COSC 2436 Lab: Graphs

1. **Introduction**

   You will implement a C++ program utilizing Graphs. Given a list of edges in a directed graph, determine if the graph has a cycle. You may use any STL implementation for this lab.

2. **Description**

   A cycle is found when the program reaches a node that has already been visited.

3. **Input Files**
   - Each input file will represent one graph.
   - The first line will contain the number of nodes that exists in the given graph.
   - Every following line will contain two integers, representing nodes, separated by a space in the format: A B
     - A and B indicate there is an edge between the two nodes.
     - The edge is NOT bi-directional. The first integer will point to the second. (**A → B**)
   - No blank lines, No empty files, All valid inputs

4. **Output Files**
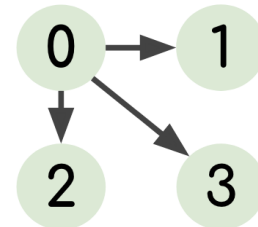   - Output **TRUE** if a cycle exists
   - Output **FALSE** otherwise
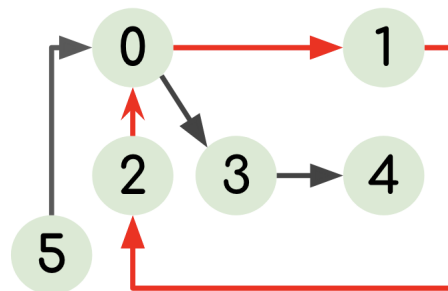
5. **Examples**

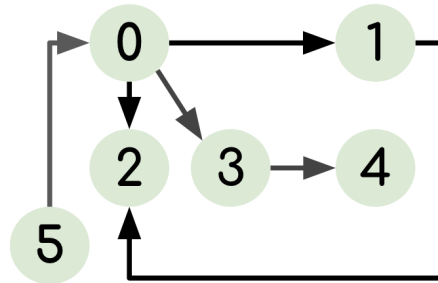| Input1.txt	output1.txt
4	FALSE
0 1	
0 2	
0 3	

Input.txt	output1.txt
6	TRUE
0 1	
0 3	
3 4	
1 2	
5 0	
2 0	

```
Input3.txt          output1.txt
6                   FALSE
0 1
0 2
0 3
1 2
3 4
5 0
```


6. Submitting

- Turn in your lab assignment in a folder named **"lab7"** to our Linux server
- Make sure to only have 1 .cpp file with the main() function in your working directory; otherwise, your program will fail the grading script.
  - Create a folder name **lab7** (case sensitive) under your root directory
  - Make sure your .cpp and .h are **lowercase and have no spaces**.
  - Upload your program and ArgumentManager.h
  - **ONLY INCLUDE NECESSARY FILES** (.cpp and .h files) in your final submission
- To test your program, copy the <u>input</u> files into the server and run your program with the commands
  - **chmod u+x test.sh**
  - **sh test.sh**
- After verifying that they pass, delete ALL .txt files.
- Remember to run the command **chmod -R 775 lab7/** in your root directory before signing off.

Please contact the TAs via email or teams for any clarifications or typos.