**HOME WORK**

**Homework based on Lecture 5.1**

1. What is the worst case time complexity of dynamic programming solution of the subset sum problem(sum=given subset sum)?  
   a) O(n)  
   b) O(sum)  
   c) O(n2)  
   **d) O(sum\*n)**
2. Which of the following is/are property/properties of a dynamic programming problem?  
   a) Optimal substructure  
   b) Overlapping subproblems  
   c) Greedy approach  
   **d) Both optimal substructure and overlapping subproblems**
3. When dynamic programming is applied to a problem, it takes far less time as compared to other methods that don’t take advantage of overlapping subproblems.  
   **a) True**b) False

**Homework based on Lecture 5.2**

1. Which of the following is false about a binary search tree?  
   a) The left child is always lesser than its parent  
   b) The right child is always greater than its parent  
   c) The left and right sub-trees should also be binary search trees  
   **d) In order sequence gives decreasing order of elements**
2. What are the conditions for an optimal binary search tree and what is its advantage?  
   **a) The tree should not be modified and you should know how often the keys are accessed, it improves the lookup cost**b) You should know the frequency of access of the keys, improves the lookup time  
   c) The tree can be modified and you should know the number of elements in the tree before hand, it improves the deletion time  
   d) The tree should be just modified and improves the lookup time

**Homework based on Lecture 5.3**

1. Consider the two matrices P and Q which are 10 x 20 and 20 x 30 matrices respectively. What is the number of multiplications required to multiply the two matrices?

a) 10\*20  
b) 20\*30  
c) 10\*30  
**d) 10\*20\*30**

7. Which of the following methods can be used to solve the matrix chain multiplication problem?  
a) Dynamic programming  
b) Brute force  
c) Recursion  
**d) Dynamic Programming, Brute force, Recursion**

**Homework based on Lecture 5.4**

1. Consider the strings “PQRSTPQRS” and “PRATPBRQRPS”. What is the length of the longest common subsequence?  
   a) 9  
   b) 8  
   **c) 7**  
   d) 6
2. Which of the following methods can be used to solve the longest common subsequence problem?  
   a) Recursion  
   b) Dynamic programming  
   **c) Both recursion and dynamic programming**  
   d) Greedy algorithm

**Homework based on Lecture 5.5**

1. When a top-down approach of dynamic programming is applied to a problem, it usually \_\_\_\_\_\_\_\_\_\_\_\_\_  
   a) Decreases both, the time complexity and the space complexity  
   **b) Decreases the time complexity and increases the space complexity**  
   c) Increases the time complexity and decreases the space complexity  
   d) Increases both, the time complexity and the space complexity
2. The travelling salesman problem can be solved in:  
   (A) Polynomial time using dynamic programming algorithm  
   (B) Polynomial time using branch-and-bound algorithm  
   **(C) Exponential time using dynamic programming algorithm or branch-and-bound algorithm**(D) Polynomial time using backtracking algorithm