1. ```c
   #include <stdio.h>

   int main() {
       int num = 5;
       int binary[32];
       int i = 0;

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

       printf("Binary representation: ");
       for (int j = i - 1; j >= 0; j--) {
           printf("%d", binary[j]);
       }
       printf("\n");

       return 0;
   }
   ```

2.
```c
#include <stdio.h>
#include <ctype.h>
void countVowelsAndConsonants(char *str, int *vowelCount, int *consonantCount) {
    *vowelCount = 0;
    *consonantCount = 0;
    while (*str != '\0') {
        char ch = tolower(*str);
        if ((ch >= 'a' && ch <= 'z')) {
            if (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u') {
                (*vowelCount)++;
            } else {
                (*consonantCount)++;
            }
        }
        str++;
    }
}
int main() {
    char str[100];
    int vowels, consonants;
    printf("Enter a string: ");
    fgets(str, sizeof(str), stdin);
    countVowelsAndConsonants(str, &vowels, &consonants);
    printf("Number of vowels: %d\n", vowels);
    printf("Number of consonants: %d\n", consonants);
    return 0;
}
```

```c
3. #include <stdio.h>

float add(float a, float b);
float subtract(float a, float b);
float multiply(float a, float b);
float divide(float a, float b);
int main() {
    int choice;
    float num1, num2, result;

    while (1) {
        printf("\nMenu:\n");
        printf("1. Addition\n");
        printf("2. Subtraction\n");
        printf("3. Multiplication\n");
        printf("4. Division\n");
        printf("5. Exit\n");
        printf("Enter your choice: ");
        scanf("%d", &choice);

        if (choice == 5) {
            printf("Exiting the program. Goodbye!\n");
            break;
        }
        printf("Enter two numbers: ");
        scanf("%f %f", &num1, &num2);
        switch (choice) {
            case 1:
                result = add(num1, num2);
                printf("Result: %.2f\n", result);
                break;
            case 2:
                result = subtract(num1, num2);
                printf("Result: %.2f\n", result);
                break;
            case 3:
                result = multiply(num1, num2);
                printf("Result: %.2f\n", result);
                break;
            case 4:
                if (num2 != 0) {
                    result = divide(num1, num2);
                    printf("Result: %.2f\n", result);
                } else {
```

```c
                printf("Error: Division by zero is not allowed.\n");
            }
            break;
        default:
            printf("Invalid choice. Please try again.\n");
    }
}

    return 0;
}

float add(float a, float b) {
    return a + b;
}

float subtract(float a, float b) {
    return a - b;
}

float multiply(float a, float b) {
    return a * b;
}

float divide(float a, float b) {
    return a / b;
}
```

main.c   Share   Run   Output   Clear

```
44      } else {
45          printf("Error: Division by zero is not allowed.\n");
46      }
47      break;
48      default:
49          printf("Invalid choice. Please try again.\n");
50      }
51   }
52
53   return 0;
54 }
55
56 float add(float a, float b) {
57      return a + b;
58 }
59
60 float subtract(float a, float b) {
61      return a - b;
62 }
63
64 float multiply(float a, float b) {
65      return a * b;
66 }
67
68 float divide(float a, float b) {
69      return a / b;
70 }
71
```

```
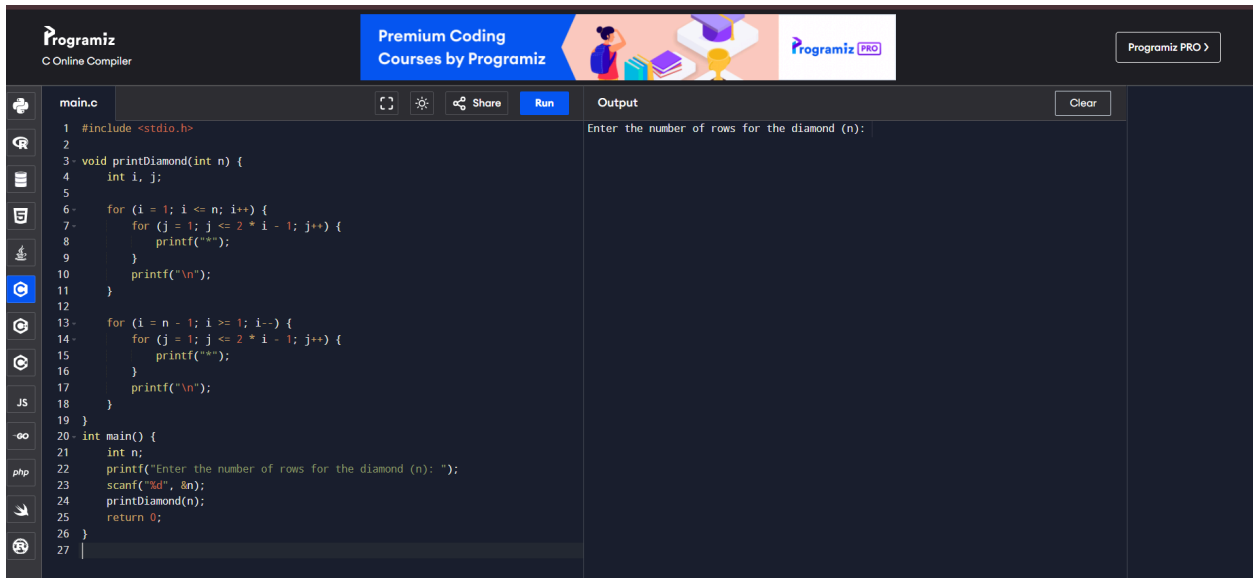Menu:
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Exit
Enter your choice:
```

4.


