Coding Age

Programming Questions:-

Topic:- Variables and Data types

Easy:-

1. Write a C program to declare and initialize a variable of type int and print its value.
2. Write a C program to declare and initialize a variable of type float and print its value.
3. Write a C program to declare and initialize a variable of type char and print its value.
4. Write a C program to declare and initialize a variable of type double and print its value.

Medium:-

5. Write a C program to declare two variables of type int and swap their values.
6. Write a C program to declare three variables of type float and find their average.
7. Write a C program to declare a variable of type int and check whether it is even or odd.
8. Write a C program to declare two variables of type float and find their product.
9. Write a C program to declare a variable of type int and find its square root.
10. Write a C program to declare a variable of type char and convert it to uppercase
11. .Write a C program to declare a variable of type double and round it off to the nearest integer.

Hard:-

12. Write a C program to declare two variables of type int and perform bitwise AND operation on them.
13. Write a C program to declare two variables of type int and perform bitwise OR operation on them.
14. Write a C program to declare two variables of type int and perform bitwise XOR operation on them.
15. Write a C program to declare a variable of type int and convert it to binary representation.

Topic:- Operators

Easy:-

1. Write a C program to perform addition of two integers using the '+' operator.
2. Write a C program to perform subtraction of two integers using the '-' operator.
3. Write a C program to perform multiplication of two integers using the '*' operator.
4. Write a C program to perform division of two integers using the '/' operator.
5. Write a C program to perform modulo operation on two integers using the '%' operator.
6. Write a C program to perform increment operation on an integer using the '++' operator.
7. Write a C program to perform decrement operation on an integer using the '--' operator.
8. Write a C program to perform logical AND operation on two integers using the '&&' operator.
9. Write a C program to perform logical OR operation on two integers using the '||' operator.
10. Write a C program to perform logical NOT operation on an integer using the '!' operator.

Medium:-

1. Write a C program to find the maximum of three integers using ternary operator.
2. Write a C program to check whether a given year is a leap year or not using conditional operator.
3. Write a C program to implement a calculator using switch statement for arithmetic operators.
4. Write a C program to perform bitwise left shift operation on an integer using the '<<' operator.
5. Write a C program to perform bitwise right shift operation on an integer using the '>>' operator.
6. Write a C program to swap two integers without using a third variable using bitwise XOR operator.
7. Write a C program to find the area of a circle using the '*' and '/' operators.

Hard:-

```
1. #include <stdio.h>
     int main(){
       float a;
       (int)a= 10;
       printf("value of a=%d",a);
       return 0;
     }
```

```
2. #include <stdio.h>
     int main(){
        int x;

        x=100,30,50;

        printf("x=%d\n",x);

        x=(100,30,50);

        printf("x=%d\n",x);

        return 0;

    }
```

```
3. #include <stdio.h>

        int main()

        {

                int i=-1,j=-1,k=0,l=2,m;

                m=i++&&j++&&k++||l++;

                printf("%d %d %d %d %d",i,j,k,l,m);

                return 0;

        }
```

```
4. #include <stdio.h>

        int main(){

          char val=250;

          int      ans;

          ans= val+ !val + ~val + ++val;

          printf("%d",ans);

          return 0;

        }
```

```
5. #include <stdio.h>

        void main()

        {

                int x=(20 || 40 ) && (10);

                printf("x= %d",x);
        }


6. #include <stdio.h>
        void main()
        {
                int x;
                x= (printf("AA")||printf("BB"));
                printf("%d",x);
                printf("\n");

                x= (printf("AA")&&printf("BB"));
                printf("%d",x);
        }
7. #include <stdio.h>
        void main()
        {
                char var=10;
                printf("var is = %d",++var++);
        }


8. #include <stdio.h>
        void main()
        {
                int a=10,b=2,x=0;
                x=a+b*a+10/2*a;
                printf("value is =%d",x);
        }


9. #include <stdio.h>
        void main()
```

```
{
        const char var='A';
        ++var;
        printf("%c",var);
}
```

10.

```
#include <stdio.h>
int main()
{
        int i=-1,j=-1,k=0,l=2,m;
        m=i++&&j++&&k++||l++;
        printf("%d %d %d %d %d",i,j,k,l,m);
        return 0;
}
```

Topic:- Conditionals

Easy:-

1. Write a C program to check whether a given integer is even or odd using if-else statement.
2. Write a C program to check whether a given character is a vowel or consonant using switch statement.
3. Write a C program to find the maximum of two integers using if-else statement.
4. Write a C program to find the minimum of two integers using ternary operator.
5. Write a C program to check whether a given integer is positive, negative or zero using if-else statement.

