C Programming Loop Assignment Name: Sonali Sagar

1.
```
#include<stdio.h>
main()
{
	int i;
	i=1;
	printf("The first 10 natural numbers are:\n");
	while(i<=10)
	{
		printf("%d ",i);
		i++;
	}
}
```
Output - The first 10 natural numbers are:
1 2 3 4 5 6 7 8 9 10

2.
```
#include<stdio.h>
main()
{
	int i,sum=0;
	i=1;
	printf("The first 10 natural numbers are:\n");
	while(i<=10)
	{
		printf("%d ",i);
		sum = sum + i;
		i++;
	}
	printf("\nThe Sum is : %d",sum);
}
```
Output - The first 10 natural numbers are:
1 2 3 4 5 6 7 8 9 10
The Sum is : 55

3.
```
#include<stdio.h>
main()
{
	int n,i,sum=0;
	i=1;
	printf("Enter n: ");
	scanf("%d",&n);
	printf("The first %d natural number is :\n",n);
	while(i<=n)
	{
		printf("%d ",i);
```

```
                sum = sum + i;
                i++;
        }
        printf("\nThe Sum of Natural Numbers upto %d terms : %d",n,sum);
}
```
Output - Enter n: 7
The first 7 natural number is :
1 2 3 4 5 6 7
The Sum of Natural Numbers upto 7 terms : 28

4.
```
#include<stdio.h>
main()
{
        int n,i,sum=0;
        float avg;
        printf("Enter 10 numbers:\n");
        for(i=1;i<=10;i++)
        {
                printf("Number - %d: ",i);
                scanf("%d",&n);
                sum = sum + n;
        }
        avg = sum/10.0;
        printf("\nSum of 10 numbers is = %d\n",sum);
        printf("\nAverage of 10 numbers is = %f\n",avg);
}
```
Output - Enter 10 numbers:
Number - 1: 23
Number - 2: 42
Number - 3: 12
Number - 4: 7
Number - 5: 76
Number - 6: 6
Number - 7: 82
Number - 8: 20
Number - 9: 90
Number - 10: 55

Sum of 10 numbers is = 413

Average of 10 numbers is = 41.299999

5.
```
#include<stdio.h>
main(){
        int n,i;
        printf("Input number of terms: ");
        scanf("%d",&n);
```

```
        for(i=1;i<=n;i++)
        {
        printf("Number is : %d and cube of the %d is :%d\n",i,i,i*i*i);
        }
}
```
Output - Input number of terms: 7
Number is : 1 and cube of the 1 is :1
Number is : 2 and cube of the 2 is :8
Number is : 3 and cube of the 3 is :27
Number is : 4 and cube of the 4 is :64
Number is : 5 and cube of the 5 is :125
Number is : 6 and cube of the 6 is :216
Number is : 7 and cube of the 7 is :343

6.
```
#include<stdio.h>
main(){
        int n,i;
        printf("Input the number (Table to be calculated): ");
        scanf("%d",&n);

        for(i=1;i<=10;i++)
        {

        printf("%d X %d = %d\n",n,i,n*i);
        }
}
```
Output - Input the number (Table to be calculated): 8
8 X 1 = 8
8 X 2 = 16
8 X 3 = 24
8 X 4 = 32
8 X 5 = 40
8 X 6 = 48
8 X 7 = 56
8 X 8 = 64
8 X 9 = 72
8 X 10 = 80

7.
```
#include<stdio.h>
main()
{
        int n,i,sum=0;
        printf("Input the number of terms : ");
        scanf("%d",&n);
        printf("The odd numbers are : ");
        for(i=1;i<=n;i++)
```

```
	{
		printf("%d ",2*i-1);
		sum += 2*i-1;
	}
	printf("\nThe Sum of even Natural Number upto %d terms : %d",n,sum);
}
```
Output-Input the number of terms : 10
The odd numbers are : 1 3 5 7 9 11 13 15 17 19
The Sum of even Natural Number upto 10 terms : 100

8.
```
#include<stdio.h>
main()
{
	int n,i,j;
	printf("Enter number: ");
	scanf("%d",&n);
	for(i=1;i<=n;i++)
	{
		for(j=1;j<=i;j++){
			printf("* ");
		}
		printf("\n");
	}

}
```
Output - Enter number: 4
```
*
* *
* * *
* * * *
```

