**SAVEETHA SCHOOL OF ENGINEERING**

**SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES**

**CSA06 – DESIGN AND ANALYSIS OF ALGORITHMS**

List of **Experiments**

1. Write a program to Print Fibonacci Series using recursion.

2. Write a program to check the given no is Armstrong or not. .

3. Write a program to find the GCD of two numbers .

4. Write a program to get the largest element of an array.

5. Write a program to find the Factorial of a number .

6. Write a program to check a number is a prime number or not .

7. Write a program to perform Selection sort.

8. Write a program to perform Bubble sort and estimate time Complexity for n values.

Perform test cases for the following set of numbers. Estimate the time iteration for the following set of numbers.

Input Output

(10,5, 80,-2, 15,23, 45) (-2, 5, 10, 15, 23, 45, 80)

(12, 3, 0, 34, -11, 2, 8) (-11, 0, 3, 8, 12, 22, 34

9. Write a program for to multiply two Matrix

10. Write a program for to check whether a given String is Palindrome or not

11.Write a program for to copy one string to another

12. Write a Program to perform binary search.

13. Write a program to print the reverse of a string

14. Write a program to find the length of a string.

15. Write a program to perform Strassen’s Matrix Multiplication.

16. Write a program to perform Merge Sort.

17. Using Divide and Conquer strategy to find Max and Min value in the list.

18. Write a program to generate all the prime numbers.

19. Write a program to perform Knapsack problem using greedy techniques.

20. Write a program to perform MST using greedy techniques.

21. Using Dynamic programming concept to find out Optimal binary search tree.

22. Using Dynamic programming techniques to find binomial coefficient of a given number

Write a program to compute Binomial coefficient for n=8, k=8 using dynamic programming Using condition such as

I nCk =1 if k=0 or n=k

II nCk – (n-1)Ck-1 + (n-1)Ck for n>k>0

23. Write a program to find the reverse of a given number.

24. Write a program to find the perfect number.

25. Write a program to perform travelling salesman problem using dynamic programming

26. Write a program for the given pattern

If n=4 1

1 2

1 2 3

1 2 3 4

27. Write a program to perform Floyd’s algorithm

28. Write a program for pascal triangle.

29. Write a program to find the optimal cost by using appropriate algorithm

30. Write a program to find the sum of digits.

31. Write a program to print a minimum and maximum value sequency for all the numbers in a list.

32. Write a program to perform n Queens problem using backtracking.

33. Write a program to inset a number in a list.

34. Write a program to perform sum of subsets problem using backtracking.

35. Write a program to perform graph coloring problem using backtracking.

36. Write a program to compute container loader Problem.

37. Write a program to generate the list of all factor for n value.

38.Write a program to perform Assignment problem using branch and bound.

39. Write a program for to perform liner search.

40.Write a program to find out Hamiltonian circuit Using backtracking method

find the time complexity for the given set of elements is

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| a | | b | | c | | d | | e | | f | |
| a | 0 | | 0 | | 1 | | 1 | | 1 | | 1 |
| b | 0 | | 0 | | 1 | | 0 | | 0 | | 1 |
| c | 1 | | 1 | | 0 | | 1 | | 1 | | 1 |
| d | 1 | | 0 | | 1 | | 0 | | 1 | | 0 |
| e | 1 | | 0 | | 0 | | 1 | | 0 | | 0 |
| f | 1 | | 1 | | 1 | | 0 | | 0 | | 0 |

41. Write a program to return all the possible subsets for a given integer array. Return the

solution in any order.

Input nums= [1,2,3]

Output : [ [], [1], [2], [3], [1,2], [1,3], [2,3], [1,2,3]]

42. Write a program to perform permutation of an array of integers and make all the arrangement are to be in possible sequence.

Input a{]={1,2,3) Output [1,2,3], [1,3,2], [2, 1, 3], [2, 3, 1], [3,1,2], [3,2,1].

43. Given a sorted array keys[0.. n-1] of search keys and an array freq[0.. n-1] of frequency counts, where freq[i] is the number of searches to keys[i]. Construct a binary search tree of all keys such that the total cost of all the searches is as small as possible.

Example

**Input:**

n = 2

keys = {10, 12}

freq = {34, 50}

**Output: 118**

**Explanation:**

There can be following two possible BSTs

10 12

\ /

12 10

*The cost of tree I is 34\*1 + 50\*2 = 134*

*The cost of tree II is 50\*1 + 34\*2 = 118*