**Assignment 4**

Nested loop for range

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

#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

PS C:\Code>

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

#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.

PS C:\Code>

1. check perfect number in the given range 1 to n?

#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

PS C:\Code>

1. check strong number in the given range 1 to n?

#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

PS C:\Code>

1. 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

PS C:\Code>

Assignment 4 Using Functions of type 1

#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()

{

    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

PS C:\Code>

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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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