

LAB-6

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CPE100 | Computer Programming for Engineers | 2022

PROBLEM 1

Write a C program to read one integer, namely n , from your standard input and show the following results.

1. Summation from 1 to n .

```
//ID 65070503410
//Name : Charunthon Limseelo
#include <stdio.h>
int main() {
    int n, i, sum = 0;
    printf("Enter a positive integer: ");
    scanf("%d", &n);
    i = 1;
    while (i <= n) {
        sum += i;
        ++i;
    }
    printf("Sum = %d", sum);
    return 0;
}
```

```
1 //ID 65070503410
2 //Name Charunthon Limseelo
3
4
5 #include <stdio.h>
6 int main() {
7     int n, i, sum = 0;
8     printf("Enter a positive integer: ");
9     scanf("%d", &n);
10    i = 1;
11    while (i <= n) {
12        sum += i;
13        ++i;
14    }
15    printf("Sum = %d", sum);
16    return 0;
17 }
```

```
Input
Enter a positive integer: 6
Sum = 21

...Program finished with exit code 0
Press ENTER to exit console.
```

2. $n!$

```
//ID 65070503410
//Name : Charunthon Limseelo
#include <stdio.h>
int main() {
    int n, i;
    unsigned long long fact = 1;
    printf("Enter an integer: ");
    scanf("%d", &n);
    if (n < 0)
        printf("Error! Factorial of a negative number doesn't exist.");
    else {
        for (i = 1; i <= n; ++i) {
            fact *= i;
        }
        printf("Factorial of %d = %llu", n, fact);
    }
    return 0;
}
```

```
1 //ID 65070503410
2 //Name Charunthon Limseelo
3
4
5 #include <stdio.h>
6 int main() {
7     int n, i;
8     unsigned long long fact = 1;
9     printf("Enter an integer: ");
10    scanf("%d", &n);
11    if (n < 0)
12        printf("Error! Factorial of a negative number doesn't exist.");
13    else {
14        for (i = 1; i <= n; ++i) {
15            fact *= i;
16        }
17    }
18    printf("Factorial of %d = %llu", n, fact);
19    return 0;
20 }
```

```
Input
Enter an integer: 6
Factorial of 6 = 720

...Program finished with exit code 0
Press ENTER to exit console.
```

PROBLEM 2: FIBONACCI NUMBER

Fibonacci number is a series of integers where the current position can be calculated by the sum of two previous numbers. Print out n Fibonacci's numbers.

1 1 2 3 5 8 13 21 34 55 89 144 233

```
//ID 65070503410
//Name : Charunthon Limseelo
#include <stdio.h>
int main()
{
    int fib1= 0, fib2 =1, fib3, num, count =0;
    printf("Enter the range of Fibonacci number: ");
    scanf("%d", &num);
    printf("First %d Fibonacci numbers are : ", num);
    printf("%d ", fib1);
    printf("%d ", fib2);
    count = 2; /* fib1 and fib2 are already used */
    while (count < num)
    {
        fib3 = fib1 + fib2;
        count++;
        printf("%d ", fib3);
        fib1 = fib2;
        fib2 = fib3;
    }
}
```

