

# Lab 11 – OJ

## Dynamic Programming (p2)

CS208 Algorithm Design and Analysis  
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# Q1: Weighted Interval Scheduling

## Description

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We have  $n$  jobs labeled  $1, 2, \dots, n$ . Job  $i$  starts at  $s_i$ , finishes at  $f_i$ , and has weight  $w_i > 0$ . Two jobs are **compatible** if they do not overlap. Your goal is to find the max-weight of mutually compatible jobs.

### Sample Input

```
8
1 4 12
3 5 20
4 7 13
3 8 26
5 9 20
6 10 11
8 11 16
0 6 23
```

### Sample Output

```
42
```

# Q2: Negative Cycles

## Description

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Given a **directed** graph consisting of  $n$  vertices and  $m$  weighted edges, find a negative cycle (if one exists).

## Input Format

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There are total  $T$  testcases, for each testcase:

The first line contains two integers  $n, m$ .

Then  $m$  lines follow, each line contains three integers  $u_i, v_i$  and  $w_i$ , separated by space. Three integers denote there is an edge from  $u_i$  to  $v_i$ , and its weight is  $w_i$ .

## Output Format

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$T$  lines, each line either outputs **YES** or **NO** to denote that if there exists a negative cycle.

# Q2: Negative Cycles

## Sample Input

```
2
6 9
1 5 5
2 1 -3
5 2 2
4 5 6
4 3 -3
3 6 -4
5 6 4
6 2 -4
5 3 -3
3 4
1 2 2
1 3 4
2 3 1
3 1 -3
```

Two graphs



## Sample Output

```
YES
NO
```