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,...,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 ai has a start time s i and a finish time fi, where $0 \leq si < fi < \infty$. Each activity a_i takes place during the half-open time interval [si, fi). Activities a_i and a_j are compatible if the intervals [si, fi) and [sj , fj) 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.