Evaluation 2

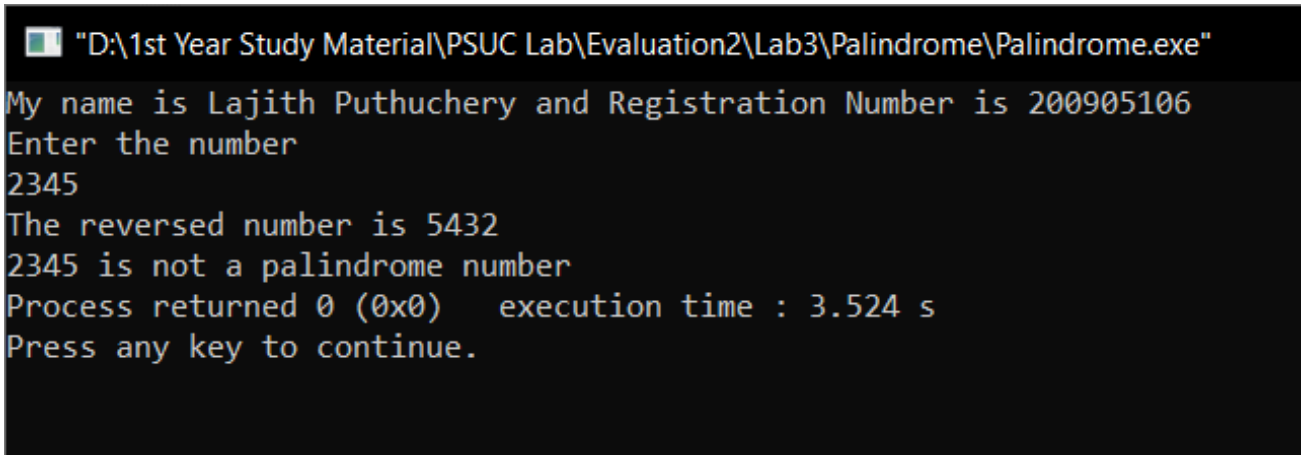
LOOPING CONTROL STRUCTURES-WHILE & DO LOOPS- Lab 3

*1.Reverse a given number and check if it is a palindrome or not. (use while loop). [Ex: 1234, reverse=4*10 3 +3 * 10 2 + 2 * 10 1 + 1 * 10 0 =4321]*

Program:

```
#include <stdio.h>


int main()
{
   int num,dig,rev=0;
   printf("My name is Lajith Puthuchery and Registration Number is 200905106\n");
   printf("Enter the number\n");
   scanf("%d",&num);
   int org = num;
   while(num)
   {
      dig = num%10;
      rev = rev*10 + dig;
      num = num/10;
   }
   printf("The reversed number is %d\n",rev);
   if(org == rev)
   {
      printf("%d is a palindrome number",org);
   }
   else
   {
      printf("%d is not a palindrome number",org);
   }
   return 0;
}
```

Output:



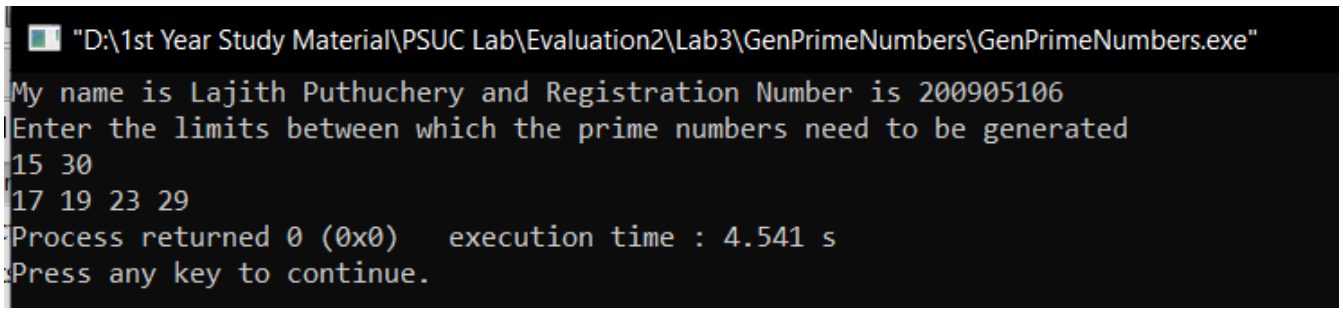
2. Generate prime numbers between 2 given limits. (Use while loop)

