1.c

```c
#include <stdio.h>
int main() {
    float a, b; char op;
    printf("Enter first number: ");
    scanf("%f", &a);
    printf("Enter an operator (+, -, *, /): ");
    scanf(" %c", &op);
    printf("Enter second number: ");
    scanf("%f", &b);
    if (op == '+') printf("%.2f\n", a + b);
    else if (op == '-') printf("%.2f\n", a - b);
    else if (op == '*') printf("%.2f\n", a * b);
    else if (op == '/' && b != 0) printf("%.2f\n", a / b);
    else printf("Error\n");
    return 0;
}
```

2.c

```c
#include <stdio.h>
int main() {
    int year;
    printf("Enter a year: ");
    scanf("%d", &year);
    if ((year % 4 == 0 && year % 100 != 0) || year % 400 == 0)
        printf("%d is a leap year.\n", year);
    else
        printf("%d is not a leap year.\n", year);
    return 0;
}
```

3.c

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

em > C 4.c > main()

```c
#include <stdio.h>
int main() {
    int month, year, days;
    printf("Enter month number (1-12): ");
    scanf("%d", &month);
    printf("Enter year: ");
    scanf("%d", &year);
    if (month == 2)
        days = (year % 4 == 0 && year % 100 != 0) || year % 400 == 0 ? 29 : 28;
    else if (month == 4 || month == 6 || month == 9 || month == 11)
        days = 30;
    else
        days = 31;
    printf("Number of days: %d\n", days);
    return 0;
}
```

n > C 5.c > ...

```c
#include <stdio.h>
int main() {
    int n;
    printf("Enter a number: ");
    scanf("%d", &n);
    printf("Sum of natural numbers up to %d = %d\n", n, n * (n + 1) / 2);
    return 0;
}
```

```c
#include <stdio.h>
int main() {
    int n, a = 0, b = 1, next;
    printf("Enter the number of terms: ");
    scanf("%d", &n);
    printf("Fibonacci sequence: ");
    for (int i = 0; i < n; i++) {
        if (i > 0) printf(", ");
        printf("%d", a);
        next = a + b;
        a = b;
        b = next;
    }
    printf("\n");
    return 0;
}
```

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

```c
#include <stdio.h>
int main() {
    int num, i;
    int isPrime = 1;
    printf("Enter a number: ");
    scanf("%d", &num);
    if (num <= 1) isPrime = 0;
    for (i = 2; i * i <= num; i++) {
        if (num % i == 0) {
            isPrime = 0;
            break;}}
    if (isPrime)
        printf("%d is a prime number.\n", num);
    else
        printf("%d is not a prime number.\n", num);

    return 0;
}
```

C 10.c > ...

```c
#include <stdio.h>
void tryvalidornah(int angle1, int angle2, int angle3) {
    if (angle1 <= 0 || angle2 <= 0 || angle3 <= 0 || (angle1 + angle2 + angle3 != 180)) {
        printf("The triangle is not valid.\n");
    } else {
        printf("The triangle is valid.\n");
    }
}
int main() {
    int angle1, angle2, angle3;
    printf("Enter the three angles of the triangle: ");
    scanf("%d %d %d", &angle1, &angle2, &angle3);
    tryvalidornah(angle1, angle2, angle3);
    return 0;
}
```

```c
#include <stdio.h>
void triChecker(int a, int b, int c) {
    if (a <= 0 || b <= 0 || c <= 0 || (a + b <= c) || (a + c <= b) || (b + c <= a)) {
        printf("Not a valid triangle.\n");
    } else if (a == b && b == c) {
        printf("The triangle is equilateral.\n");
    } else if (a == b || b == c || a == c) {
        printf("The triangle is isosceles.\n");
    } else {
        printf("The triangle is scalene.\n");
    }
}
int main() {
    int a, b, c;
    printf("Enter the lengths of the three sides of the triangle: ");
    scanf("%d %d %d", &a, &b, &c);
    triChecker(a, b, c);
    return 0;
}
```

C 11.c > ...

```c
#include <stdio.h>
void Quadetermine(float x, float y) {
    if (x > 0 && y > 0) {
        printf("The point (%.2f, %.2f) is in Quadrant I.\n", x, y);
    } else if (x < 0 && y > 0) {
        printf("The point (%.2f, %.2f) is in Quadrant II.\n", x, y);
    } else if (x < 0 && y < 0) {
        printf("The point (%.2f, %.2f) is in Quadrant III.\n", x, y);
    } else if (x > 0 && y < 0) {
        printf("The point (%.2f, %.2f) is in Quadrant IV.\n", x, y);
    } else if (x == 0 && y != 0) {
```

```c
        printf("The point (%.2f, %.2f) is on the X-axis.\n", x, y);
    } else {
        printf("The point (%.2f, %.2f) is at the origin.\n", x, y);
    }
}
int main() {
    float x, y;
    printf("Enter the coordinates (x y): ");
    scanf("%f %f", &x, &y);
    Quadetermine(x, y);
    return 0;
}
```

n > C 12.c > ...

