

CMSC 401 – Fall 2016

Assignment 4 (due Thursday 12/1 – 11:59pm)

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CMSC 401- Algorithm Analysis with
Advanced Data Structures



VCU

School of Engineering | Computer Science

Road Trip

- You are planning to drive from Richmond to L.A.
- You want to spend as little as possible on the gas and motels.
- So you need to pick the best route – with cheapest motels and smallest cost of gas
- You have done your research and you know:
 - cost of an overnight stay in the cheapest motel in each of the cities on the possible routes
 - cost of driving between cities without overnight stays
- Now you need to write a program that will take all that data, and find the cheapest route
 - The route with lowest sum of motel and gas costs

Assignment 4

- Write a program cmssc401.java that reads the database of gas & motel costs, which is in the format below:
 - The number of cities, N , in the first line. $N \geq 3$, $N \leq 1000$
 - The total number of direct highways between cities, M , in the second line. $M \geq 2$, $M \leq 10000$
 - Lowest motel price for each of $N-2$ cities (excluding L.A. and Richmond), each as a single line of two numbers: city number ($3 \dots N$), motel cost ($1 \dots 200$)
 - Gas prices for traveling direct highways between two cities, each as a single line of three numbers: city number ($1 \dots N$), city number ($1 \dots N$), cost of gas for travel between the two cities ($1 \dots 200$)
 - Richmond is city number 1, L.A. is city number 2
 - Cost shouldn't include a motel in Richmond, not in L.A.

```
5
7
3 78
4 87
5 98
1 4 98
5 4 45
1 5 140
4 3 87
2 5 150
3 5 109
3 2 73
```

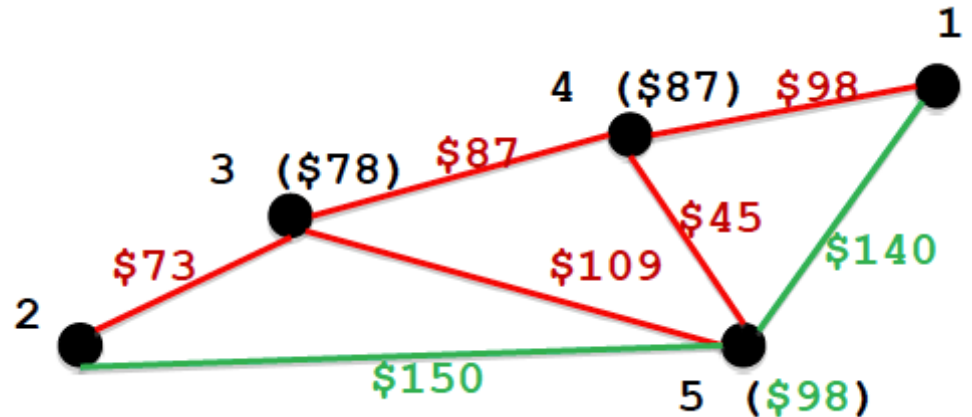
Example

Input in correct format

```
5
7
3 78
4 87
5 98
1 4 98
5 4 45
1 5 140
4 3 87
2 5 150
3 5 109
3 2 73
```

Correct output

388



Green shows the cheapest route from city 1 (Richmond) to city 2 (L.A). Cost is \$388: \$140+\$150 for gas + \$98 for motel

Remarks

- There will always be at least one way of getting from city 1 to city 2
- If a cost for gas from city A to B is in the input, cost for gas from B to A is the same and will not be in the input
- No other text, comments, questions on output

Submission

- **Date due:** Thursday, Dec 1st, 11:59 pm
- Upload through Blackboard
 - Your submission should be a zip archive **4_FamilyName_FirstName.zip** containing
 - Java source code in a file **cmssc401.java** (all low case letters!)
 - The file should have your name in a comment in the first line
 - If you use multiple files, the main file must be cmssc401.java
 - Remember: in Java, class name should match the file name, and is case sensitive
- Please do NOT create your own packages
- Do NOT place the file into a folder – just zip the file
- Use standard I/O to read input (System.in, System.out) and output
- Make sure the program compiles