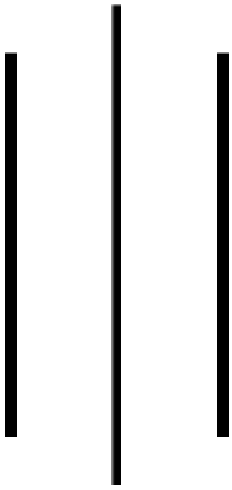
PATAN MULTIPLE CAMPUS

Patan Dokha, Lalitpur



Assignment on : C Programming (CSC115)
Assignment No. : 2

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Submitted to :
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(C Programming)

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Note : *To write code, "**Font-family: JetBrains Mono"** has been used. In this font family:*
== : ═ , >= : ⩾
!= : ≠ , <= : ⩽

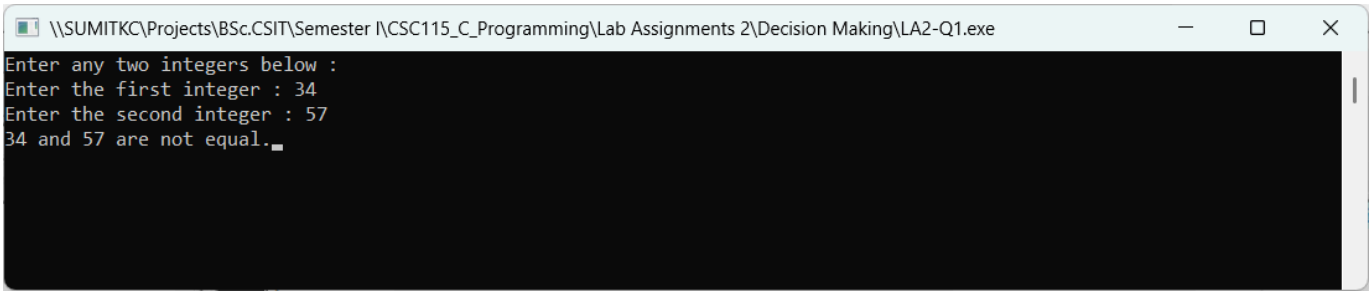
DECISION MAKING

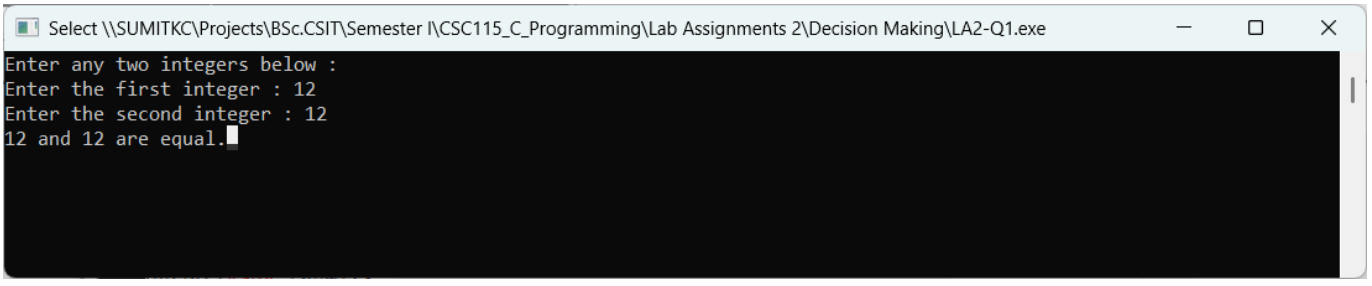
1. Write a C program to accept two integers and check whether they are equal or not.

Source Code: LA2-Q1.c

```c
#include <stdio.h>
int main()
{
	int num1, num2;
	printf("Enter any two integers below : \n");
	printf("Enter the first integer : ");
	scanf("%d", &num1);
	printf("Enter the second integer : ");
	scanf("%d", &num2);
	if (num1 == num2)
		printf("%d and %d are equal.", num1, num2);
	else
		printf("%d and %d are not equal.", num1, num2);
	return 0;
}
```

Output: LA2-Q1.exe



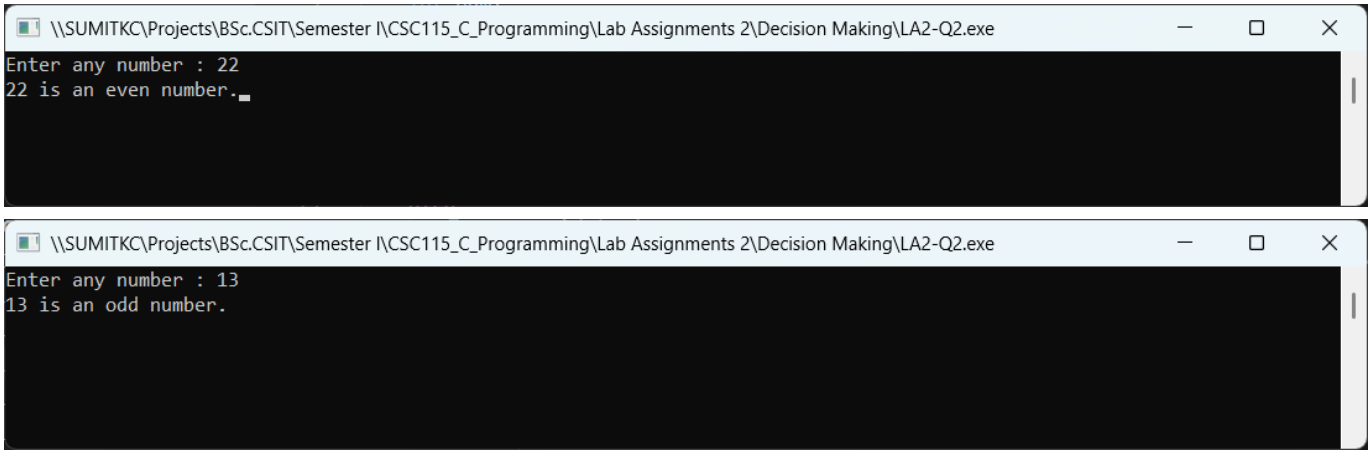


2. Write a C program to check whether a given number is even or odd.

Source Code: LA2-Q2.c

```c
#include <stdio.h>
int main()
{
    int num;
    printf("Enter any number : ");
    scanf("%d", &num);
    if (num % 2 == 0)
        printf("%d is an even number.", num);
    else
        printf("%d is an odd number.", num);
    return 0;
}
```

Output: LA2-Q2.exe

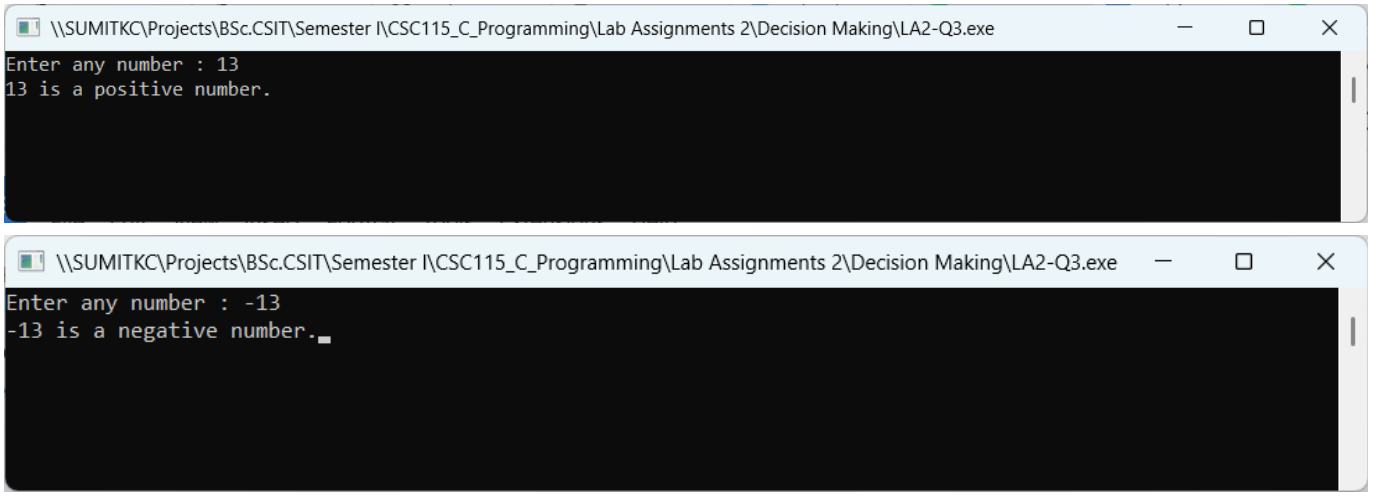


3. Write a C program to check whether a given number is positive or negative.

Source Code: LA2-Q3.c

```c
#include <stdio.h>
int main()
{
    int num;
    printf("Enter any number : ");
    scanf("%d", &num);
    if (num > 0)
        printf("%d is a positive number.", num);
    else if (num < 0)
        printf("%d is a negative number.", num);
    else
        printf("The number is zero which is neither positive nor negative.");
    return 0;
}
```

Output: LA2-Q3.exe

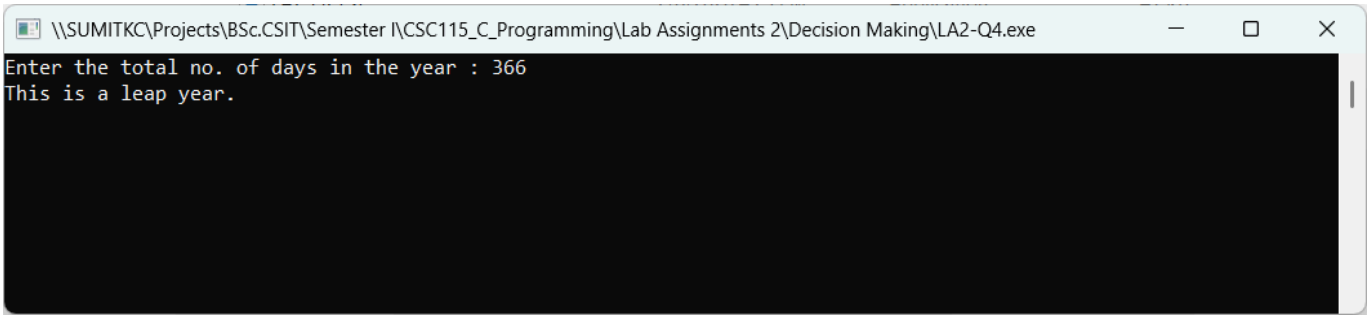


4. Write a C program to find whether a given year is a leap year or not.

Source Code: LA2-Q4.c

```c
#include <stdio.h>
int main()
{
	int days;
	printf("Enter the total no. of days in the year : ");
	scanf("%d", &days);
	if (days == 366)
		printf("This is a leap year.");
	else if (days == 365)
		printf("This is not a leap year.");
	else
		printf("Enter the valid days of a year.");
	return 0;
}
```

Output: LA2-Q4.exe

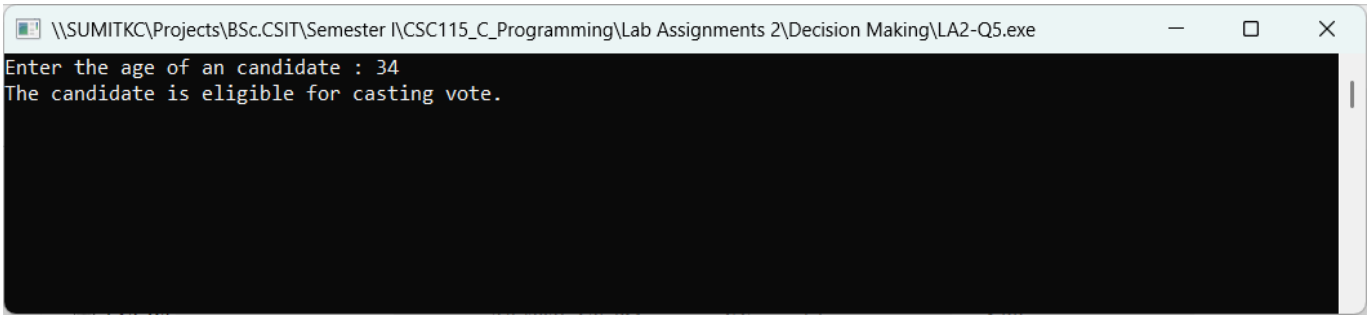


5. Write a C program to read the age of a candidate and determine whether it is eligible for casting his/her own vote.

Source Code: LA2-Q5.c

```
#include <stdio.h>
int main()
{
	int age;
	printf("Enter the age of an candidate : ");
	scanf("%d", &age);
	if (age ⩾ 18)
		printf("The candidate is eligible for casting vote.");
	else if (age > 0)
		printf("The candidate is not eligible for casting vote.");
	else
		printf("Enter the valid age of candidate.");
	return 0;
}
```

Output: LA2-Q5.exe

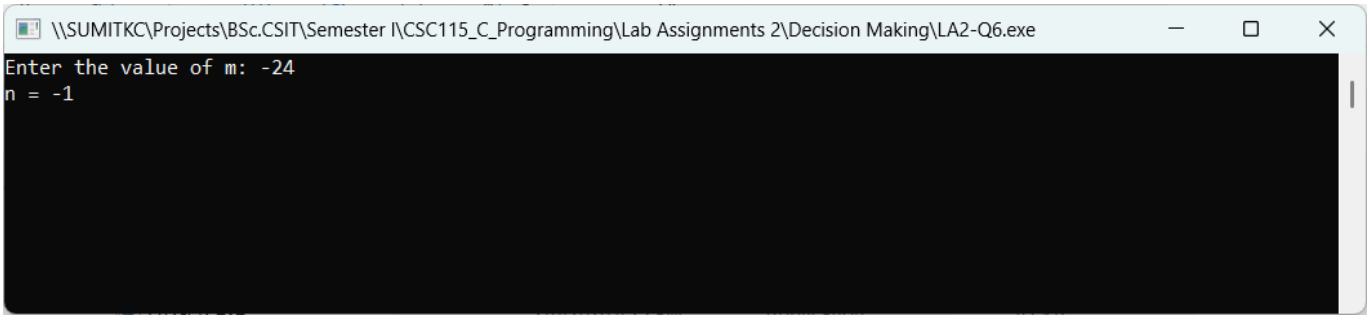


6. Write a C program to read the value of an integer m and display the value of n is 1 when m is larger than 0, 0 when m is 0 and -1 when m is less than 0.

Source Code: LA2-Q6.c

```
#include <stdio.h>

int main()
{
    int m, n;

    printf("Enter the value of m: ");
    scanf("%d", &m);

    if (m > 0)
        n = 1;
    else if (m == 0)
        n = 0;
    else
        n = -1;

    printf("n = %d\n", n);\

    return 0;
}
```

Output: LA2-Q6.exe

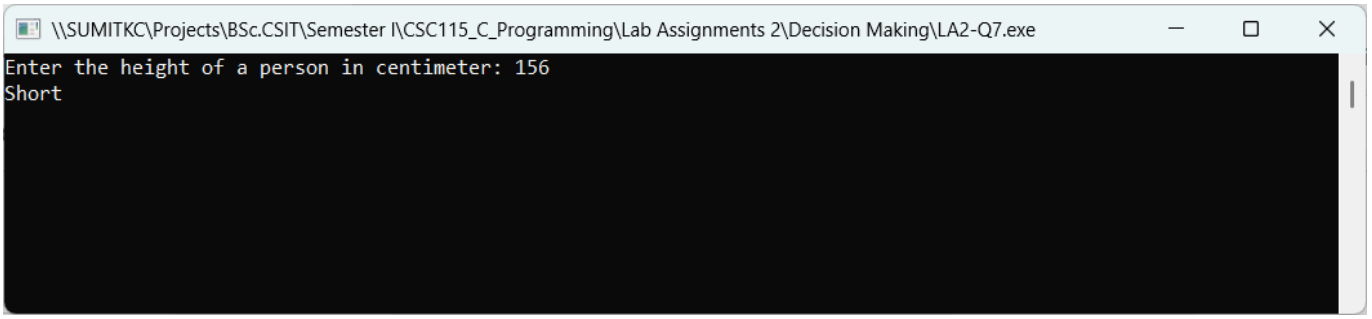


7. Write a C program to accept the height of a person in centimeters and categorize the person according to their height.