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

> C 13.c > ...

```c
#include <stdio.h>
int gcd(int a, int b) {
    while (b != 0) {
        int temp = b;
        b = a % b;
        a = temp;}
    return a;}
int main() {
    int num1, num2, lcm;
    printf("Enter two numbers: ");
    scanf("%d %d", &num1, &num2);
    lcm = (num1 * num2) / gcd(num1, num2);
    printf("Least Common Multiple (LCM) of %d and %d is %d\n", num1, num2, lcm);
    return 0;}
```

> C 14.c > main()

```c
#include <stdio.h>
#include <math.h>
int main() {
    int num, original, remainder, result = 0, n = 0;
    printf("Enter a number: ");
    scanf("%d", &num);

    original = num;
    while (original != 0) {
        original /= 10;
        ++n;}
    original = num;
    while (original != 0) {
        remainder = original % 10;
        result += pow(remainder, n);
        original /= 10;
    }
    if (result == num)
        printf("%d is an Armstrong number.\n", num);
    else
        printf("%d is not an Armstrong number.\n", num);
    return 0;
}
```

> C 15.c > ...

```c
#include <stdio.h>
int main() {
    int n, i;
    printf("Enter the number of elements: ");
    scanf("%d", &n);
    int arr[n];
    printf("Enter %d elements:\n", n);
    for (i = 0; i < n; i++) {
        scanf("%d", &arr[i]);}
    int largest = arr[0];
    for (i = 1; i < n; i++) {
        if (arr[i] > largest) {
            largest = arr[i];}}
    printf("The largest element is %d\n", largest);
    return 0;}
```

> C 16.c > main()

```c
#include <stdio.h>
int main() {
    int n, i;
    printf("Enter the number of elements: ");
    scanf("%d", &n);
    if (n < 2) {
        printf("Array must contain at least two elements.\n");
        return 1;}
    int arr[n];
    printf("Enter %d elements:\n", n);
    for (i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    int largest, secondLargest;
    if (arr[0] > arr[1]) {
        largest = arr[0];
        secondLargest = arr[1];
    } else {
        largest = arr[1];
        secondLargest = arr[0];
    }
```

```c
    for (i = 2; i < n; i++) {
        if (arr[i] > largest) {
            secondLargest = largest;
            largest = arr[i];
        } else if (arr[i] > secondLargest && arr[i] != largest) {
            secondLargest = arr[i];}}
    if (secondLargest == largest) {
        printf("There is no second largest element.\n");
    } else {
        printf("The second largest element is %d\n", secondLargest);}
    return 0;}
```

```c
#include <stdio.h>
int main() {
    int n, i, j;
    printf("Enter the number of elements: ");
    scanf("%d", &n);
    if (n <= 1) {
        printf("Array must contain more than one element.\n");
        return 1;}
    int arr[n];
    printf("Enter %d elements:\n", n);
    for (i = 0; i < n; i++) {
        scanf("%d", &arr[i]);}
    printf("Duplicate elements are: ");
    int foundDup = 0;
    for (i = 0; i < n; i++) {
        for (j = i + 1; j < n; j++) {
            if (arr[i] == arr[j]) {
                int isPrinted = 0;
                for (int k = 0; k < i; k++) {
                    if (arr[k] == arr[i]) {
                        isPrinted = 1;
                        break;}}
                if (!isPrinted) {
                    printf("%d ", arr[i]);
                    foundDup = 1;}
                break;}}}
    if (!foundDup) {
        printf("None\n");}
    printf("\n");
    return 0;}
```

> C 18.c > main()

```c
#include <stdio.h>
int main() {
    int n, i;int sum = 0;
    printf("Enter the number of elements: ");
    scanf("%d", &n);
    int arr[n];
    printf("Enter %d elements:\n", n);
    for (i = 0; i < n; i++) {
        scanf("%d", &arr[i]);sum += arr[i];}
    printf("The sum of all elements is %d\n", sum);
    return 0;}
```

> C 19.c > ...

```c
#include <stdio.h>
int main() {
    int n, i;
    printf("Enter the number of elements: ");
    scanf("%d", &n);
    int arr[n];
    printf("Enter %d elements:\n", n);
    for (i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    int start = 0, end = n - 1;
    while (start < end) {
        int temp = arr[start];arr[start] = arr[end];
        arr[end] = temp;start++;end--;}
    printf("Reversed array:\n");
    for (i = 0; i < n; i++) {
        printf("%d ", arr[i]);}
    printf("\n");
    return 0;}
```

> C 20.c > ...

```c
#include <stdio.h>
int main() {
    int n, i, j;
    printf("Enter the number of elements: ");
    scanf("%d", &n);
    if (n <= 0) {
        printf("Array must contain at least one element.\n");
        return 1;}
    int arr[n];
    printf("Enter %d elements:\n", n);
    for (i = 0; i < n; i++) {
        scanf("%d", &arr[i]);}
    printf("Element frequencies:\n");
    for (i = 0; i < n; i++) {
        int count = 1;
        if (arr[i] == -1) {
            continue;}
        for (j = i + 1; j < n; j++) {
            if (arr[i] == arr[j]) {
                count++;
                arr[j] = -1;}}
        printf("%d occurs %d times\n", arr[i], count);}
    return 0;}
```