



North South University

Department of Electrical and Computer Engineering
CSE 373: Design and Analysis of Algorithms

Summer 2018

Assignment 01

Problem description:

Suppose that, you have an interval $[a, b]$ on the real number-line in addition to a number of subintervals $[a_1, b_1]$, $[a_2, b_2]$, $[a_3, b_3]$, \dots , $[a_n, b_n]$, such that $[a_1, b_1] \cup [a_2, b_2] \cup [a_3, b_3] \cup \dots \cup [a_n, b_n] = [a, b]$. Write a **C program** that determines the minimal subset of subintervals S so that the union of the subintervals in S is the interval $[a, b]$.

For example, if $[a, b]$ is $[1, 9]$ and the subintervals are $\{[1,2], [3,5], [1,5], [2,4], [4,5], [3,6], [2,7], [7,9], [4,8]$ and $[1,3]\}$, then S is $\{[1, 5], [4, 8]$ and $[7, 9]\}$ since $[1, 5] \cup [4, 8] \cup [7, 9] = [1, 9]$. Note that, there can be other solutions as well, such as $\{[1, 5], [2, 7]$ and $[7, 9]\}$.

Input and output specification:

The input is a sequence of integers. The first integer n is the number of subintervals. The next n pairs of integers are the subintervals themselves. The last pair of integers is union of all the subintervals. The output of your program is a single integer which represents the number of subintervals in S .

Sample input: 10 1 2 3 5 1 5 2 4 4 5 3 6 2 7 7 9 4 8 1 3 1 9

Sample output: 3

Submission instructions:

Please read carefully the following instructions on how to submit your assignment. If you make any mistake at all in the submission process, your assignment will not be marked.

Suppose your NSU student ID is 1234567890. After you complete the assignment, **rename** your source file (let's say `main.c` for example) as "1234567890.c" and upload this file on Google Classroom in assignment section. Do not send assignments as message attachment. Do not upload any additional file.

Any form of cheating will be penalized heavily. Duplicate codes (no matter if full or partial) will not be marked regardless of which one the original is.