Source Code: LA2-Q7.c

```c
#include <stdio.h>

int main()
{
    float height;

    printf("Enter the height of a person in centimeter: ");
    scanf("%f", &height);

    if (height < 100)
        printf("Dwarf\n");
    else if (height ⩾ 100 && height < 150)
        printf("Very Short\n");
    else if (height ⩾ 150 && height < 170)
        printf("Short\n");
    else if (height ⩾ 170 && height < 190)
        printf("Average\n");
    else if (height ⩾ 190 && height < 210)
        printf("Tall\n");
    else
        printf("Very Tall\n");

    return 0;
}
```

Output: LA2-Q7.exe

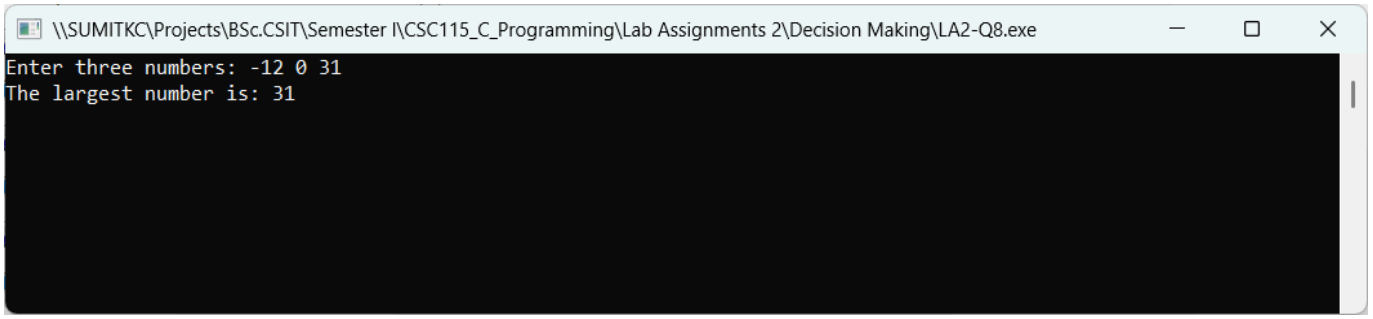


8. Write a C program to find the largest of three numbers.

Source Code: LA2-Q8.c

```c
#include <stdio.h>

int main()
{
    int a, b, c, largest;

    printf("Enter three numbers: ");
    scanf("%d %d %d", &a, &b, &c);

    if (a > b && a > c)
        largest = a;
    else if (b > a && b > c)
        largest = b;
    else
        largest = c;

    printf("The largest number is: %d\n", largest);

    return 0;
}
```

Output: LA2-Q8.exe

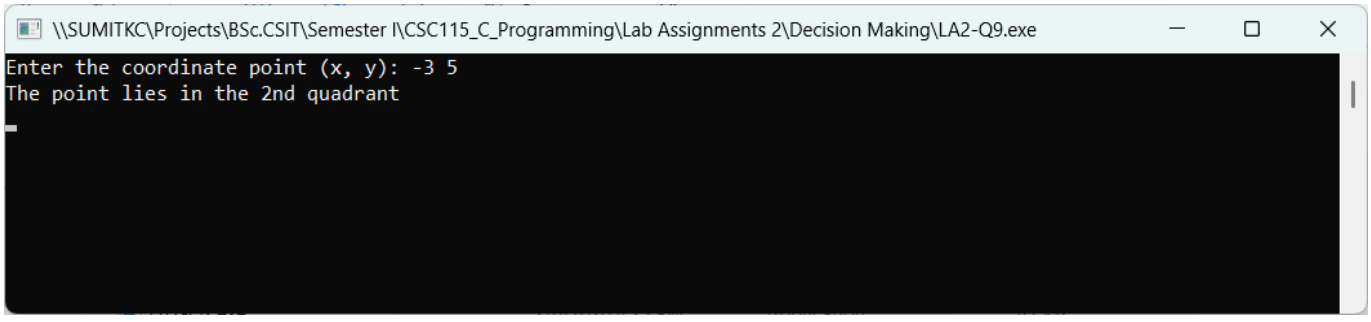


9. Write a C program to accept a coordinate point in a XY coordinate system and determine in which quadrant the coordinate point lies.

Source Code: LA2-Q9.c

```c
#include <stdio.h>

int main()
{
    int x, y;

    printf("Enter the coordinate point (x, y): ");
    scanf("%d %d", &x, &y);

    if (x > 0 && y > 0)
        printf("The point lies in the 1st quadrant\n");
    else if (x < 0 && y > 0)
        printf("The point lies in the 2nd quadrant\n");
    else if (x < 0 && y < 0)
        printf("The point lies in the 3rd quadrant\n");
    else if (x > 0 && y < 0)
        printf("The point lies in the 4th quadrant\n");
    else if (x == 0 && y == 0)
        printf("The point lies at the origin\n");
    else if (x == 0)
        printf("The point lies on the Y-axis\n");
    else
        printf("The point lies on the X-axis\n");

    return 0;
}
```

Output: LA2-Q9.exe



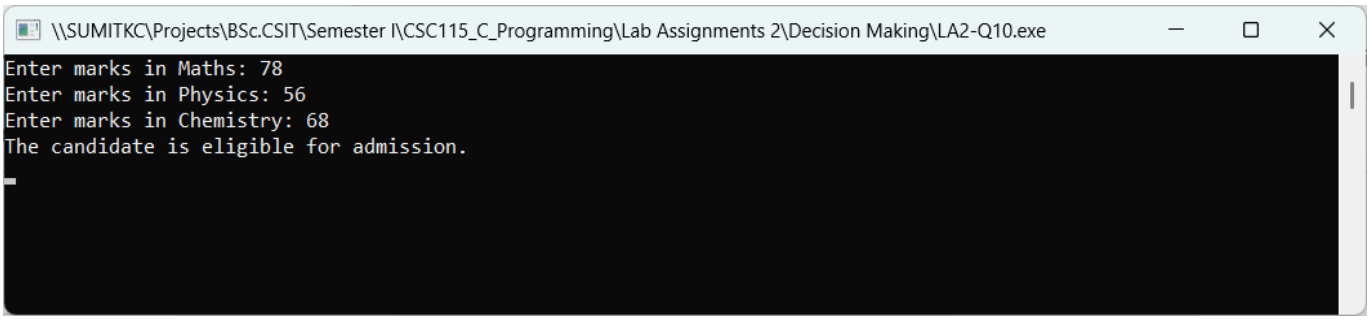
10. Write a C program to find the eligibility of admission for a professional course based on the following criteria:

Marks in Maths >=65
Marks in Phy >=55
Marks in Chem>=50
Total in all three subject >=180
or
Total in Math and Subjects >=140

Source Code: LA2-Q10.c

```
#include <stdio.h>
int main()
{
    int maths, phy, chem, total;
    printf("Enter marks in Maths: ");
    scanf("%d", &maths);
    printf("Enter marks in Physics: ");
    scanf("%d", &phy);
    printf("Enter marks in Chemistry: ");
    scanf("%d", &chem);

    total = maths + phy + chem;

    if ((maths ⩾ 65 && phy ⩾ 55 && chem ⩾ 50 && total ⩾ 180) || (maths +
phy ⩾ 140)) {
        printf("The candidate is eligible for admission.\n");
    } else {
        printf("The candidate is not eligible for admission.\n");
    }

    return 0;
}
```

Output: LA2-Q10.exe

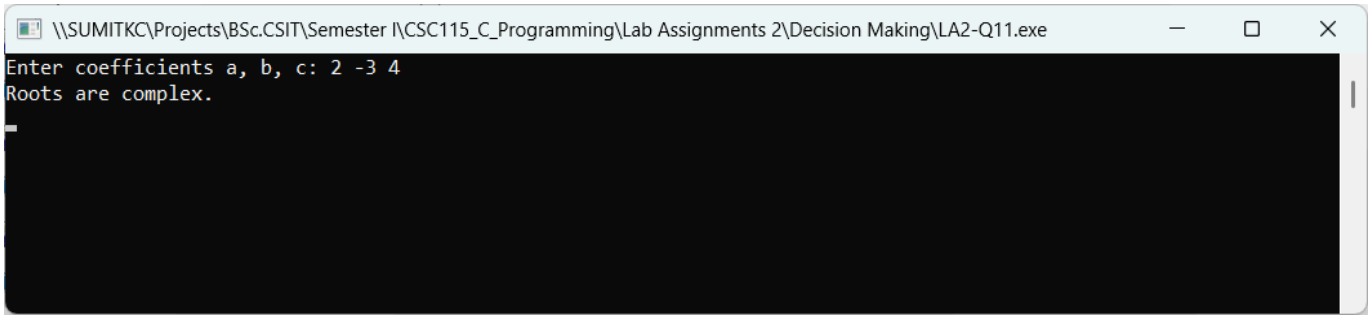


11. Write a C program to calculate the root of a Quadratic Equation.

Source Code: LA2-Q11.c

```c
#include <stdio.h>

int main()
{
    float a, b, c, discriminant, root1, root2;

    printf("Enter coefficients a, b, c: ");
    scanf("%f %f %f", &a, &b, &c);

    discriminant = (b * b) - (4 * a * c);

    if (discriminant > 0) {
        root1 = (-b + sqrt(discriminant)) / (2 * a);
        root2 = (-b - sqrt(discriminant)) / (2 * a);
        printf("Root 1 = %.2f\n", root1);
        printf("Root 2 = %.2f\n", root2);
    } else if (discriminant == 0) {
        root1 = -b / (2 * a);
        printf("Root = %.2f\n", root1);
    } else {
        printf("Roots are complex.\n");
    }

    return 0;
}
```

Output: LA2-Q11.exe

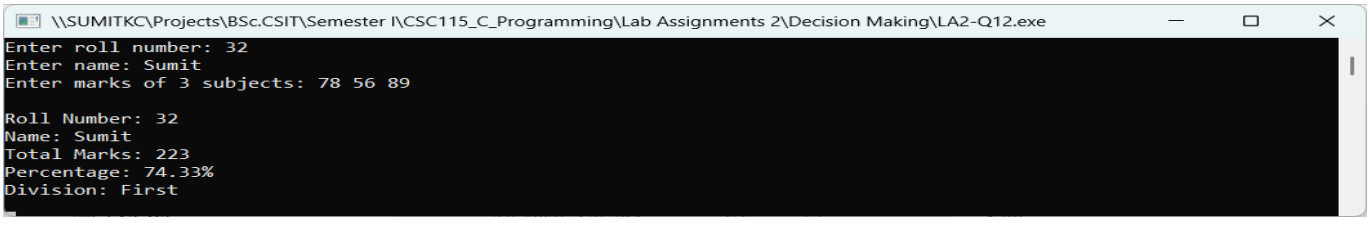


12. Write a C program to read roll no, name and marks of three subjects and calculate the total, percentage and division.

Source Code: LA2-Q12.c

```c
#include <stdio.h>
int main()
{
    int rollNo, marks1, marks2, marks3, total;
    float percentage;
    char name[50];

    printf("Enter roll number: ");
    scanf("%d", &rollNo);
    printf("Enter name: ");
    scanf("%s", name);
    printf("Enter marks of 3 subjects: ");
    scanf("%d %d %d", &marks1, &marks2, &marks3);

    total = marks1 + marks2 + marks3;
    percentage = (total / 300.0) * 100;

    printf("\nRoll Number: %d\n", rollNo);
    printf("Name: %s\n", name);
    printf("Total Marks: %d\n", total);
    printf("Percentage: %.2f%%\n", percentage);

    if (percentage ⩾ 60)
        printf("Division: First\n");
    else if (percentage ⩾ 45)
        printf("Division: Second\n");
    else if (percentage ⩾ 33)
        printf("Division: Third\n");
    else
        printf("Division: Fail\n");
    return 0;
}
```

Output: LA2-Q12.exe



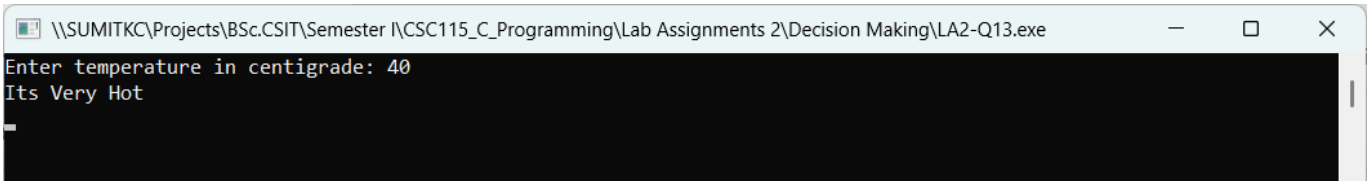
13. Write a C program to read temperature in centigrade and display a suitable message according to temperature state below:

Temp < 0 then Freezing weather
Temp 0-10 then Very Cold weather
Temp 10-20 then Cold weather
Temp 20-30 then Normal in Temp
Temp 30-40 then Its Hot
Temp >=40 then Its Very Hot

Source Code: LA2-Q13.c

```
#include <stdio.h>

int main()
{
    float temp;

    printf("Enter temperature in centigrade: ");
    scanf("%f", &temp);

    if (temp < 0)
        printf("Freezing weather\n");
    else if (temp ⩾ 0 && temp < 10)
        printf("Very Cold weather\n");
    else if (temp ⩾ 10 && temp < 20)
        printf("Cold weather\n");
    else if (temp ⩾ 20 && temp < 30)
        printf("Normal temperature\n");
    else if (temp ⩾ 30 && temp < 40)
        printf("Its Hot\n");
    else if (temp ⩾ 40)
        printf("Its Very Hot\n");

    return 0;
}
```

Output: LA2-Q13.exe

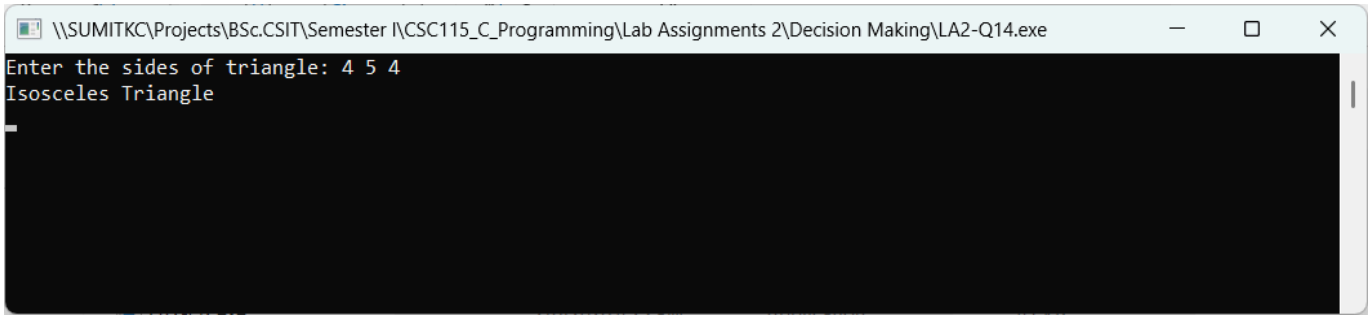


14. Write a C program to check whether a triangle is Equilateral, Isosceles or Scalene.

Source Code: LA2-Q14.c

```c
#include <stdio.h>

int main()
{
    int a, b, c;

    printf("Enter the sides of triangle: ");
    scanf("%d %d %d", &a, &b, &c);

    if (a == b && b == c)
        printf("Equilateral Triangle\n");
    else if (a == b || b == c || a == c)
        printf("Isosceles Triangle\n");
    else
        printf("Scalene Triangle\n");

    return 0;
}
```

