CSE 115 Lab on nested loop (part 2)

C programs to print the following patterns:

1.

```
        *
       * *
      * * *
     * * * *
    * * * * *
```

```
#include <stdio.h>
void main()
{
    int i, j, rows;
    printf("Enter no. of rows: ");
    scanf("%d",&rows);

    int space=rows-1;
    for(i=1; i<=rows; i++){
        for(j=1;j<=space; j++)
            printf(" ");

        for(j=1; j<=i; j++)
            printf("* ");

        printf("\n");
        space--;
    }
}
```

2.

```
      1
     1 2
    1 2 3
   1 2 3 4
  1 2 3 4 5
```

```
#include <stdio.h>
void main()
{
    int i, j, rows;
    printf("Enter no. of rows: ");
    scanf("%d",&rows);

    int space=rows-1;
    for(i=1; i<=rows; ++i){
        for(j=1;j<=space; j++)
            printf(" ");

        for(j=1; j<=i; j++)
            printf("%d ",j);

        printf("\n");
        space--;
    }
}
```

3. Write a C program to compute the sum of the following series using nested loop

$$\frac{1}{1}+\left(\frac{1}{1}+\frac{1}{2}\right)+\left(\frac{1}{1}+\frac{1}{2}+\frac{1}{3}\right)+\cdots+\left(\frac{1}{1}+\frac{1}{2}+\cdots+\frac{1}{n}\right)$$

```
#include<stdio.h>
void main()
{
   int i, j, n;
   float sum=0, term;
   printf("Enter n:");
   scanf("%d", &n);

   for ( i = 1 ; i <= n ; i++ ) {
        //compute i-th term = 1/1 + 1/2 + … + 1/i
         term = 0;
         for ( j = 1 ; j <= i ; j++ )
                term+=1.0/j;
         //add i-th term with sum
         sum += term;
   }//i
   printf("%f\n",sum);
}//main
```

4. Write a program that prints first n prime numbers (n is input). E.g. for n = 5 it should print: 2,3,5,7,11,

```
#include<stdio.h>

void main()
{
    int n, i = 2, count=0, j, isPrime;

    printf("Enter n: ");
    scanf("%d",&n);

    printf("First %d prime numbers: ", n);
    while (count < n)
    {
        //if current value of i is a prime no., then print it
        isPrime = 1;  //let the current value of i is a prime no.
        for ( j = 2 ; j <= i/2; j++ )
        {
            if ( i%j == 0 ){ //if i has a divisor then i isn't prime
                isPrime = 0; //so assign 0 to isPrime to indicate this
                break;
            }
        }//for
        if (isPrime)
        {
            printf("%d, ",i); //move this outside while loop to print n-th prime
            count++;
        }
        i++;
    }//while
}//main
```

<u>Exercise Problems</u>:

1. **Write separate C programs to print the following patterns (read number of rows from user):**

* * * * * * * * * * * * * * *	A A B A B C A B C D A B C D E	A ABC ABCDE ABCDEFG ABCDEFGHI

2. **Write a C program to print all prime numbers between 1 and n in reverse order (n is an input).**

   Sample input/output:

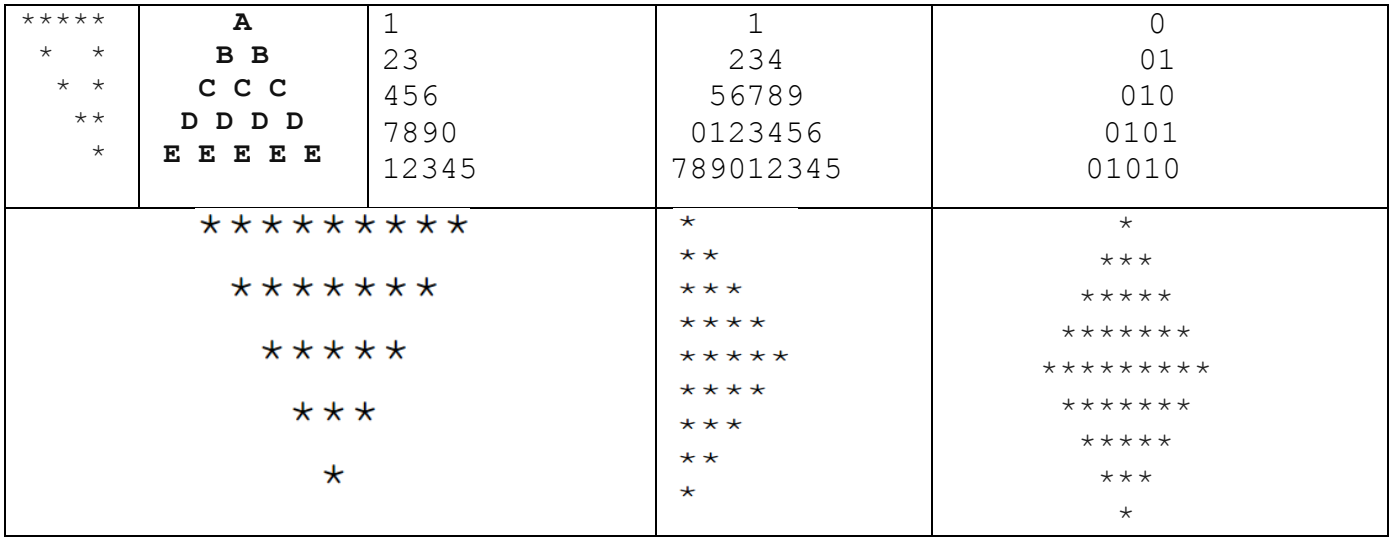
   Enter n: 20

   All prime numbers between 1 and 20 (in reverse order):19, 17, 13, 11, 7, 5, 3, 2,

3. **Write a C program to compute and print the sum of all prime numbers between m and n (m, n are inputs)**
4. **Write a C program to print the first n perfect numbers where n is an input.**
5. **Write a C program to compute and print the sum of first n perfect numbers.**
6. **Write a C program to print the n-th perfect number where n is an input.**

Assignment Problems:

1. **Write separate C programs to print the following patterns for n lines (n is input) using nested loop:**



2. **Write a C program to print all palindrome numbers between m and n (m, n are inputs). For e.g. 121 is a palindrome since the reverse of 121 = 121; but 152 is not a palindrome.**
3. **Write a C program to compute and print the sum of palindrome numbers between m and n**
4. **Write a C program to print the first n palindrome numbers where n is an input.**