8.1   Write a method to generate the nth Fibonacci number.

8.2   Imagine a robot sitting on the upper left hand corner of an NxN grid. The robot can only move in two directions: right and down. How many possible paths are there for the robot?

FOLLOW UP

Imagine certain squares are "off limits", such that the robot can not step on them. Design an algorithm to get all possible paths for the robot.

8.3   Write a method that returns all subsets of a set.

8.4   Write a method to compute all permutations of a string.

8.5   Implement an algorithm to print all valid (e.g., properly opened and closed) combinations of n-pairs of parentheses.

EXAMPLE:

input: 3 (e.g., 3 pairs of parentheses)

output: ()()(), ()(()), (())(), ((()))

8.6   Implement the "paint fill" function that one might see on many image editing programs. That is, given a screen (represented by a 2 dimensional array of Colors), a point, and a new color, fill in the surrounding area until you hit a border of that color.'

8.7   Given an infinite number of quarters (25 cents), dimes (10 cents), nickels (5 cents) and pennies (1 cent), write code to calculate the number of ways of representing n cents.

8.8   Write an algorithm to print all ways of arranging eight queens on a chess board so that none of them share the same row, column or diagonal.