Program:

```
#include <stdio.h>


int main()
{
   int a,b,j,flag=0;
   printf("My name is Lajith Puthuchery and Registration Number is 200905106\n");
   printf("Enter the limits between which the prime numbers need to be generated\n");
   scanf("%d %d",&a,&b);
   while(a<(b-1))
   {
      flag=0;
      a++;
      j=2;
      while(j < a)
      {
         if((a)%j == 0)
         {
            flag=1;
            break;
         }
```

```
        j++;
      }
      if(flag==0)
      {
        printf("%d ",a);
      }
   }
}
```

Output:



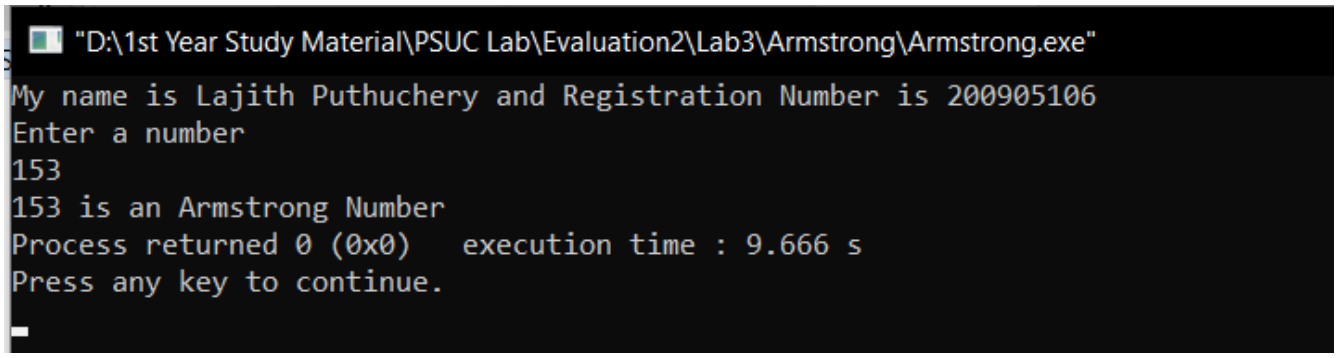
3. Check if the sum of the cubes of all digits of an inputted number equals the number itself (Armstrong Number). (Use while loop)

Program:

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

int main()
{
   int num,org,sum=0,dig;
   printf("My name is Lajith Puthuchery and Registration Number is 200905106\n");
   printf("Enter a number\n");
   scanf("%d",&num);
   org=num;
   while(num)
   {
      dig = num%10;
      sum += pow(dig,3);
```

```
        num = num/10;
    }
    if(sum == org)
    {
        printf("%d is an Armstrong Number",org);
    }
    else
    {
        printf("%d is not an Armstrong Number",org);
    }
    return 0;
}
```

Output:



4. Write a program using do-while loop to read the numbers until -1 is encountered. Also count the number of prime numbers and composite numbers entered by user. [Hint: 1 is neither prime nor composite]

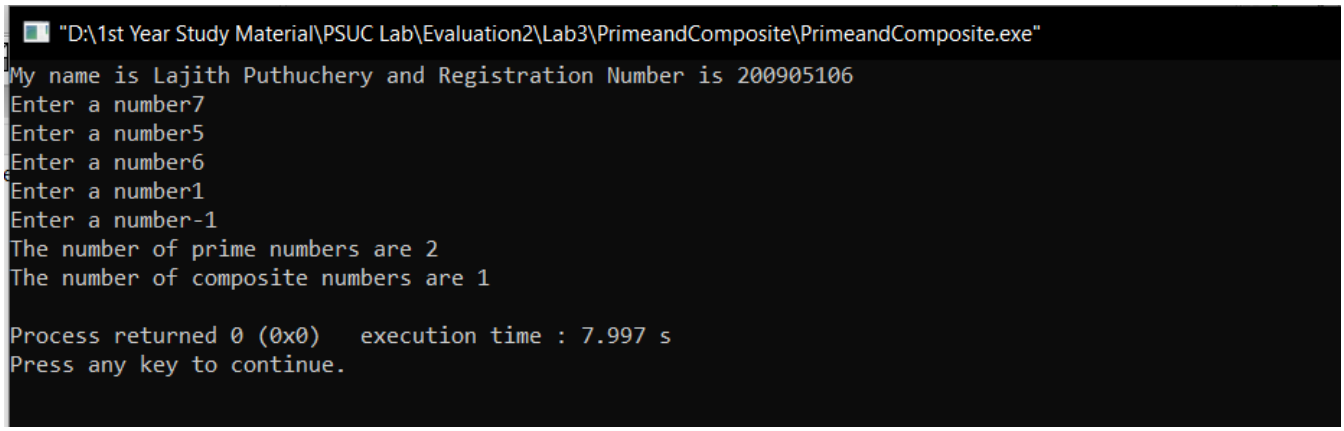
Program:

```
#include <stdio.h>


int main()
{
    int num;
    int prime=0,comp=0;
    int flag=0;
    printf("My name is Lajith Puthuchery and Registration Number is 200905106\n");
```

```
do
{
   printf("Enter a number");
   scanf("%d",&num);
   flag=0;
   if(num==1)
   {
      continue;
   }
   if(num==-1)
   {
      break;
   }
   int j=2;
   while(j<num)
   {
      if(num%j==0)
      {
         comp++;
         flag=1;
         break;
      }
      j++;
   }
   if(flag==0)
   {
      prime++;
   }
}while(num);

printf("The number of prime numbers are %d\n",prime);
```

```
    printf("The number of composite numbers are %d\n",comp);
    return 0;
}
```

Output:



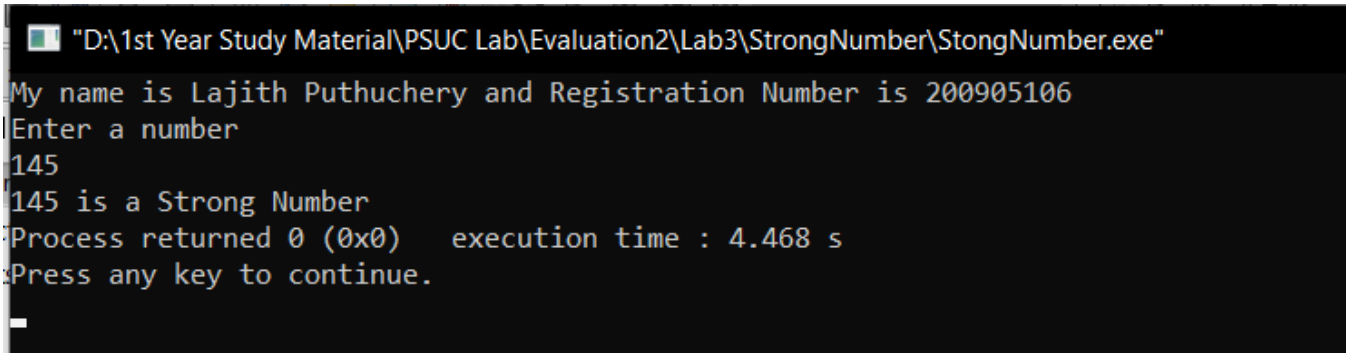
5. Check whether the given number is strong or not. [Hint: Positive number whose sum of the factorial of its digits is equal to the number itself] Ex: 145 = 1! + 4! + 5! = 1 + 24 + 120 = 145 is a strong number.

Program:

```
#include <stdio.h>


int main()
{
    int num,sum=0,dig,fact=1;
    printf("My name is Lajith Puthuchery and Registration Number is 200905106\n");
    printf("Enter a number\n");
    scanf("%d",&num);
    int org = num;
    while(num)
    {
        dig = num%10;
        fact =1;
        while(dig!=1)
        {
            fact *= dig;
```

