# May 18

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Consider the instance of Knapsack problem. Find max project using fractional knapsack

Compute worst case complexity of the following program segment

Write quick sort algorithm using divide and conquer approach. Derive its complexity for all three cases

Explain divide and conquer approach. Write a recursive algorithm to determine the max and min from given elements and explain. Derive the time complexity for this algorithm and compare it with simple bruteforce algorithm for finding max and min. For the following list of elements trace the recursive algorithm for finding max and min and determine how many comparisons have been made

What is optimal binary search tree? Compute and construct OBST for above value using Dynamic programming

Solve 8 puzzle problem by branch and bound. Draw state space tree

Write and explain the algorithm to compute all pair source shortest path using dynamic programming and prove that it is optimal. For the following graph determine the all pairs source shortest path

Write an algorithm to determine the sum of subsets for a given sum and a set of numbers. Draw the tree representation to solve the subset sum problem. Comment on the complexity of the algorithm

An algorithm takes 0.5ms for input size 100. How long will it take for an input size 500. If the running time is following: 1) linear 2) quadratic 3) cubic 4) root n 5) nlogn

Explain the idea behind backtracking. Write an algorithm for N-queen problem. Draw state space tree for 4-queen problem.

What is LCS? Find LCS for string

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# May 17

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Write and algorithm for finding maximum and minimum number from given set

Write the algorithm and derive the complexity of Binary Search algorithm

Explain masters method with example

Write a note on flow shop scheduling

Write and explain string matching with finite automata with an example

Explain hoe branch and bound strategy can be used in 15 puzzle problem

What is 0/1 knapsack and fractional knapsack problem. Solve the following using 0/1 knapsack method

Explain insertion sort and derive its complexity

What is Binary Search tree? How to generate optimal binary search tree

What is the longest common subsequence problem? Find LCS for following string

Explain job sequencing with deadlines

Explain prims algorithm and find minimum spanning tree for the following graph

Write short notes on problem of multiplying long integers

Write short notes on strassen’s matrix multiplication

Write short notes on Knuth Morris Pratt’s Pattern matching

Write short notes on Multi stage Graphs

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# May 16

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Explain the asymptotic notations

Write an algorithm to find minimum and maximum value using divide and conquer and also derive its complexity

Explain the concept of multiplying long integers using divide and conquer

Sort the following numbers using Quick sort. Also derive the time complexity of quick sort

Solve the following job sequencing with deadline problem

Explain different string matching algorithms

Find the minimum spanning tree of the following graph using kruskal’s algorithm

Explain flow shop scheduling with example

Write an algorithm for sum of subsets. Solve the following problem

Find the shortest path from source vertex A using Djikstra’s algorithm

Write a note on Strassen’s matrix multiplication

Write a note on 8-Queen problem

Write a note on Graph coloring

Write a note on 15-puzzle problem

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# May 15

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Write abstract algorithm for greedy design method

What are different factors considered for sorting elements

Explain flow shop scheduling technique

Explain three cases of master theorem

Write and explain sum of subset algorithm for

Explain randomized version of quick sort and derive its complexity

Explain bubble sort algorithm and derive its best case and worst case complexity

Find the huffman code for the following message

What is hamiltonian cycle? Write an algorithm to find all hamiltonian cycles

Suppose you are given n number of coins, in that one coin is faulty, its weight is less than standard coin weight. To find this faulty coin in a list using proper searching method, what will be the complexity of searching method

Explain job sequencing with deadliner for the given instance

Explain naive string matching algorithm with example

Write note on rabin karp algorithm

Write note on 15-puzzle problem

Write note on travelling sales person problem

Write note on strassen’s matrix multiplication

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# May 14

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Explain big oh, omega and theta notations with the help of graph. Represent the following functions using above notations.

Explain 0/1 knapsack problem with example

Write an algorithm of sum of subsets. Solve the following problem and draw portion of state space tree

Explain longest common subsequence with example

Explain all pair shortest path algorithm with suitable example

Explain different string matching algorithms

Write a min max function to find minimum and maximum value from given set of values using divide and conquer.also derive its complexity

Comment on any two modules of computation

To find djikstra’s shortest path from vertex 1 to 4 for following graph

Explain flow shop scheduling with example

Write note on job sequencing with deadlines

Write note on randomized algorithm

Write note on 15-puzzle problem

Write note on n-queen problem

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# Dec 19

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Explain recurrences and various methods to solve recurrences