Output: LA2-Q14.exe

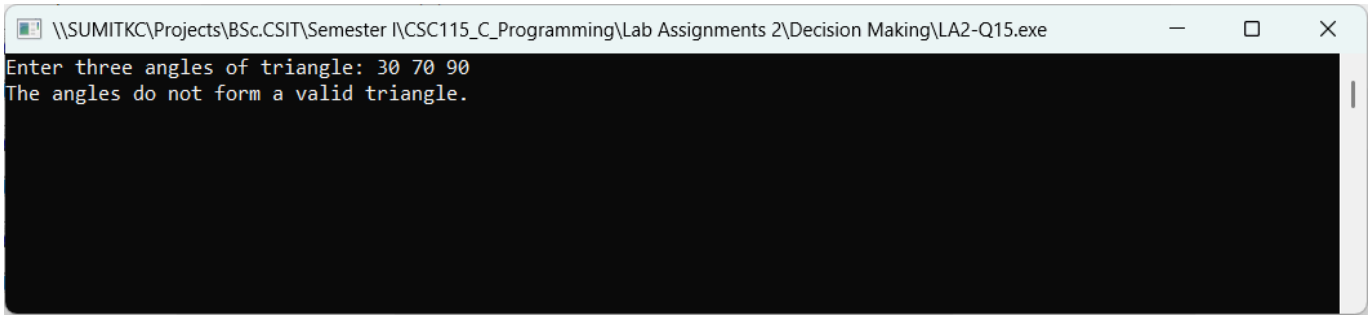


15. Write a C program to check whether a triangle can be formed by the given value for the angles.

Source Code: LA2-Q15.c

```c
#include <stdio.h>

int main()
{
    int angle1, angle2, angle3, sum;

    printf("Enter three angles of triangle: ");
    scanf("%d %d %d", &angle1, &angle2, &angle3);

    sum = angle1 + angle2 + angle3;

    if (sum == 180 && angle1 > 0 && angle2 > 0 && angle3 > 0)
        printf("The angles form a valid triangle.\n");
    else
        printf("The angles do not form a valid triangle.\n");

    return 0;
}
```

Output: LA2-Q15.exe

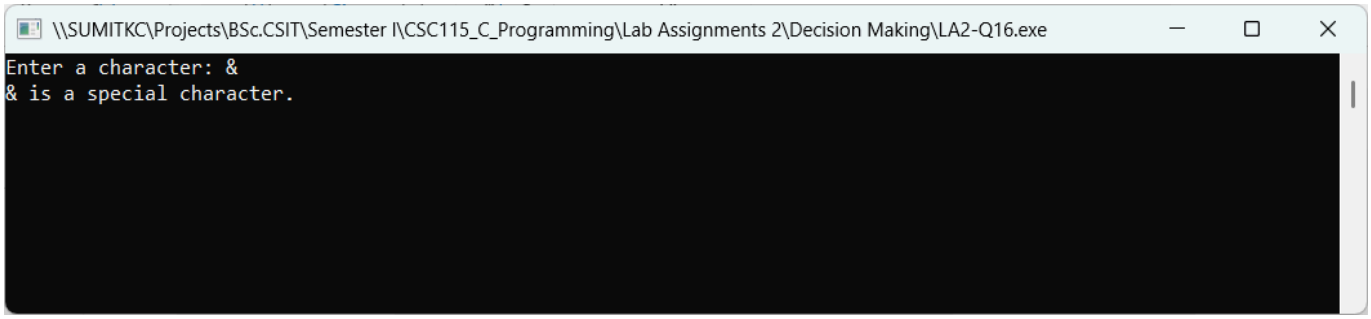


16. Write a C program to check whether a character is an alphabet, digit or special character.

Source Code: LA2-Q16.c

```c
#include <stdio.h>

int main()
{
    char ch;

    printf("Enter a character: ");
    scanf("%c", &ch);

    if ((ch ⩾ 'a' && ch ⩽ 'z') || (ch ⩾ 'A' && ch ⩽ 'Z'))
        printf("%c is an alphabet.\n", ch);
    else if (ch ⩾ '0' && ch ⩽ '9')
        printf("%c is a digit.\n", ch);
    else
        printf("%c is a special character.\n", ch);

    return 0;
}
```

Output: LA2-Q16.exe

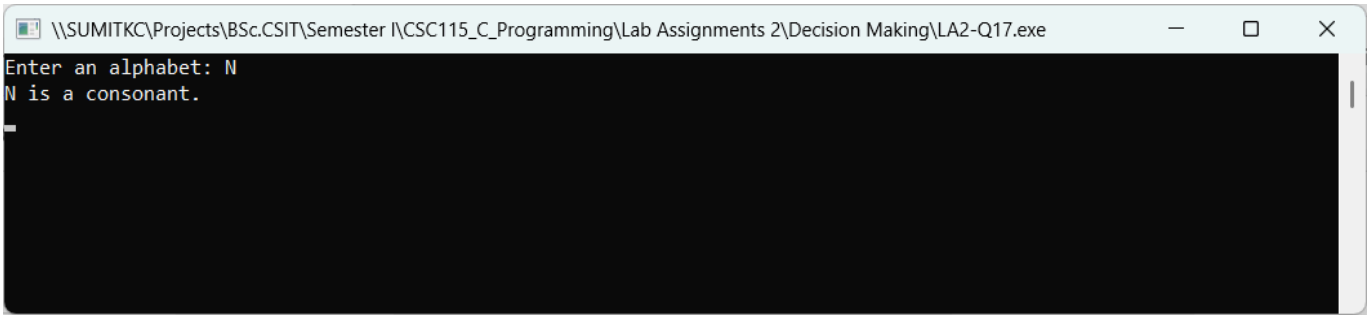


17. Write a C program to check whether an alphabet is a vowel or consonant.

Source Code: LA2-Q17.c

```c
#include <stdio.h>

int main()
{
    char ch;

    printf("Enter an alphabet: ");
    scanf("%c", &ch);

    if (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u' ||
        ch == 'A' || ch == 'E' || ch == 'I' || ch == 'O' || ch == 'U')
        printf("%c is a vowel.\n", ch);
    else
        printf("%c is a consonant.\n", ch);

    return 0;
}
```

Output: LA2-Q17.exe

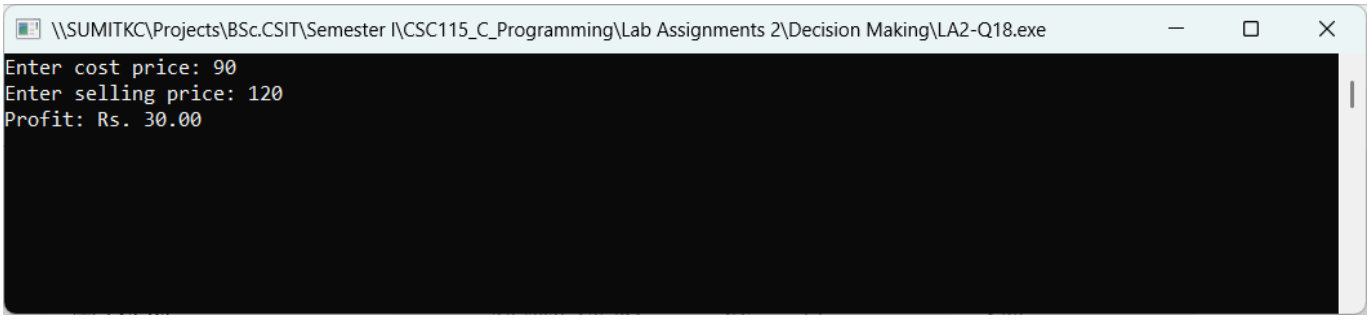


18. Write a C program to calculate profit and loss on a transaction.

Source Code: LA2-Q18.c

```c
#include <stdio.h>

int main()
{
    float costPrice, sellingPrice, profitLoss;

    printf("Enter cost price: ");
    scanf("%f", &costPrice);
    printf("Enter selling price: ");
    scanf("%f", &sellingPrice);

    profitLoss = sellingPrice - costPrice;

    if (profitLoss > 0)
        printf("Profit: Rs. %.2f\n", profitLoss);
    else if (profitLoss < 0)
        printf("Loss: Rs. %.2f\n", -profitLoss);
    else
        printf("No profit, no loss.\n");

    return 0;
}
```

Output: LA2-Q18.exe



19. Write a program in C to calculate and print the Electricity bill of a given customer. The customer id., name and unit consumed by the user should be taken from the keyboard and display the total amount to pay to the customer. The charge are as follow:

Unit	Charge/unit
upto 199	@1.20
200 and above but less than 400	@1.50
400 and above but less than 600	@1.80
600 and above	@2.00

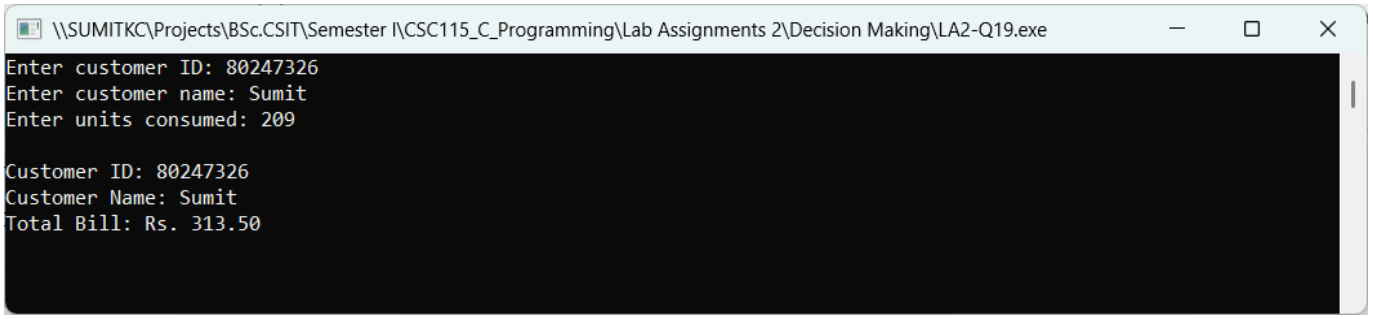
If bill exceeds Rs. 400 then a surcharge of 15% will be charged and the minimum bill should be of Rs. 100/-

Source Code: LA2-Q19.c

```
#include <stdio.h>

int main()
{
    int custId, units;
    float chargePerUnit, bill, surcharge;
    char custName[50];

    printf("Enter customer ID: ");
    scanf("%d", &custId);
    printf("Enter customer name: ");
    scanf("%s", custName);
    printf("Enter units consumed: ");
    scanf("%d", &units);

    if (units ⩽ 199)
        chargePerUnit = 1.20;
    else if (units ⩽ 399)
        chargePerUnit = 1.50;
    else if (units ⩽ 599)
        chargePerUnit = 1.80;
    else
        chargePerUnit = 2.00;

    bill = units * chargePerUnit;
```

```
    if (bill > 400) {
        surcharge = bill * 0.15;
        bill += surcharge;
    }

    if (bill < 100)
        bill = 100;

    printf("\nCustomer ID: %d\n", custId);
    printf("Customer Name: %s\n", custName);
    printf("Total Bill: Rs. %.2f\n", bill);

    return 0;
}
```

Output: LA2-Q19.exe

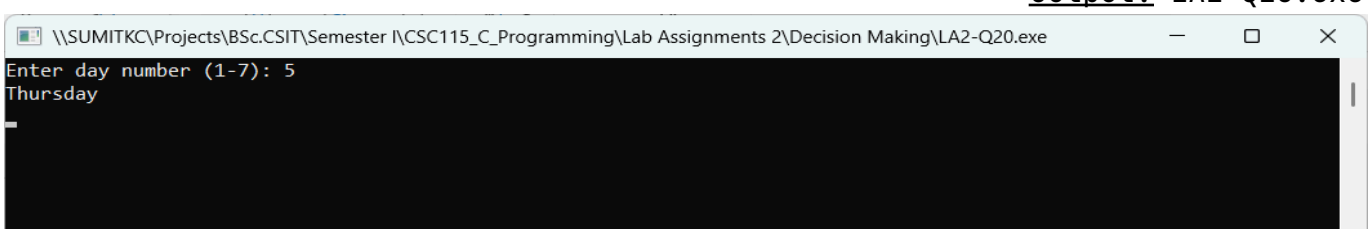


20. Write a program in C to read any day number in integer and display day name in the word.

Source Code: LA2-Q20.c

```c
#include <stdio.h>
int main()
{
    int day;
    printf("Enter day number (1-7): ");
    scanf("%d", &day);
    switch (day) {
        case 1:
            printf("Monday\n");
            break;
        case 2:
            printf("Tuesday\n");
            break;
        case 3:
            printf("Wednesday\n");
            break;
        case 4:
            printf("Thursday\n");
            break;
        case 5:
            printf("Friday\n");
            break;
        case 6:
            printf("Saturday\n");
            break;
        case 7:
            printf("Sunday\n");
            break;
        default:
            printf("Invalid day number.\n");
    }
    return 0;
}
```

Output: LA2-Q20.exe



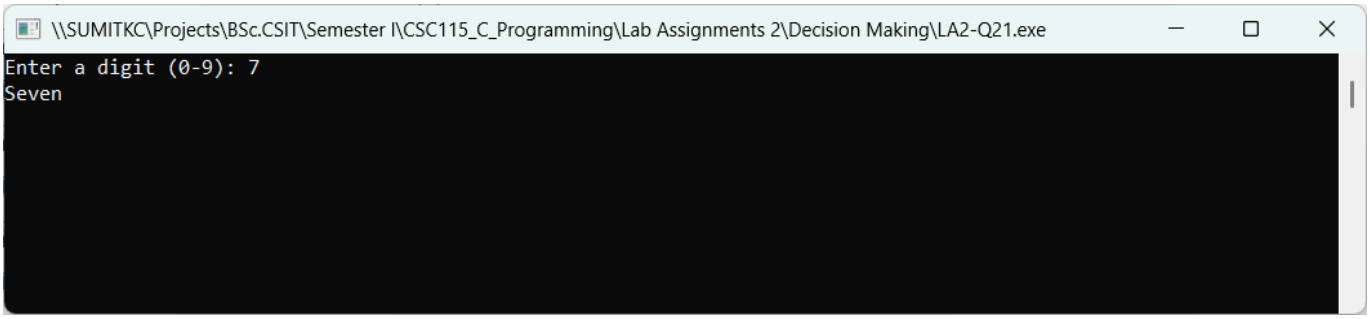
21. Write a program in C to read any digit, displayed in the word.

Source Code: LA2-Q21.c

```
#include <stdio.h>

int main()
{
    int digit;

    printf("Enter a digit (0-9): ");
    scanf("%d", &digit);

    switch (digit) {
        case 0:
            printf("Zero\n");
            break;
        case 1:
            printf("One\n");
            break;
        case 2:
            printf("Two\n");
            break;
        case 3:
            printf("Three\n");
            break;
        case 4:
            printf("Four\n");
            break;
        case 5:
            printf("Five\n");
            break;
        case 6:
            printf("Six\n");
            break;
        case 7:
            printf("Seven\n");
            break;
        case 8:
            printf("Eight\n");
            break;
        case 9:
            printf("Nine\n");
            break;
        default:
            printf("Invalid digit.\n");
```

```
    }

    return 0;
}
```

Output: LA2-Q21.exe



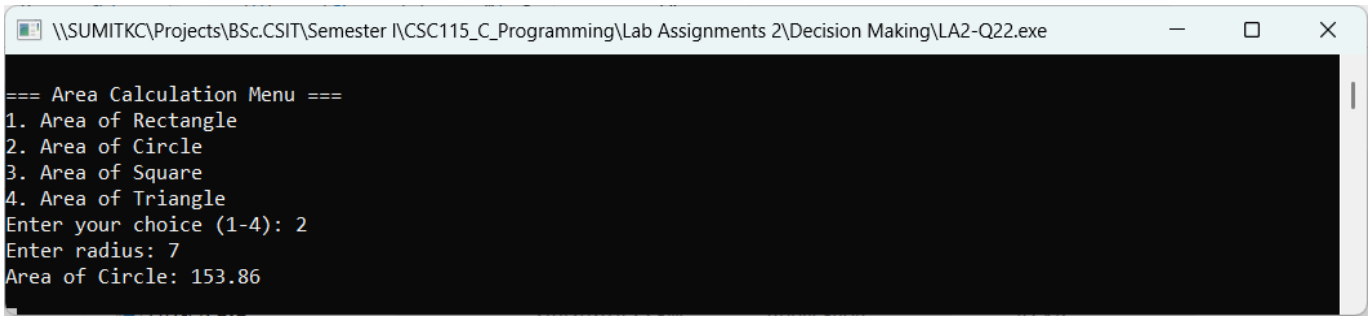
22. Write a program in C which is a Menu-Driven Program to compute the area of the various geometrical shapes.

