

SHAKUNTALA KRISHNA INSTITUTE OF TECHNOLOGY KANPUR DEHAT

Practical Work of C Programming and

Office Automation

BCA-1006P

2026-2027

Student Name	**Class**
Roll Number	**Submitted To**

Date: _____

SHAKUNTALA KRISHNA INSTITUTE OF TECHNOLOGY

KANPUR DEHAT, UTTAR PRADESH

CERTIFICATE

This is to certify that Mr./Ms. _____, Roll No. _____, a student of BCA _____ Year / Semester, has satisfactorily completed the practical work in the subject "C Programming Lab" (BCA-1002P) during the Academic Session 2026-2027, under my guidance and supervision.

The work submitted in this practical file is found satisfactory and is being submitted as a part of the academic requirements of the BCA programme.

_____	_____
Subject Teacher	**Head of Department**
_____	_____
External Examiner	**Principal**

Date: _____ **Place: Kanpur Dehat**

SHAKUNTALA KRISHNA INSTITUTE OF TECHNOLOGY

KANPUR DEHAT, UTTAR PRADESH

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I would like to express my sincere gratitude to everyone who helped and guided me in completing this C Programming practical file.

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I also thank my classmates, friends, and family members for their support and cooperation. This practical work helped me strengthen my understanding of C programming and improve my problem-solving skills.

Finally, I take this opportunity to thank everyone who contributed, directly or indirectly, to the successful completion of this practical file.

Yours sincerely,

Name: _____

Roll No.: _____

BCA _____ Year / Semester

Program - 1: First Program of C

```
#include <stdio.h>
int main() {
    printf("Hello C!");
    return 0;
}
```

Program - 2: Variable Declaration and Initialization

```
#include <stdio.h>
int main() {
    int a;
    int x, y, z;
    int m = 10, n = 20, o = 30;

    printf("%d %d %d %d %d %d %d", a, x, y, z, m, n, o);
    return 0;
}
```

Program - 3: Arithmetic Operators

```
#include <stdio.h>
int main() {
    int a, b, c;
    a = 11;
    b = 3;
    c = 5;

    int sum = a + b + c;
    printf("sum is = %d\n", sum);

    int sub = a - b - c;
    printf("subtract is = %d\n", sub);

    int mult = a * b * c;
    printf("multiplication is = %d\n", mult);

    int div = a / b;
    printf("division is = %d\n", div);

    int remainder = a % b;
    printf("remainder is = %d\n", remainder);

    return 0;
}
```

Program - 4: Comparison (Relational) Operators

```c
#include <stdio.h>
int main() {
    int a, b;
    a = 10;
    b = 20;

    int res = a == b;
    printf("Is %d equal to %d : %d\n", a, b, res);

    int res1 = a != b;
    printf("Is %d not equal to %d : %d\n", a, b, res1);

    int res2 = a > b;
    printf("Is %d greater than %d : %d\n", a, b, res2);

    int res3 = a < b;
    printf("Is %d less than %d : %d\n", a, b, res3);

    int res4 = a <= b;
    printf("Is %d less than or equal to %d : %d\n", a, b, res4);

    int res5 = a >= b;
    printf("Is %d greater than or equal to %d : %d\n", a, b, res5);

    return 0;
}
```

Program - 5: Logical AND Operator

```
#include <stdio.h>
int main() {
    int a, b, c;
    a = 1; b = 0; c = 1;

    int res = a && c;
    printf("%d && %d = %d\n", a, c, res);

    int res1 = a && b;
    printf("%d && %d = %d\n", a, b, res1);

    int res2 = b && c;
    printf("%d && %d = %d\n", b, c, res2);

    int res3 = b && b;
    printf("%d && %d = %d\n", b, b, res3);

    return 0;
}
```

Program - 6: Logical OR Operator

```
#include <stdio.h>
int main() {
    int a, b, c;
    a = 1; b = 0; c = 1;

    int res = a || c;
    printf("%d || %d = %d\n", a, c, res);

    int res1 = a || b;
    printf("%d || %d = %d\n", a, b, res1);

    int res2 = b || c;
    printf("%d || %d = %d\n", b, c, res2);

    int res3 = b || b;
    printf("%d || %d = %d\n", b, b, res3);

    return 0;
}
```

Program - 7: Logical NOT Operator

```
#include <stdio.h>
int main() {
    int a, b;
    a = 1; b = 0;

    int res = !a;
    printf("!%d = %d\n", a, res);

    int res1 = !b;
    printf("!%d = %d\n", b, res1);

    return 0;
}
```

