

Name: _____

CSSE/MA 473 Worksheet for Class #20
January 13, 2023

Dynamic Programming

1. Dynamic programming (DP) is a technique for solving problems with _____.
2. Summarize the main idea of dynamic programming.
3. We can categorize dynamic programming algorithms as using a _____ because _____.
4. How are dynamic programming and divide-and-conquer similar? How are they different?
5. Dynamic programming is good for solving _____ and _____ problems.

Robot Coin Collection

6. Brainstorm: How can we use dynamic programming to solve the Robot Coin Collection problem? What are the subproblems, and how do they help us arrive at an overall solution?

7. Outline the DP solution for the Robot Coin Collection problem.

8. What are the time and space complexities of this DP algorithm?

9. How would you modify the DP algorithm for the Robot Coin Collection problem if some cells on the board are inaccessible for the robot? Apply your algorithm to the board below, where the inaccessible cells are marked by X's. How many optimal paths are there for this board?

	1	2	3	4	5	6
1		X		○		
2	○			X	○	
3		○		X	○	
4				○		○
5	X	X	X		○	