Algorithm HW#2

greedy_algorithms

1) Scheduling problem

You are given an array A of integers, where each element indicates the time a thing takes for completion. You want to calculate the maximum number of things that you can do in the limited time that you have.

Input: $A = \{5, 3, 4, 2, 1\}$ and $T = 6$
Output: 3

2) Activity Selection Problem

You are given n activities with their start and finish times. Select the maximum number of activities that can be performed by a single person, assuming that a person can only work on a single activity at a time.

start = $\{10, 12, 20\}$
finish = $\{20, 25, 30\}$

A person can perform at most two activities. The maximum set of activities that can be executed is {0, 2} [These are indexes in start and finish]

3 Travelling Salesman Problem

Task. Given a matrix cost of size n where cost[i][j] denotes the cost of moving from city i to city j. Your task is to complete a tour from the city 0 (0 based index) to all other cities such that you visit each city at most once and then at the end come back to city 0 in min cost.

Input: cost = {{0,111},{112,0}}
Output: 223
Explanation: We can visit 0->1->0 and cost = 111 + 112.

Input: cost = {{0,1000,5000},{5000,0,1000}, {1000,5000,0}}
Output: 3000
Explanation: We can visit 0->1->2->0 and cost = 1000+1000
$$+1000 = 3000$$

Good Luck