Program - 8: Bitwise AND Operator

```
#include <stdio.h>
int main() {
    int a, b, c;
    a = 1; b = 0; c = 1;

    int res = a & c;
    printf("%d & %d = %d\n", a, c, res);

    int res1 = a & b;
    printf("%d & %d = %d\n", a, b, res1);

    int res2 = b & c;
    printf("%d & %d = %d\n", b, c, res2);

    int res3 = b & b;
    printf("%d & %d = %d\n", b, b, res3);

    return 0;
}
```

Program - 9: Bitwise OR Operator

```
#include <stdio.h>
int main() {
    int a, b, c;
    a = 1; b = 0; c = 1;

    int res = a | c;
    printf("%d | %d = %d\n", a, c, res);

    int res1 = a | b;
    printf("%d | %d = %d\n", a, b, res1);

    int res2 = b | c;
    printf("%d | %d = %d\n", b, c, res2);

    int res3 = b | b;
    printf("%d | %d = %d\n", b, b, res3);

    return 0;
}
```

Program - 10: Post Increment / Decrement

```c
#include <stdio.h>
int main() {
    int a = 10;
    a++;
    a--;

    int b = a++;
    int c = b++;
    b = a--;
    c = c--;

    printf("value of %d\nvalue of %d\nvalue of %d\n", a, b, c);
    return 0;
}
```

Program - 11: Pre Increment / Decrement

```
#include <stdio.h>
int main() {
    int a = 10;
    ++a;
    --a;

    int b = --a;
    int c = ++b;
    b = --a;
    c = --c;

    printf("value of %d\nvalue of %d\nvalue of %d\n", a, b, c);
    return 0;
}
```

Program - 12: Calculator using Switch Case

```
#include <stdio.h>
int main() {
    int num1, num2;
    char op;

    printf("Enter first number: ");
    scanf("%d", &num1);
    printf("Enter second number: ");
    scanf("%d", &num2);
    printf("Enter arithmetic operator: ");
    scanf(" %c", &op);

    switch (op) {
        case '+': printf("Sum is %d", num1 + num2); break;
        case '-': printf("Difference is %d", num1 - num2); break;
        case '*': printf("Multiplication is %d", num1 * num2); break;
        case '/': printf("Division is %d", num1 / num2); break;
        case '%': printf("Remainder is %d", num1 % num2); break;
        default: printf("Enter a valid arithmetic operator");
    }
    return 0;
}
```

Program - 13: Even or Odd using Ternary Operator

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

Program - 14: Maximum of Two using Ternary Operator

```
#include <stdio.h>
int main() {
    int num1, num2;
    printf("Enter first number: ");
    scanf("%d", &num1);
    printf("Enter second number: ");
    scanf("%d", &num2);

    int max = (num1 > num2) ? num1 : num2;
    printf("%d is maximum", max);
    return 0;
}
```

Program - 15: Minimum of Two using Ternary Operator

```
#include <stdio.h>
int main() {
    int num1, num2;
    printf("Enter first number: ");
    scanf("%d", &num1);
    printf("Enter second number: ");
    scanf("%d", &num2);

    int min = (num1 < num2) ? num1 : num2;
    printf("%d is minimum", min);
    return 0;
}
```

Program - 16: Maximum of Three using Ternary Operator

```
#include <stdio.h>
int main() {
    int num1, num2, num3;
    printf("Enter first number: ");
    scanf("%d", &num1);
    printf("Enter second number: ");
    scanf("%d", &num2);
    printf("Enter third number: ");
    scanf("%d", &num3);

    int max = (num1 > num2 && num1 > num3) ? num1 :
              ((num2 > num3 && num2 > num1) ? num2 : num3);

    printf("%d is maximum", max);
    return 0;
}
```

Program - 17: ATM using Switch and If-Else

```
#include <stdio.h>
int main() {
    int balance = 10000, pin = 1111;
    int withdrawPin, work, withdrawMoney;

    printf("Withdraw for 1\nCheck balance for 2\nWhat you want: ");
    scanf("%d", &work);

    switch (work) {
        case 1:
            printf("Enter money: ");
            scanf("%d", &withdrawMoney);
            printf("Enter your pin: ");
            scanf("%d", &withdrawPin);

            if (withdrawPin == pin) {
                if (balance >= withdrawMoney) {
                    balance -= withdrawMoney;
                    printf("Money withdrawn = %d\nYour balance is = %d",
                           withdrawMoney, balance);
                } else {
                    printf("Insufficient money");
                }
            } else {
                printf("Your pin is not correct");
            }
            break;

        case 2:
            printf("Enter your pin: ");
            scanf("%d", &withdrawPin);

            if (withdrawPin == pin)
                printf("Your balance is %d", balance);
            else
                printf("Your pin is not correct");
            break;

        default:
            printf("Choose right choice\nThank you");
    }
    return 0;
}
```

