CSE 3101: Introduction to the Design and Analysis of Algorithms

Instructor: Suprakash Datta (datta[at]cse.yorku.ca) ext 77875

Lectures: Tues, BC 215, 7–10 PM

Office hours: Wed 4-6 pm (CSEB 3043), or by appointment.

Textbook: Cormen, Leiserson, Rivest, Stein.
 Introduction to Algorithms (3nd Edition)

More DP problems

- Longest increasing subsequence
- Rod cutting
- Coin changing
- Snowboarding problem

Other uses of DP (next hw)

- Counting
- Finding a solution

Longest increasing subsequence

Given an array of distinct integers, to find the longest
increasing subsequence.

- Choice ?
- Recurrence?

Rod cutting

Given a table of length vs costs calculate the optimal
 cuts to a given rod.

- Choice ?
- Recurrence?

Coin changing

Given an amount and a set of denominations, to make change with the fewest number of coins.

- Choice ?
- Recurrence?

Trickier problem

The snow boarding problem : Find the longest path on a grid. One can slide down from one point to a connected other one if and only if the height decreases. One point is connected to another if it's at left, at right, above or below it. Example:

```
 1   2   3   4  5
16  17  18  19  6
15  24  25  20  7
14  23  22  21  8
13  12  11  10  9
```

- Choice ?
- Recurrence?

Elevator scheduling problem

There is a slow elevator that will only make up to k stops. The building has more than k floors. Find the floors that it should stop at to minimize the sum of the number of floors people have to climb up or down.

- Choice ?
- Recurrence?