Medium:-

1. Write a C program to check whether a given integer is a multiple of 3 using if-else statement.
2. Write a C program to check whether a given integer is a palindrome or not using if-else statement.
3. Write a C program to check whether a given integer is a prime number or not using if-else statement.

4. Write a C program to check whether a given year is a leap year or not using if-else statement.
5. Write a C program to check whether a given integer is divisible by both 3 and 5 using if-else statement.

Hard:-

1. Write a C program to find the largest of three numbers using nested if-else statements.
2. Write a C program to check whether a given string is a palindrome or not using recursive function.
3. Write a C program to sort three integers in ascending order using if-else statements.
4. Write a C program to find the roots of a quadratic equation using if-else statements.
5. Write a C program to implement a basic calculator using switch statement for arithmetic operators and nested if-else statements for error handling.
6. Write a C program to implement a vending machine using if-else statements and switch statements.
7. Write a C program to check whether a given year is a leap year or not using ternary operator.
8. Write a C program to find the maximum of four integers using nested if-else statements.
9. Write a C program to implement a menu-driven calculator using switch statement for arithmetic operators and switch statement for input validation.
10. Write a C program to implement a state machine that controls the traffic lights using switch statement. The state machine should have three states: Red, Green and Yellow, and the transition from one state to another should follow the standard traffic rules.

Topic:- Loops

Easy:-

1. Write a C program to print all natural numbers from 1 to n using for loop.
2. Write a C program to print the multiplication table of a given number using while loop.
3. Write a C program to find the factorial of a given number using for loop.
4. Write a C program to print the Fibonacci series up to a given number using for loop.
5. Write a C program to find the sum of all even numbers between 1 to n using while loop.

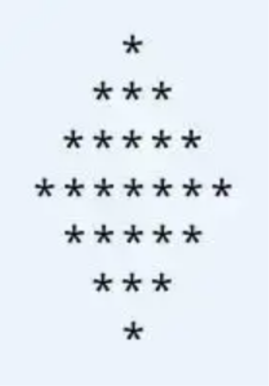
Medium:-

1. Write a C program to print all Armstrong numbers between 1 to n using for loop.
2. Write a C program to check whether a given number is a prime number or not using for loop.
3. Write a C program to print the pattern of a right-angled triangle using nested for loop.

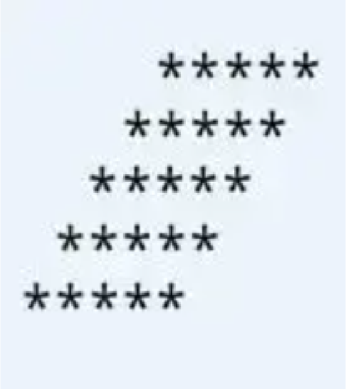
4. Write a C program to calculate the average of an array of n numbers using for loop.
5. Write a C program to find the greatest common divisor (GCD) of two numbers using while loop.

Hard:-

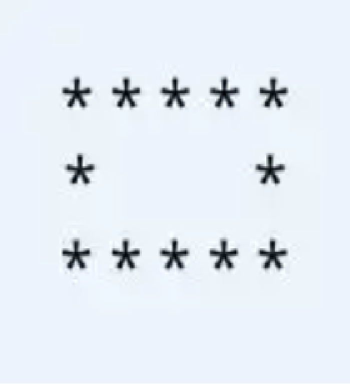
Print the following pattern:-



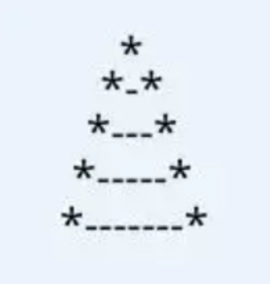
```
   *
  ***
 *****
*******
 *****
  ***
   *
```



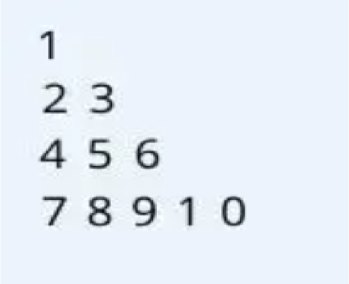
```
    *****
   *****
  *****
 *****
*****
```



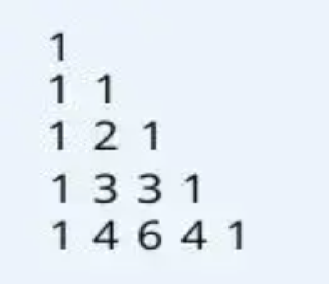
```
* * * * *
*       *
* * * * *
```



```
    *
   *_*
  *___*
 *_____*
*_______*
```



```
1
2 3
4 5 6
7 8 9 1 0
```



```
1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
```

Topic:- Arrays

Easy:-

1. Write a program in C to store elements in an array and print them.
2. Write a program in C to read n number of values in an array and display them in reverse order.
3. Write a program in C to find the sum of all elements of the array.
4. Write a program in C to copy the elements of one array into another array.
5. Write a program in C to count the total number of duplicate elements in an array.

Medium:-

1. Write a programme in c so that read a matrix and find sum, product of all elements of two dimensional (matrix) array
2. Write a programme in c that transpose a matrix.
3. Write a programme that reads a matrix and print the diagonals.
4. Write a programme that checks if the both 2-d arrays are identical or not.
5. Write a programme that sort an array in ascending order as well as descending order.

Hard:-

1. Write a programme tot rotate an arary by d elements

   Input: {1,2,3,4,5,6,7} d=2

   outpur{{3,4,5,6,7,1,2}
2. Write a programme to find the “Kth” largest element in the array

   Input: {7,10,4,3,20,15} k=3

   Output: 10
3. Write a programme to find the missing number in an arra of consecutive numbers

   Input{1,2,3,5,6,7,8}

   Output: Missing number is 4
4. Write a programme to find equilibrium point in the array

   Input: {0,-3,5,-4,-2,3,1,0}

   Output: equlibrium point is 3
5. Write a program to find the common elements in three sorted arrays

   Input: Array1 = { 1, 5, 10, 20, 40, 80 }, Array2 = { 6, 7, 20, 80, 100 }, Array3 = { 3, 4, 15, 20, 30, 70, 80, 120 }

   Output: Common elements are 20 and 80
6. Write a program to find the maximum product subarray in an array

   Input: { 6, -3, -10, 0, 2 } Output: The maximum product subarray is { 6, -3, -10 }
7. Write a program to find the minimum distance between two numbers in an array

   Input: { 2, 5, 3, 5, 4, 4, 2, 3 }, x = 3, y = 2

Output: The minimum distance between 3 and 2 is 1

8. Write a program to find the maximum length bitonic subarray in an array

   Input: { 12, 4, 78, 90, 45, 23 }

   Output: The maximum length bitonic subarray is { 4, 78, 90, 45, 23 }

9. Write a program to find the leaders in an array

   Input: { 16, 17, 4, 3, 5, 2 }

   Output: Leaders in the array are 17, 5 and 2

10. Write a program to find the minimum platforms required for a railway station

    Input: Arrivals = { 900, 940, 950, 1100, 1500, 1800 }, Departures = { 910, 1200, 1120, 1130, 1900, 2000 }