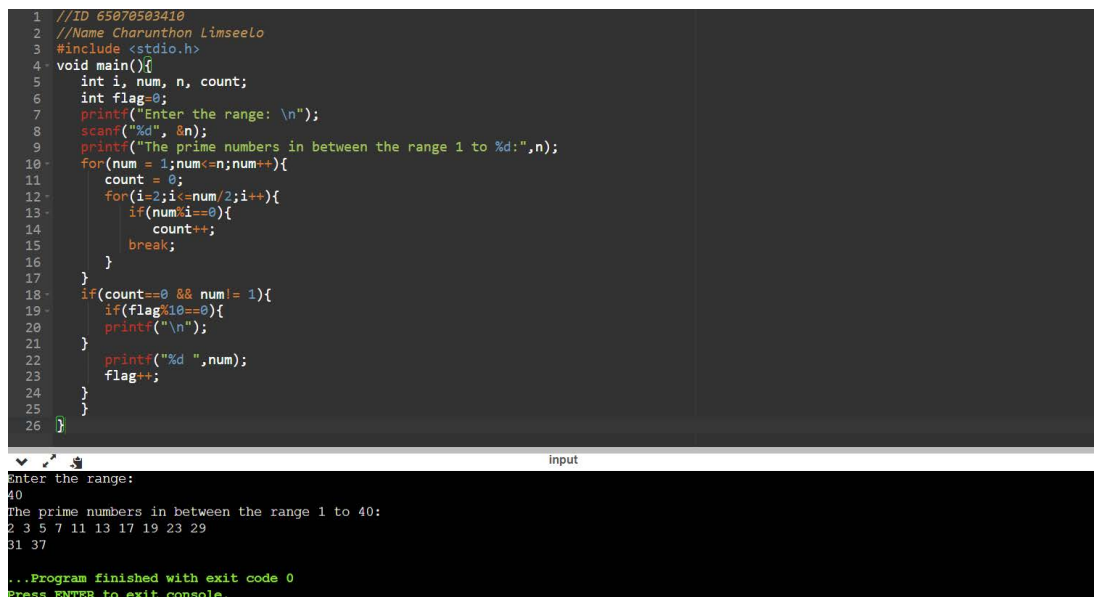
PROBLEM 3: PRIME NUMBER

Write a C program to read one integer from your standard input and show the prime numbers from 2 to that input number. The format can be shown as below. There must be 10 numbers displayed per one row.

Enter the number: 40

2 3 5 7 11 13 17 19 23 29
31 37

```
//ID 65070503410
//Name Charunthon Limseelo
#include <stdio.h>
void main(){
    int i, num, n, count;
    int flag=0;
    printf("Enter the range: \n");
    scanf("%d", &n);
    printf("The prime numbers in between the range 1 to %d:",n);
    for(num = 1;num<=n;num++){
        count = 0;
        for(i=2;i<=num/2;i++){
            if(num%i==0){
                count++;
                break;
            }
        }
        if(count==0 && num!= 1){
            if(flag%10==0){
                printf("\n");
            }
            printf("%d ",num);
            flag++;
        }
    }
}
```



The screenshot shows a code editor with the C program code and a terminal window below it. The terminal output shows the program running, asking for the range, receiving 40, and displaying the prime numbers 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, and 37, with a newline after every 10 numbers. The program finishes with exit code 0.

```
1 //ID 65070503410
2 //Name Charunthon Limseelo
3 #include <stdio.h>
4 void main(){
5     int i, num, n, count;
6     int flag=0;
7     printf("Enter the range: \n");
8     scanf("%d", &n);
9     printf("The prime numbers in between the range 1 to %d:",n);
10    for(num = 1;num<=n;num++){
11        count = 0;
12        for(i=2;i<=num/2;i++){
13            if(num%i==0){
14                count++;
15                break;
16            }
17        }
18        if(count==0 && num!= 1){
19            if(flag%10==0){
20                printf("\n");
21            }
22            printf("%d ",num);
23            flag++;
24        }
25    }
26 }
```

Enter the range:
40
The prime numbers in between the range 1 to 40:
2 3 5 7 11 13 17 19 23 29
31 37
...Program finished with exit code 0
Press ENTER to exit console.

PROBLEM 4: PRIME FACTOR

Write a C program to read one integer from your standard input and show the prime factor of such number.

Enter the number: 60

The factor of 60 is 2*2*3*5

```
//ID 65070503410
//Name : Charunthon Limseelo
#include <stdio.h>
int main()
{
    int x, i;
    printf("Enter an integer: ");
    scanf("%d", &x);
    if (x <= 1)
    {
        return 1;
    }
    printf("The prime factorization of %d is ", x);
    if (x > 1)
    {
        while (x % 2 == 0)
        {
            printf("2 ");
            x = x / 2;
            if(x > 1) {
                printf("* ");
            }
        }
        for (i = 3; i < 1009; i = i + 2)
        {
            while (x % i == 0)
            {
                printf("%d ", i);
                x = x / i;
                if(x > 1) {
                    printf("* ");
                }
            }
        }
    }
    return 0;
}
```

```
Enter an integer: 60
The prime factorization of 60 is 2 * 2 * 3 * 5

...Program finished with exit code 0
Press ENTER to exit console.
```

PROBLEM 5: MY CALENDAR

Write a C program to print out the current month using for loop as follows.

SEPTEMBER 2022						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

```
//ID 65070503410
//Name : Charunthon Limseelo
#include <stdio.h>
int main()
{
    int i;
    printf("\n\n\t\tSEPTEMBER\n");
    printf("\n\t S M T W T F S\n");
    printf("\n\t          ");
    for(i=1;i<=30;i++){
        if(i%7==4){
            printf("\n\t");
        }
        printf("%3d", i);
    }
    printf("\n");
    return 0;
}
```