Introduction to Computers and Programming

Homework 12

2023/12/12

1. Deadline

You have one week to complete the homework. Hand in your homework via E3 before 2023/12/25 23:55. Please finish your homework as soon as possible. In addition, make sure that your code can be executed on Visual Studio Community 2019. We will use Online Judge for grading.

2. Problems

2.1 Optimizing Information Transmission: Minimizing Costs in Landmine Awareness

You are a team leader, and you have several subordinates informing you about road segments where landmines may be present. There is a possibility of overlap in the information provided by different subordinates. Your task is to organize these segments, including those with overlapping information, and convey the minimum amount of information to ensure that all subordinates are aware of the segments that should be avoided. The transmission of each segment incurs a cost of 2 units.

You need to write a program that returns the minimum cost required to inform all subordinates.

Input
A integer N represents the number of road segments where landmines may be present, followed by multiple lines of road segments [Rstart, Rend].

$(1 \leq N \leq 50, 0 \leq Rstart \leq Rend \leq 1e9)$

Hint:
Case1: [1, 4], [4, 10] => [1, 10] :: cost 2

Case2: [1, 4], [5, 10] => [1, 10] :: cost 2

Case3: [1, 4], [6, 10] => [1, 4], [6, 10] :: cost 4

Output
Print out the number of the minimum cost required to inform all subordinates, including the newline characters.

Example 1 :
Input
4

1 3

2 6

8 10

15 18

Output (Symbol '↵' represents the presence of a newline character, not meant to be actually output.)

6↵

Explanation
[1,6]

[8,10]

[15,18]

Total cost: 6

Example 2 :
Input
2

1 4

4 5

Output (Symbol '↵' represents the presence of a newline character, not meant to be actually output.)

2↵

Explanation
[1,5]

Total cost: 2

3. Submission format

Your submission should follow the format below, or you might get some penalty for the wrong format.

yourStudentID_hw_w14.zip

└── /yourStudentID_hw_01.cpp

4. Reminders

- Remember to change the filename before handing in the homework.