Introduction to Algorithm

Assignment 2

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Part 1: True or False

Q)1 The dynamic Programming is an algorithm

Q2) Bellman ford algorithm is a single source shortest path algorithm

Q3) In dynamic programming we Do not need to carefully identify/define the subproblem

Q4) Dynamic programming was introduced by Lenardo martin

Q5) Dynamic programming is typically applied to optimization problem

Part 2: Multiple Choices

Q1) Divide And conquer algorithm includes?

A) **Partition the problem into independent sub-problem**
B) **Solve the sub-problem recursively**
C) **Combine their solution to solve the original problem**
D) **All**

Q2) Is Dynamic programming applicable when the sub-problems are?

A) dependent

B) independent

C) Solved

D) none

Q3) In dynamic programming the term programming refers to?

A) Planning

B) Solving Problem

C) designing

D) none of the above

Q4) Floyd-War shall Algorithm is used for finding the? b

A) **Longest Path between all the pairs of vertices in a weighted graph**

B) **Shortest Path between all the pairs of vertices in a weighted graph**
C) **Longest Path between all the pairs of vertices in a non-weighted graph**
D) **None**

Q5) floyd-Warshall Algorithm works for all the following except?

A) **Directed Weight graph**
B) **Undirected Weight graph**
C) **Negative cycles**
D) **All of the above**

Q6) 0/1 Knapsack Will Fail in which one the following algorithm?

A) **Dynamic programming**
B) **Greedy Algorithm**
C) **Both A and B**
D) **None**

Q7) Which of the following is the main idea of Dynamic programming?

A) **Solve smaller problem**
B) **Record Solution in a table**
C) **Extract solution to the initial instance from that table**
D) **All**

Q8) Which of the following steps will be omitted if the value of an optimal solution is required?

A) **Compute the value of an optimal solution in a bottom-up fashion**
B) **Recursively define the value of an optimal solution**
C) **Construct an optimal solution from computed information**
D) **NONE**

Q9) When a recursive algorithm revisits the same problem repeatedly then the optimization problem has?

A) **Overlapping sub problems**
B) **Optimal substructure**
C) **Optimal solution**
D) **None**

Q10) What is the main drawback of the bellman ford algorithm?

A) **It will not produce the correct answer if the sum of the edge is negative**
B) **It will not produce the correct answer if the sum of the edge is positive**
C) **It will not produce the correct answer if the sum of the edge is greater than 1**
D) **It will not produce the correct answer if the sum of the edge is 0**

Part 3: Work Out

Q1) What is Dynamic programming?

Q2) What is the best Approach to solve for 0/1 Knapsack?

Q3) What is the main Drawback of the Bellman ford Algorithm?

Q4) What is Bellman ford Algorithm

Q5) What is Floyd-Warsha'll Algorithm?

Answers

T/F:

1) **False**
2) **True**
3) **False**
4) **False**
5) **True**

Choose

1) **D**
2) **B**
3) **A**
4) **B**
5) **C**
6) **B**
7) **D**
8) **C**
9) **A**
10) **A**

WorkOut

1) **Dynamic Programming is a general algorithm design technique for solving problems defined by recurrences with overlapping subproblems**

2) **The best Approach to solve for the 0/1 knapsack is to use the dynamic programming approach**
3) **The Main drawback of the bellman ford algorithm is that it will not produce the correct answer if the sum of the edge is negative**
4) **Bellman ford algorithm is a single source shortest path algorithm**
5) **Floyd-war shall Algorithm is an algorithm for finding the shortest path between all pairs of vertices in a weighted graph**