

Exercise 9
CSE2012 DAA Lab

Slot: L33+L34

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Activity Selection Problem Description

A activity selection problem is one in which there are several competing activities that require exclusive use of a common resource. Goal of the problem is to Select a maximum-size set of mutually compatible activities. Given a set S of 'n' proposed activities $S = \{a_1, a_2, \dots, a_n\}$ and we wish to use a resource, such as a lecture hall, which can serve only one activity at a time, select a subset of S with maximum length and that can exclusively use the resource. Each activity a_i has a start time s_i and a finish time f_i , where $0 \leq s_i < f_i < \infty$. Each activity a_i takes place during the half-open time interval $[s_i, f_i)$. Activities a_i and a_j are compatible if the intervals $[s_i, f_i)$ and $[s_j, f_j)$ do not overlap. That is, a_i and a_j are compatible if $s_i \geq f_j$ or $s_j \geq f_i$.

- ✓ 1. Given a set 'S' of 'n' activities, implement the recursive greedy algorithm to select a subset of activities from S by selecting the task that finishes first.
- ✓ 2. Given a set 'S' of 'n' activities, implement the iterative

greedy algorithm to select a subset of activities from S by selecting the task that finishes first.

- ✓ 3. Given a set 'S' of 'n' activities, implement the recursive greedy algorithm that uses a priority queue to select a subset of activities from S by selecting the task that finishes first.
- ✓ 4. Given a set 'S' of 'n' activities, implement the iterative greedy algorithm that uses a priority queue to select a subset of activities from S by selecting the task that finishes first.
- ✓ 5. Given a set 'S' of 'n' activities, implement the recursive greedy algorithm that uses a priority queue to select a subset of activities from S by selecting the task that starts last.
- ✓ 6. Given a set 'S' of 'n' activities, implement the iterative greedy algorithm that uses a priority queue to select a subset of activities from S by selecting the task that starts last.