Course: Introduction to programming (C language)

Exercises

1. Write a C program to print your name, date of birth. and mobile number.

   Expected Output:

   Name : Alexandra Abramov
   DOB : July 14, 1975
   Mobile : 99-9999999999

2. Write a C program to print a block F using hash (#), where the F has a height of six characters and width of five and four characters.

   Expected Output:

   ```
   ######
   #
   #
   #####
   #
   #
   #
   ```

3. Write a C program that accepts two integers from the user and calculate the sum of the two integers.

   Input the first integer: 25
   Input the second integer: 38

   Expected Output:

   Sum of the above two integers = 63

4. Write a C program to compute the perimeter and area of a square with a length enter by the user.

   Input the length of the square in centimeters: 10

   Expected Output:

   Perimeter of the square = 40 cm
   Area of the square = 100 square cm

5. Write a C program to compute the perimeter and area of a circle with a given radius.

   Input the radius of the circle in centimeters: 10

   Expected Output:

   Perimeter of the Circle = 62.83 cm
   Area of the Circle = 314.15 square cm

6. Repeat the previous exercise by defining a function to calculate the area.

7. Write a C program that accepts an employee's ID, total worked hours of a month and the amount he received per hour. Print the employee's ID and salary (with two decimal places) of a particular month.

   Input the Employees ID(Max. 10 chars): 0342
   Input the working hrs: 160
   Salary amount/hr: 100

   Expected Output:
   Employees ID = 0342
   Salary = U$ 16000.00

8. Write a C program that accepts three integers and find the maximum of three.

   Input the first integer: 25
   Input the second integer: 35
   Input the third integer: 15

   Expected Output: Maximum value of three integers: 35

9. Write a C program to convert a given integer (in seconds) to hours, minutes and seconds.

   Input seconds: 25300

   Expected Output:
   There are:
   H:M:S - 7:1:40

10. Write a C program to calculate x raised to the power n (x^n).

    Input:
    x = 7.0
    n = 2

    Expected Output:
    Result:(x^n) : 49.000000

11. Write a C program to check whether a given number is even or odd.

    Test Data : 15

Expected Output :
15 is an odd integer

12. Write a program in C to check whether a number is a prime number or not using the function.

    Test Data :
    Input a positive number : 5

    Expected Output :
    The number 5 is a prime number.

13. Write a C program to print the roots of Bhaskara's formula from the given three floating numbers. Display a message if it is not possible to find the roots.

    Input the first number(a): 1
    Input the second number(b): 5
    Input the third number(c): 4

    Expected Output:
    Root1 = -4.00
    Root2 = -1.00

14. Write a program in C to store elements in an array and print it.

    Test Data :
    Input 10 elements in the array :
    element - 0 : 1
    element - 1 : 1
    element - 2 : 2
    .....

    Expected Output :
    Elements in array are: 1 1 2 3 4 5 6 7 8 9

15. Change the previous program to print the numbers in reverse order.

16. Write a program in C to find the sum of all elements of the array.

    Test Data :
    Input the number of elements to be stored in the array :3
    Input 3 elements in the array :
    element - 0 : 2
    element - 1 : 5
    element - 2 : 8

    Expected Output :
    Sum of all elements stored in the array is : 15

17. Write a program in C to copy the elements of one array into another array.

    Test Data :
    Input the number of elements to be stored in the array :3
    Input 3 elements in the array :
    element - 0 : 15
    element - 1 : 10
    element - 2 : 12

    Expected Output :
    The elements stored in the first array are :
    15 10 12
    The elements copied into the second array are :
    15 10 12

18. Write a program in C to sort in crescent order the elements of an array.

    Test Data :
    Input the number of elements to be stored in the array :3
    Input 3 elements in the array :
    element - 0 : 15
    element - 1 : 10
    element - 2 : 12

    Expected Output :
    The elements stored in the array in crescent order are:
    10 12 15

19. Write a program in C to count the frequency of each element of an array.

    Test Data :
    Input the number of elements to be stored in the array :3
    Input 3 elements in the array :
    element - 0 : 25
    element - 1 : 12
    element - 2 : 43

    Expected Output :
    The frequency of all elements of an array :
    25 occurs 1 times
    12 occurs 1 times
    43 occurs 1 times

20. Write a program in C to find the maximum and minimum element in an array.

    Test Data :
    Input the number of elements to be stored in the array :3

Input 3 elements in the array :
element - 0 : 45
element - 1 : 25
element - 2 : 21

Expected Output :
Maximum element is : 45
Minimum element is : 21

21. Write a C program to calculate the dot product of two 3D vectors.

Test Data:
Input the elements of the first vector:
element - 0 : 1
element - 1 : 0
element - 2 : -1
Input the elements of the second vector:
element - 0 : 2
element - 1 : 1
element - 2 : 1

Expected Output :
The dot product between the vectors is: 1

22. Write a C program to calculate the vector product of two 3D vectors.

Test Data:
Input the elements of the first vector:
element - 0 : 1
element - 1 : 0
element - 2 : -1
Input the elements of the second vector:
element - 0 : 2
element - 1 : 1
element - 2 : 1

Expected Output :
The vector product between the vectors is:

23. Write a program in C for a 2D array of size 3x3 and print the matrix.

Test Data :
Input elements in the matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [0],[2] : 3
element - [1],[0] : 4

element - [1],[1] : 5
element - [1],[2] : 6
element - [2],[0] : 7
element - [2],[1] : 8
element - [2],[2] : 9

Expected Output :
The matrix is :

1 2 3
4 5 6
7 8 9

24. Write a program in C for addition of two Matrices of same size.

Test Data :
Input the size of the square matrix (less than 5): 2
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [1],[0] : 3
element - [1],[1] : 4

Input elements in the second matrix :
element - [0],[0] : 5
element - [0],[1] : 6
element - [1],[0] : 7
element - [1],[1] : 8

Expected Output :
The First matrix is :

1 2
3 4

The Second matrix is :

5 6
7 8

The Addition of two matrix is :

6 8
10 12

25. Write a program in C for multiplication of two square Matrices.

Test Data :
Input the rows and columns of first matrix : 2 2
Input the rows and columns of second matrix : 2 2
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [1],[0] : 3
element - [1],[1] : 4
Input elements in the second matrix :
element - [0],[0] : 5
element - [0],[1] : 6
element - [1],[0] : 7
element - [1],[1] : 8

Expected Output :
The First matrix is :

1 2
3 4

The Second matrix is :

5 6
7 8
The multiplication of two matrix is :

19 22
43 50

26. Write a program in C to find transpose of a given matrix.

Test Data :
Input the rows and columns of the matrix : 2 2
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [1],[0] : 3
element - [1],[1] : 4

Expected Output :
The matrix is :

1 2
3 4

The transpose of a matrix is :
1 3

2 4

27. Write a program in C to calculate determinant of a 3 x 3 matrix.

Test Data :
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 0
element - [0],[2] : -1
element - [1],[0] : 0
element - [1],[1] : 0
element - [1],[2] : 1
element - [2],[0] : -1
element - [2],[1] : -1
element - [2],[2] : 0

Expected Output :
The matrix is :
1 0 -1
0 0 1
-1 -1 0

The Determinant of the matrix is: 1

References:

- https://www.w3resource.com/c-programming-exercises
- https://codeforwin.org/c-programming-examples-exercises-solutions-beginners