Differentiate between p and np

Differentiate between prims and kruskals algorithm

Explain dynamic programming with example

Define branch and bound and explain 15 puzzle problem

Apply djikstra’s algorithm on the following graph

Find longest common subsequence for the following strings

Explain backtracking with n-queen problem

Formulate knapsack problem. Explain and differentiate between greedy knapsack and 0/1 knapsack

Explain multistage graph with example

Rewrite KMP algorithm and explain with example

Define chromatic number of graph. Explain graph coloring algorithm

Write a short note on master theorem

Write a short note on rabin karp algorithm

Write a short note on steps for np completeness proofs

Write a short note on assembly line scheduling problem

Write a short note on strassen’s matrix multiplication

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# Dec 18

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Explain strassen’s matrix multiplication concept with an example. Derive it’s time complexity

Apply quick sort algorithm to sort the list in alphabetical order. Analyze the best case, worst case and average case complexities of quick sort

Solve following problem of sum of subset and draw portion of state space tree. Find all possible subsets of w that sum to m

What is single source shortest path algorithm. Write an algorithm to find single source shortest path using greedy methods

Prove that vertex covering problem is np complete

Explain various string matching algorithms

Find the minimum cost path from s to t in the following figure using multistage graph

Describe travelling sale person problem and discuss how to solve it using dynamic programming with example

What is longest common subsequence problem? Find the LCS for the following problem

Write a short note on 8 queen problem. Write an algorithm for the same

Write a short note on branch and bound strategy

Write a short note on algorithms to find minimum spanning tree

Write a short note on recurrences

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# Dec 18 (1)

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Explain asymptotic notations

Explain randomized algorithms

Write an algorithm for merge sort and derive its best case and worst case complexity

Explain master’s theorem to find complexity of a recurrence relation

Explain naive string matching algorithm with example

Explain single source shortest path algorithm using dynamic programming with suitable example

Write an algorithm for graph coloring problem. Also derive its complexity

Write an algorithm for knapsack problem using greedy method. Also derive its complexity

Explain the travelling salesman problem using branch and bound

Explain flow shop scheduling technique

Write an algorithm to find minimum cost spanning tree. Also derive its complexity

Write short notes on strassen’s matrix multiplication

Write short notes on job-sequencing with deadlines

Write short notes on multistage graphs

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# Dec 17

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What is backtracking approach. Explain how it is used in graph coloring

Explain randomized algorithm with example

What is knuth morris pratt method of pattern matching. Give examples

Explain in brief the concept of multistage graphs

Merge sort and its complexity

Derive and comment on the complexity of quick sort algorithm

Solve following knapsack problem using dynamic approach

What is sum of subset problem? Write the algorithm and solve the following array

Write the algorithm for finding strassens matrix multiplication and show how the complexity is being affected

What is the longest common subsequence problem? Find LCS for following

Explain binary search tree. How to generate an optional binary search tree

What is all pairs shortest path algorithm? Apply the same on following graph

Find MST of following graph using prims and kruskals algorithm

Write short note on optimal storage on tapes

Write short note on 15 puzzle problem

Write short note on binary search and its complexity

Write short note on problem of multiplying long integers

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# Dec 16

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Which are the different methods of solving recurrences. Explain with examples

Compare greedy and dynamic programming approaches for algorithm design. Explain how both can be used to solve knapsack problem

Explain the analysis of quick sort and apply the same to sort following data

Write single source shortest path algorithm and apply the same for following

Explain string matching with finite automata and apply the same technique to match following pattern

Compare prims and kruskal’s method for finding minimum spanning tree. Find MST for following using prims method

Explain with example how to divide and conquer strategy is used in binary search

Solve sum of subsets problem for following. Also write the algorithm for it

Explain longest common subsequence problem with example

What is backtracking method. How it is used in graph coloring problem

Write short notes on 8 queens problem

Write short notes on job sequencing with deadlines

Write short notes on flow shop scheduling

Write short notes on multistage graphs

Write short notes on asymptotic notations

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# Dec 14

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Write and algorithm to find minimum and maximum value using divide and conquer and also derive its complexity

To sort the given set of number using insertion sort and also show the result of each pass

Find and optimal solution to the knapsack instance

Explain optimal storage on tape with example

Find a minimum cost path from 1 to 9 in the given graph using dynamic programming

Find the path of travelling sales person problem of given graph

To generate the huffman code for given set of frequencies

To implement the knuth morris pratt string matching algorithm

To find MST of following graph using prim’s and kruskal’s algorithm

Explain the flow shop scheduling using suitable data

Write notes on n-queen problem

Write notes on randomized algorithm

Write notes on tries

Write notes on 15-puzzle problem