Source Code: LA2-Q22.c

```
#include <stdio.h>

int main()
{
    int choice;
    float area, length, breadth, radius, side, base, height;

    printf("\n=== Area Calculation Menu ===");
    printf("\n1. Area of Rectangle\n");
    printf("2. Area of Circle\n");
    printf("3. Area of Square\n");
    printf("4. Area of Triangle\n");
    printf("Enter your choice (1-4): ");
    scanf("%d", &choice);

    switch (choice) {
        case 1:
            printf("Enter length and breadth: ");
            scanf("%f %f", &length, &breadth);
            area = length * breadth;
            printf("Area of Rectangle: %.2f\n", area);
            break;
        case 2:
            printf("Enter radius: ");
            scanf("%f", &radius);
            area = 3.14 * radius * radius;
            printf("Area of Circle: %.2f\n", area);
            break;
        case 3:
            printf("Enter side: ");
            scanf("%f", &side);
            area = side * side;
            printf("Area of Square: %.2f\n", area);
            break;
        case 4:
            printf("Enter base and height: ");
            scanf("%f %f", &base, &height);
            area = 0.5 * base * height;
            printf("Area of Triangle: %.2f\n", area);
            break;
        default:
```

```
            printf("Invalid choice.\n");
    }

    return 0;
}
```

Output: LA2-Q22.exe



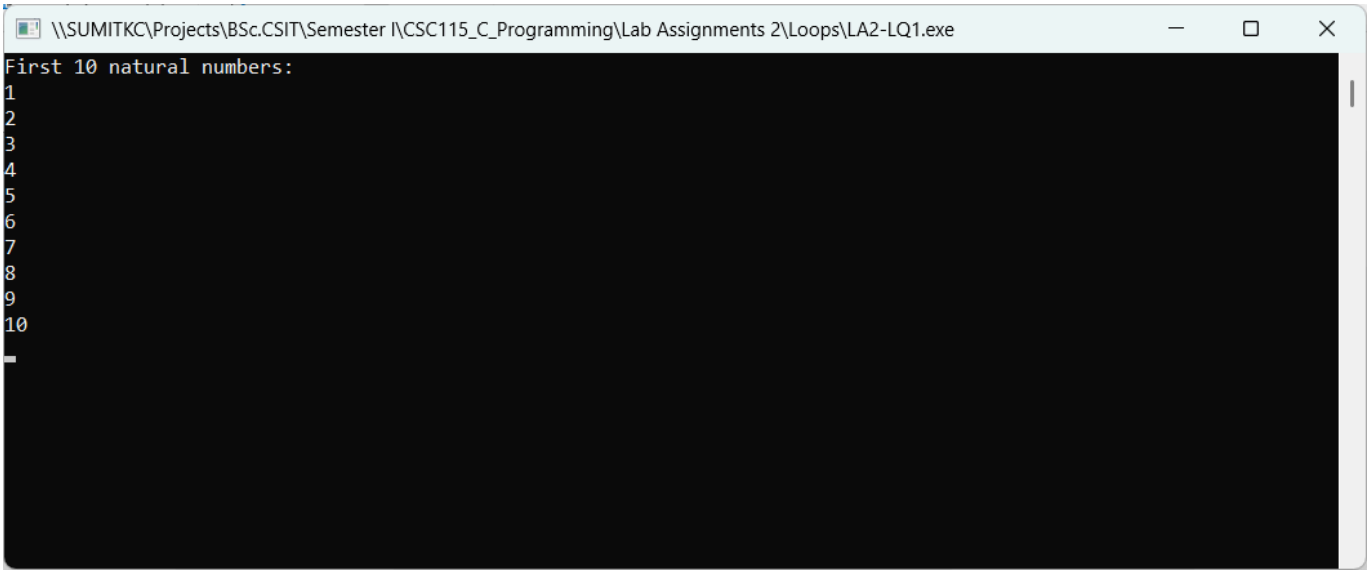
LOOPS

1. Write a program in C to display the first 10 natural numbers.

Source Code: LA2-lQ1.c

```c
#include <stdio.h>
int main()
{
    int i;
    printf("First 10 natural numbers:\n");
    for (i = 1; i ⩽ 10; i++) {
        printf("%d\n", i);
    }
    return 0;
}
```

Output: LA2-LQ1.exe

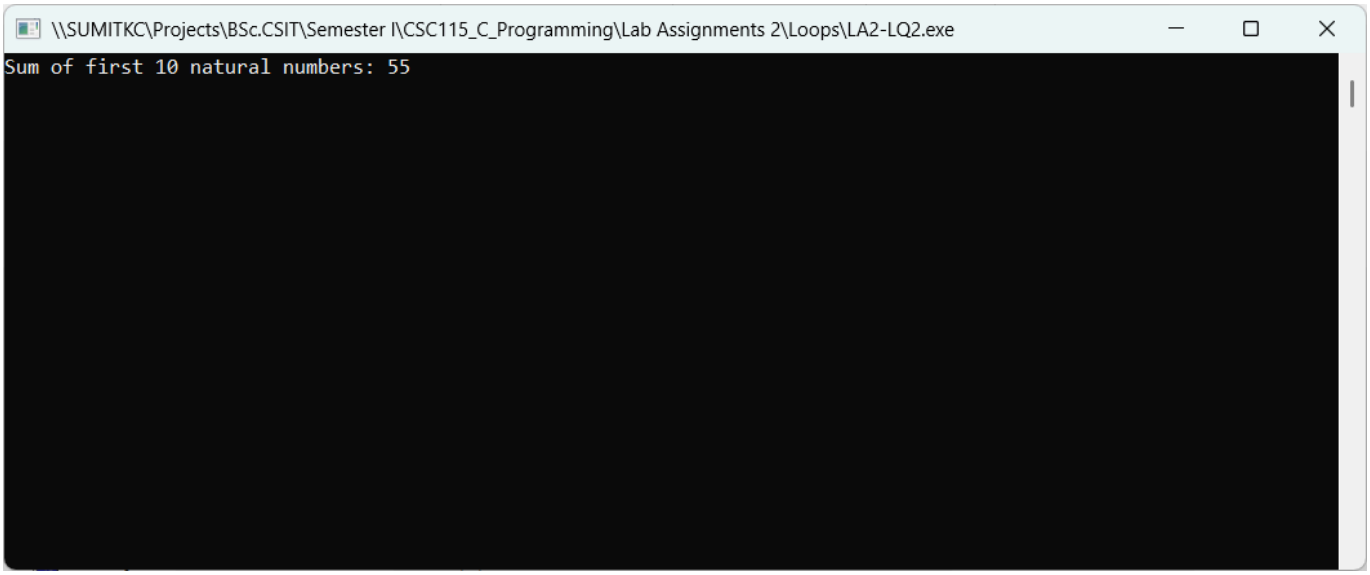


2. Write a C program to find the sum of the first 10 natural numbers.

Source Code: LA2-lQ2.c

```c
#include <stdio.h>
int main()
{
    int i, sum = 0;
    for (i = 1; i ⩽ 10; i++) {
        sum += i;
    }
    printf("Sum of first 10 natural numbers: %d\n", sum);
    return 0;
}
```

Output: LA2-LQ2.exe

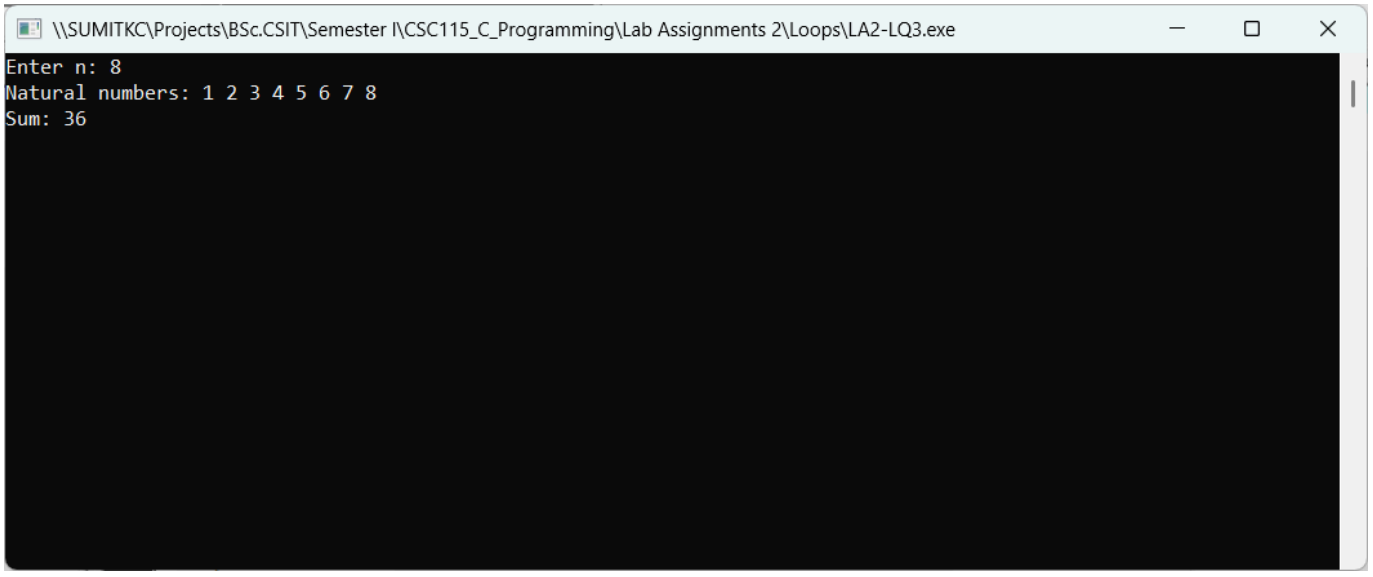


3. Write a program in C to display n terms of natural numbers and their sum.

Source Code: LA2-lQ3.c

```
#include <stdio.h>
int main()
{
    int n, i, sum = 0;
    printf("Enter n: ");
    scanf("%d", &n);
    printf("Natural numbers: ");
    for (i = 1; i ⩽ n; i++) {
        printf("%d ", i);
        sum += i;
    }
    printf("\nSum: %d\n", sum);
    return 0;
}
```

Output: LA2-LQ3.exe

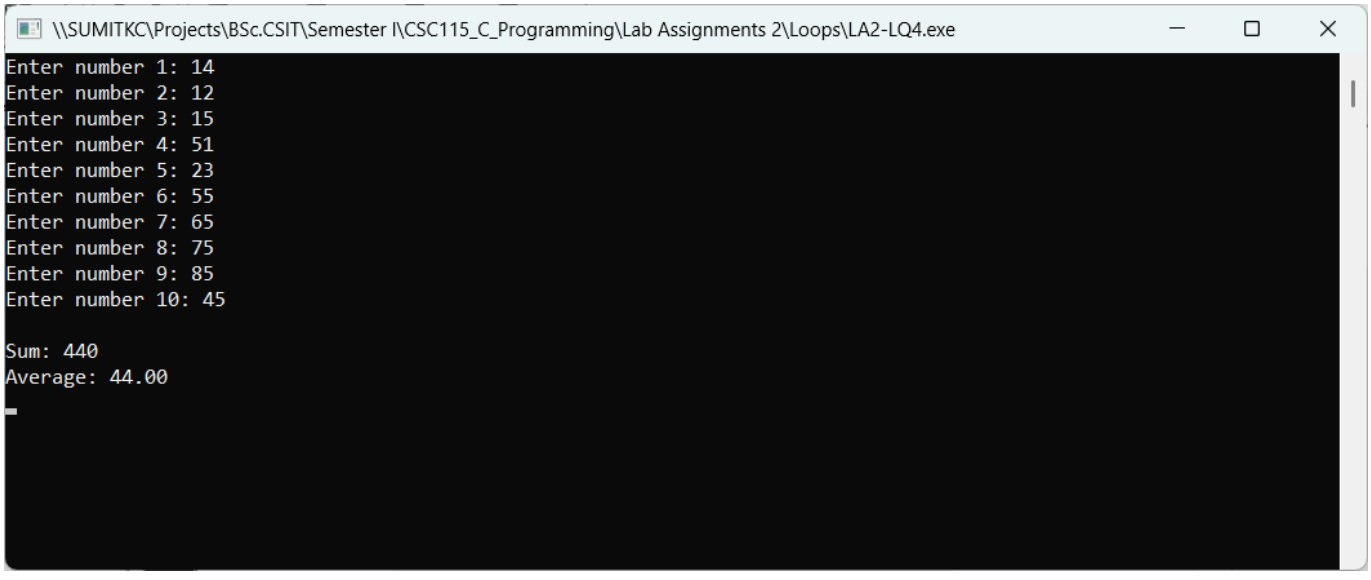


4. Write a program in C to read 10 numbers from the keyboard and find their sum and average.

Source Code: LA2-lQ4.c

```c
#include <stdio.h>
int main()
{
    int i, num, sum = 0;
    float avg;
    for (i = 0; i < 10; i++) {
        printf("Enter number %d: ", i + 1);
        scanf("%d", &num);
        sum += num;
    }
    avg = (float)sum / 10;
    printf("\nSum: %d\n", sum);
    printf("Average: %.2f\n", avg);
    return 0;
}
```

Output: LA2-LQ4.exe

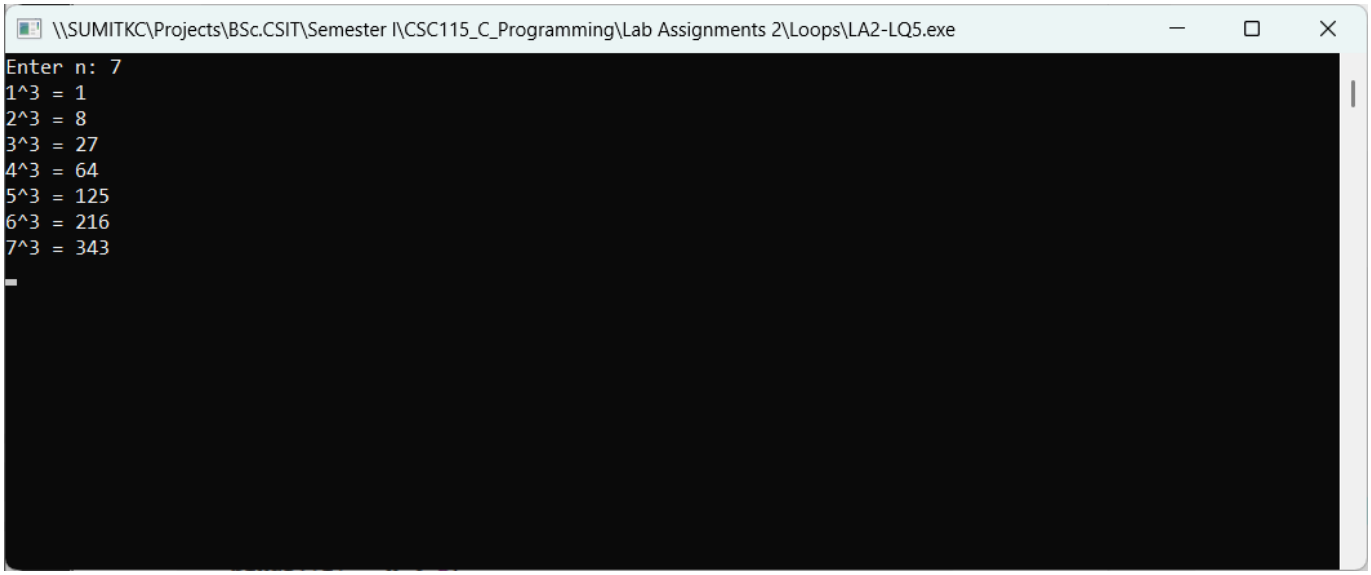


5. Write a program in C to display the cube of the number upto given integer.

Source Code: LA2-lQ5.c

```c
#include <stdio.h>
int main()
{
    int n, i;
    printf("Enter n: ");
    scanf("%d", &n);
    for (i = 1; i ⩽ n; i++) {
        printf("%d^3 = %d\n", i, i * i * i);
    }
    return 0;
}
```

