Lab Report

Fundamentals Of C Programming

CSC-102

Anukul Adhikari
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Information

All code used in this report including source code of this report itself is available at:
`https://github.com/beinganukul/Assignments-Of-C/tree/master/A02`

Software

Following compiler and configuration is verified to work with the snippets in this report:
`Compiler - gcc 9.2.0 (GCC)`
`Compiler target - x86_64-pc-linux-gnu`

Contents

Program 1

While Loop

1.1 Problem Statement

Write a program to reverse a number using while loop.

1.2 Program

```
#include<stdio.h>
int main() {
    int a,b=0,c;
    printf("Enter an integer number: ");
    scanf("%d",&a);
    while(a!=0) {
        c=a%10;
        b=b*10+c;
        a /=10;
    }
    printf("Reversed number is : %d ",b);
}
```

Program 2

Looping The Sentence For n Numbers Of Times

2.1 Problem Statement

Write a pogram to read an integer number n from keyboard and display the message Get Well Soon n times.

2.2 Program

```
#include<stdio.h>
int main() {
    int a,i;
    printf("Enter a number to display the number of times.");
    scanf("%d",&a);
    for(i=0;i<=a;i++)
    {
        printf("Get Well Soon\n");
    }
}
```

Program 3

Factorial

3.1 Problem Statement

Write a program to compute the following using factorial.

1. factorial of an integer n.

3.2 Factorial's Algorithm

The factorial of a positive integer n can be obtained recursively using the following algorithm.

- If $n = 0$, return 1.
- Multiply n by $(n - 1)!$ and return the result.

3.3 Factorial

```
#include <stdio.h>
long int factorial(int number);

void main() {

    int number;

    printf("Enter a positive number: ");
    scanf(" %d", &number);

    printf("The factorial of %d is %d\n", number, factorial(number));
}

long int factorial(int number) {

    if(number >= 1)
        return number * factorial(number - 1);

    else
        return 1;

}
```

Program 4

Sum Of Natural Numbers

4.1 Problem Statement

Write a program that asks an integer number n and calculate sum of all natural numbers from 1 to n.

4.2 Program

```
#include<stdio.h>
int main () {
    int a,b,c=0;
    printf("Enter a positive integer number.");
    scanf("%d",&a);
    for ( b=1; b<=a;++b)
    {
        c +=b;
    }
    printf("Sum= %d",c);
}
```

Program 5

Sum of Series using Loop

5.1 Problem Statement

Compute $1^2 + 2^2 + 3^3 + ... + n^2$ using for loop taking n as input from user.

5.2 Program

```
#include <stdio.h>
int main() {
  int n, i, s = 0;
  printf("\nEnter any positive integer: \n");
  scanf("%d",&n);

  s = (n * (n + 1) * (2 * n + 1 )) / 6;

  for(i =1; i<=n;i++)
  {
    if (i != n)
       printf("%d^2 + ",i);
    else
       printf("%d^2 = %d ",i, s);
  }
}
```

Program 6

Prime Numbers

6.1 Problem Statement

Write an program to find the prime numbers from given input.

6.2 Algorithm

A natural number is called a prime number (or a prime) if it has exactly two positive divisors, 1 and the number itself. The prime numbers can be computed using following algorithm:

- Inside each iteration, divide the number by every number less than itself except 1.
- If remainder $\neq 0$, the number prime. Otherwise `break` from the loop.

6.3 Program

```
#include<stdio.h>
int main() {
    int a,b,c=0;
    printf("Enter a number to find prime number.");
    scanf("%d",&a);
    for(b=2;b<=a/2;++b)
    {
        if(a%b==0)
        {
            c=1;
            break;
        }
    }
    if(a==1 || c!=0)
        {printf("%d is not a prime neither.",a);}
    else
        {printf("%d is a prime number.",a);}
}
```