FOUNDATION 60

BASICS

1. Print Hello World !!

2. Write a program that prints the perimeter of a rectangle to take its height and width as input
   [Perimeter = 2 * (Height + Width)
   Sample Input → Height : 10
   Sample Input → Width : 15
   Sample Output → Perimeter of the rectangle is 50

3. Write a program to compute the perimeter and area of a circle with a given radius
   [Perimeter = 2 * π * r] [Area = π * r ^ 2]]
   Sample Input → Radius :
   Sample Output → Perimeter of the circle is
   Sample Output → Area of the circle is

4. Write a program to find the Area of Triangle given Base and Height
   [Area = 0.5 * Base * Height]
   Sample Input → Height : 10
   Sample Input → Base : 15
   Sample Output → Area of the rectangle is 50

5. Create a program that converts temperatures from Celsius to Fahrenheit
   [Fahrenheit= (Celsius * 9 / 5) + 32]
   Sample Input → Celsius : 36
   Sample Output → Fahrenheit : 96.8

6. Write a program that converts kilometers per hour to miles per hour
   [Miles per hour (mph) = Kilometers per hour (kmph) * 0.621371]
   Sample Input → Kmph : 50
   Sample Output → Mph : 31.0686

7.
   a. Write a program that takes hours and minutes as input, and calculates the total number of minutes
      Sample Input → Hours : 5
      Sample Input → Minutes : 37
      Sample Output → 337 minutes
   b. Write a program that takes minutes as input, and display the total number of hours a minutes
      Sample Input → Minutes : 546
      Sample Output → 9 Hours, 6 Minutes

8. Design a program that calculates the simple interest based on user-provided principal, rate, and time
   [Simple Interest = (Principal x Interest x Time)/ 100]

9.
   a. Accept two numbers from user and swap their values
   b. Accept two numbers from user and swap their values without using third variable
      Sample Input → a : 69
      Sample Input → b : 96
      Sample Output → a = 96 , b = 69

10. Write a program to calculate a bike's average consumption from the given total distance (integer value) travelled (in km) and spent fuel (in litters, float number – 2 decimal points)

    [Average = Total Distance / Fuel Consumed]

    Sample Input → Fuel Consumed : 5

    Sample Input → Total Distance : 350

    Sample Output → Average ⇒ 70

CONDITIONAL

11. Write a program to accept two integers and check whether they are equal or not

    Case 1 :

    Sample Input → a : 69

    Sample Input → b: 69

    Sample Output → Equal

    Case 2 :

    Sample Input → a : 69

    Sample Input → b : 96

    Sample Output → Not Equal

12. Write a program to find whether a given year is a leap year or not

    Case 1 :

    Sample Input → 2024

    Sample Output → Leap Year

    Case 2 :

    Sample Input → 2024

    Sample Output → Leap Year

13. Write a program to find the largest among three numbers

    Sample Input → a : 1

    Sample Input → b : 12

    Sample Input → c : 56

    Sample Output → C is the largest

14. Write a program to check whether a given number is positive or negative and also check whether the given number is even or odd

    Sample Input → a : 12

    Sample Output → Positive and Even

15. Write a program to read the age of a candidate and determine whether it is eligible for casting his/her own vote

    Case 1 :

    Sample Input → Age : 12

    Sample Output → Go to home and watch pogo

    Case 2 :

    Sample Input → Age : 19

    Sample Output → Vote for Sheryians

16. Accept marks of 4 subjects and calculate percentage if percentage is below 35% - F ,below 45% - D , below 55% - C , below 75% - B , above 75% - A

Case 1 :

Sample Input → Mathematics : 82

Sample Input → Science : 96

Sample Input → English : 88

Sample Input → Hindi : 93

Sample Output → A (Expectation)

Case 2 :

Sample Input → Mathematics : 48

Sample Input → Science : 52

Sample Input → English : 49

Sample Input → Hindi : 51

Sample Output → D (Reality)

