Activity Selection

You are given n activities with their start and end 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. Activities are sorted according to end time.

start = [10, 12, 20]
end = [20, 25, 30]

ans = 2 (A0 & A2)

Fractional Knapsack

Given the weights and values of N items, put these items in a knapsack of capacity W to get the maximum total value in the knapsack.

value = [60, 100, 120]
weight = [10, 20, 30]
W = 50

ans = 240

Min Absolute Difference Pairs

Given two arrays A and B of equal length n. Pair each element of array A to an element in array B, such that sum S of absolute differences of all the pairs is minimum.

A= [1, 2, 3]
B= [2, 1, 3]
ans = 0

Max Length Chain of Pairs

You are given n pairs of numbers. In every pair, the first number is always smaller than the second number. A pair (c, d) can come after pair (a, b) if b < c.
Find the longest chain which can be formed from a given set of pairs.

pairs =
(5, 24)
(39, 60)
(5, 28)
(27, 40)
(50, 90)

ans = 3

Indian Coins

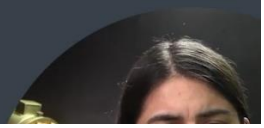
We are given an infinite supply of denominations [1, 2, 5, 10, 20, 50, 100, 500, 2000]. Find min no. of coins/notes to make change for a value V.

V = 121

ans = 3 (100+20+1)

V = 590

ans = 4 (500+50+20+20)

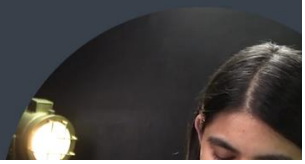


Job Sequencing Problem

Given an array of jobs where every job has a deadline and profit if the job is finished before the deadline. It is also given that every job takes a single unit of time, so the minimum possible deadline for any job is 1. Maximize the total profit if only one job can be scheduled at a time.

Job A = 4, 20
Job B = 1, 10
Job C = 1, 40
Job D = 1, 30

ans = C, A



Chocola Problem

We are given a bar of chocolate composed of mxn square pieces. One should break the chocolate into single squares. Each break of a part of the chocolate is charged a cost expressed by a positive integer. This cost does not depend on the size of the part that is being broken but only depends on the line the break goes along. Let us denote the costs of breaking along consecutive vertical lines with x1, x2, ..., xm-1 and along horizontal lines with y1, y2, ..., yn-1.
Compute the minimal cost of breaking the whole chocolate into single squares.