

Programming Assignment 7

due March 31, 2025

Use the time module of Python to measure the execution times of your solutions.

Problem 1:

Assume that you can walk / jump up a long set of stairs by going up one, two, or three stairs. Find a recursive solution for the number of ways you can get up a set of stairs of n steps. For example, to go up a set of stairs with 10 steps, I could use jumps of $3+1+2+2+1+1$ or $1+1+2+2+1+3$, which would be two different ways of going up.

Time your approach for a stair of 10, 20, 30, 40, 50, ... steps using memoization and not using memoization.

Problem 2:

Ajeebdes does not exist, but it has coins of denominations 1, 4, 6, and 9 rupees. Write a program that finds all possible ways in which an automaton can make change for n rupees. The order in which coins are returned matters.

Time your program if you use memoization or if not.

