

國立清華大學 電機工程學系 一〇二學年度第二學期

EE-2410 資料結構 Data Structure

Homework #5 (學期總成績 bonus 3 分)

Due on June 5, 2014

請上助教網站上傳包含【原始碼及執行結果】的綜合 PDF file

助教網頁: <http://www.ee.nthu.edu.tw/ee241000>

1. (學期總成績 Bonus 3 分) Consider a graph defined in a file called “**roadmap.txt**”. Each line specifies a **weighted directed edge**, where $(i, j, 5)$ means an edge from vertex i to vertex j with a weight of 5. We plan to interpret the information of this graph as follows:

- A **vertex** denotes a **city**.
- An **edge** denotes a **highway segment** linking two cities.
- The **weight** of an edge denotes the **distance** of a highway segment.

Try to develop a C++ program to **report the shortest path length from a “source city” to all other destination cities**. Note that there are in total 10 cities in file “roadmap.txt”, denoted as 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. You can use two-dimensional *adjacency matrix* for graph representation to simplify your program.

(Command format example): %route <source city>

(Result to be reported): % route 0

(Input roadmap file): http://www.ee.nthu.edu.tw/~syhuang/data_structure/roadmap.txt

繳交資料: Combine all your following documents into a single PDF file for submission to the TA web page. On top of the combined PDF file should be a **cover page** with your 系所，中英文姓名，學號等資訊。

- (a) All your **source codes** (C or C++ file).
- (b) Show the **execution trace** of your program.