1. 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

1. Write a program to find the factorial (fact)of a number and to estimate time complexity.

Conditions such as i. n=0, return 1 otherwise fact (n-1) \* n Testing condition

* 1. 4 Value is 24
  2. -3 No negative value
  3. 6 Value is 720

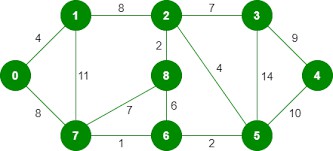
1. Write a program to perform Knapsack problem using dynamic programming for the following set of object values.,

Knapsack weight = 100

|  |  |  |
| --- | --- | --- |
| item | Weight | Profit |
| 1 | 40 | 80 |
| 2 | 30 | 70 |
| 3 | 20 | 50 |
| 4 | 30 | 80 |

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1. Write a program to find a minimum spanning tree using prims technique for the given graph.



1. Write a program to print the first n perfect numbers. (Hint Perfect number means **a positive**

integer that is equal to the sum of its proper divisors)

Sample Input:

N = 3

Sample Output:

First 3 perfect numbers are: 6 , 28 , 496 Test Cases:

* 1. N = 0
  2. N = 5
  3. N = -2
  4. N = -5
  5. N = 0.2

1. Write a [Program to find even Sum of Fibonacci Series Till number N](https://www.geeksforgeeks.org/java-program-to-find-sum-of-fibonacci-series-numbers-of-first-n-even-indexes/)? Sample Input: n = 4

Sample Output: 33

(N = 4, So here the Fibonacci series will be produced from 0th term till 8th term: 0, 1, 1, 2, 3, 5, 8, 13, 21

Sum of numbers at even indexes = 0 + 1 + 3 + 8 + 21 = 33)

1. Write a program to perform Selection sort and estimate time Complexity Estimate the time iteration for the following set of numbers.

Input Output

1. (10,5, 80,-2, 15,23, 45) (-2, 5, 10, 15, 23, 45, 80)
2. (12, 3, 0, 34, -11, 2, 8) (-11, 0, 3, 8, 12, 22, 34
3. A **[perfect number](https://en.wikipedia.org/wiki/Perfect_number)** is a **positive integer** that is equal to the sum of its **positive divisors**, excluding the number itself. A **divisor** of an integer x is an integer that can divide x evenly.

Given an integer n, return true *if* n *is a perfect number, otherwise return* false.

Write a program to check for the following cases and find its time complexity

Case 1: Given string is palindrome or not Case 2: Given number is palindrome or not Sample Input:

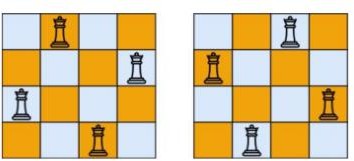
Case = 1

String = MADAM Sample Output:

Palindrome Test cases:

* 1. MONEY
  2. 5678765
  3. MALAY12321ALAM
  4. MALAYALAM
  5. 1234.4321

1. Write a program to insert a number in a list Testing Condition
   1. Insert at the beginning
   2. Insert in the middle
   3. Insert at the last
   4. Not Available position in a list
2. The n-queens puzzle is the problem of placing n queens on an n x n chessboard such that no two queens attack each other. Given an integer n, return all distinct solutions to the n-queens puzzle. You may return the answer in any order. Write a program for the same.



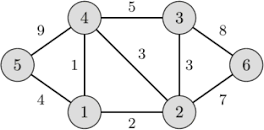
1. Write a [Program to find even Sum of Fibonacci Series Till number N](https://www.geeksforgeeks.org/java-program-to-find-sum-of-fibonacci-series-numbers-of-first-n-even-indexes/)? Sample Input: n = 4

Sample Output: 33

(N = 4, So here the Fibonacci series will be produced from 0th term till 8th term: 0, 1, 1, 2, 3, 5, 8, 13, 21

Sum of numbers at even indexes = 0 + 1 + 3 + 8 + 21 = 33)

1. Write a program to perform Minimum spanning tree using greedy techniques and estimate time complexity for the given set of values.



1. Write a program to perform Knapsack problem using greedy approach for the following set of object values.,

Knapsack weight = 100

|  |  |  |
| --- | --- | --- |
| item | Weight | Profit |
| 1 | 40 | 80 |
| 2 | 30 | 70 |
| 3 | 20 | 50 |
| 4 | 30 | 80 |

1. Write a program to perform Quick sort and estimate time complexity.

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

1. Write a program to print the reverse of a string. And estimate the time complexity for the given inputs.

Test cases: output –

“ as\nr5Y” Y5rn|sa

“7yut02” 20tuy7

“EryEq qEyrE

1. 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

1. 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*

1. 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].

1. Write a program to print first 2 minimum values from the numbers in below list.

Input a[]=(3, 5, -4, 1, 8, 2, 0, 4) Output (-4, 0)

1. Write a program to check whether the given no is palindrome or not Given an integer x, return true if x is a palindrome, and false otherwise

input out put

121 True

234 False

4554 True

1. Write a program for the given pattern the given pattern If n=4

|  |
| --- |
| 1 |
| 1 2 |
| 1 2 3 |
| 1 2 3 4 |

1. Write a program to find out Hamiltonian circuit using backtracking method. And 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 |

1. 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]]

## SET 10