9.
```
#include<stdio.h>
main()
{
	int n,i,j;
	printf("Enter number: ");
	scanf("%d",&n);
	for(i=1;i<=n;i++)
	{
		for(j=1;j<=i;j++){
			printf("%d",j);
		}
		printf("\n");
	}

}
```

Output - Enter number: 4
1
12
123
1234

10. #include<stdio.h>
main()
{
	int n,i,j;
	printf("Enter number: ");
	scanf("%d",&n);
	for(i=1;i<=n;i++)
	{
		for(j=1;j<=i;j++){
			printf("%d",i);
		}
		printf("\n");
	}

}
Output - Enter number: 4
1
22
333
4444

11. #include<stdio.h>
main()
{
	int n,i,j,k=1;
	printf("Enter number: ");
	scanf("%d",&n);
	for(i=1;i<=n;i++)
	{
		for(j=1;j<=i;j++){
			printf("%d ",k);
		k++;

	}
printf("\n");
}
}
Output - Enter number: 4
1
2 3
4 5 6

7 8 9 10

12. #include <stdio.h>

```
 int main() {
    int i,n,j,b=1,c;
    printf("Enter number: ");
    scanf("%d",&n);

       for(i=0;i<=n;i++)
       {
          for(c=n+1;c>i;c--)
          {
             printf(" ");
          }
           for(j=1;j<=i;j++)
           {
           printf("%d ",b++);
           }

        printf("\n");

             }
}
```

Output - Enter number: 4

```
   1
  2 3
 4 5 6
7 8 9 10
```

13. #include <stdio.h>

```
int main() {
int i, j, space, rows, k;
printf("Input number of rows : ");
scanf("%d", &rows);
space = rows + 4 - 1;

   for (i = 1; i <= rows; i++) {
      for (k = space; k >= 1; k--) {
         printf(" ");
      }

      for (j = 1; j <= i; j++) {
         printf("* ");
      }
```

```
    printf("\n");
    space--;
  }
   return 0;
}
```
Output - Input number of rows : 4
```
    *
   * *
  * * *
 * * * *
```

```
14. #include<stdio.h>
main()
{
        int n,fact=1,a;
        printf("Input the number: ");
        scanf("%d",&n);
        a=n;

        while(n>=1)
                {
                fact=fact*n;
                n--;
        }
        printf("The Factorial of %d is: %d",a,fact);
}
```
Output - Input the number: 4
The Factorial of 4 is: 24

```
15. #include<stdio.h>
main()
{
        int n,i,sum=0;
        printf("Input the number of terms : ");
        scanf("%d",&n);
        printf("The even numbers are : ");
        for(i=1;i<=n;i++)
        {
                printf("%d ",2*i);
                sum += 2*i;
        }
        printf("\nThe Sum of even Natural Number upto %d terms : %d",n,sum);
}
```
Output - Input the number of terms : 5
The even numbers are : 2 4 6 8 10
The Sum of even Natural Number upto 5 terms : 30

16.
```
#include<stdio.h>
main(){
        int n,i,j,k;
        printf("Enter number: ");
        scanf("%d",&n);
        for(i=1;i<=n;i++)
        {
                for(j=n-1;j>=i;j--)
                {
                        printf(" ");
                }
                for(k=1;k<=i;k++)
                {
        printf("%d",i);
                }
                printf("\n");
        }
}
```
Output - Enter number: 4
```
    1
   22
  333
4444
```

17.
```
#include<stdio.h>
main(){
int n,i,j,k;
printf("Enter number: ");
scanf("%d",&n);
for(i=1;i<=n;i++)
{
for(j=n-1;j>=i;j--)
{
printf(" ");
}
for(k=1;k<=i;k++)
{
printf("*");
}
printf("\n");
}
}
```
Output - Enter number: 4
```
      *
     **
    ***
   ****
```

```
18. #include <stdio.h>
int main() {
   int n, i, t = 9, sum = 0;
   printf("Input the number or terms :");
   scanf("%d", &n);
   for (i = 1; i <= n; i++)
   {
      sum += t;
      printf("%d\t", t);
      t = t * 10 + 9;
   }
   printf("\nThe sum of the series = %d \n", sum);
}
```

Output - Input the number or terms :6
9 99 999 9999 99999 999999
The sum of the series = 1111104

```
20.#include<stdio.h>
main(){
        int n,i,sum=0;
        printf("Input number of terms: ");
        scanf("%d",&n);
        printf("The square natural upto %d terms are:",n);
        for(i=1;i<=n;i++)
        {
        printf("%d ",i*i);
        sum = sum + i*i;
        }
        printf("\nThe sum of square natural number upto %d terms = %d",n,sum);
}
```

