

## CSE 2320 Lab Assignment 2

Due March 11, 2010

### Goals:

1. Understanding of the dynamic programming solution to the (one room) weighted interval scheduling problem.
2. Understanding of the five steps for developing a dynamic programming solution.

### Requirements:

1. Your task is to write a Java program to solve the two room weighted interval scheduling problem by using dynamic programming. The first line of the input will be the number of intervals (n) and each of the remaining n lines have three non-negative integers ( $s_i$ ,  $f_i$ ,  $v_i$ ) for the start time, finish time, and weight for an interval. The intervals will be ordered by ascending finish time. You should echo the input.
2. Email your program (as an attachment) to [fawaz.bokhari@mavs.uta.edu](mailto:fawaz.bokhari@mavs.uta.edu) by 10:45 a.m. on March 11, 2010.

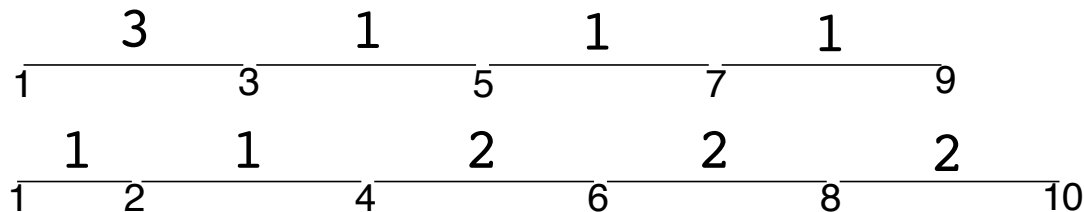
### Getting Started:

1. The input is easily read by importing `java.util.Scanner` and using code like:

```
Scanner sc=new Scanner(System.in);
int n=sc.nextInt();
```

Do not prompt for a file name!

2. Your solution must use dynamic programming to maximize the total weight of the intervals assigned to the two rooms. The intervals assigned to a room may not overlap (two intervals  $i$  and  $j$  overlap if either  $s_i < s_j < f_i$  or  $s_i < f_j < f_i$ ).
3. Applying the simple (one room) solution in Notes 7.B to get a maximum solution for one room and then applying again the same technique to the leftover intervals (to assign intervals to the second room) is a ***non-optimal*** greedy technique.



4. n will not exceed 20.
5. You should print your dynamic programming table(s) with appropriate labeling.
6. Your solution should be formatted as:
  - a. A line with just the number of intervals assigned to the first room.
  - b. A line for each of the intervals assigned to the first room: start time, finish time, weight.
  - c. A line with just the number of intervals assigned to the second room.
  - d. A line for each of the intervals assigned to the second room: start time, finish time, weight.
  - e. A line with the total weight that has been achieved

and appear at the end of your output. No particular ordering of the intervals is required.