Output: LA2-LQ5.exe

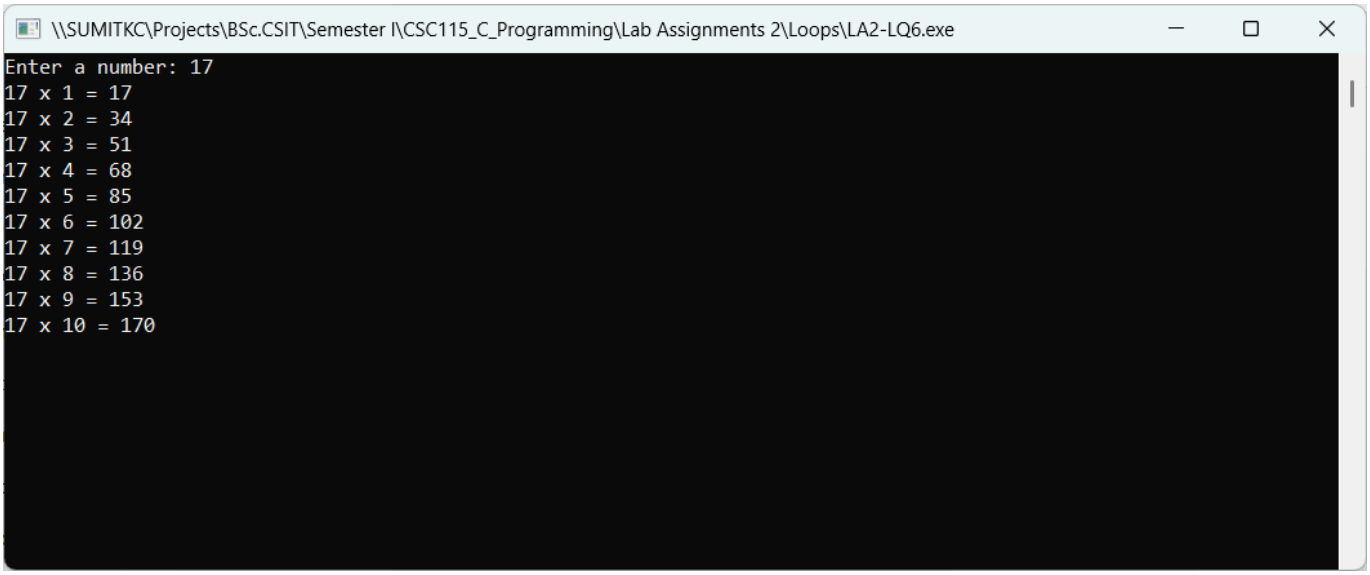


6. Write a program in C to display the multiplication table of a given integer.

Source Code: LA2-lQ6.c

```c
#include <stdio.h>
int main()
{
    int n, i;
    printf("Enter a number: ");
    scanf("%d", &n);
    for (i = 1; i ⩽ 10; i++) {
        printf("%d x %d = %d\n", n, i, n * i);
    }
    return 0;
}
```

Output: LA2-LQ6.exe

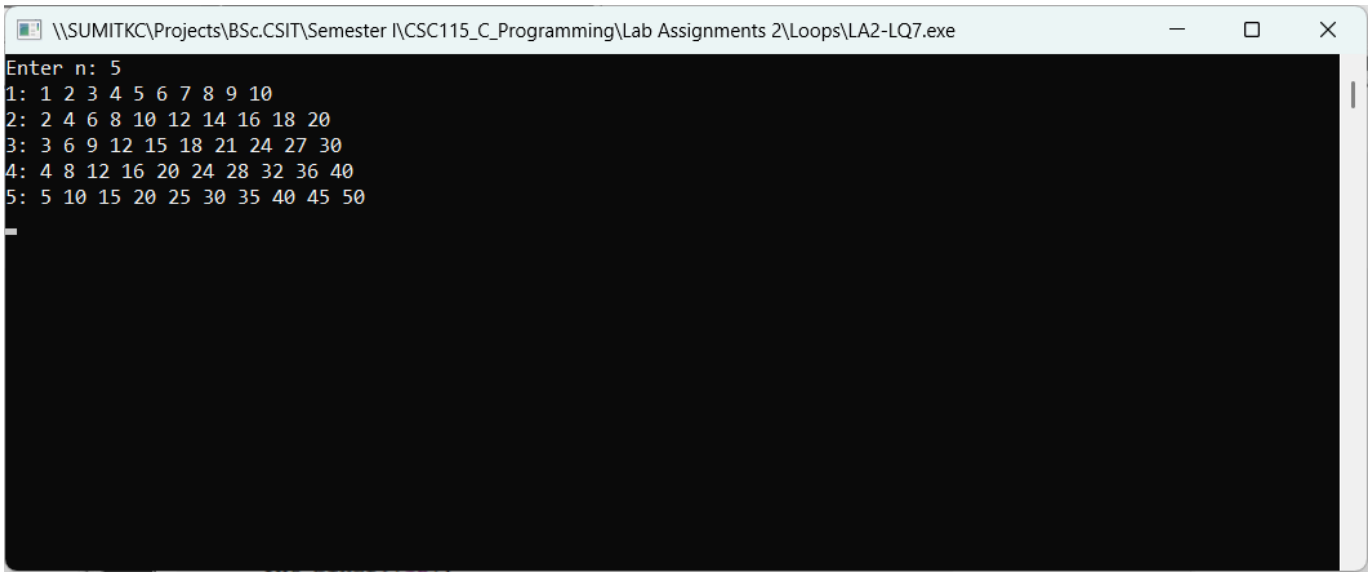


7. Write a program in C to display the multiplication table vertically from 1 to n.

Source Code: LA2-lQ7.c

```c
#include <stdio.h>
int main()
{
    int n, i, j;
    printf("Enter n: ");
    scanf("%d", &n);
    for (i = 1; i ⩽ n; i++) {
        printf("%d: ", i);
        for (j = 1; j ⩽ 10; j++) {
            printf("%d ", i * j);
        }
        printf("\n");
    }
    return 0;
}
```

Output: LA2-LQ7.exe



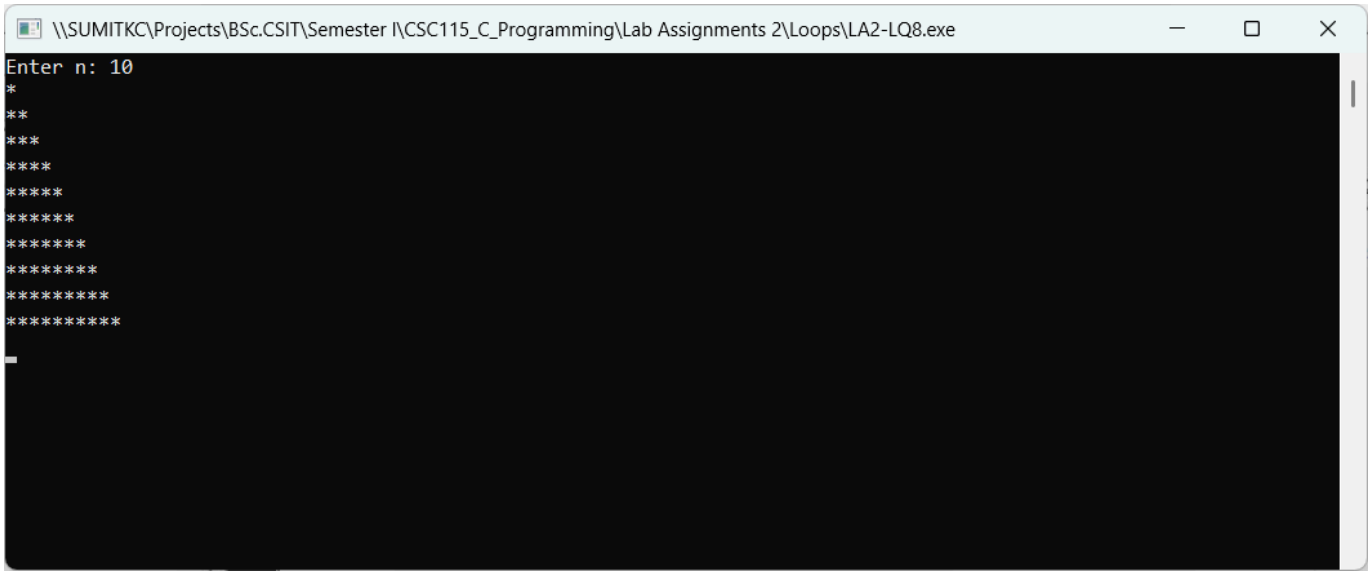
8. Write a program in C to display the pattern like a right angle triangle using an asterisk.

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

Source Code: LA2-lQ8.c

```
#include <stdio.h>
int main()
{
    int n, i, j;
    printf("Enter n: ");
    scanf("%d", &n);
    for (i = 1; i ⩽ n; i++) {
        for (j = 1; j ⩽ i; j++) {
            printf("*");
        }
        printf("\n");
    }
    return 0;
}
```

Output: LA2-LQ8.exe



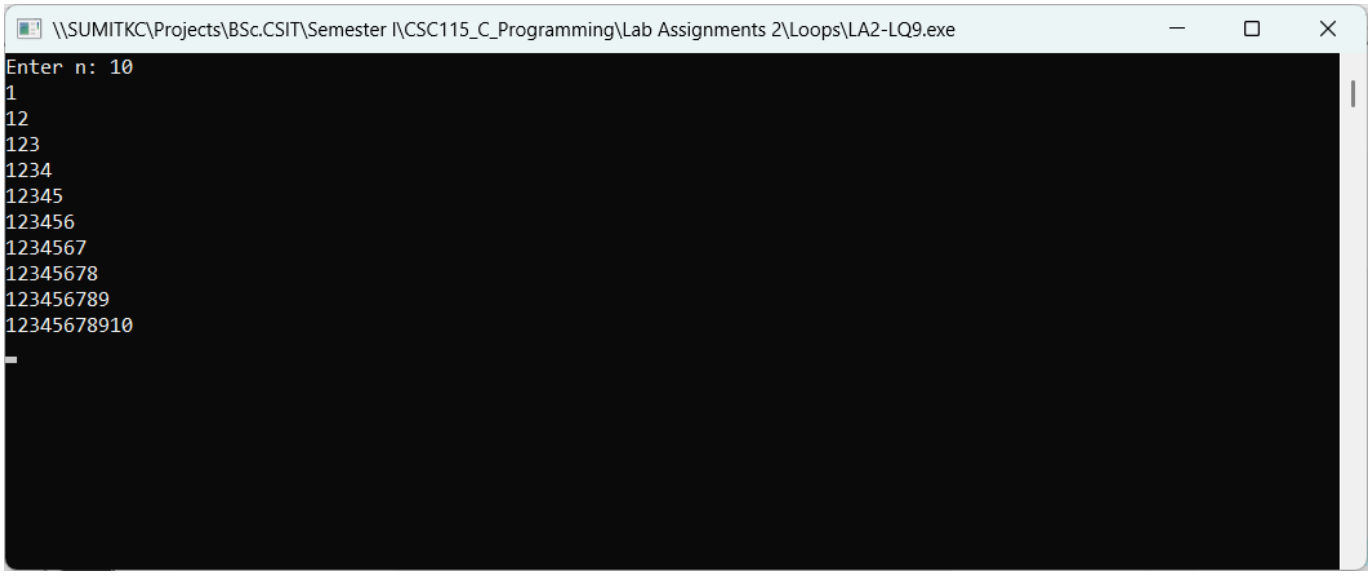
9. Write a program in C to display the pattern like a right angle triangle with a number.

1
12
123
1234

Source Code: LA2-lQ9.c

```
#include <stdio.h>
int main()
{
    int n, i, j;
    printf("Enter n: ");
    scanf("%d", &n);
    for (i = 1; i ⩽ n; i++) {
        for (j = 1; j ⩽ i; j++) {
            printf("%d", j);
        }
        printf("\n");
    }
    return 0;
}
```

Output: LA2-LQ9.exe



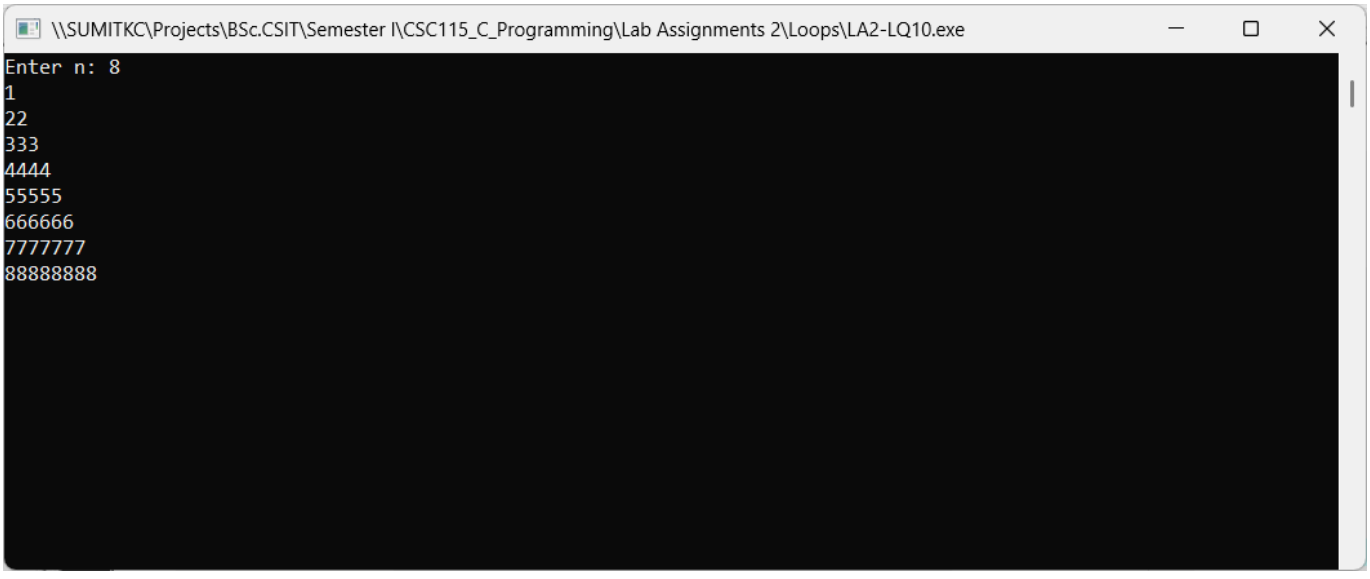
10. Write a program in C to make such a pattern like a right angle triangle with a number which will repeat a number in a row.

1
22
333
4444

Source Code: LA2-lQ10.c

```c
#include <stdio.h>
int main()
{
    int n, i, j;
    printf("Enter n: ");
    scanf("%d", &n);
    for (i = 1; i ⩽ n; i++) {
        for (j = 1; j ⩽ i; j++) {
            printf("%d", i);
        }
        printf("\n");
    }
    return 0;
}
```

Output: LA2-LQ10.exe



11. Write a program in C to make such a pattern like a right angle triangle with the number increased by 1.

1
2 3
4 5 6
7 8 9 10

Source Code: LA2-lQ11.c

```c
#include <stdio.h>
int main()
{
    int n, i, j, num = 1;
    printf("Enter n: ");
    scanf("%d", &n);
    for (i = 1; i ⩽ n; i++) {
        for (j = 1; j ⩽ i; j++) {
            printf("%d ", num);
            num++;
        }
        printf("\n");
    }
    return 0;
}
```

Output: LA2-LQ11.exe

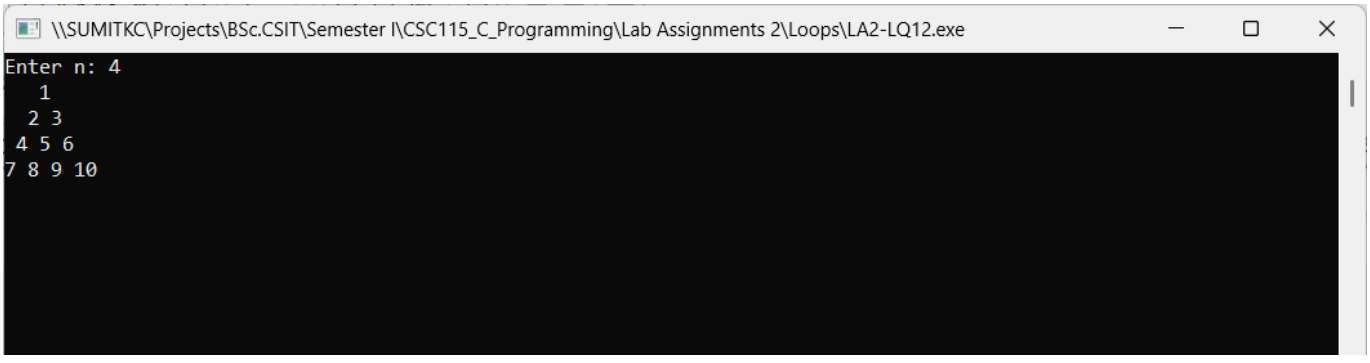
12. Write a program in C to make such a pattern like a pyramid with numbers increased by 1.

```
  1
 2 3
4 5 6
7 8 9 10
```

