Program Exercise #8 (1)

- In-class Demo: Dec. 10 (Tue.) 9:10-12:00 a.m.
- TA: 張維峻(d0657491@mail.fcu.edu.tw)
  林品秀 (d0676600@o365.fcu.edu.tw)
- Software: Dev-C++
- Submission:
  - Filename format:
    學號_PE#-#.c
    例如: M06455505_PE8.c
  - 得分100: 當日(Dec. 10 Tue. 12:00 p.m.)結束前完成 demo，且正確回答助教提問
  - 得分 90: 以iLearn 系統最後修改時間為基準(deadline: Dec. 13 Fri. 23.59 p.m.)，上傳繳交，並於隔週實習課完成 demo 以及正確回答助教提問

Program Exercise #8 (2)

- Grading:
  - Correctness 50%
  - Program structure 20%
  - Comments 10%
  - Header block 5%
  - Variable dictionary 10%
  - Procedures and functions 5%
- Special notice:
  - 請勿抄襲別人程式(助教會當場進行測問、判定)，或是遲交作業，否則一律 0分計算
  - 請一律使用 C 語言來撰寫程式，且必須保證你的程式能夠再 Dev-C++ 軟體上成功編譯與執行，使用其他程式語言一律不予計分
  - 請依照題目給的輸入格式，否則不計分
  - 本次上機實作有一個題目，佔比為100%

Program Exercise #8 (3)

- Problem from 2018 ACM_ICPC (100%):
  Write a program to indicate the largest number of planet will be infected

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Definition:

Disaster is coming! A virus named **TABX-4869** is developed by a mad scientist. **TABX-4869** can infect all creatures on a planet instantly. People infected with **TABX-4869** will always enter *TAB* when they want to enter *SPACE* !

The mad scientist plans to spread **TABX-4869** to the whole galaxy through star routes. The galaxy contains *N* planets and *M* undirected routes. **TABX-4869** can spread to all neighbor planets at a time, but it needs *D* time unit(s) when spread through a route with distance *D*. You can assume that the galaxy is connected via star routes.

To prevent the worst, the Galaxy Government (**GG**) developed the vaccine and want to spread it as soon as possible. The vaccine can prevent uninfected creature from getting infected but cannot cure infected creatures. In addition, the vaccine can be spread rapidly exactly like **TABX-4869**.

GG has observed that the mad scientist will begin to spread **TABX-4869** from a particular planet as source. Unfortunately, **GG** cannot predict which planet is the source. Due to the limited amount of vaccine, **GG** can only select exactly one planet as the source of vaccine as soon as the source of **TABX-4869** is observed. (You can assume that **GG** and the mad scientist will start spreading both at the same time.)

There are many great engineers and mathematicians in **GG**, so **GG** will always find the best vaccine source to minimize the disaster. However, they may not save all planets if the mad scientist is smart enough. Please help **GG** to compute the largest possible number of planets that will be infected.

Note that a planet will be infected even if **TABX-4869** and the vaccine are spread to it at the same time.

Program Exercise #8 (4)

- Continue…

  Basic requirements:

  Input: The first line contains an integer *T* indicating the number of test cases, described by the following lines. For each test case, the first line contains two space-separated integers *N* and *M*. Each of the following *M* lines contains three space-separated integers *A*, *B*, *D* that denote a route between planet *A* and planet *B* with distance *D*. Planets are numbered from 1 to *N*. Each pair of planets has at most one star route between them.

  - $1 \le T \le 20$
  - $3 \le N \le 200$
  - $N \le M \le \frac{N(N-1)}{2}$
  - $0 \le D \le 10000$

  Output: For each test case, please output one line containing only one integer indicating the largest number of planet will be infected.

Program Exercise #8 (5)

- Continue …

  Sample:

  Input:

```
%> 2
%> 3 3
%> 1 2 5
%> 2 3 8
%> 3 1 6
%> 5 5
%> 1 2 1
%> 1 3 1
%> 1 4 1
%> 1 5 1
%> 3 4 1
```

  Output:

```
%> 2
%> 4
```

  Sample Explanations:

  - For the first sample, at least 2 planets will be infected if the TABX-4869 source is planet 1. (If the TABX-4869 source is not planet 1,we can save more planets. Hooray!)
  - For the second sample, at least 4 planets will be infected if the TABX-4869 source is planet 1.