Weighted Interval Scheduling

Project 4 100 points

Due Tuesday November 4

Note. The Weighted Interval Scheduling problem is described in the posted file
Weighted Interval Scheduling.ppt
Memoization is described in the above file and more completely in the posted file
Chap04 Memoization.pdf
Both of these files are posted in the folder "Lecture Notes".

This project may be done in pairs, but the pairs CANNOT BE THE SAME AS ON THE FINAL PROJECT.

The **Weighted Interval Scheduling** problem is this: Given a set of weighted intervals, choose a set of non-overlapping intervals such that the total weight is maximal.

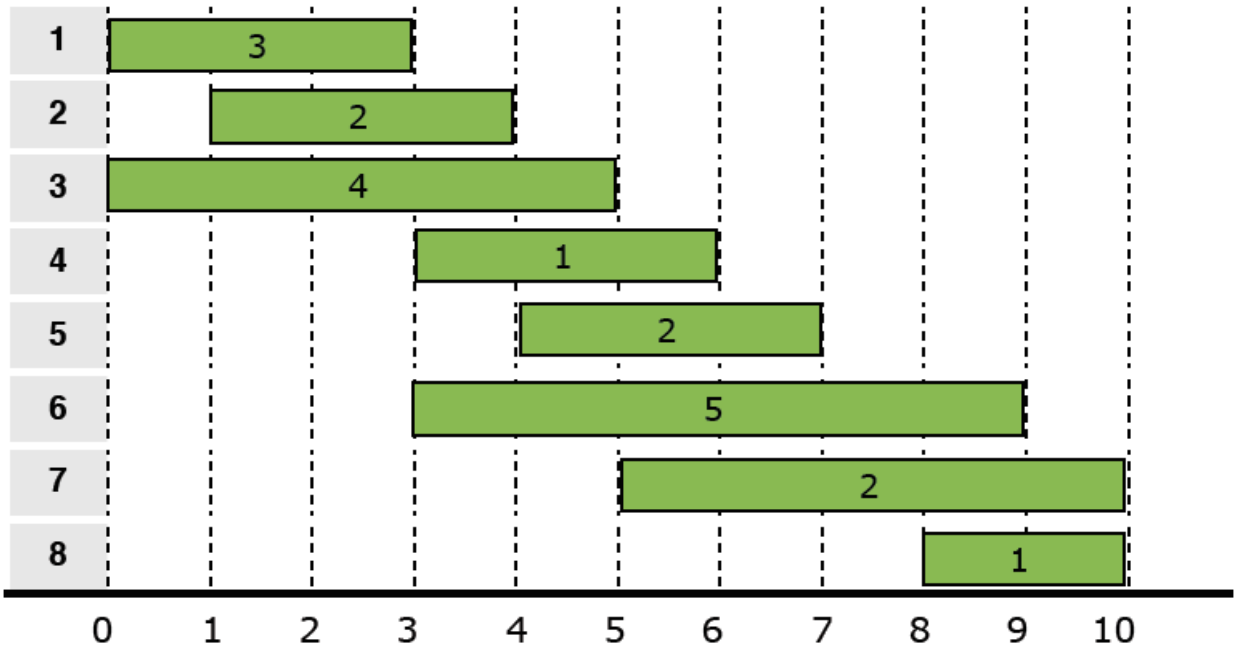
A weighted interval x can be represented by a triple

$x = (s, f, v)$,

where

s = start time of x, f = finish time of x, v = weight or value of x

For example, consider the test case for Weighted Interval Scheduling problem depicted below:



These weighted intervals can be represented by the triples

(0,3,3) (1,4,2) (0,5,4) (3,6,1) (4,7,2) (3,9,5) (5,10,2) (8,10,1)

Write a program to compute a solution to the Weighted Interval Scheduling problem.

Your program must read in a set of weighted intervals. Each interval should be entered as 3 integers. The intervals must be given in a textfile and also be entered in increasing order of finish time. In the above case we would have

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

The program should print out the value of the total weight of the optimum solution and the indices of the selected intervals. In the above case, the output would be something like (this output is NOT correct)

```
Optimum value: 7
Interval Sequence: 2 5
```

The program MUST use recursion. An iterative solution will not receive full credit. Use of memoization will receive 20 points extra credit.