Programming Assignment #4 (due 11:59pm, 2014, 12/26)

**Problem: Cycle Detection**

In this programming assignment, you are asked to write a C++ program to check if there exists a cycle in a directed graph. A cycle is a simple path where the first and last vertices are the same.

**Provided files: (1)main.cpp, (2)cycleDetection.cpp, (3) cycleDetection.h, (4)vertex.h, (5)example**

* **Main.cpp –** It executes the function **cycleDetection()** to check if there exists a cycleand can be changed if necessary for you to debug.
* **cycleDetection.cpp & cycleDetection.h –** These are the program files you need to implement.

These two files include the targeted function **cycleDetection()** in this homework, which returns whether the cycle exists or not.

These two files also include two finished functions called **parseFile()** and **checkNode()**. **parseFile()** reads the graph from an input file and **checkNode()** return the pointer of the vertex for the given name.

* **vertex.h –** It defines the class Vertex, which you need not modify.

**Input (example)**

A graph example is shown below:

Each line lists the two vertices of an edge in the directed graph.

Ex: 1 4 means an edge <1, 4>

1 4

1 5

2 4

2 6

3 4

3 6

4 6

**Language**

C++.

**Platform**

You may develop your software on UNIX/Linux.

Compile: $ g++ main.cpp cycleDetection.cpp

Execution: $ ./a.out

**Submission**

Please update the following materials to **online judge system** on the course website by the deadline, specifying your account and check the leader board.

(1) **cycleDetection.h**

(2) **cycleDetection.cpp**

**Grading**

(1) example correct: 40%

(2) 100% accuracy: 20%

(3) leader board ranking: 20% (ranking priority: accuracy > run time)

(4) hidden cases ranking: 20% (ranking priority: accuracy > run time)