Source Code: LA2-lQ12.c

```c
#include <stdio.h>
int main()
{
    int n, i, j, num = 1;
    printf("Enter n: ");
    scanf("%d", &n);
    for (i = 1; i ⩽ n; i++) {
        for (j = 1; j ⩽ n - i; j++) {
            printf(" ");
        }
        for (j = 1; j ⩽ i; j++) {
            printf("%d ", num);
            num++;
        }
        printf("\n");
    }
    return 0;
}
```

Output: LA2-LQ12.exe



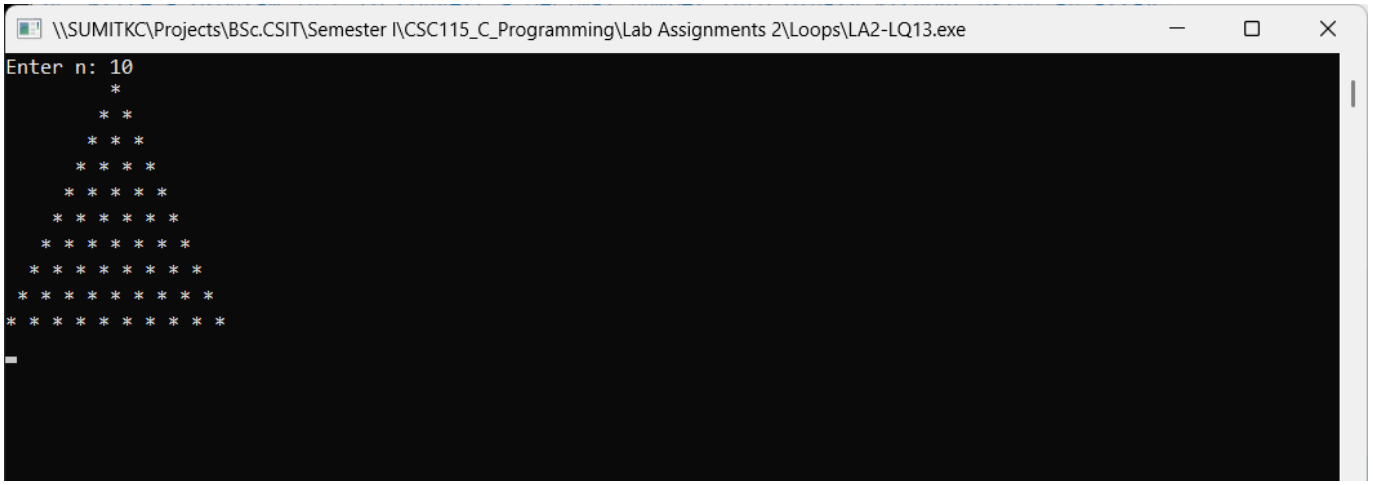
13. Write a program in C to make such a pattern like a pyramid with an asterisk.

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

Source Code: LA2-lQ13.c

```
#include <stdio.h>
int main()
{
    int n, i, j;
    printf("Enter n: ");
    scanf("%d", &n);
    for (i = 1; i ⩽ n; i++) {
        for (j = 1; j ⩽ n - i; j++) {
            printf(" ");
        }
        for (j = 1; j ⩽ i; j++) {
            printf("* ");
        }
        printf("\n");
    }
    return 0;
}
```

Output: LA2-LQ13.exe

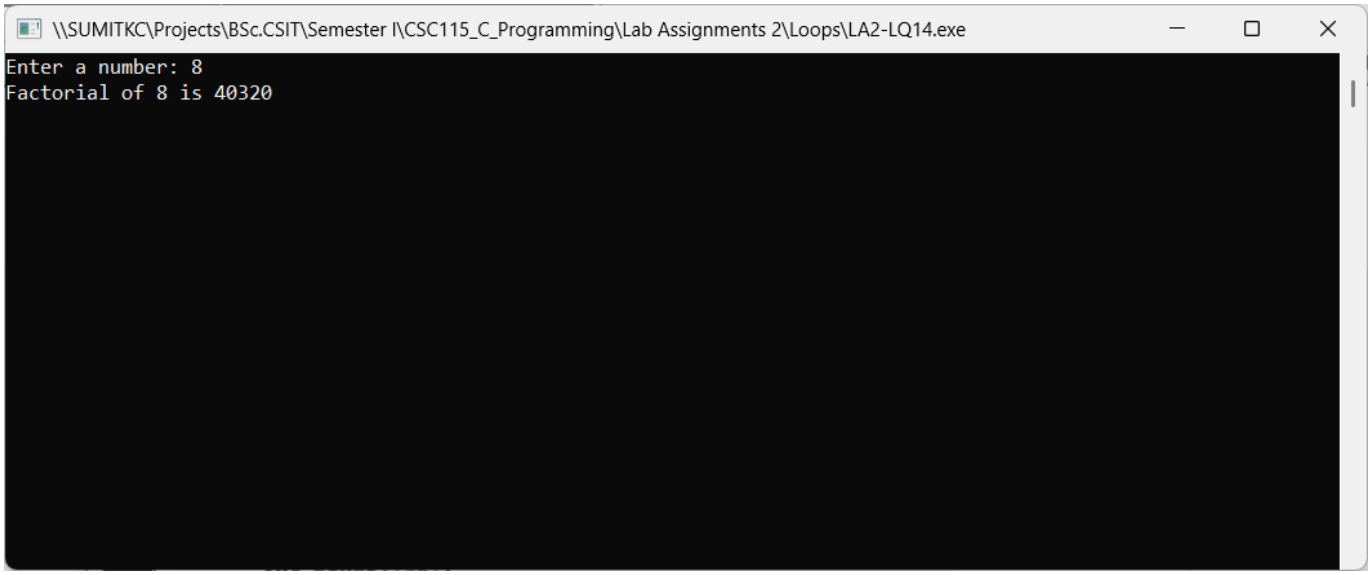


14. Write a C program to calculate the factorial of a given number.

Source Code: LA2-lQ14.c

```c
#include <stdio.h>
int main()
{
    int n, i, fact = 1;
    printf("Enter a number: ");
    scanf("%d", &n);
    for (i = 1; i ⩽ n; i++) {
        fact *= i;
    }
    printf("Factorial of %d is %d\n", n, fact);
    return 0;
}
```

Output: LA2-LQ14.exe



15. Write a program in C to display the n terms of even natural numbers and their sum.

Source Code: LA2-lQ15.c

```c
#include <stdio.h>
int main()
{
    int n, i, sum = 0;
    printf("Enter n: ");
    scanf("%d", &n);
    printf("Even natural numbers: ");
    for (i = 1; i ⩽ n; i++) {
        if (i % 2 == 0) {
            printf("%d ", i);
            sum += i;
        }
    }
    printf("\nSum: %d\n", sum);
    return 0;
}
```

Output: LA2-LQ15.exe

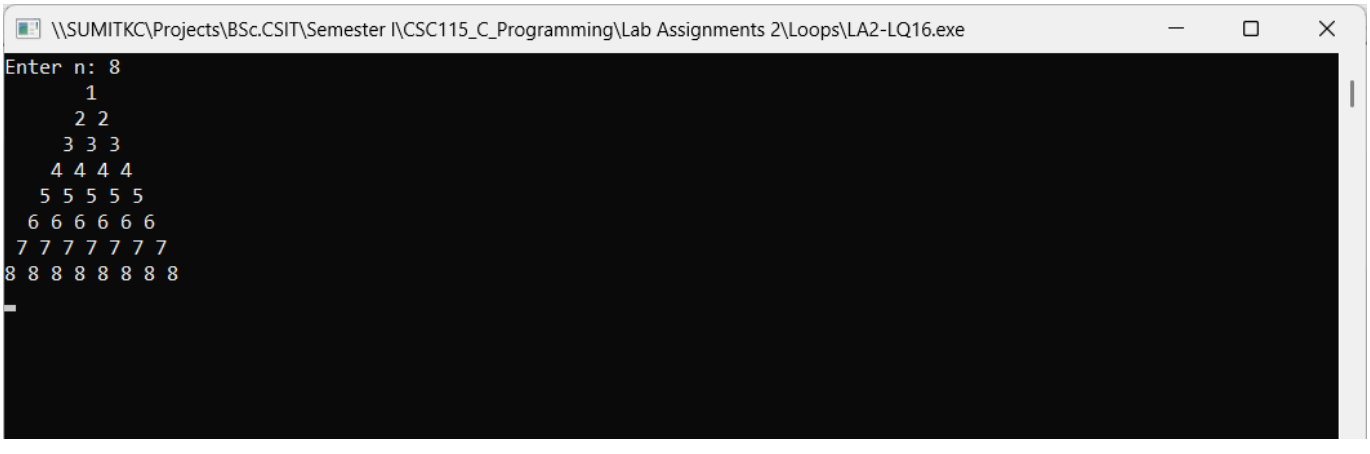
16. Write a program in C to make such a pattern like a pyramid with a number which will repeat the number in the same row.

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

Source Code: LA2-lQ16.c

```
#include <stdio.h>
int main()
{
    int n, i, j;
    printf("Enter n: ");
    scanf("%d", &n);
    for (i = 1; i ⩽ n; i++) {
        for (j = 1; j ⩽ n - i; j++) {
            printf(" ");
        }
        for (j = 1; j ⩽ i; j++) {
            printf("%d ", i);
        }
        printf("\n");
    }
    return 0;
}
```

Output: LA2-LQ16.exe

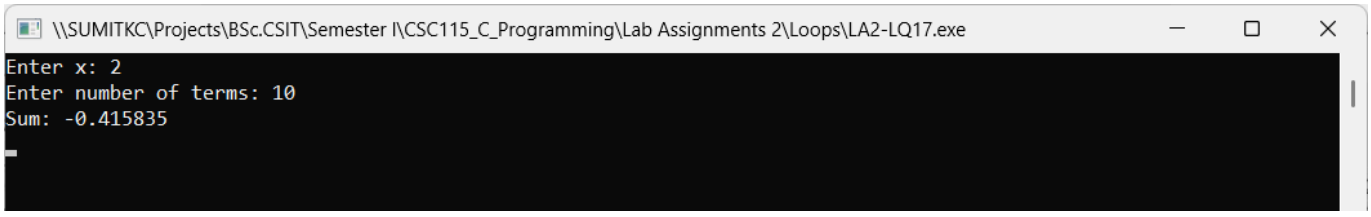


17. Write a program in C to find the sum of the series [1-X^2/2!+X^4/4!- .....].

Source Code: LA2-lQ17.c

```
#include <stdio.h>
int main()
{
    int n, i;
    double x, sum = 1.0, term;
    long fact;
    printf("Enter x: ");
    scanf("%lf", &x);
    printf("Enter number of terms: ");
    scanf("%d", &n);
    for (i = 1; i < n; i++) {
        fact = 1;
        int j;
        for (j = 1; j <= 2 * i; j++) {
            fact *= j;
        }
        term = 1.0;
        for (j = 0; j < 2 * i; j++) {
            term *= x;
        }
        if (i % 2 == 1) {
            sum -= term / fact;
        } else {
            sum += term / fact;
        }
    }
    printf("Sum: %.6f\n", sum);
    return 0;
}
```

Output: LA2-LQ17.exe

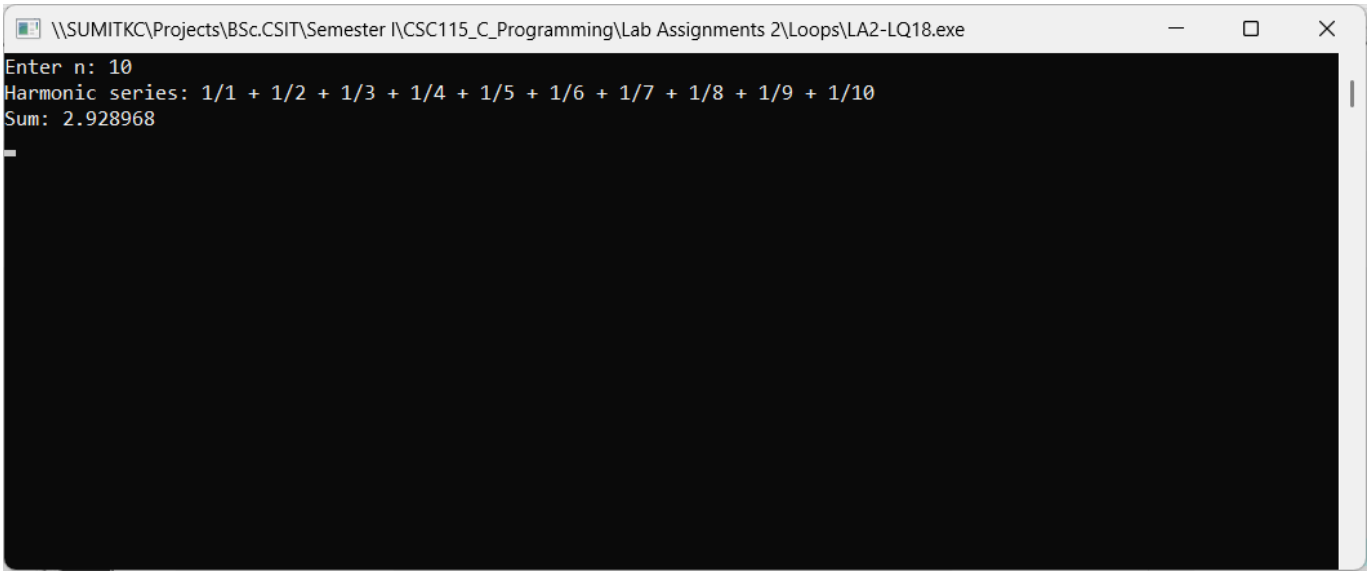


18. Write a program in C to display the n terms of harmonic series and their sum. 1 + 1/2 + 1/3 + 1/4 + 1/5 ... 1/n terms.

Source Code: LA2-lQ18.c

```c
#include <stdio.h>
int main()
{
    int n, i;
    double sum = 0.0;
    printf("Enter n: ");
    scanf("%d", &n);
    printf("Harmonic series: ");
    for (i = 1; i <= n; i++) {
        printf("1/%d ", i);
        if (i < n) printf("+ ");
        sum += 1.0 / i;
    }
    printf("\nSum: %.6f\n", sum);
    return 0;
}
```

Output: LA2-LQ18.exe



19. Write a program in C to print the Floyd's Triangle.

1
01
101
0101
10101

Source Code: LA2-lQ19.c

```c
#include <stdio.h>
int main()
{
    int n, i, j;
    printf("Enter n: ");
    scanf("%d", &n);
    for (i = 1; i ⩽ n; i++) {
        for (j = 1; j ⩽ i; j++) {
            printf("%d", (j + i) % 2);
        }
        printf("\n");
    }
    return 0;
}
```

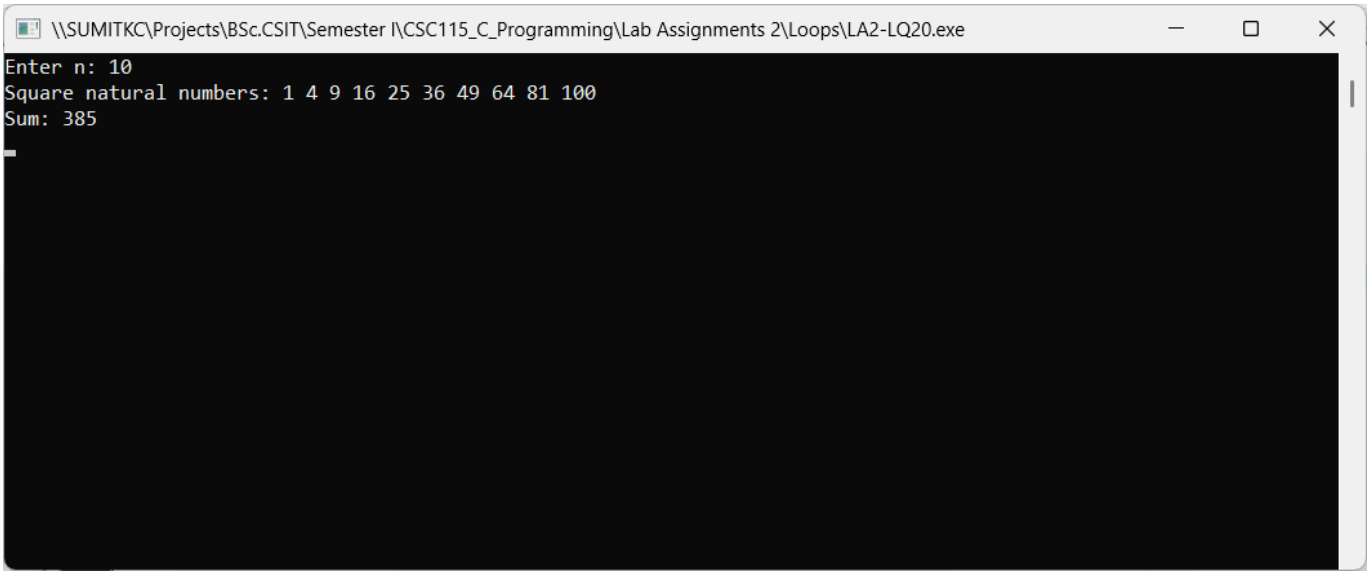
Output: LA2-LQ19.exe

20. Write a program in C to display the n terms of square natural numbers and their sum.

Source Code: LA2-lQ20.c

```
#include <stdio.h>
int main()
{
    int n, i, sum = 0;
    printf("Enter n: ");
    scanf("%d", &n);
    printf("Square natural numbers: ");
    for (i = 1; i ⩽ n; i++) {
        printf("%d ", i * i);
        sum += i * i;
    }
    printf("\nSum: %d\n", sum);
    return 0;
}
```

