

# Data Structure Assignment 7

## Programming Homework 1

Write a C/C++ program that allows the user to input a weighted undirected graph and then configure a *minimum cost spanning tree* on it using **Sollin's algorithm**. (You'll get no point if you don't implement the system with Sollin's algorithm)

### Input

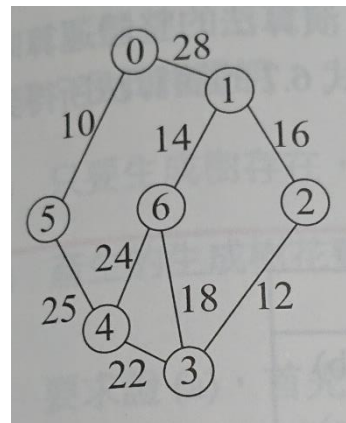
The input consists of several lines. The first line contains an integer number  $N$  ( $< 100$ ) indicating the number of the edges of the graph. The following  $N$  lines indicate the edges. Each of these  $N$  lines consists of three integer numbers, representing with the two endpoints and the weight of the edge, respectively.

### Output

Print out each of the edges of the minimum cost spanning tree configured on the input graph, representing with the two endpoints and the weight of the edge, respectively.

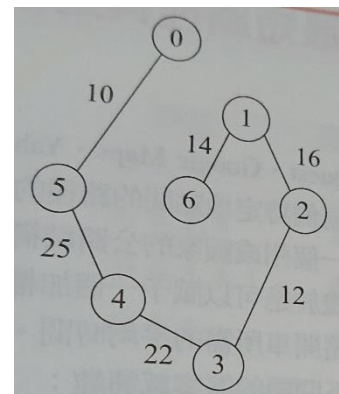
### Sample Input

```
9
0 1 28
0 5 10
0 5 10
1 2 16
1 6 14
2 3 12
3 4 22
3 6 18
4 5 25
4 6 24
```



### Sample Output

```
1 2 16
1 6 14
2 3 12
3 4 22
4 5 25
0 5 10
```



## Programming Homework 2

Write a C/C++ program that allows the user to input an AOE network. The program should calculate and output the early( $i$ ) and late( $i$ ) times and the degree of criticality for each activity.

### Input

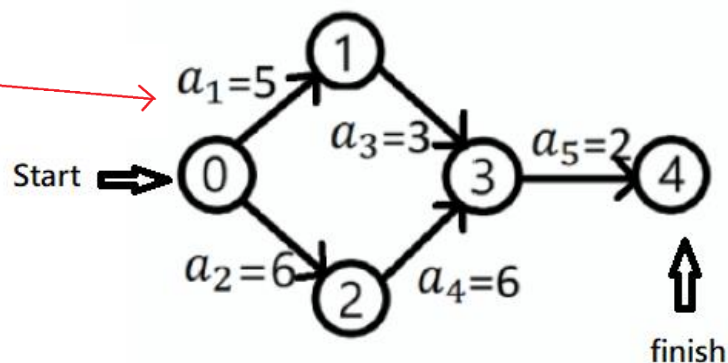
The input consists of several lines. The first line contains an integer number  $N$  ( $< 100$ ) indicating the number of activities. The following  $N$  lines are the information of activities. Each of these  $N$  lines consists of four integer numbers, representing the activity No., the start vertex of activity, the end vertex of activity and the duration of activity.

### Output

Print out each activity's **act.**(activity No.), **e**(early time), **l**(late time), **slack**( $l - e$ ), and **critical**( $l - e = 0 \rightarrow$  Yes,  $l - e \neq 0 \rightarrow$  No).

### Sample Input

```
5
1 0 1 5
2 0 2 6
3 1 3 3
4 2 3 6
5 3 4 2
```

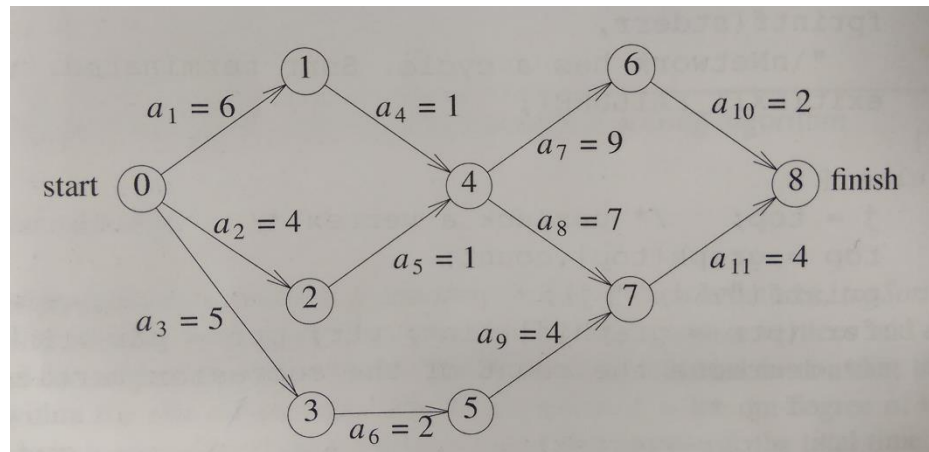


### Sample Output

act.	e	l	slack	critical
1	0	4	4	No
2	0	0	0	Yes
3	5	9	4	No
4	6	6	0	Yes
5	12	12	0	Yes

### Sample Input

11  
5 2 4 1  
2 0 2 4  
3 0 3 5  
10 6 8 2  
4 1 4 1  
6 3 5 2  
11 7 8 4  
7 4 6 9  
8 4 7 7  
9 5 7 4  
10 1 6



### Sample Output

act.	e	l	slack	critical
1	0	0	0	Yes
2	0	2	2	No
3	0	3	3	No
4	6	6	0	Yes
5	4	6	2	No
6	5	8	3	No
7	7	7	0	Yes
8	7	7	0	Yes
9	7	10	3	No
10	16	16	0	Yes
11	14	14	0	Yes

### General Information:

- Deadline : 2019/1/9 23:55.
- Upload your assignment to Moodle system.
- Upload file format : "student-ID\_Name.rar" or "student-ID\_Name.zip",  
Ex. F12345678\_王小明.rar
- Your file should consist of the following items : **Source Code** & **Readme file**(Program description)
- Late homework will not be accepted.
- Any copies will be scored as zero. Do not plagiarize.