```
        dig--;
      }
      sum += fact;
      num = num/10;
   }
   if(sum == org)
   {
      printf("%d is a Strong Number",org);
   }
   else
   {
      printf("%d is not a Strong Number",org);
   }
   return 0;
}
```

Output:



6. Write a program to demonstrate use of break and continue statements in while and do-while loops.

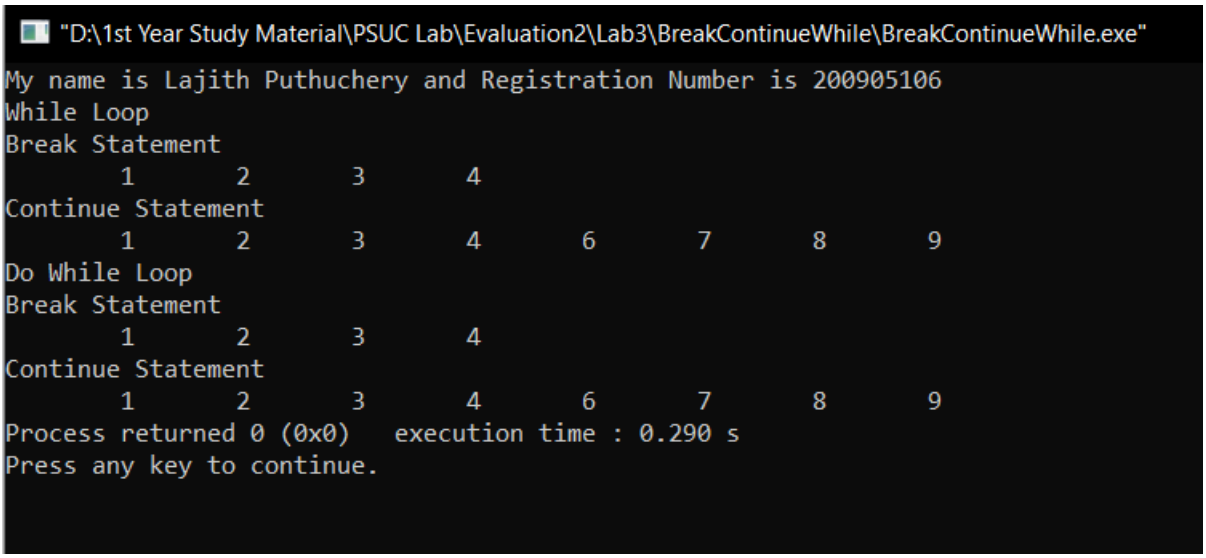
Program:

```
#include <stdio.h>


int main()
{
   int n=1;
   printf("My name is Lajith Puthuchery and Registration Number is 200905106\n");
```

```
printf("While Loop\n");
printf("Break Statement\n");
while(n!=10)
{
   if(n==5)
   {
      break;
   }
   printf("\t%d",n);
   n++;
}
printf("\nContinue Statement\n");
n=1;
while(n!=10)
{
   if(n==5)
   {
      n++;
      continue;
   }
   printf("\t%d",n);
   n++;
}
printf("\nDo While Loop\n");
printf("Break Statement\n");
n=1;
do
{
   if(n==5)
   {
      break;
```

```
    }
    printf("\t%d",n);
    n++;
  } while(n!=10);

  printf("\nContinue Statement\n");
  n=1;
  do
  {
    if(n==5)
    {
      n++;
      continue;
    }
    printf("\t%d",n);
    n++;
  } while(n!=10);
}
```

Output:



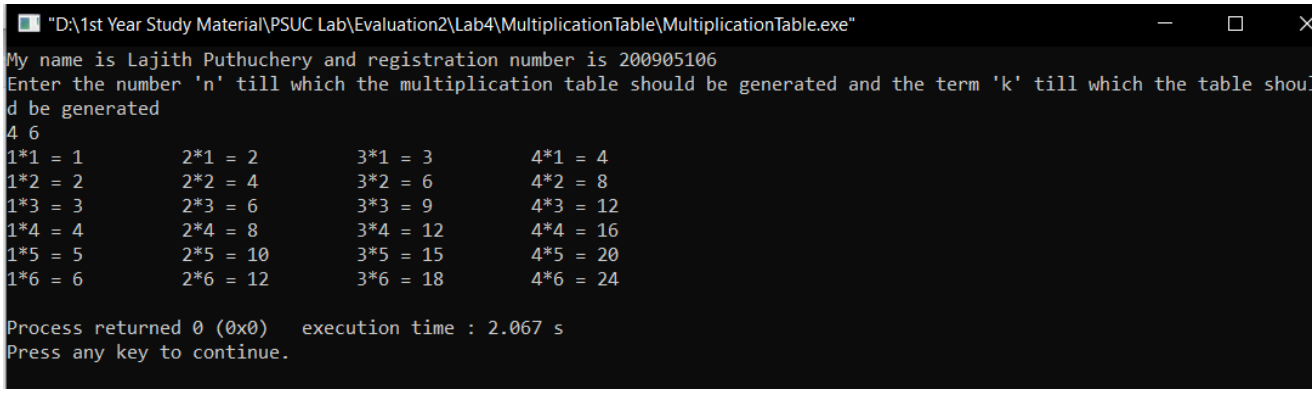
LOOPING CONTROL STRUCTURES- FOR LOOPS – Lab 4

*1.Generate the multiplication table for 'n' numbers up to 'k' terms (using nested for loops). [Hint: 1 2 3 4 5 …. k 2 4 6 8 10 ….2*k …… n…… n*k]*

Program:

```
#include <stdio.h>


int main()

{

   int n,k;

   printf("My name is Lajith Puthuchery and registration number is 200905106\n");

   printf("Enter the number 'n' till which the multiplication table should be generated and the term 'k' till which the table should be generated\n");

   scanf("%d%d",&n,&k);

   for(int i=1; i<=k; i++)

   {

      for(int j=1; j<=n; j++)

      {

         printf("%d*%d = %d \t",j,i,i*j);

      }

      printf("\n");

   }

   return 0;

}
```

Output:



2. Generate Floyd's triangle using natural numbers for a given limit N. (using for loops) [Hint: Floyd's triangle is a right angled-triangle using the natural numbers] Ex: Input: N = 4 14

Output: 1

2 3

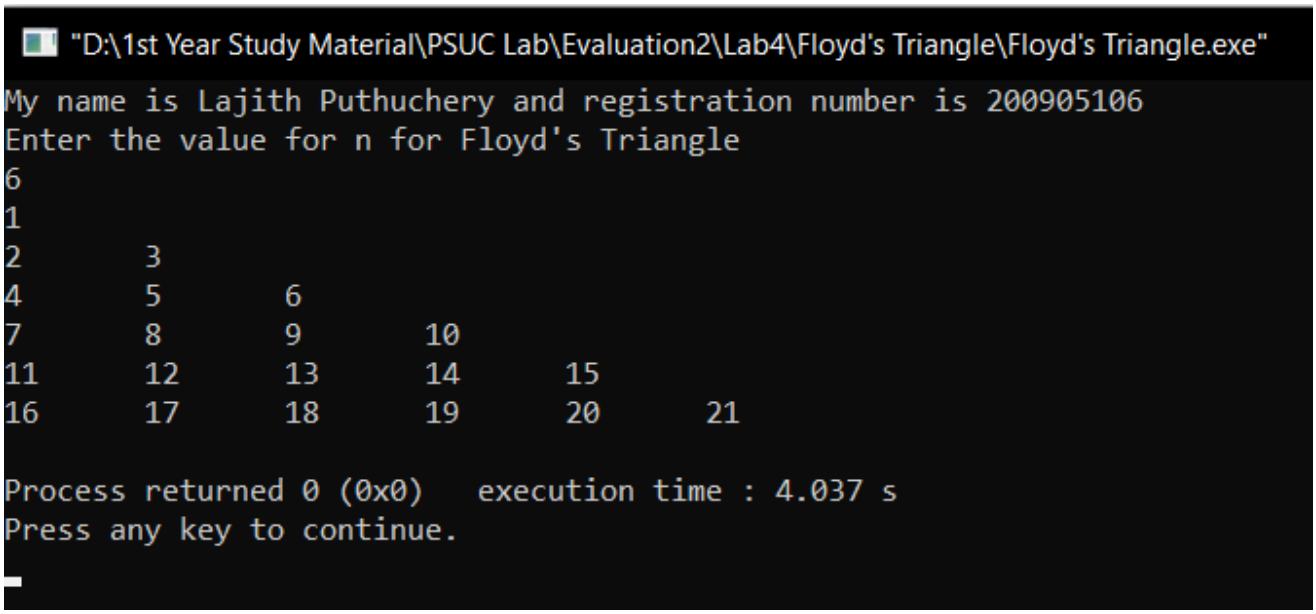
4 5 6

7 8 9 10

Program:

```
#include <stdio.h>


int main()
{
   int n,m=1;
   printf("My name is Lajith Puthuchery and registration number is 200905106\n");
   printf("Enter the value for n for Floyd's Triangle\n");
   scanf("%d",&n);
   for(int i=1; i<=n; i++)
   {
      for(int j=1; j<=i ; j++)
      {
         printf("%d\t",m);
         m++;
      }
      printf("\n");
   }
   return 0;
}
```

Output:



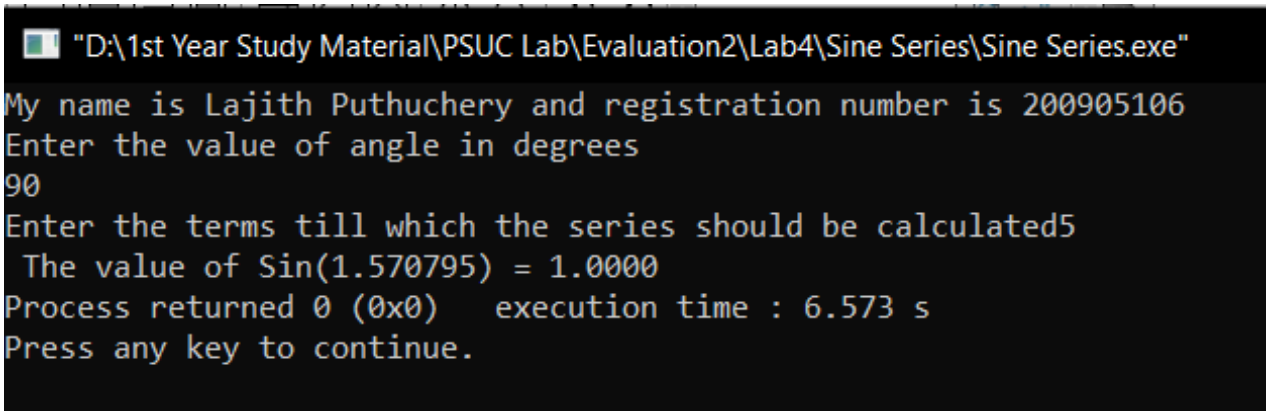
3. Evaluate the sine series, sin(x)= x- x 3 /3! + x5 /5!–x 7 /7!+ …… to n terms.

Program:

```
#include <stdio.h>


int main()
{
   float x,sum,t;
   int n;
   printf("My name is Lajith Puthuchery and registration number is 200905106\n");
   printf("Enter the value of angle in degrees\n");
   scanf("%f",&x);
   printf("Enter the terms till which the series should be calculated");
   scanf("%d",&n);
   x=x*3.14159/180;
   t=x;
   sum=x;
   for(int i=1;i<=n;i++)
   {
      t=(t*(-1)*x*x)/(2*i*(2*i+1));
      sum=sum+t;
```

```
    }


    printf(" The value of Sin(%f) = %.4f",x,sum);
    return 0;
}
```

Output:



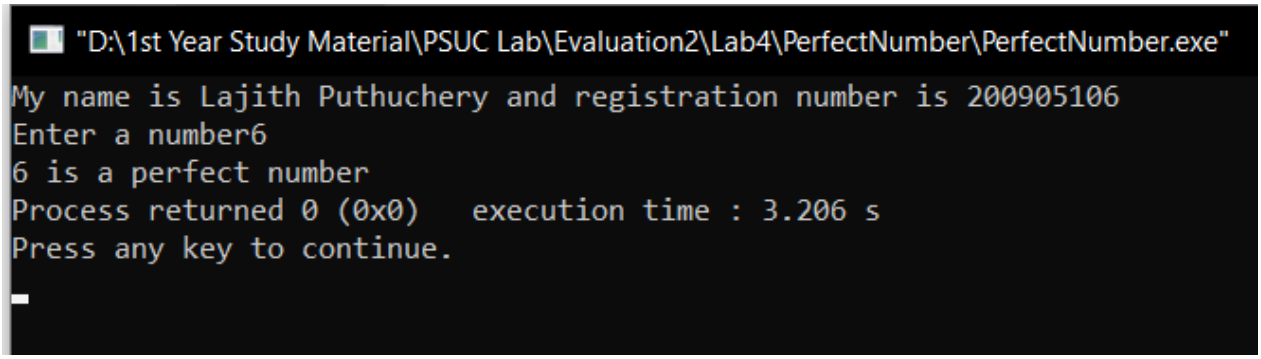
4. Check whether a given number is perfect or not. [Hint: Sum of all positive divisors of a given number excluding the given number is equal to the number] Ex: 28 = 1+ 2 + 4 + 7 + 14 = 28 is a perfect number

Program:

```
#include <stdio.h>


int main()
{
    int num,rem,sum=0;
    printf("My name is Lajith Puthuchery and registration number is 200905106\n");
    printf("Enter a number");
    scanf("%d",&num);
    for(int i=1; i<num; i++)
    {
        rem = num%i;
        if(rem==0)
        {
            sum+= i;
```

```
    }
  }
  if(sum==num)
  {
    printf("%d is a perfect number",num);
  }
  else
  {
    printf("%d is not a perfect number",num);
  }
  return 0;
}
```

Output:



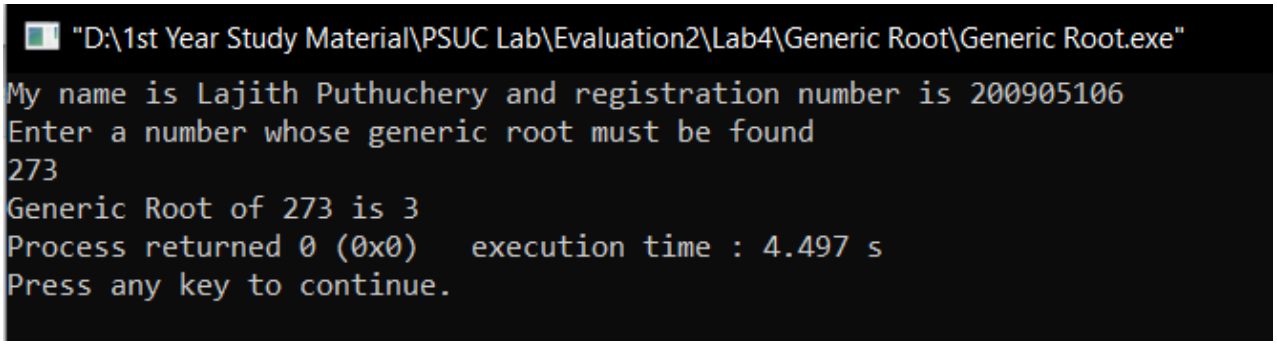
5. Find out the generic root of any number. [Hint: Generic root is the sum of digits of a number until a single digit is obtained.] Ex: Generic root of 456 is 4 + 5 + 6 = 15 = 1+5 = 6

Program:

```
#include <stdio.h>


int main()
{
  int num,dig,sum=0;
  printf("My name is Lajith Puthuchery and registration number is 200905106\n");
  printf("Enter a number whose generic root must be found\n");
  scanf("%d",&num);
  int orig = num;
```

```
    while(num>10)
    {
        sum = 0;
        while(num)
        {
            dig = num%10;
            sum += dig;
            num /= 10;
        }
        if(sum>10)
        {
            num=sum;
        }
        else
        {
            break;
        }
    }
    printf("Generic Root of %d is %d",orig,sum);
    return 0;
}
```

Output:



6. Write a program to demonstrate use of break and continue statements in for loop

Program:

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

```
int main()
{
    int i = 0, j = 0;
    printf("My name is Lajith Puthuchery and Registration Number is 200905106\n");
    printf("\nBreak Statement\n");

    for (int i = 0; i < 5; i++)
    {
        printf("i = %d, j = ", i);

        for (int j = 0; j < 5; j++)
        {
            //Break Statement
            if (j == 2)
                break;

            printf("%d ", j);
        }

        printf("\n");
    }

     i = 0, j = 0;
     printf("\nContinue Statement\n");

    for (int i = 0; i < 5; i++)
    {
        printf("i = %d, j = ", i);

        for (int j = 0; j < 5; j++)
```

```
        {
            // Continue Statement
            if (j == 2)
                continue;

            printf("%d ", j);
        }

        printf("\n");
    }
    return 0;
}
```

Output: