**Assignment 2 | 5th January 2021 Data Structure And Algorithm**

**Question 1**

**Write a program to print the following pattern**

**1**

**2\*2**

**3\*3\*3**

**4\*4\*4\*4**

#include <stdio.h>

int main()

{

int i, j;

for(i=1; i<=4 ; i++)

{

for(j=1; j<=i; j++)

{

printf("%d",i);

if(i!=j)

printf("\*");

}

printf("\n");

}

return 0;

}

**Question 2**

**Write a program to print the following pattern**

**1**

**01**

**101**

**0101**

**10101**

#include <stdio.h>

int main()

{

int i, j;

for(i=1; i<=5 ; i++)

{

for(j=1; j<=i; j++)

{

if((i%2 == 0 && j%2 == 0) || (i%2==1 && j%2==1))

printf("1");

else

printf("0");

}

printf("\n");

}

return 0;

}

**Question 3**

**Write the similarity and difference between an array name and a pointer variable**.

**Difference** - The difference between a pointer variable and an array name is that you can never change the address of the array name. It will always point to the first element of the array as long as it exists. The pointer variables on the other hand are quite flexible and can be pointed to somewhere else during the course of the program. In the same way \*(a+1) refer to the element a[1].

**Similarity**- When you declare arrays in C programming language, unknowingly you are declaring a **pointer**. You may be surprised at this point as you have never thought of it that way. When you declare an array using **int a[10]**, you actually define a pointer **a** that points to the first element of the array. In other words it carries the address of the first element of the array. So, you can say that **a** is equivalent to **&a[0]**, the address of **a[0]**. Therefore, the 'i'th element can be accessed by **\*(a+i)** or the value at **(a+i)**.