Assignment 4

Nested loop for range

1. Print armstrong number in the the given range 1 to n?

```c
#include <stdio.h>
void main()
{
    armstrongNum();
}
void armstrongNum()
{
    int start, end;
    printf("Enter The range start :");
    scanf("%d", &start);
    printf("Enter The range end :");
    scanf("%d", &end);

    for (int i = start; i <= end; i++)
    {
        int rem, armN = 0;
        // printf("\n Inside For loop \n");
        int temp = i;
        while (temp)
        {
            // printf("Inside While \n");
            // printf("Temp : %d\n", temp);
            rem = temp % 10;
            armN += rem * rem * rem;
            temp /= 10;
        }
        if (armN == i)
        {
            printf("\n %d is Armstrong", i);
        }
        else
        {
            continue;
        }
    }
}
```

Output:

Enter The range start :1

Enter The range end :1000

1 is Armstrong

153 is Armstrong

370 is Armstrong

371 is Armstrong

407 is Armstrong

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2. Print prime number in the given range 1 to n?

```c
#include <stdio.h>
void main()
{
    int start, end;
    printf("Enter The range start :");
    scanf("%d", &start);
    printf("Enter The range end :");
    scanf("%d", &end);

    for (int i = start; i <= end; i++)
    {
        int j;
        if (i == 1 || i == 0)
        {
            continue;
        }
        for (j = 2; j <= (i / 2); j++)
        {
            if (i % j == 0)
                break;
        }
        if (j == (i / 2) + 1)
        {
            printf("\n %d is Prime.", i);
        }
    }
}
```

Output:
Enter The range start :1
Enter The range end :10
2 is Prime.
3 is Prime.
5 is Prime.
7 is Prime.
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3. check perfect number in the given range 1 to n?

```c
#include <stdio.h>
void main()
{
    int start, end;
    printf("Enter The range start :");
    scanf("%d", &start);
    printf("Enter The range end :");
    scanf("%d", &end);

    for (int i = start; i <= end; i++)
    {
        int sumOfDivisor = 0;
        for (int j = 1; j < i; j++)
        {
            if (i % j == 0)
            {
                sumOfDivisor += j;
            }
        }

        if (sumOfDivisor == i && i != 0)
        {
            printf("Number %d is perfect number \n", i);
        }
    }
}
```

Output:
Enter The range start :1
Enter The range end :100
Number 6 is perfect number
Number 28 is perfect number
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4. check strong number in the given range 1 to n?

```c
#include <stdio.h>
void main()
{
    int start, end;
    printf("Enter The range start :");
    scanf("%d", &start);
    printf("Enter The range end :");
    scanf("%d", &end);
    for (int i = start; i <= end; i++)
    {
        int sumOfFactorials = 0;
```

```
        int temp = i;

        while (temp > 0)
        {
            int digit = temp % 10;
            int factorial = 1;

            for (int j = 1; j <= digit; j++)
            {
                factorial *= j;
            }

            sumOfFactorials += factorial;
            temp /= 10;
        }

        if (sumOfFactorials == i)
        {
            printf("Number %d is a strong number \n", i);
        }
    }
}
```

Output:
Enter The range start :1
Enter The range end :150
Number 1 is a strong number
Number 2 is a strong number
Number 145 is a strong number
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5. Print fibonacci series?(optional)

```
#include <stdio.h>
void main()
{

    int n, fib1 = 0, fib2 = 1, fibNext;

    printf("Enter the number of terms: ");
    scanf("%d", &n);

    printf("Fibonacci series:\n");

    for (int i = 1; i <= n; i++)
    {
        printf("%d ", fib1);
```

```
        fibNext = fib1 + fib2;
        fib1 = fib2;
        fib2 = fibNext;
    }
    printf("\n");
}
```

Output:

Enter the number of terms: 10

Fibonacci series:

0 1 1 2 3 5 8 13 21 34

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Assignment 4 Using Functions of type 1

```c
#include <stdio.h>
void armstrongInRange();

void main()
{
    printf("What do you want to do : \n 1> Armstrong Numbers in range. \n 2>
Prime numbers in range \n");
    printf("3> Perfect Numbers in range. \n 4> Strong numbers in range \n
Enter Your choice (1,2,3,4) :");
    int ch;
    scanf("%d", &ch);
    if (ch == 1)
    {
        armstrongInRange();
    }
    else if (ch == 2)
    {
        primeInRange();
    }
    else if (ch == 3)
    {
        perfectInRange();
    }
    else if (ch == 4)
    {
        strongInRange();
    }
    else
    {
        printf("Invalid choice");
    }
}
void armstrongInRange()
{
    int start, end;
    printf("\n Enter The range start :");
    scanf("%d", &start);
    printf("\n Enter The range end :");
    scanf("%d", &end);

    for (int i = start; i <= end; i++)
    {
        int rem, armN = 0;
        // printf("\n Inside For loop \n");
```

```
        int temp = i;
        while (temp)
        {
            // printf("Inside While \n");
            // printf("Temp : %d\n", temp);
            rem = temp % 10;
            armN += rem * rem * rem;
            temp /= 10;
        }
        if (armN == i)
        {
            printf("\n %d is Armstrong", i);
        }
        else
        {
            continue;
        }
    }
}
void primeInRange()
{
    int start, end;
    printf("Enter The range start :");
    scanf("%d", &start);
    printf("Enter The range end :");
    scanf("%d", &end);

    for (int i = start; i <= end; i++)
    {
        int j;
        if (i == 1 || i == 0)
        {
            continue;
        }
        for (j = 2; j <= (i / 2); j++)
        {
            if (i % j == 0)
            {
                break;
            }
        }
        if (j == (i / 2) + 1)
        {
            printf("\n %d is Prime.", i);
        }
    }
}
void perfectInRange()
```

```c
{
    int start, end;
    printf("Enter The range start :");
    scanf("%d", &start);
    printf("Enter The range end :");
    scanf("%d", &end);

    for (int i = start; i <= end; i++)
    {
        int sumOfDivisor = 0;
        for (int j = 1; j < i; j++)
        {
            if (i % j == 0)
            {
                sumOfDivisor += j;
            }
        }

        if (sumOfDivisor == i && i != 0)
        {
            printf("Number %d is perfect number \n", i);
        }
    }
}
void strongInRange()
{
    int start, end;
    printf("Enter The range start :");
    scanf("%d", &start);
    printf("Enter The range end :");
    scanf("%d", &end);

    for (int i = start; i <= end; i++)
    {
        int sumOfFactorials = 0;
        int temp = i;

        while (temp > 0)
        {
            int digit = temp % 10;
            int factorial = 1;

            for (int j = 1; j <= digit; j++)
            {
                factorial *= j;
            }

            sumOfFactorials += factorial;
```

```
            temp /= 10;
        }

        if (sumOfFactorials == i)
        {
            printf("Number %d is a strong number \n", i);
        }
    }
}
```

Output:

What do you want to do :

1> Armstrong Numbers in range.

2> Prime numbers in range

3> Perfect Numbers in range.

4> Strong numbers in range

Enter Your choice (1,2,3,4) :1

Enter The range start :0

Enter The range end :500

0 is Armstrong

1 is Armstrong

153 is Armstrong

370 is Armstrong

371 is Armstrong

407 is Armstrong

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What do you want to do :

1> Armstrong Numbers in range.

2> Prime numbers in range

3> Perfect Numbers in range.

4> Strong numbers in range

Enter Your choice (1,2,3,4) :4

Enter The range start :0

Enter The range end :1000

Number 0 is a strong number

Number 1 is a strong number

Number 2 is a strong number

Number 145 is a strong number

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