Graph Algorithms

- (1) Dijktra's shortest path algorithm
- (2) Prim's Algorithm for finding spanning tree from a weighted graph

Greedy algorithms which are correct

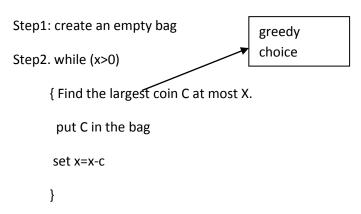
Coin Changing Problem

Suppose that, in a certain country, the coin denominations are

\$1, \$4, \$5, \$10.

You want to design an algorithm such that you can make change of any X dollars using the fewest number of coins.

Greedy Algorithm X=9 (5,4)



Step 3: return coins in the bag

Brute force approach

- (1) Compute all possible subsets of the coins whose sum is X
- (2) Find the size for each subset
- (3) Choose the subject containing min. number of coins.

Greedy does not always work.

Dijktra's shortest path algorithm