Program - 18: Maximum of Three using If-Else

```
#include <stdio.h>
int main() {
    int num1, num2, num3, max;

    printf("Enter first number: ");
    scanf("%d", &num1);
    printf("Enter second number: ");
    scanf("%d", &num2);
    printf("Enter third number: ");
    scanf("%d", &num3);

    if (num1 > num2 && num1 > num3)
        max = num1;
    else if (num2 > num3 && num2 > num1)
        max = num2;
    else
        max = num3;

    printf("%d is maximum", max);
    return 0;
}
```

Program - 19: continue Statement

```
#include <stdio.h>
int main() {
    int a = 10, i;
    for (i = 0; i <= a; i++) {
        if (i == 3)
            continue;
        printf("%d\n", i);
    }
    return 0;
}
```

Program - 20: break Statement

```
#include <stdio.h>
int main() {
    int i;
    for (i = 0; i <= 10; i++) {
        if (i == 3)
            break;
        printf("%d\n", i);
    }
    return 0;
}
```

Program - 21: Fibonacci Series

```c
#include <stdio.h>
int main() {
    int a = 0, b = 1, c, i;

    printf("%d\n%d\n", a, b);
    for (i = 1; i <= 10; i++) {
        c = a + b;
        printf("%d\n", c);
        a = b;
        b = c;
    }
    return 0;
}
```

Program - 22: Print Squares from 1 to N

```
#include <stdio.h>
int main() {
    int N, square, i;
    printf("Enter Number: ");
    scanf("%d", &N);

    for (i = 1; i <= N; i++) {
        square = i * i;
        printf("Square of %d: %d\n", i, square);
    }
    return 0;
}
```

Program - 23: Factorial of a Number

```
#include <stdio.h>
int main() {
    int num, res = 1, i;
    printf("Enter number: ");
    scanf("%d", &num);

    for (i = num; i >= 1; i--)
        res *= i;

    printf("%d", res);
    return 0;
}
```

Program - 24: Print Cubes from 1 to N

```
#include <stdio.h>
int main() {
    int N, cube, i;
    printf("Enter Number: ");
    scanf("%d", &N);

    for (i = 1; i <= N; i++) {
        cube = i * i * i;
        printf("Cube of %d: %d\n", i, cube);
    }
    return 0;
}
```

Program - 25: Armstrong Number

```
#include <stdio.h>
int main() {
    int ld, num1, digit = 0, num;

    printf("Enter Number: ");
    scanf("%d", &num);
    num1 = num;

    while (num1 > 0) {
        ld = num1 % 10;
        digit += ld * ld * ld;
        num1 = num1 / 10;
    }

    if (digit == num)
        printf("Number is Armstrong");
    else
        printf("Number is not Armstrong");

    return 0;
}
```

Program - 26: Palindrome Number

```
#include <stdio.h>
int main() {
    int ld, num1, digit = 0, num;

    printf("Enter Number: ");
    scanf("%d", &num);
    num1 = num;

    while (num1 > 0) {
        ld = num1 % 10;
        digit = digit * 10 + ld;
        num1 = num1 / 10;
    }

    if (num == digit)
        printf("Number is palindrome");
    else
        printf("Number is not palindrome");

    return 0;
}
```

Program - 27: Area of Circle

```
#include <stdio.h>
int main() {
    float r, area;
    printf("Enter radius: ");
    scanf("%f", &r);
    area = 3.14159f * r * r;
    printf("Area = %.2f", area);
    return 0;
}
```

Program - 28: Area of Rectangle

```
#include <stdio.h>
int main() {
    float l, b;
    printf("Enter length and breadth: ");
    scanf("%f%f", &l, &b);
    printf("Area = %.2f", l * b);
    return 0;
}
```

Program - 29: Area of Triangle

```
#include <stdio.h>
int main() {
    float base, height;
    printf("Enter base and height: ");
    scanf("%f%f", &base, &height);
    printf("Area = %.2f", 0.5f * base * height);
    return 0;
}
```

Program - 30: Simple Interest

```
#include <stdio.h>
int main() {
    float p, r, t, si;
    printf("Enter principal, rate and time: ");
    scanf("%f%f%f", &p, &r, &t);
    si = (p * r * t) / 100;
    printf("Simple Interest = %.2f", si);
    return 0;
}
```