Output - Input number of terms: 6
The square natural upto 6 terms are:1 4 9 16 25 36
The sum of square natural number upto 6 terms = 91

```
21. #include <stdio.h>
int main() {
   int n, i, t = 1, sum = 0;
   printf("Input the number or terms :");
   scanf("%d", &n);
   for (i = 1; i <= n; i++)
   {
      sum += t;
      printf("%d +", t);
      t = t * 10 + 1;
   }
   printf("\nThe sum is: %d \n", sum);
}
```

Output - Input the number or terms :6
1 +11 +111 +1111 +11111 +111111 +
The sum is: 123456

22.#include <stdio.h>
main(){
int num, r, sum=0, temp;
printf("Input a number: ");
scanf("%d",&num);
for(temp=num;num!=0;num=num/10){
r=num % 10;
sum=sum+(r*r*r);
}

if(sum==temp)
printf("%d is an Armstrong number.\n",temp);
else
printf("%d is not an Armstrong number.\n",temp);
}
Output - Input a number: 152
152 is not an Armstrong number.

23.#include <stdio.h>
int main() {
int num, r, sum, temp;
int stno, enno;
printf("Enter starting range: ");
scanf("%d", &stno);
printf("Enter ending range : ");
scanf("%d", &enno);
printf("Armstrong numbers in the given range are: ");
for (num = stno; num <= enno; num++) {
temp = num;
sum = 0;
while (temp != 0) {
r = temp % 10;
temp = temp / 10;
sum = sum + (r * r * r);
}
if (sum == num)
printf("%d ", num);
}

printf("\n");

}

Output - Enter starting range: 1
Enter ending range : 1000
Armstrong numbers in the given range are: 1 153 370 371 407

25.#include<stdio.h>
main()
{
	int n,i=2,flag=1;
	printf("Enter number: ");
	scanf("%d",&n);
	while(i<n)
	{
		if(n%i==0)
		{
			flag=0;
			break;
		}
		i++;
	}

	if(flag==1)
	printf("%d is a prime number.",n);
	else
	printf("%d is not a prime number.",n);
}
Output - Enter number: 7
7 is a prime number.

28.#include<stdio.h>
main(){
	int n,i,term1=0,term2=1,next_term;
	printf("Input number of terms to display: ");
	scanf("%d",&n);
	printf("\n%d%d ",term1,term2);
	for(i=2;i<n;i++)
	{
		next_term = term1 + term2;
	 printf("%d ",next_term);
		term1=term2;
		term2=next_term;
	}

}
Output - Input number of terms to display: 8

01 1 2 3 5 8 13

29.#include <stdio.h>
```
int main() {
   int num, reversedNumber = 0, remainder;

   printf("Enter an integer: ");
   scanf("%d", &num);

   while(num != 0) {
      remainder = num % 10;
      reversedNumber = reversedNumber * 10 + remainder;
      num /= 10;
   }

   printf("Reversed Number = %d", reversedNumber);
   return 0;
}
```
Output - Enter an integer: 12345
Reversed Number = 54321

30. #include <stdio.h>
```
int main() {
  int n, reversed = 0, remainder, original;
   printf("Enter an integer: ");
   scanf("%d", &n);
   original = n;
   while (n != 0) {
      remainder = n % 10;
      reversed = reversed * 10 + remainder;
      n /= 10;
   }
   if (original == reversed)
      printf("%d is a palindrome.", original);
   else
      printf("%d is not a palindrome.", original);
}
```
Output - Enter an integer: 1221
1221 is a palindrome.

32.#include<stdio.h>
```
main()
{
   int num1, num2, hcf, remainder, numerator, denominator;

   printf("Enter two numbers\n");
   scanf("%d %d", &num1, &num2);
   if (num1 > num2)
   {
```

```
    numerator = num1;
    denominator = num2;
  }
  else
  {
    numerator = num2;
    denominator = num1;
  }
  remainder = numerator % denominator;
  while (remainder != 0)
  {
    numerator   = denominator;
    denominator = remainder;
    remainder   = numerator % denominator;
  }
  hcf = denominator;
  printf("HCF of %d and %d = %d\n", num1, num2, hcf);
}
```

Output - Enter two numbers

24 28

HCF of 24 and 28 = 4