17. Write a program to input cost price and selling price of a product and check profit or loss

Sample Input → Cost Price : 150

Sample Input → Selling Price : 200

Sample Output → Profit of 50

18. Write a program to check whether an alphabet is a vowel or a consonant.

Case 1 :

Sample Input → Character : A

Sample Output → Vowel

Case 2 :

Sample Input → Character : X

Sample Output → Consonant

19. Write a program to read any day number in integer and display the day name in word format.

Case 1 :

Sample Input → Day : 2

Sample Output → Tuesday

Case 2 :

Sample Input → Day : 4

Sample Output → Thursday

20. Write a program for reading any Month Number and displaying the Month name as a word.

Case 1 :

Sample Input → Month : 3

Sample Output → March

Case 2 :

Sample Input → Month : 10

Sample Output → October

21. Write a program to accept the height of a person in centimeter and categorize the person according to their height if below 150 he is dwarf if above 150 and below 200 average and above 200 tall

Case 1 :

Sample Input → Height : 223

Sample Output → Tall guy (Lambu)

Case 2 :

Sample Input → Height : 143

Sample Output → Chotu 2 chai lana

22. Build a Calculator which perform these operations (+ , - , / , x , %) [MINI PROJECT]

    Case 1 :

    Sample Input → Number 1 : 2

    Sample Input → Operator : +

    Sample Input → Number 2 : 8

    Sample Output → Result ⇒ 2 + 8 ⇒ 10

    Case 2 :

    Sample Input → Number 1 : 10

    Sample Input → Operator : %

    Sample Input → Number 2 : 2

    Sample Output → Result ⇒ 10 % 2 ⇒ 0

LOOPS

23. Write a program in C to print natural numbers up to n

    Sample Input → N : 8

    Sample Output → 1 2 3 4 5 6 7 8

24. Write a program to print the factorial of a number

    Sample Input → Number : 5

    Sample Output → Factorial ⇒ 120

25. Write a program to find the sum and average up to nth term.

    Sample Input → Number : 5

    Sample Output → Sum ⇒ 15 & Average ⇒ 3

26. Write a program to print the sum of all factors of a number

    Sample Input → Number : 12

    [Explanation : Factors of 12 = 1,2,3,4,6,12]

    [Sum of Factors =1 + 2 + 3 + 4 + 6 + 12 = 28]

    Sample Output → Sum ⇒ 28

27. Write a program to print the power of a raised to the power of b.

    Sample Input → a : 10

    Sample Input → b : 2

    [Explanation : a ^ b ⇒ 10^2 ⇒ 10*10 = 100]

    Sample Output → 100

28. Write a program to print the sum of all even & odd numbers separately up to n term

    Sample Input → n : 10

    [Explanation : even ⇒ 2,4,6,8,10]

    [Sum of even ⇒ 2+4+6+8+10 = 30]

    Sample Output → 30

29. Write a program to find the prime numbers within a range of numbers

    Sample Input → Start : 10

    Sample Input → End : 50

    Sample Output → 11 , 13 , 17, 19, 23, 29, 31, 37, 41, 43, 47

30. Write a program to sum of digits of a number

    Sample Input → Number : 465

    [Explanation : Sum ⇒ 4 + 5 + 6 = 15]

Sample Output → 15

31. Write a C program to print Fibonacci series up to Nth terms
    Sample Input → N : 7
    Sample Output → 0 1 1 2 3 5 8

32. Write a program to check whether a number is a palindrome or not

    Case 1 :
        Sample Input → Number : 121
        Sample Output → Palindromic Number
    Case 2 :
        Sample Input → Number : 123
        Sample Output → Not a Palindromic Number

33. Write a program to find the LCM of two numbers
    Sample Input → a : 6
    Sample Input → b : 12
    Sample Output → The LCM of 6 & 12 is 12

34. Write a program to find the sum of the series 1 +11 + 111 + 1111 + .. n terms
    Sample Input → n : 5
    [Explanation : Sum of the series ⇒ 1 + 11 + 111 + 1111 + 11111 = 12345]
    Sample Output → 12345