Program - 31: Temperature Celsius to Fahrenheit

```
#include <stdio.h>
int main() {
    float c, f;
    printf("Enter temperature in Celsius: ");
    scanf("%f", &c);
    f = (c * 9.0f / 5.0f) + 32;
    printf("Fahrenheit = %.2f", f);
    return 0;
}
```

Program - 32: Even or Odd using if-else

```
#include <stdio.h>
int main() {
    int n;
    scanf("%d", &n);
    if (n % 2 == 0)
        printf("Even");
    else
        printf("Odd");
    return 0;
}
```

Program - 33: Positive, Negative or Zero

```
#include <stdio.h>
int main() {
    int n;
    scanf("%d", &n);
    if (n > 0)
        printf("Positive");
    else if (n < 0)
        printf("Negative");
    else
        printf("Zero");
    return 0;
}
```

Program - 34: Largest of Two Numbers using if-else

```
#include <stdio.h>
int main() {
    int a, b;
    scanf("%d%d", &a, &b);
    if (a > b)
        printf("%d is largest", a);
    else
        printf("%d is largest", b);
    return 0;
}
```

Program - 35: Leap Year

```
#include <stdio.h>
int main() {
    int year;
    scanf("%d", &year);
    if ((year % 400 == 0) || (year % 4 == 0 && year % 100 != 0))
        printf("Leap Year");
    else
        printf("Not a Leap Year");
    return 0;
}
```

Program - 36: Vowel or Consonant

```
#include <stdio.h>
int main() {
    char ch;
    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("Vowel");
    else
        printf("Consonant");
    return 0;
}
```

Program - 37: Uppercase or Lowercase

```
#include <stdio.h>
int main() {
    char ch;
    scanf(" %c", &ch);
    if (ch >= 'A' && ch <= 'Z')
        printf("Uppercase");
    else if (ch >= 'a' && ch <= 'z')
        printf("Lowercase");
    else
        printf("Not an alphabet");
    return 0;
}
```

Program - 38: Divisible by 5 and 11

```
#include <stdio.h>
int main() {
    int n;
    scanf("%d", &n);
    if (n % 5 == 0 && n % 11 == 0)
        printf("Divisible by 5 and 11");
    else
        printf("Not divisible by 5 and 11");
    return 0;
}
```

Program - 39: Sum of First N Natural Numbers

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

Program - 40: Multiplication Table

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

Program - 41: Reverse a Number

```
#include <stdio.h>
int main() {
    int n, rev = 0, digit;
    scanf("%d", &n);
    while (n != 0) {
        digit = n % 10;
        rev = rev * 10 + digit;
        n /= 10;
    }
    printf("Reverse = %d", rev);
    return 0;
}
```

Program - 42: Sum of Digits

```
#include <stdio.h>
int main() {
    int n, sum = 0;
    scanf("%d", &n);
    while (n != 0) {
        sum += n % 10;
        n /= 10;
    }
    printf("Sum = %d", sum);
    return 0;
}
```

Program - 43: Count Digits

```
#include <stdio.h>
int main() {
    int n, count = 0;
    scanf("%d", &n);
    if (n == 0) count = 1;
    while (n != 0) {
        count++;
        n /= 10;
    }
    printf("Digits = %d", count);
    return 0;
}
```

Program - 44: Prime Number

```
#include <stdio.h>
int main() {
    int n, i, prime = 1;
    scanf("%d", &n);
    if (n < 2) prime = 0;
    for (i = 2; i * i <= n; i++)
        if (n % i == 0) { prime = 0; break; }

    if (prime) printf("Prime");
    else printf("Not Prime");
    return 0;
}
```

Program - 45: Prime Numbers in a Range

```
#include <stdio.h>
int main() {
    int start, end, n, i, prime;
    scanf("%d%d", &start, &end);

    for (n = start; n <= end; n++) {
        prime = (n >= 2);
        for (i = 2; i * i <= n && prime; i++)
            if (n % i == 0) prime = 0;
        if (prime) printf("%d ", n);
    }
    return 0;
}
```

Program - 46: Perfect Number

```
#include <stdio.h>
int main() {
    int n, i, sum = 0;
    scanf("%d", &n);
    for (i = 1; i < n; i++)
        if (n % i == 0) sum += i;

    if (sum == n) printf("Perfect Number");
    else printf("Not a Perfect Number");
    return 0;
}
```