Output: LA2-LQ20.exe



21. Write a program in C to find the sum of the series 1 +11 + 111 + 1111 + .. n terms. Test Data :

Input the number of terms : 5

Expected Output :

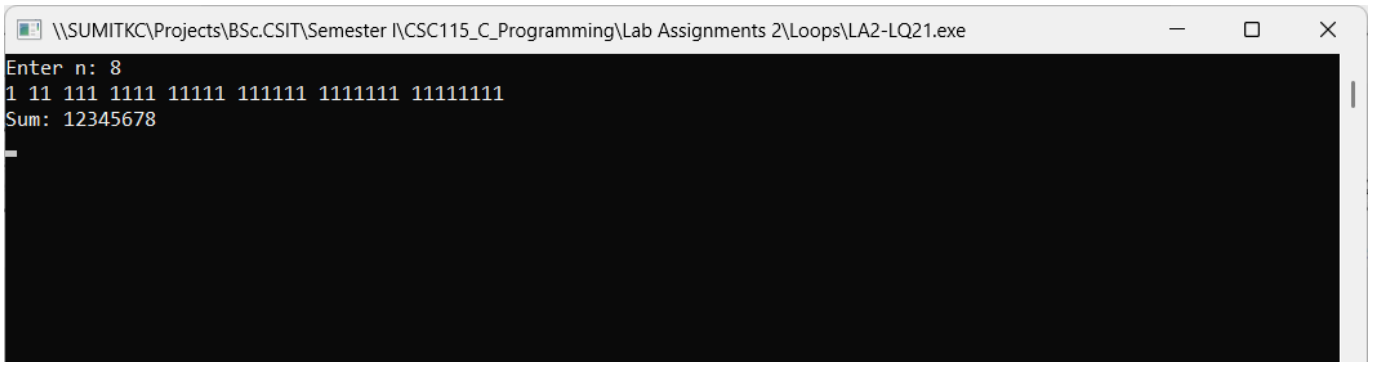
1 + 11 + 111 + 1111 + 11111

The Sum is : 12345

Source Code: LA2-lQ21.c

```
#include <stdio.h>
int main()
{
    int n, i, num, sum = 0;
    printf("Enter n: ");
    scanf("%d", &n);
    for (i = 1; i ⩽ n; i++) {
        num = 0;
        int j;
        for (j = 0; j < i; j++) {
            num = num * 10 + 1;
        }
        sum += num;
        printf("%d ", num);
    }
    printf("\nSum: %d\n", sum);
    return 0;
}
```

Output: LA2-LQ21.exe



22. Write a c program to check whether a given number is a perfect number or not.

Test Data :

Input the number : 56

Expected Output :

The positive divisor : 1 2 4 7 8 14 28

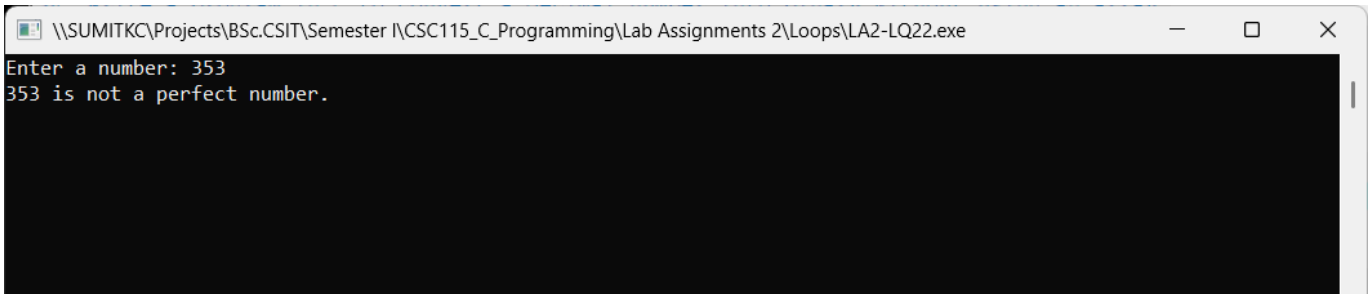
The sum of the divisor is : 64

So, the number is not perfect.

Source Code: LA2-lQ22.c

```c
#include <stdio.h>
int main()
{
    int n, i, sum = 0;
    printf("Enter a number: ");
    scanf("%d", &n);
    for (i = 1; i < n; i++) {
        if (n % i == 0) {
            sum += i;
        }
    }
    if (sum == n) {
        printf("%d is a perfect number.\n", n);
    } else {
        printf("%d is not a perfect number.\n", n);
    }
    return 0;
}
```

Output: LA2-LQ22.exe



23. Write a c program to find the perfect numbers within a given number of range.

Source Code: LA2-lQ23.c

```c
#include <stdio.h>
int main()
{
    int start, end, n, i, sum;
    printf("Enter range (start end): ");
    scanf("%d %d", &start, &end);
    printf("Perfect numbers: ");
    for (n = start; n ⩽ end; n++) {
        sum = 0;
        for (i = 1; i < n; i++) {
            if (n % i == 0) {
                sum += i;
            }
        }
        if (sum == n) {
            printf("%d ", n);
        }
    }
    printf("\n");
    return 0;
}
```

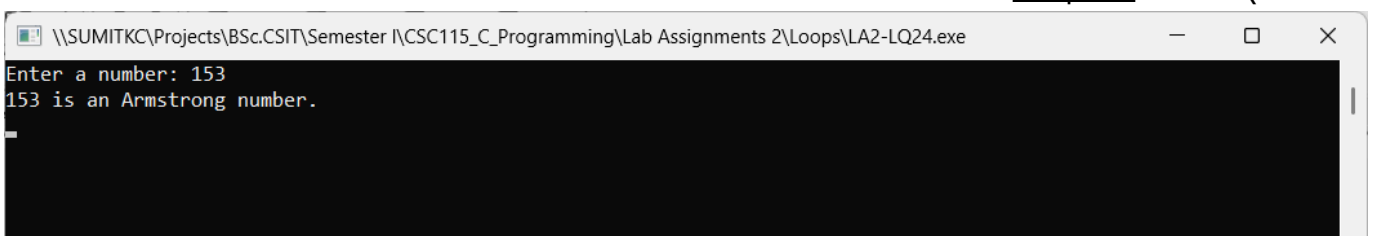
Output: LA2-LQ23.exe

24. Write a C program to check whether a given number is an armstrong number or not.

Source Code: LA2-lQ24.c

```c
#include <stdio.h>
int main()
{
    int n, temp, sum = 0, digits = 0, i;
    printf("Enter a number: ");
    scanf("%d", &n);
    temp = n;
    while (temp > 0) {
        digits++;
        temp /= 10;
    }
    temp = n;
    while (temp > 0) {
        int digit = temp % 10;
        int power = 1;
        for (i = 0; i < digits; i++) {
            power *= digit;
        }
        sum += power;
        temp /= 10;
    }
    if (sum == n) {
        printf("%d is an Armstrong number.\n", n);
    } else {
        printf("%d is not an Armstrong number.\n", n);
    }
    return 0;
}
```

Output: LA2-LQ24.exe



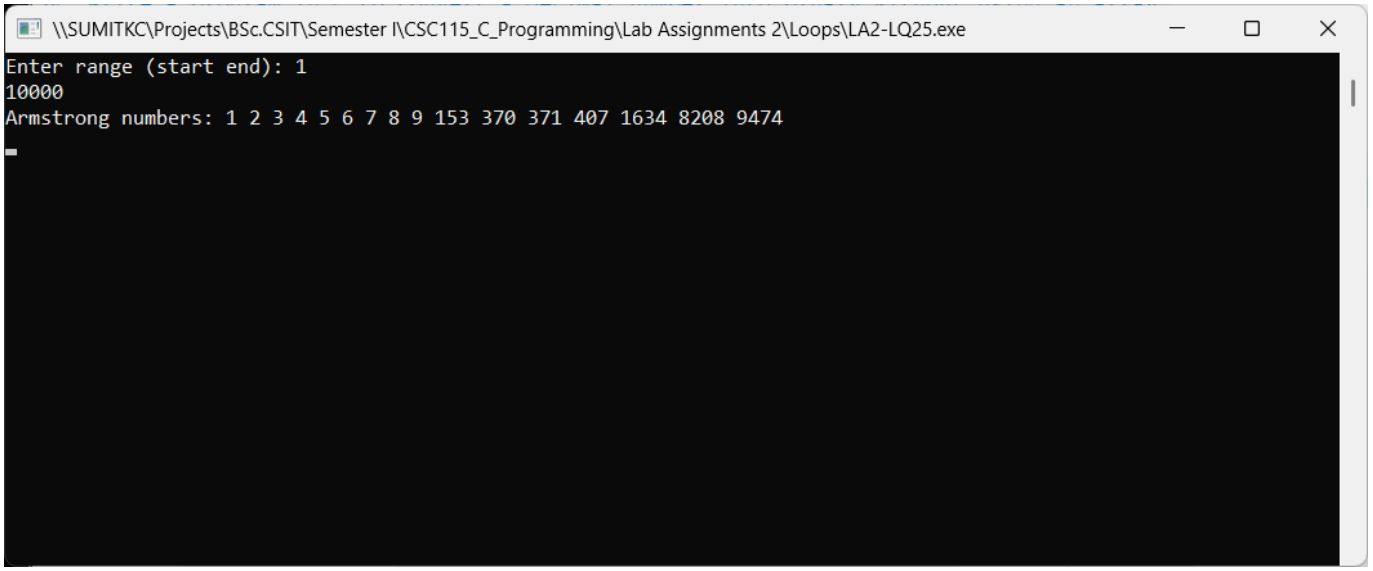
25. Write a C program to find the Armstrong number for a given range of numbers.

Source Code: LA2-lQ25.c

```
#include <stdio.h>
int main()
{
    int start, end, n, temp, sum, digits, i, j;

    printf("Enter range (start end): ");
    scanf("%d %d", &start, &end);

    printf("Armstrong numbers: ");
    for (n = start; n ⩽ end; n++) {
        temp = n;
        digits = 0;
        while (temp > 0) {
            digits++;
            temp /= 10;
        }

        sum = 0;
        temp = n;
        while (temp > 0) {
            int digit = temp % 10;
            int power = 1;
            for (j = 0; j < digits; j++) {
                power *= digit;
            }
            sum += power;
            temp /= 10;
        }

        if (sum == n) {
            printf("%d ", n);
        }
    }

    printf("\n");
```

```
    return 0;
}
```

Output: LA2-LQ25.exe



26. Write a program in C to display the pattern like a diamond.

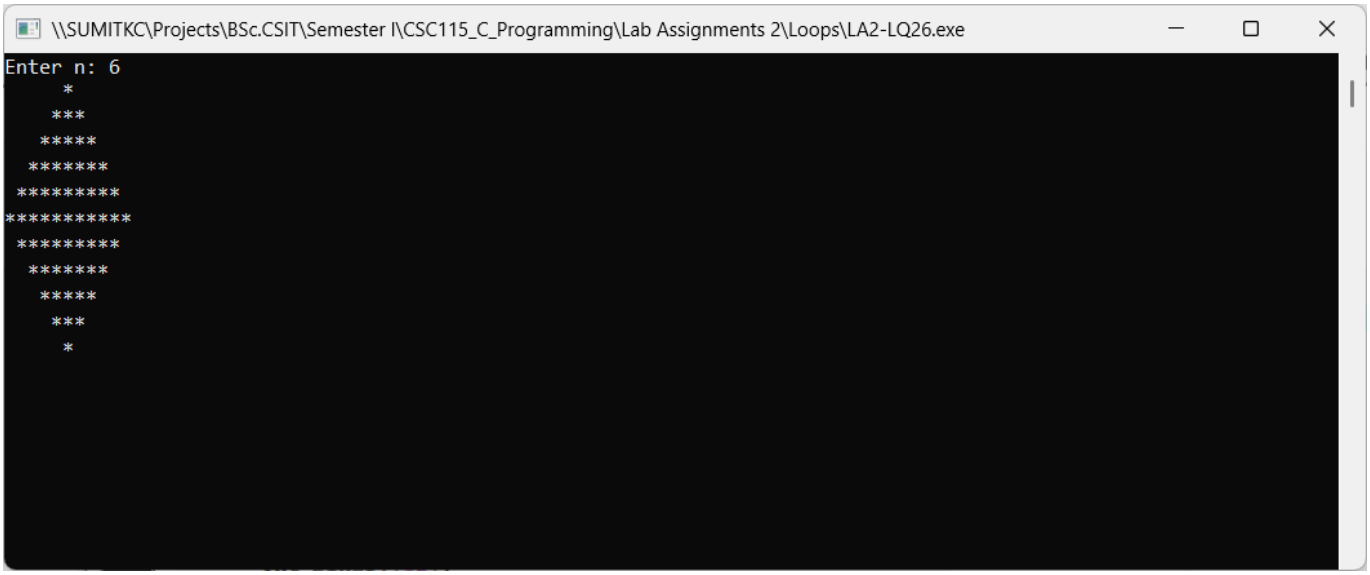
```
   *
  ***
 *****
*******
*********
*******
 *****
  ***
   *
```

Source Code: LA2-lQ26.c

```
#include <stdio.h>

int main()
{
    int n, i, j, k;

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

    for (i = 1; i ⩽ n; i++) {
        for (j = 1; j ⩽ n - i; j++) {
            printf(" ");
        }
        for (j = 1; j ⩽ 2 * i - 1; j++) {
            printf("*");
        }
        printf("\n");
    }

    for (i = n - 1; i ⩾ 1; i--) {
        for (j = 1; j ⩽ n - i; j++) {
            printf(" ");
        }
        for (j = 1; j ⩽ 2 * i - 1; j++) {
            printf("*");
        }
        printf("\n");
```

```
    }

    return 0;
}
```

Output: LA2-LQ26.exe

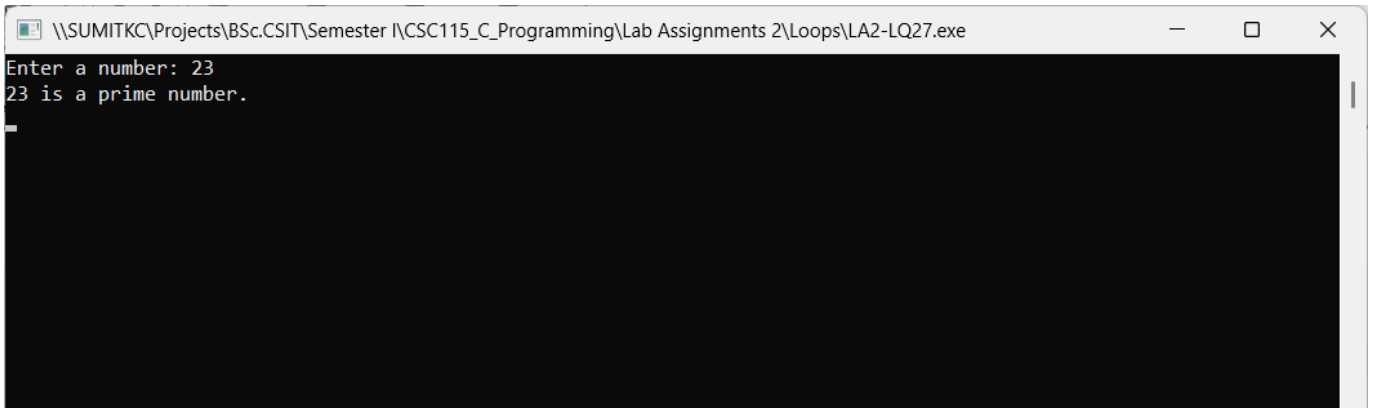


27. Write a C program to determine whether a given number is prime or not.

Source Code: LA2-lQ27.c

```c
#include <stdio.h>
int main()
{
    int n, i;
    printf("Enter a number: ");
    scanf("%d", &n);
    if (n < 2) {
        printf("%d is not a prime number.\n", n);
        return 0;
    }
    for (i = 2; i < n; i++) {
        if (n % i == 0) {
            printf("%d is not a prime number.\n", n);
            return 0;
        }
    }
    printf("%d is a prime number.\n", n);
    return 0;
}
```