35. Write a program to check whether a given number is a 'Harshad' number or not.
    Sample Input → n : 24
    [Explanation : Harshad number is a number which is completely divisible by sum of its digits]
    [For e.g 24 , Sum of digits = 2 + 4 = 6 , 24 % 6 = 0 which means it is completely divisible]
    Sample Output → Yes it is a Harshad Number

36. Write a program to check whether a given number is a 'Perfect' number or not.
    Sample Input → n : 6
    [Explanation : A number whose sum of factors(excluding number itself) is equal to itself]
    [For e.g 6 , Sum of Factor of 6 ⇒ 1 + 2 + 3 ⇒ 6]
    Sample Output → Yes it is a Perfect Number

37. Write a program to check whether a given number is an Armstrong number or not.
    Sample Input → n : 407
    [Explanation : Sum of cube of all digits will be equal to itself]
    [For e.g 407 , Sum of cube of digits ⇒ 4^3 + 0^3 + 7^3 ⇒ 64 + 0 + 343 ⇒ 407]
    Sample Output → Yes it is a Armstrong Number

38. Write a program to check whether a number is a Strong Number or not..
    Sample Input → n : 145
    [Explanation :Sum of factorial of each digit will be equal to the original number]
    [For e.g 145 , Sum of factorial of digits ⇒ 1! + 4! + 5! ⇒ 1 + 4*3*2*1 + 5*4*3*2*1 ⇒ 1 + 24 + 120 = 145]
    Sample Output → Yes it is a Strong Number

ARRAY

39. Write a program to accept n elements in an array and print it in normal order and in reverse order

Sample Input → n (size of array) : 5

Sample Input → Elements of array : 1 2 3 4 5

Sample Output → Normal Order : 1 2 3 4 5

Sample Output → Reverse Order : 5 4 3 2 1

40. Write a program to print positive and negative elements of an array separately .

Sample Input → n (size of array) : 5

Sample Input → Elements of array : 1 -23 56 -69 36

Sample Output → Positive Elements : 1 56 36

Sample Output → Negative Elements : -23 -69

41. Accept size n from user and create a n size array then take n inputs into the and finally Print the sum of all elements .

Sample Input → n (size of array) : 5

Sample Input → Elements of array : 1 2 3 4 5

[Explanation : Sum of all Array Elements ⇒ 1 + 2 + 3 + 4 + 5 = 15]

Sample Output → Sum of all Array Elements = 15

42. Write a program to perform Linear Search on an array - If element found print the index else -1

Case 1 :

Sample Input → n (size of array) : 5

Sample Input → Elements of array : 1 2 3 4 5

Sample Input → K (Element you wan to search) : 3

Sample Output → 3 found at 2 index

Case 2 :

Sample Input → n (size of array) : 5

Sample Input → Elements of array : 1 2 3 4 5

Sample Input → K (Element you wan to search) : 69

Sample Output → -1

43. Write a program to perform Binary Search on an array If element found print the index else -1

Case 1 :

Sample Input → n (size of array) : 5

Sample Input → Elements of array : 1 2 3 4 5

Sample Input → K (Element you want to search) : 5

Sample Output → 5 found at 4 index

Case 2 :

