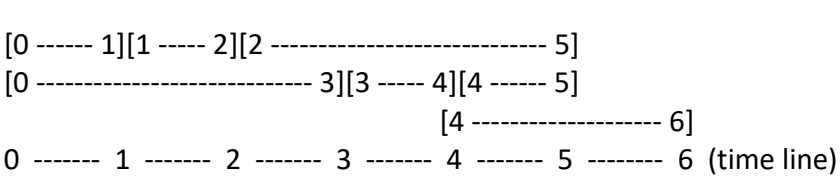
CS4335 Design and Analysis of Algorithms

Tutorial 2 - Solution

Exercise 1. (basic)
For the interval scheduling problem (in week2's slides), the set of jobs (s_i, f_i) are as follows:
(0, 6), (1, 4), (3, 8), (2, 3), (6, 9) (4, 10), (5, 11), and (6, 7).
Use the greedy algorithm to give the maximum number of compatible jobs.
Solution:
Step 1. Sort all the jobs by finish time:
(2, 3), (1, 4), (0, 6), (6, 7), (3, 8), (6, 9) (4, 10), (5, 11)
Step 2. Select the first job, and choose the rest jobs one by one if one is compatible with the former job:
(2, 3), (6, 7)

Exercise 2. (basic)
For the interval partitioning problem, the set of lectures (s_i, f_i) are as follows:
(0, 1), (0, 3), (1, 2), (2, 5), (3, 4), (4, 5) and (4, 6).
Use the greedy algorithm to give minimum number of classrooms.
Solution:
Step 1. Sort all the jobs by starting time:
(0, 1), (0, 3), (1, 2), (2, 5), (3, 4), (4, 5) and (4, 6). (already sorted)

Step 2:



Remarks: 3 classrooms are required. Each row represents a classroom

Selecting breakpoints: See Slides.