```c
#include <stdio.h>

void printDiamond(int n) {
    int i, j;

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

    for (i = n - 1; i >= 1; i--) {
        for (j = 1; j <= 2 * i - 1; j++) {
            printf("*");
        }
        printf("\n");
    }
}
int main() {
    int n;
    printf("Enter the number of rows for the diamond (n): ");
    scanf("%d", &n);
    printDiamond(n);
    return 0;
}
```

5. #include <stdio.h>

```c
int stringLength(char *str) {
    int length = 0;

    while (*str != '\0') {
        length++;
        str++;
    }

    return length;
}

int main() {
    char str[] = "Hello";
    int length;

    length = stringLength(str);
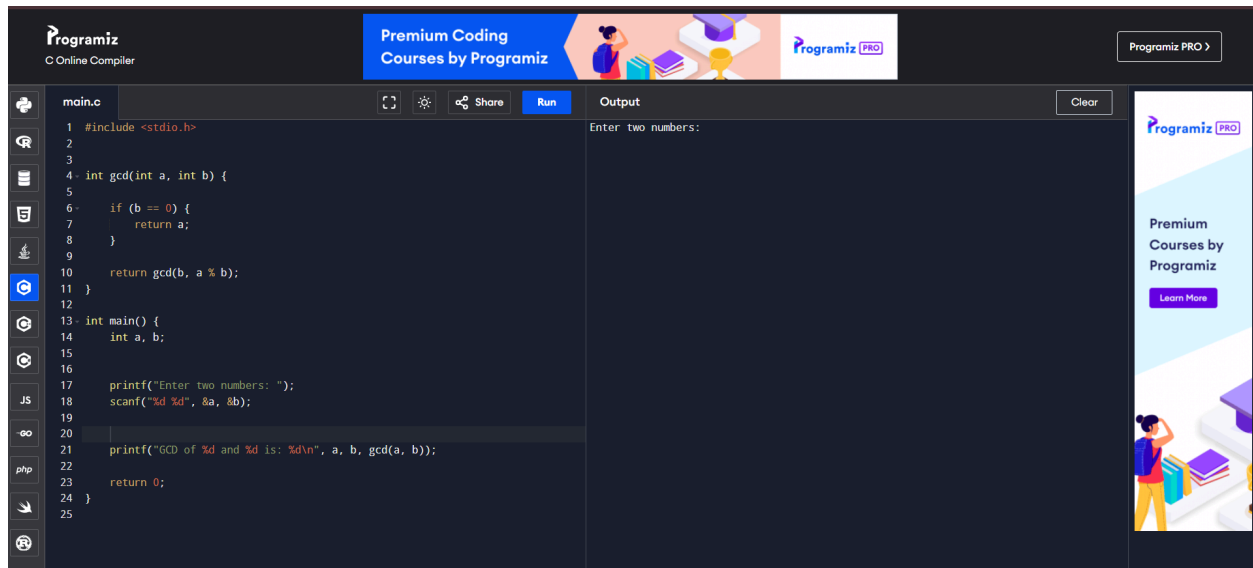    printf("The length of the string \"%s\" is: %d\n", str, length);

    return 0;
}
```

main.c

Share   Run

Output   Clear

```c
1  #include <stdio.h>
2
3
4  int gcd(int a, int b) {
5
6      if (b == 0) {
7          return a;
8      }
9
10     return gcd(b, a % b);
11 }
12
13 int main() {
14     int a, b;
15
16
17     printf("Enter two numbers: ");
18     scanf("%d %d", &a, &b);
19
20
21     printf("GCD of %d and %d is: %d\n", a, b, gcd(a, b));
22
23     return 0;
24 }
25
```

Enter two numbers:

```c
#include <stdio.h>


int gcd(int a, int b) {

    if (b == 0) {
        return a;
    }

    return gcd(b, a % b);
}

int main() {
    int a, b;


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


    printf("GCD of %d and %d is: %d\n", a, b, gcd(a, b));

    return 0;
}
```