Green University of Bangladesh

Department of Computer Science and Engineering (CSE)
Faculty of Sciences and Engineering
Semester: Spring, Year: 2022, B.Sc. in CSE (DAY)

LAB REPORT NO # 04

Course Title: Structured Programming Lab
Course Code: CSE 104 **Section: CSE 213 - DB (PC)**

Lab Experiment Name(s):

- While and Do - While Loop and Control Structure in C

Student Details

Name	ID
Md. Shahidul Islam Prodhan	213902017

Lab Date: 26 February 2022

Submission Date: 05 March 2022

Course Teacher's Name: Md. Solaiman Mia, Assistant Professor.

[For Teacher's use only: Don't write anything inside this box]

Lab Report Status

Marks:	**Signature:**
Comments:	**Date:**

1. TITLE OF THE LAB EXPERIMENT

Lab Report of While and Do -While Loop Control Structure in C

2. OBJECTIVES

By doing this experiment we will learn about different kinds of loops in the C language and we will be able to solve complex problem using loops.

3. PROCEDURE

Problem 1: Write a C program to find sum of first and last digit of any number.

First we declare the necessary variables in int function and take input from the user a valid integer by using printf and scanf function. Then we keep first digit in n variable and for last digit we use mod of 10 (n % 10). By using while loop we decide the first digit will be equal or greater than 10. Then we sum the first and last digit and print the result.

Problem 2: Write a C program to swap first and last digits of any number.

First we declare necessary variables and take valid input from the user. Then for the last digit we use mod operator. When modulo divided by 10 returns last digit of the input number. Find the first digit with the help of mathematical operation. We use necessary logic to swap first and the last digit.

Problem 3: Write a C program to calculate product of digits of any number.

At first, we declare necessary variables and take valid user input. We use while loop until num is not equals to 0. We store product in product variable and multiply that with num variable. Then we print the output.

Problem 4: Write a C to find the sum of the series 1 +11 + 111 + 1111 + .. n terms.

We take necessary variables to and functions. We use int, long and long int to store large type of number. We take valid user input and run it in for loop. Then by using if condition we check if the i < n. we use sum variable to store sum and to increase 1. Then we print the sum of the nth terms of that following series.

Problem 5: Write a C program to find frequency of each digit in a given integer.

We take necessary variables and take array because the number of numbers is 10. We take valid user input and use for loop where we use array. In while loop we check if n is not equaling to 0. We use while loop and if conditions to perform the following problem.

4. IMPLEMENTATION & TEST RESULT

Problem 1: C program to find sum of first and last digit of any number.

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

int main ()
{
   int n, first_digit, last_digit, sum;
   printf("Sum of first and last digit of given
                                    number: \n", sum);
   scanf("%d", &n);
   first_digit = n;
   last_digit = n %10;
   while (first_digit >=10)
      {
       first_digit = firstdigit /10;
      }
   sum = first_digit + last_digit;

   return 0;
}
```

```
"C:\Users\shahi\Desktop\CSE 104 - Structured_Programming_C_Lab\26Feb202
213902017
Sum of first and last digit of given number: 9

Process returned 0 (0x0)   execution time : 7.164 s
Press any key to continue.
```

Problem 2: C program to swap first and last digits of any number.

```
#include <stdio.h>
# include <math.h>
 int main()
 {
  int n, firstDigit, lastDigit, digits, swappedNum;
  printf("Enter number = ");
  scanf("%d", &n);
  lastDigit = n % 10;
  digits = (int) log10(n);
  first digit = (int) (n / pow(10, digits));
  swappedNum = lastDigit;
  swappedNum *= (int) round(pow(10, digits));
  swapped Num += n % ((int) round(pow(10, digits)));
  swapped Num -= lastDigit;
  swappedNum += firstDigit;
  printf("Number after swapping first and last
        digit : %d", swappedNum);

  return 0;
 }
```

```
"C:\Users\shahi\Desktop\CSE 104 - Structured_Programming_C_Lab\26Feb2022\Lat
Enter number = 213902017
Number after swapping first and last digit: 713902012
Process returned 0 (0x0)   execution time : 4.614 s
Press any key to continue.
```

Problem 3: C program to calculate product of digits of any number.

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

int main()
{
   int num, product =1
   printf("Enter a valid integer to calculate
          the product of the digits of that
            integer : \n");
   scanf("%d", &num);
   while (num != 0)
         { product = product * (num % 10);
           num = num / 10;
         }
   printf("Product of Digits of that number:
                                  %d \n", product);
   return 0;
}
```

```
"C:\Users\shahi\Desktop\CSE 104 - Structured_Programming_C_Lab\26Feb2022\Lab exercise\code 2\bin\Debug\coc
Enter a valid integer to calculate the product of the digits of that integer:
7599
Product of digits of that number: 2835

Process returned 0 (0x0)   execution time : 15.592 s
Press any key to continue.
```

Problem 4: C to find the sum of the series 1 +11 + 111 + 1111 + .. n terms.

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

```
"C:\Users\shahi\Desktop\CSE 104 - Structured_Programming_C_Lab\26Feb2022\Lab
Input the number of terms : 7
1  + 11  + 111  + 1111  + 11111  + 111111  + 1111111
The Sum is : 1234567

Process returned 22 (0x16)   execution time : 1.525 s
Press any key to continue.
```

Problem 5: C program to find frequency of each digit in a given integer. (Lab Task)

```
# include < stdio.h >
#include <stdlib.h>
int main()
{
  long long int num, n, i, last_digit;
  int array [10];
  printf("Enter any number to find frequency
          of each of that number: \n");
  scanf ("%d", &num);
  n = num;
  for (i = 0; i<10; i++)
     { array [i] = 0;
     }
  while (n!=0)
     { last_digit = n%10;
       array [last_digit] = array [last_digit]+1;
       n= n/10;
  for (i= 0; i<10; i++)
  { if (array[i] >0)
     {
       printf ("%d ---> %d \n", i, array[i]);
     }
  }
  return 0;
}
```

```
"C:\Users\shahi\Desktop\CSE 104 - Structured_Programming_C_Lab\26Feb2022\lab tasks\lab task 4\bi
Enter any number to find the frequency of each digit of that number:
213902017
0 ---> 2
1 ---> 2
2 ---> 2
3 ---> 1
7 ---> 1
9 ---> 1

Process returned 0 (0x0)   execution time : 3.233 s
Press any key to continue.
```

6. ANALYSIS AND DISCUSSION

1) We have solved those problems using CodeBlocks IDE and there were no errors occurred. And we can successfully print the output of those problems.
2) We have faced a little bit difficulty while performing 2nd and 5th problem showing the wrong results but then we have passed errors and corrected our program and it gives correct result.
3) Solving these 5 problems, we have initially learned the very basics of how to solve complex problems in C language using different loops.

7. SUMMARY

From the given experiments, we have learned the very basic implementation of C language in order to make some complex level calculations and decisions which introduces us with the following function/statements/loops – While and Do - While Loop.