Program - 47: Strong Number

```
#include <stdio.h>
int main() {
    int n, temp, digit, i, fact, sum = 0;
    scanf("%d", &n);
    temp = n;

    while (temp != 0) {
        digit = temp % 10;
        fact = 1;
        for (i = 1; i <= digit; i++) fact *= i;
        sum += fact;
        temp /= 10;
    }

    if (sum == n) printf("Strong Number");
    else printf("Not a Strong Number");
    return 0;
}
```

Program - 48: Automorphic Number

```
#include <stdio.h>
int main() {
    int n, sq, temp, mod = 1;
    scanf("%d", &n);
    sq = n * n;
    temp = n;

    while (temp > 0) {
        mod *= 10;
        temp /= 10;
    }

    if (sq % mod == n) printf("Automorphic Number");
    else printf("Not Automorphic");
    return 0;
}
```

Program - 49: Neon Number

```
#include <stdio.h>
int main() {
    int n, sq, sum = 0;
    scanf("%d", &n);
    sq = n * n;

    while (sq != 0) {
        sum += sq % 10;
        sq /= 10;
    }

    if (sum == n) printf("Neon Number");
    else printf("Not Neon");
    return 0;
}
```

Program - 50: GCD / HCF of Two Numbers

```
#include <stdio.h>
int main() {
    int a, b, r;
    scanf("%d%d", &a, &b);

    while (b != 0) {
        r = a % b;
        a = b;
        b = r;
    }

    printf("GCD = %d", a);
    return 0;
}
```

Program - 51: LCM of Two Numbers

```
#include <stdio.h>
int main() {
    int a, b, x, y, r, gcd;
    scanf("%d%d", &a, &b);
    x = a; y = b;

    while (y != 0) {
        r = x % y;
        x = y;
        y = r;
    }
    gcd = x;
    printf("LCM = %d", (a / gcd) * b);
    return 0;
}
```

Program - 52: Decimal to Binary

```
#include <stdio.h>
int main() {
    int n, binary[32], i = 0, j;
    scanf("%d", &n);

    if (n == 0) {
        printf("0");
        return 0;
    }

    while (n > 0) {
        binary[i++] = n % 2;
        n /= 2;
    }

    for (j = i - 1; j >= 0; j--)
        printf("%d", binary[j]);
    return 0;
}
```

Program - 53: Binary to Decimal

```
#include <stdio.h>
int main() {
    int n, digit, base = 1, decimal = 0;
    scanf("%d", &n);

    while (n > 0) {
        digit = n % 10;
        decimal += digit * base;
        base *= 2;
        n /= 10;
    }

    printf("Decimal = %d", decimal);
    return 0;
}
```

Program - 54: Swap Two Numbers using Third Variable

```
#include <stdio.h>
int main() {
    int a, b, temp;
    scanf("%d%d", &a, &b);
    temp = a;
    a = b;
    b = temp;
    printf("a = %d, b = %d", a, b);
    return 0;
}
```

Program - 55: Swap Two Numbers without Third Variable

```
#include <stdio.h>
int main() {
    int a, b;
    scanf("%d%d", &a, &b);
    a = a + b;
    b = a - b;
    a = a - b;
    printf("a = %d, b = %d", a, b);
    return 0;
}
```

Program - 56: ASCII Value of a Character

```
#include <stdio.h>
int main() {
    char ch;
    scanf(" %c", &ch);
    printf("ASCII value = %d", ch);
    return 0;
}
```

Program - 57: Print A-Z using ASCII

```
#include <stdio.h>
int main() {
    int i;
    for (i = 65; i <= 90; i++)
        printf("%c ", i);
    return 0;
}
```

Program - 58: Power of a Number

```
#include <stdio.h>
int main() {
    int base, exp, i, result = 1;
    scanf("%d%d", &base, &exp);

    for (i = 1; i <= exp; i++)
        result *= base;

    printf("Power = %d", result);
    return 0;
}
```

Program - 59: Average of N Numbers

```c
#include <stdio.h>
int main() {
    int n, i;
    float x, sum = 0;
    scanf("%d", &n);

    for (i = 1; i <= n; i++) {
        scanf("%f", &x);
        sum += x;
    }

    printf("Average = %.2f", sum / n);
    return 0;
}
```

Program - 60: Largest Element in Array

```
#include <stdio.h>
int main() {
    int a[100], n, i, max;
    scanf("%d", &n);

    for (i = 0; i < n; i++) scanf("%d", &a[i]);
    max = a[0];

    for (i = 1; i < n; i++)
        if (a[i] > max) max = a[i];

    printf("Largest = %d", max);
    return 0;
}
```