Sample Input → n (size of array) : 5

Sample Input → Elements of array : 1 2 3 4 5

Sample Input → K (Element you want to search) : 69

Sample Output → -1

44. Write a program to perform Bubble sort on an array

Sample Input → n (size of array) : 8

Sample Input → Elements of array : 5 3 8 4 7 1 2 6

Sample Output → Sorted Array : 1 2 3 4 5 6 7 8

45. Write a program of Array left Rotation by 1 element.

Sample Input →n (size of array) : 5

Sample Input → Elements of array : 1 2 3 4 5

Sample Output → Result ⇒ 2 3 4 5 1

46. Write a program of Array right Rotation by 1 element.

    Sample Input →n (size of array) : 5

    Sample Input → Elements of array : 1 2 3 4 5

    Sample Output → Result ⇒ 5 1 2 3 4

47. Write a program of Array left rotation by K elements..

    Sample Input →n (size of array) : 5

    Sample Input → Elements of array : 1 2 3 4 5

    Sample Input → K : 3

    Sample Output → Result ⇒ 4 5 1 2 3

48. Write a program of Array right rotation by K elements.

    Sample Input →n (size of array) : 5

    Sample Input → Elements of array : 1 2 3 4 5

    Sample Input → K : 3

    Sample Output → Result ⇒ 3 4 5 1 2

49. Write a program to check whether the given array is palindrome or not

    Case 1 :

    Sample Input →n (size of array) : 4

    Sample Input → Elements of array : 1 2 2 1

    Sample Output → Yes its a Palindromic Array

    Case 2 :

    Sample Input →n (size of array) : 4

    Sample Input → Elements of array : 1 2 3 4

    Sample Output → No its not a Palindromic Array

50. Write a program to find the largest element of an array and print its index.

    Sample Input →n (size of array) : 5

    Sample Input → Elements of array : 7 27 12 19 3

    Sample Output → 27 is largest element and its index is 1

STRING

51. Write a program to input a string and print it. Also, find its length.

    Sample Input →String : “Hello Shery”

    Sample Output → String is “Hello Shery” and its length is 11

52. Write a program to print the characters of a string in reverse order.

    Sample Input →String : “adakam”

    Sample Output → Result ⇒ “makada”

53. Write a program to separate the individual characters from a string.

    Sample Input → String : “SHERYIANS”

    Sample Output → S H E R Y I A N S

54. Write a program to compare two strings if they are identical print (identical) else (not identical)

Case 1 :

Sample Input → String 1 : “Labrador lag gaye”

Sample Input → String 2 : “Labrador lag gaye”

Sample Output → Identical

Case 2 :

Sample Input → String 1 : “Labrador lag gaye”

Sample Input → String 2 : “L**de lag gaye”

Sample Output → Not identical

55. Write a program to find maximum occurring character(exclude space) in a string and print how many time it appeared .

    Sample Input → String : “Haan Bhoola Main Jahan Main Masti Mein Ghoomun Main Karta Dua Ke Hasti Rahe Tu”

    Sample Output → a is the maximum occurring character which comes 14 times

56. Write a program to input two string and add these strings in alternate order like

    Sample Input →String : “Hello Shery”

    Sample Output → String is “Hello Shery” and its length is 11

57. Write a program to check whether string is palindromic or not

    Case 1 :

    Sample Input → String : “level”

    Sample Output → Palindromic String

    Case 2 :

    Sample Input → String : “level up”

    Sample Output → Not a Palindromic String

58. Write a program to remove the spaces from a string

    Sample Input → String : “S H O O R V E E R ”

    Sample Output → Result ⇒ “SHOORVEER”

59. Write a program to count the total number of alphabets, digits, and special characters in a string...

    Sample Input → String : “1 2 ka 4 , 4 2 ka 1 my name is sheryians”

    Sample Output → Numbers of Alphabets ⇒ 21

    Sample Output → Numbers of Digits ⇒ 6

    Sample Output → Numbers of Special Characters ⇒ 1

60. Write a program to Alternatively Merge two Strings

    Sample Input → String 1 : “abcde”

    Sample Input → String 2 : “pqrst”

    Sample Output → Result ⇒ “apbqcrdset”

Pattern Programming

1. Right Triangle - Star

```
*
* *
* * *
* * * *
* * * * *
```

2. Right Triangle - Number

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

3. Inverted Right Triangle - Star

```
* * * * *
* * * *
* * *
* *
*
```

4. Mirrored Right Triangle - Star

```
        *
      * *
    * * *
  * * * *
* * * * *
```

5. Hallow Square - Star

```
* * * * *
*       *
*       *
*       *
* * * * *
```