Output: LA2-LQ27.exe



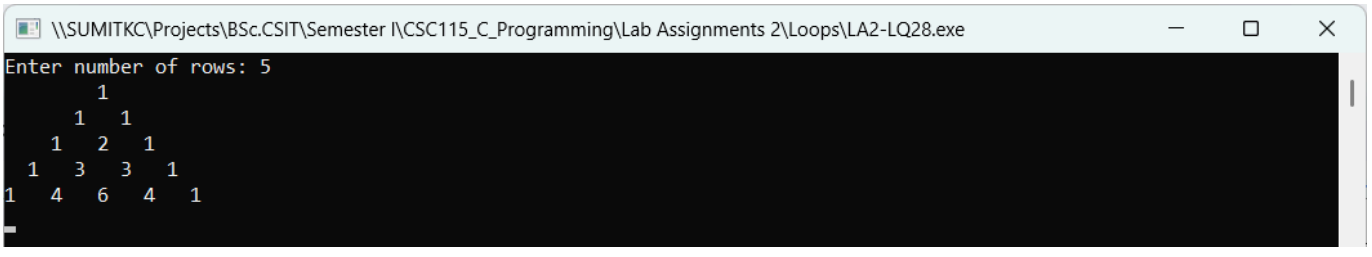
28. Write a C program to display Pascal's triangle.

```
    1
   1  1
  1  2  1
 1  3  3  1
1  4  6  4  1
```

Source Code: LA2-lQ28.c

```c
#include <stdio.h>
int main()
{
    int n, i, j, k, coeff;
    printf("Enter number of rows: ");
    scanf("%d", &n);
    for (i = 0; i < n; i++) {
        for (k = 0; k < n - i - 1; k++) {
            printf("  ");
        }
        for (j = 0; j <= i; j++) {
            if (j == 0) {
                coeff = 1;
            } else {
                coeff = coeff * (i - j + 1) / j;
            }
            printf("%d   ", coeff);
        }
        printf("\n");
    }
    return 0;
}
```

Output: LA2-LQ28.exe

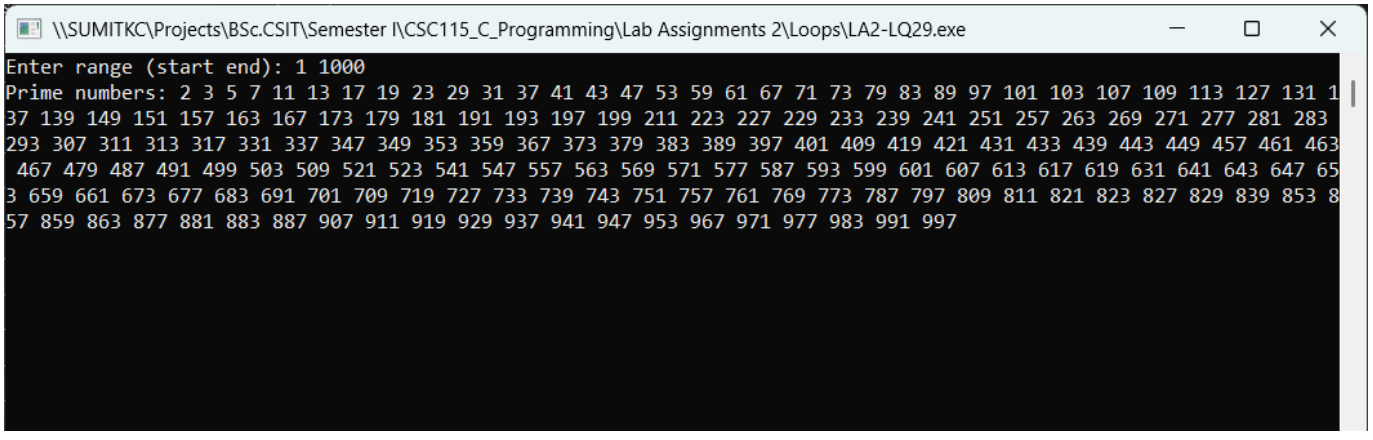


29. Write a program in C to find the prime numbers within a range of numbers.

Source Code: LA2-lQ29.c

```c
#include <stdio.h>
int main()
{
    int start, end, n, i, isPrime;
    printf("Enter range (start end): ");
    scanf("%d %d", &start, &end);
    printf("Prime numbers: ");
    for (n = start; n ⩽ end; n++) {
        isPrime = 1;
        for (i = 2; i < n; i++) {
            if (n % i == 0) {
                isPrime = 0;
                break;
            }
        }
        if (isPrime && n ⩾ 2) {
            printf("%d ", n);
        }
    }
    printf("\n");
    return 0;
}
```

Output: LA2-LQ29.exe

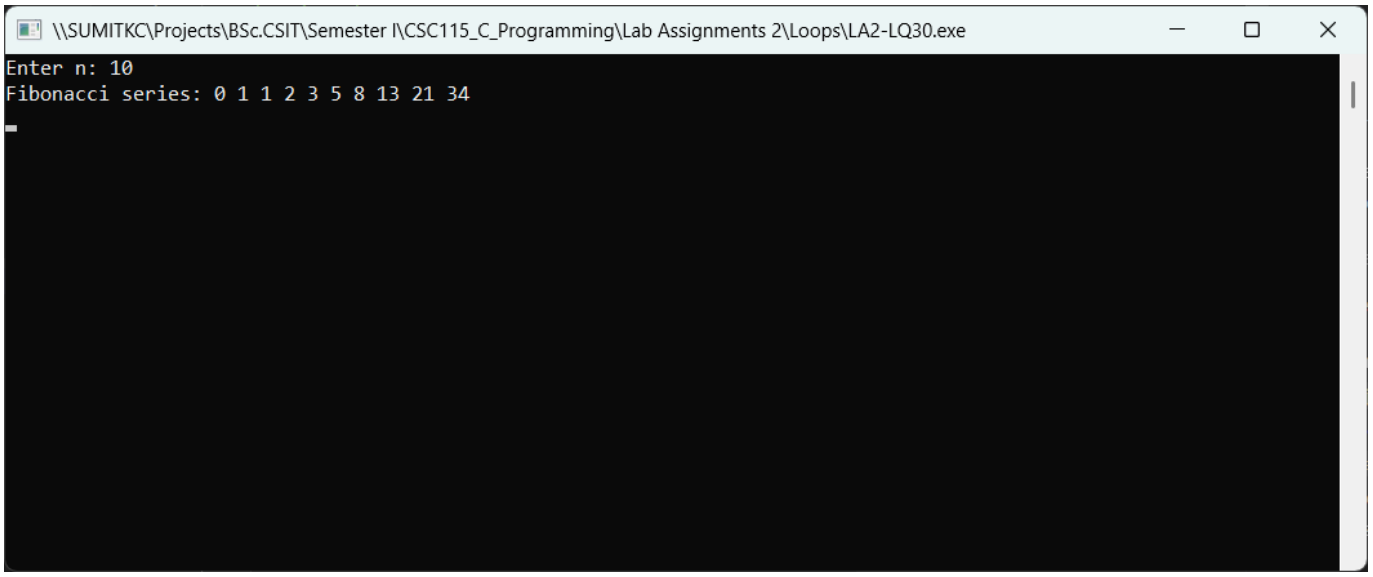


30. Write a program in C to display the first n terms of Fibonacci series.

Source Code: LA2-lQ30.c

```c
#include <stdio.h>
int main()
{
    int n, i;
    long a = 0, b = 1, c;
    printf("Enter n: ");
    scanf("%d", &n);
    printf("Fibonacci series: ");
    for (i = 0; i < n; i++) {
        printf("%ld ", a);
        c = a + b;
        a = b;
        b = c;
    }
    printf("\n");
    return 0;
}
```

Output: LA2-LQ30.exe



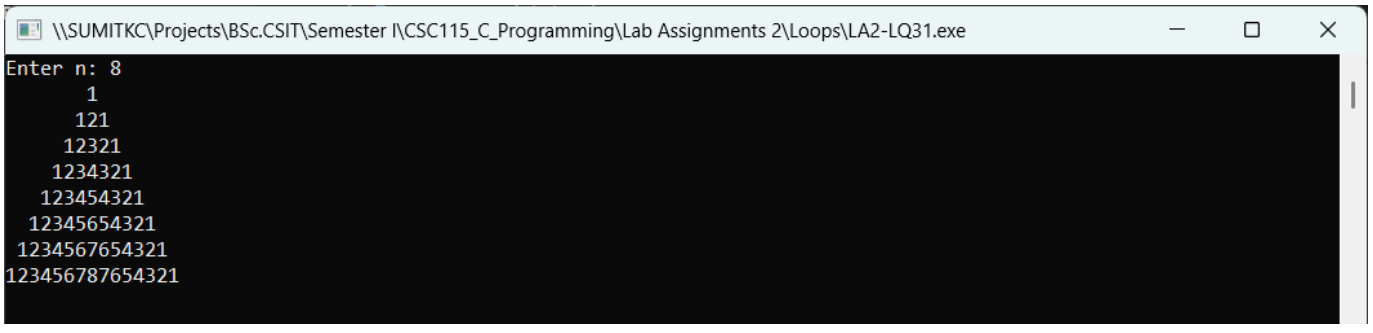
31. Write a program in C to display the such a pattern for n number of rows using a number which will start with the number 1 and the first and a last number of each row will be 1.

```
 1
 121
12321
```

Source Code: LA2-lQ31.c

```
#include <stdio.h>
int main()
{
    int n, i, j;
    printf("Enter n: ");
    scanf("%d", &n);
    for (i = 1; i ⩽ n; i++) {
        for (j = 1; j ⩽ n - i; j++) {
            printf(" ");
        }
        for (j = 1; j ⩽ 2 * i - 1; j++) {
            if (j ⩽ i) {
                printf("%d", j);
            } else {
                printf("%d", 2 * i - j);
            }
        }
        printf("\n");
    }
    return 0;
}
```

Output: LA2-LQ31.exe



32. Write a program in C to display the number in reverse order.

Source Code: LA2-lQ32.c

```c
#include <stdio.h>
int main()
{
    int n;
    printf("Enter a number: ");
    scanf("%d", &n);
    printf("Reverse: ");
    while (n > 0) {
        printf("%d", n % 10);
        n /= 10;
    }
    printf("\n");
    return 0;
}
```

Output: LA2-LQ32.exe

33. Write a program in C to check whether a number is a palindrome or not.

Source Code: LA2-lQ33.c

```c
#include <stdio.h>
int main()
{
    int n, temp, reverse = 0;
    printf("Enter a number: ");
    scanf("%d", &n);
    temp = n;
    while (temp > 0) {
        reverse = reverse * 10 + temp % 10;
        temp /= 10;
    }
    if (n == reverse) {
        printf("%d is a palindrome.\n", n);
    } else {
        printf("%d is not a palindrome.\n", n);
    }
    return 0;
}
```

Output: LA2-LQ33.exe

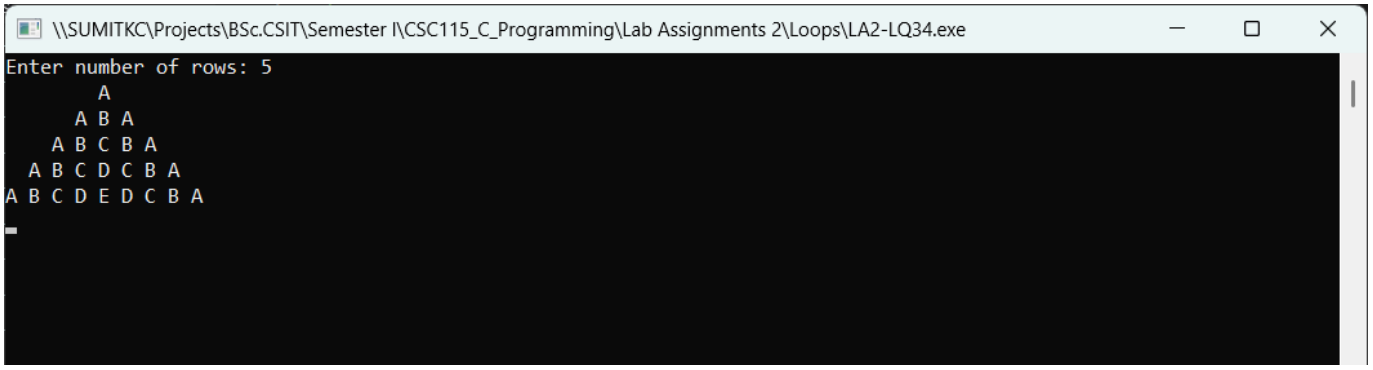
34. Write a C Program to display the pattern like a pyramid using the alphabet.

```
    A
   A B A
  A B C B A
 A B C D C B A
```

Source Code: LA2-lQ34.c

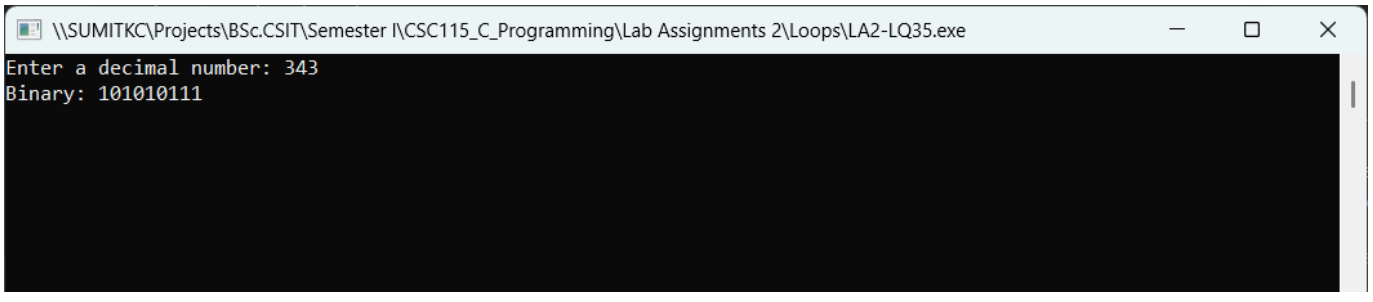
```
#include <stdio.h>
int main()
{
    int n, i, j, k;
    printf("Enter number of rows: ");
    scanf("%d", &n);
    for (i = 1; i ⩽ n; i++) {
        for (k = 0; k < n - i; k++) {
            printf("  ");
        }
        for (j = 0; j < i; j++) {
            printf("%c ", 'A' + j);
        }
        for (j = i - 2; j ⩾ 0; j--) {
            printf("%c ", 'A' + j);
        }
        printf("\n");
    }
    return 0;
}
```

Output: LA2-LQ34.exe



35. Write a program in C to convert a decimal number into binary without using an array. The Binary of 25 is 11001.

Source Code: LA2-lQ35.c

```c
#include <stdio.h>
int main()
{
    int n;
    printf("Enter a decimal number: ");
    scanf("%d", &n);
    printf("Binary: ");
    if (n == 0) {
        printf("0\n");
    } else {
        int binary[32];
        int i = 0;
        while (n > 0) {
            binary[i] = n % 2;
            n /= 2;
            i++;
        }
        for (int j = i - 1; j >= 0; j--) {
            printf("%d", binary[j]);
        }
        printf("\n");
    }
    return 0;
}
```

Output: LA2-LQ35.exe