Program - 61: Smallest Element in Array

```
#include <stdio.h>
int main() {
    int a[100], n, i, min;
    scanf("%d", &n);

    for (i = 0; i < n; i++) scanf("%d", &a[i]);
    min = a[0];

    for (i = 1; i < n; i++)
        if (a[i] < min) min = a[i];

    printf("Smallest = %d", min);
    return 0;
}
```

Program - 62: Sum and Average of Array Elements

```
#include <stdio.h>
int main() {
    int a[100], n, i, sum = 0;
    scanf("%d", &n);

    for (i = 0; i < n; i++) {
        scanf("%d", &a[i]);
        sum += a[i];
    }

    printf("Sum = %d\nAverage = %.2f", sum, (float)sum / n);
    return 0;
}
```

Program - 63: Reverse an Array

```
#include <stdio.h>
int main() {
    int a[100], n, i;
    scanf("%d", &n);

    for (i = 0; i < n; i++) scanf("%d", &a[i]);

    for (i = n - 1; i >= 0; i--)
        printf("%d ", a[i]);

    return 0;
}
```

Program - 64: Search an Element in Array

```
#include <stdio.h>
int main() {
    int a[100], n, key, i, found = 0;
    scanf("%d", &n);

    for (i = 0; i < n; i++) scanf("%d", &a[i]);
    scanf("%d", &key);

    for (i = 0; i < n; i++) {
        if (a[i] == key) {
            found = 1;
            break;
        }
    }

    if (found) printf("Element found at index %d", i);
    else printf("Element not found");
    return 0;
}
```

Program - 65: Count Even and Odd in Array

```
#include <stdio.h>
int main() {
    int a[100], n, i, even = 0, odd = 0;
    scanf("%d", &n);

    for (i = 0; i < n; i++) {
        scanf("%d", &a[i]);
        if (a[i] % 2 == 0) even++;
        else odd++;
    }

    printf("Even = %d\nOdd = %d", even, odd);
    return 0;
}
```

Program - 66: Sort Array in Ascending Order

```
#include <stdio.h>
int main() {
    int a[100], n, i, j, temp;
    scanf("%d", &n);

    for (i = 0; i < n; i++) scanf("%d", &a[i]);

    for (i = 0; i < n - 1; i++)
        for (j = i + 1; j < n; j++)
            if (a[i] > a[j]) {
                temp = a[i]; a[i] = a[j]; a[j] = temp;
            }

    for (i = 0; i < n; i++) printf("%d ", a[i]);
    return 0;
}
```

Program - 67: Sort Array in Descending Order

```
#include <stdio.h>
int main() {
    int a[100], n, i, j, temp;
    scanf("%d", &n);

    for (i = 0; i < n; i++) scanf("%d", &a[i]);

    for (i = 0; i < n - 1; i++)
        for (j = i + 1; j < n; j++)
            if (a[i] < a[j]) {
                temp = a[i]; a[i] = a[j]; a[j] = temp;
            }

    for (i = 0; i < n; i++) printf("%d ", a[i]);
    return 0;
}
```

Program - 68: Second Largest Element in Array

```
#include <stdio.h>
#include <limits.h>
int main() {
    int a[100], n, i, largest, second;
    scanf("%d", &n);

    for (i = 0; i < n; i++) scanf("%d", &a[i]);

    largest = second = INT_MIN;
    for (i = 0; i < n; i++) {
        if (a[i] > largest) {
            second = largest;
            largest = a[i];
        } else if (a[i] > second && a[i] != largest) {
            second = a[i];
        }
    }

    printf("Second largest = %d", second);
    return 0;
}
```

Program - 69: Remove Duplicate Elements from Array

```
#include <stdio.h>
int main() {
    int a[100], n, i, j, k;
    scanf("%d", &n);
    for (i = 0; i < n; i++) scanf("%d", &a[i]);

    for (i = 0; i < n; i++) {
        for (j = i + 1; j < n; j++) {
            if (a[i] == a[j]) {
                for (k = j; k < n - 1; k++)
                    a[k] = a[k + 1];
                n--;
                j--;
            }
        }
    }

    for (i = 0; i < n; i++) printf("%d ", a[i]);
    return 0;
}
```

Program - 70: Matrix Addition

```
#include <stdio.h>
int main() {
    int a[2][2], b[2][2], c[2][2], i, j;

    for (i = 0; i < 2; i++)
        for (j = 0; j < 2; j++) scanf("%d", &a[i][j]);

    for (i = 0; i < 2; i++)
        for (j = 0; j < 2; j++) scanf("%d", &b[i][j]);

    for (i = 0; i < 2; i++)
        for (j = 0; j < 2; j++) c[i][j] = a[i][j] + b[i][j];

    for (i = 0; i < 2; i++) {
        for (j = 0; j < 2; j++) printf("%d ", c[i][j]);
        printf("\n");
    }
    return 0;
}
```

