1. What does DP stand for in Dynamic Programming?
   1. Deterministic Programming
   2. **Dynamic Programming**
   3. Distributed Programming
   4. Deferred Programming
2. Dynamic Programming is primarily used to solve problems that exhibit which property?
   1. **Overlapping Subproblems**
   2. Non-deterministic behavior
   3. Regular structure
   4. Static nature
3. Which type of programming involves breaking down a problem into smaller subproblems and storing their solutions to avoid redundant calculations?
   1. Divide and Conquer
   2. **Dynamic Programming**
   3. Greedy Programming
   4. Backtracking
4. Which of the following is not a characteristic of Dynamic Programming?
   1. Memoization
   2. Recursion
   3. Tabulation
   4. **Divide and Conquer**
5. Which technique in Dynamic Programming involves solving a problem by solving and storing solutions to smaller instances of the same problem?
   1. Divide and Conquer
   2. **Bottom-Up DP**
   3. Top-Down DP
   4. Greedy Programming
6. In 1-Dimensional Dynamic Programming, the problem space is typically represented as:
   1. A grid
   2. A binary tree
   3. **A single array**
   4. A linked list
7. What is the time complexity of a typical 1-Dimensional DP problem with n states and each state taking O(1) time to compute?
   1. **O(n)**
   2. O(log n)
   3. O(n^2)
   4. O(2^n)
8. Which type of 1-Dimensional DP problems involve finding the maximum or minimum value of a function?
   1. **Optimization**
   2. Counting
   3. Coin Change
   4. Longest Common Subsequence
9. What is the key characteristic of a "Counting" type 1-Dimensional DP problem?
   1. Minimizing a value
   2. Maximizing a value
   3. **Counting the number of valid solutions**
   4. Finding a specific solution
10. Which of the following is not a common approach for solving 1-Dimensional DP problems?
    1. Top-Down DP
    2. Bottom-Up DP
    3. **Recursive DP**
    4. Iterative DP
11. What is the primary goal of Top-Down DP in 1-Dimensional DP problems?
    1. **Solving subproblems first and storing their results**
    2. Starting from the top and working downwards
    3. Using recursion without memoization
    4. Avoiding recursion altogether
12. Which type of Dynamic Programming involves solving a problem from the smallest subproblem and building up to the original problem?
    1. Top-Down DP
    2. Divide and Conquer
    3. Recursive DP
    4. **Bottom-Up DP**
13. What is the time complexity of Bottom-Up DP for 1-Dimensional problems with n states?
    1. O(1)
    2. O(log n)
    3. **O(n)**
    4. O(n^2)
14. In 1-Dimensional DP, what is the main difference between Bottom-Up DP and Top-Down DP?
    1. **The order of computation**
    2. The use of recursion
    3. The number of dimensions
    4. The types of problems they solve
15. In which type of 1-Dimensional DP problem is the goal to find the longest sequence that satisfies a certain condition?
    1. **Longest Increasing Subsequence**
    2. Coin Change
    3. Fibonacci Sequence
    4. Counting
16. What is the time complexity of solving a Longest Increasing Subsequence (LIS) problem using Dynamic Programming?
    1. O(n)
    2. O(n log n)
    3. **O(n^2)**
    4. O(2^n)
17. In a 1-Dimensional DP problem, when using tabulation, what is typically stored in the DP table?
    1. Recursive function calls
    2. **Intermediate results of subproblems**
    3. The input data
    4. The final answer to the problem
18. What is the classic example of a "Counting" type 1-Dimensional DP problem?
    1. Fibonacci Sequence
    2. Longest Common Subsequence
    3. **Coin Change**
    4. Knapsack Problem
19. What is the goal of solving the Longest Common Subsequence (LCS) problem using DP?
    1. Finding the longest subarray in an array
    2. Finding the longest substring in a string
    3. **Finding the longest subsequence common to two sequences**
    4. Counting the number of elements in an array
20. In Dynamic Programming, what does the "Optimization" type refer to?
    1. Finding the most efficient algorithm
    2. **Maximizing or minimizing a value**
    3. Counting the number of solutions
    4. Solving problems optimally
21. Which of the following is not a common category of 1-Dimensional DP problems?
    1. Optimization
    2. Counting
    3. **Decision-Making**
    4. Longest Common Subsequence
22. In 1-Dimensional DP, what is the primary use of memoization?
    1. Reducing the time complexity of the problem
    2. Keeping track of the number of recursive calls
    3. **Storing the results of subproblems to avoid redundant computations**
    4. Converting recursive solutions to iterative solutions
23. Which type of 1-Dimensional DP problem is focused on making decisions to maximize or minimize a value?
    1. **Optimization**
    2. Counting
    3. Coin Change
    4. Longest Common Subsequence
24. In which type of 1-Dimensional DP problem do you need to find the fewest number of coins to make up a certain amount?
    1. Counting
    2. **Optimization**
    3. Decision-Making
    4. Longest Common Subsequence
25. What is the main difference between "Tabulation" and "Memoization" in 1-Dimensional DP?
    1. Tabulation uses recursion, while Memoization uses iteration.
    2. **Tabulation stores results in an array, while Memoization uses function calls.**
    3. Tabulation is top-down, while Memoization is bottom-up.
    4. Tabulation is faster than Memoization.
26. Which of the following is a common example of a 1-Dimensional DP problem?
    1. Traveling Salesman Problem
    2. Breadth-First Search
    3. **Fibonacci Sequence**
    4. Depth-First Search
27. In 1-Dimensional DP, which technique involves solving a problem iteratively from the smallest subproblem to the largest?
    1. Top-Down DP
    2. Recursive DP
    3. **Bottom-Up DP**
    4. Divide and Conquer
28. What is the primary advantage of using Dynamic Programming over a naive recursive approach?
    1. DP always guarantees a faster solution.
    2. **DP avoids redundant calculations by storing intermediate results.**
    3. DP works better for all types of problems.
    4. DP uses fewer computational resources.
29. In 1-Dimensional DP, what is the main purpose of using an array to store results?
    1. To reduce memory usage
    2. **To avoid using recursion**
    3. To keep track of function calls
    4. To eliminate the need for loops
30. Which type of Dynamic Programming problems involve solving problems by finding a sequence of decisions that maximizes or minimizes a value?
    1. Optimization
    2. Counting
    3. **Decision-Making**
    4. Longest Common Subsequence
31. What is the primary goal of solving a "Decision-Making" type Dynamic Programming problem?
    1. Finding the maximum or minimum value
    2. Counting the number of valid solutions
    3. **Finding the optimal sequence of decisions**
    4. Solving problems efficiently
32. In 1-Dimensional DP, what is the significance of the "1-Dimensional" aspect?
    1. It implies that the DP table has only one dimension.
    2. **It refers to the number of states or subproblems.**
    3. It indicates that only one type of problem can be solved.
    4. It signifies the use of recursion.
33. In a "Counting" type Dynamic Programming problem, what does the DP table typically represent?
    1. Intermediate results
    2. Decision sequences
    3. **The number of valid solutions for different states**
    4. The input data
34. In 1-Dimensional DP, what is the purpose of finding the "optimal substructure" in a problem?
    1. To determine the number of recursive calls required
    2. To identify the smallest subproblem in the problem space
    3. To ensure that the problem can be solved using memoization
    4. **To break down the problem into smaller subproblems with the same structure**