    Output: The minimum number of platforms required is 3

11. Write a program to find the maximum profit by buying and selling a share at most "k" times

    Input: Prices = { 10, 22, 5, 75, 65, 80 }, k = 2

    Output: The maximum profit is 87

12. Write a program to find the triplet whose sum is closest to zero

    Input: { -1, 2, 1, -4 }

    Output: The closest triplet sum to zero is -1

13. Write a program to count inversions in an array

    Input: { 2, 4, 1, 3, 5 }

    Output: The number of inversions in the array is 3

14. Write a program to print all the subsets of an array

    Input: { 1, 2, 3 }

    Output: { {}, {1}, {2}, {3}, {1,2}, {1,3}, {2,3}, {1,2,3} }

15. Write a program to find the next greater element for each element in an array

    Input: { 4, 5, 2, 25 }

    Output: Next greater element for each element in the array is { 5, 25, 25, -1 }

16. Write a program to find the kth smallest element in an unsorted array

    Input: { 7, 10, 4, 3, 20, 15 }, k = 3

Output: The 3rd smallest element in the array is 7

17. Write a program to find the maximum sum increasing subsequence in an array

    Input: { 1, 101, 2, 3, 100, 4, 5 }

    Output: The maximum sum increasing subsequence is { 1, 2, 3, 100 }

18. Write a program to rearrange an array such that arr[i] = i

    Input: { -1, -1, 6, 1, 9, 3, 2, -1, 4, -1 }

    Output: { -1, 1, 2, 3, 4, -1, 6, -1, -1, 9 }

19. Write a program to find the maximum sum subarray of a given size "k"

    Input: { 1, 4, 2, 10, 2, 3, 1, 0, 20 }, k = 4

    Output: The maximum sum subarray of size 4 is { 2, 10, 2, 3 }

20. Write a program to find the first repeating element in an array

    Input: { 10, 5, 3, 4, 3, 5, 6 }

    Output: The first repeating element is 5

Topic:- Functions

Easy:-

1. Write a C program to define a function that prints "Hello, World!" on the console and call the function from the main function.
2. Write a C program to define a function that finds the sum of two numbers and returns the result to the main function.
3. Write a C program to define a function that finds the maximum of two numbers and returns the result to the main function.
4. Write a C program to define a function that calculates the area of a rectangle and returns the result to the main function.
5. Write a C program to define a function that checks whether a given number is even or odd and returns the result to the main function.
6. Write a C program to define a function that calculates the factorial of a given number and returns the result to the main function.

7. Write a C program to define a function that calculates the simple interest and returns the result to the main function.
8. Write a C program to define a function that checks whether a given character is a vowel or consonant and returns the result to the main function.
9. Write a C program to define a function that calculates the power of a number using recursion and returns the result to the main function.
10. Write a C program to define a function that finds the absolute value of a given number and returns the result to the main function.

Medium:-

1. Write a C program to define a function that finds the sum of all elements in an array of n integers and returns the result to the main function.
2. Write a C program to define a function that calculates the GCD of two given numbers using recursion and returns the result to the main function.
3. Write a C program to define a function that calculates the LCM of two given numbers and returns the result to the main function.
4. Write a C program to define a function that checks whether a given string is a palindrome and returns the result to the main function.
5. Write a C program to define a function that calculates the area of a circle and returns the result to the main function.
6. Write a C program to define a function that calculates the volume of a cylinder and returns the result to the main function.
7. Write a C program to define a function that calculates the roots of a quadratic equation and returns the result to the main function.
8. Write a C program to define a function that finds the second largest element in an array of n integers and returns the result to the main function.
9. Write a C program to define a function that checks whether a given number is a prime number or not and returns the result to the main function.
10. Write a C program to define a function that calculates the Fibonacci series up to n terms and returns the result to the main function.

Hard:-

1. Write a C program to define a function that calculates the area of a polygon with n sides and returns the result to the main function.
2. Write a C program to define a function that sorts an array of n integers in ascending order and returns the result to the main function.
3. Write a C program to define a function that reverses a given string and returns the result to the main function.
4. Write a C program to define a function that calculates the power of a number using iterative approach and returns the result to the main function.
5. Write a C program to define a function that calculates the volume of a sphere and returns the result to the main function.
6. Write a C program to define a function that calculates the factorial of a given number using recursion and returns the result to the main function.
7. Write a C program to define a function that calculates the sum of the series 1/1! + 2/2! + 3/3! + ... + n/n! and returns the result to the main function.
8. Write a C program to define a function that calculates the sum of the first n terms of the series 1 + x + x^2 + x^3 + ... + x^n and returns the result to the main function.
9. Write a C program to define a function that calculates the determinant of a given matrix and returns the result to the main function.
10. Write a C program to define a function that checks whether a given number is a Armstrong number or not and returns the result to the main function.