Program - 71: Right Triangle Star

```
#include <stdio.h>
int main( ) {
    int n, i, j;
    printf("Enter rows: ");
    scanf("%d", &n);

    for (i = 1; i <= n; i++) {
        for (j = 1; j <= i; j++) {
            printf("*");
        }
        printf("\n");
    }
    return 0;
}
```

Sample Output (n = 5):

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

Program - 72: Inverted Right Triangle Star

```
#include <stdio.h>
int main( ) {
    int n, i, j;
    printf("Enter rows: ");
    scanf("%d", &n);

    for (i = n; i >= 1; i--) {
        for (j = 1; j <= i; j++) {
            printf("*");
        }
        printf("\n");
    }
    return 0;
}
```

Sample Output (n = 5):

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

Program - 73: Number Triangle

```
#include <stdio.h>
int main( ) {
    int n, i, j;
    printf("Enter rows: ");
    scanf("%d", &n);

    for (i = 1; i <= n; i++) {
        for (j = 1; j <= i; j++) {
            printf("%d", j);
        }
        printf("\n");
    }
    return 0;
}
```

Sample Output (n = 5):

```
1
12
123
1234
12345
```

Program - 74: Inverted Number Triangle

```
#include <stdio.h>
int main( ) {
    int n, i, j;
    printf("Enter rows: ");
    scanf("%d", &n);

    for (i = n; i >= 1; i--) {
        for (j = 1; j <= i; j++) {
            printf("%d", j);
        }
        printf("\n");
    }
    return 0;
}
```

Sample Output (n = 5):

```
12345
1234
123
12
1
```

Program - 75: Same Number Triangle

```
#include <stdio.h>
int main( ) {
    int n, i, j;
    printf("Enter rows: ");
    scanf("%d", &n);

    for (i = 1; i <= n; i++) {
        for (j = 1; j <= i; j++) {
            printf("%d", i);
        }
        printf("\n");
    }
    return 0;
}
```

Sample Output (n = 5):

```
1
22
333
4444
55555
```

Program - 76: Floyd's Triangle

```
#include <stdio.h>
int main( ) {
    int n, i, j, number = 1;
    printf("Enter rows: ");
    scanf("%d", &n);

    for (i = 1; i <= n; i++) {
        for (j = 1; j <= i; j++) {
            printf("%d ", number);
            number++;
        }
        printf("\n");
    }
    return 0;
}
```

Sample Output (n = 5):

```
1
2 3
4 5 6
7 8 9 10
11 12 13 14 15
```

Program - 77: Star Pyramid

```
#include <stdio.h>
int main( ) {
    int n, i, j;
    printf("Enter rows: ");
    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");
    }
    return 0;
}
```

Sample Output (n = 5):

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

Program - 78: Inverted Star Pyramid

```
#include <stdio.h>
int main( ) {
    int n, i, j;
    printf("Enter rows: ");
    scanf("%d", &n);

    for (i = n; i >= 1; i--) {
        for (j = 1; j <= n - i; j++) printf(" ");
        for (j = 1; j <= 2 * i - 1; j++) printf("*");
        printf("\n");
    }
    return 0;
}
```

Sample Output (n = 5):

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

Program - 79: Hollow Square

```
#include <stdio.h>
int main( ) {
    int n, i, j;
    printf("Enter size: ");
    scanf("%d", &n);

    for (i = 1; i <= n; i++) {
        for (j = 1; j <= n; j++) {
            if (i == 1 || i == n || j == 1 || j == n)
                printf("*");
            else
                printf(" ");
        }
        printf("\n");
    }
    return 0;
}
```

Sample Output (n = 5):

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

Program - 80: Hollow Right Triangle

```
#include <stdio.h>
int main( ) {
    int n, i, j;
    printf("Enter rows: ");
    scanf("%d", &n);

    for (i = 1; i <= n; i++) {
        for (j = 1; j <= i; j++) {
            if (j == 1 || j == i || i == n)
                printf("*");
            else
                printf(" ");
        }
        printf("\n");
    }
    return 0;
}
```

Sample Output (n = 5):

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

Program - 81: 0-1 Triangle

```
#include <stdio.h>
int main( ) {
    int n, i, j;
    printf("Enter rows: ");
    scanf("%d", &n);

    for (i = 1; i <= n; i++) {
        for (j = 1; j <= i; j++) {
            if ((i + j) % 2 == 0)
                printf("1");
            else
                printf("0");
        }
        printf("\n");
    }
    return 0;
}
```

Sample Output (n = 5):

```
1
01
101
0101
10101
```

Program - 82: Alphabet Triangle

```
#include <stdio.h>
int main( ) {
    int n, i, j;
    printf("Enter rows (maximum 26): ");
    scanf("%d", &n);

    if (n < 1 || n > 26) {
        printf("Enter rows from 1 to 26.\n");
        return 0;
    }

    for (i = 1; i <= n; i++) {
        for (j = 0; j < i; j++) {
            printf("%c", 'A' + j);
        }
        printf("\n");
    }
    return 0;
}
```

Sample Output (n = 5):

```
A
AB
ABC
ABCD
ABCDE
```

Program - 83: Repeated Alphabet Triangle

```
#include <stdio.h>
int main( ) {
    int n, i, j;
    printf("Enter rows (maximum 26): ");
    scanf("%d", &n);

    if (n < 1 || n > 26) {
        printf("Enter rows from 1 to 26.\n");
        return 0;
    }

    for (i = 0; i < n; i++) {
        for (j = 0; j <= i; j++) {
            printf("%c", 'A' + i);
        }
        printf("\n");
    }
    return 0;
}
```

Sample Output (n = 5):

```
A
BB
CCC
DDDD
EEEEE
```

Program - 84: Diamond Star Pattern

```
#include <stdio.h>
int main( ) {
    int n, i, j;
    printf("Enter half-height: ");
    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;
}
```

Sample Output (n = 5):

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

Program - 85: Hollow Pyramid

```
#include <stdio.h>
int main( ) {
    int n, i, j;
    printf("Enter rows: ");
    scanf("%d", &n);

    for (i = 1; i <= n; i++) {
        for (j = 1; j <= 2 * n - 1; j++) {
            if (i == n || j == n - i + 1 || j == n + i - 1)
                printf("*");
            else
                printf(" ");
        }
        printf("\n");
    }
    return 0;
}
```

Sample Output (n = 5):

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

Program - 86: Pascal Triangle

```
#include <stdio.h>
int main( ) {
    int n, i, j, value;
    printf("Enter rows: ");
    scanf("%d", &n);

    for (i = 0; i < n; i++) {
        for (j = 0; j < n - i; j++) printf(" ");
        value = 1;
        for (j = 0; j <= i; j++) {
            printf("%d ", value);
            value = value * (i - j) / (j + 1);
        }
        printf("\n");
    }
    return 0;
}
```

Sample Output (n = 5):

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

Program - 87: Increasing Number Pattern

```
#include <stdio.h>
int main( ) {
    int n, i, j;
    printf("Enter rows: ");
    scanf("%d", &n);

    for (i = 1; i <= n; i++) {
        for (j = 1; j <= i; j++) {
            printf("%d ", j);
        }
        printf("\n");
    }
    return 0;
}
```

Sample Output (n = 5):

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

Program - 88: Decreasing Number Pattern

```
#include <stdio.h>
int main( ) {
    int n, i, j;
    printf("Enter rows: ");
    scanf("%d", &n);

    for (i = 1; i <= n; i++) {
        for (j = i; j <= n; j++) {
            printf("%d", j);
        }
        printf("\n");
    }
    return 0;
}
```

Sample Output (n = 5):

```
12345
2345
345
45
5
```

Program - 89: X Star Pattern

```
#include <stdio.h>
int main( ) {
    int n, i, j;
    printf("Enter size (odd number recommended): ");
    scanf("%d", &n);

    for (i = 0; i < n; i++) {
        for (j = 0; j < n; j++) {
            if (j == i || j == n - i - 1)
                printf("*");
            else
                printf(" ");
        }
        printf("\n");
    }
    return 0;
}
```

Sample Output (n = 5):

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

Program - 90: Butterfly Star Pattern

```
#include <stdio.h>
int main( ) {
    int n, i, j;
    printf("Enter half-height: ");
    scanf("%d", &n);

    for (i = 1; i <= n; i++) {
        for (j = 1; j <= i; j++) printf("*");
        for (j = 1; j <= 2 * (n - i); j++) printf(" ");
        for (j = 1; j <= i; j++) printf("*");
        printf("\n");
    }
    for (i = n - 1; i >= 1; i--) {
        for (j = 1; j <= i; j++) printf("*");
        for (j = 1; j <= 2 * (n - i); j++) printf(" ");
        for (j = 1; j <= i; j++) printf("*");
        printf("\n");
    }
    return 0;
}
```

Sample Output (n = 5):

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