes to perform a topological ordering of the graph. For example, for the graph below, the **top_order** program would output the following:



1 2 3 4 5 6 7

5. You can further test your program by creating input text files following the format of the sample input text files provided.

6. Please submit your assignment in the appropriate location on Blackboard. If you get stuck or have any questions, please feel free to email me at romoore@ku.edu. I will try to get back to you as quickly as possible. It is better to contact me during the week, as I am less responsive on the weekend because, well, it is the weekend. This does not mean that I will not respond to your emails on the weekend, it only means that the response time will be longer than it would be during the week. However, I will do the best I can to respond as quickly as possible.