B.Tech II Year, Computer Organization Lab

Practical 01

Prepare the c program for the followings with separate header file consists of all functions that you are using in the programs:

1. Take a decimal number from command line and convert into binary number.

```c
// Question 1 :Take a decimal number from command line
//  and convert into binary number.

#include <stdio.h>

int main()
{
    int n;
    printf("Enter A Decimal(Integer) Number : ");
    scanf("%d", &n);

    int ans = 0;
    int power = 1;

    while (n)
    {
        ans += ((n%2)*power);
        power *= 10;
        n = n/2;
    }

    printf("Binary Number : %d\n", ans);

    return 0;
}
```

Some Test Cases: (10, 16, 100)

```
Enter A Decimal(Integer) Number : 10
Binary Number : 1010
PS C:\Users\Admin\Desktop\3RD_SEMESTER\6
\" ; if ($?) { gcc Q1.c -o Q1 } ; if ($?
Enter A Decimal(Integer) Number : 16
Binary Number : 10000
PS C:\Users\Admin\Desktop\3RD_SEMESTER\6
\" ; if ($?) { gcc Q1.c -o Q1 } ; if ($?
Enter A Decimal(Integer) Number : 100
Binary Number : 1100100
```

2. Take a binary number from command line and convert into decimal number.

```c
// Question 2 : Take a binary number from command line
//  and convert into decimal number.

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

int main()
{
    long bnum;
    printf("Enter Binary Number : \n");
    scanf("%ld", &bnum);
    fflush(stdin);
    int ans = 0, r=0, base = 1,i=0;

    while (bnum) //bnum!=0
    {
        r = bnum%10; // remainder
        bnum /= 10;
        ans += (r*pow(2,i));
        i++;
    }

    printf("The Decimal Number : %d\n", ans);

    return 0;
}
```

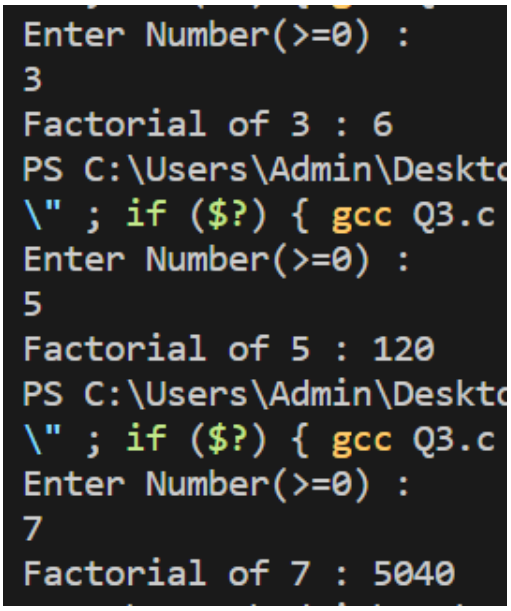
Some Test Cases: (1111, 1010, 11101)

```
Enter Binary Number :
1111
The Decimal Number : 15
PS C:\Users\Admin\Desktop\
\" ; if ($?) { gcc Q2.c -o
Enter Binary Number :
1010
The Decimal Number : 10
PS C:\Users\Admin\Desktop\
\" ; if ($?) { gcc Q2.c -o
Enter Binary Number :
11101
The Decimal Number : 29
```

3. Take a decimal number from command line and display its factorial using recursion.

```c
//Question 3 : Take a decimal number from command line
//  and display its factorial using recursion.
#include <stdio.h>

long long int fact(int n)
{
    //Base Case
    if (n==0 || n==1)
    {
        return 1;
    }

    return n*fact(n-1);
    // since n! = n*(n-1)!
}

int main()
{
    int num;
    printf("Enter Number(>=0) :\n");
    scanf("%d", &num);
    long long int ans = fact(num);
    printf("Factorial of %d : %lld\n", num, ans);

    return 0;
}
```

Some Test Cases: (3, 5, 7)



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