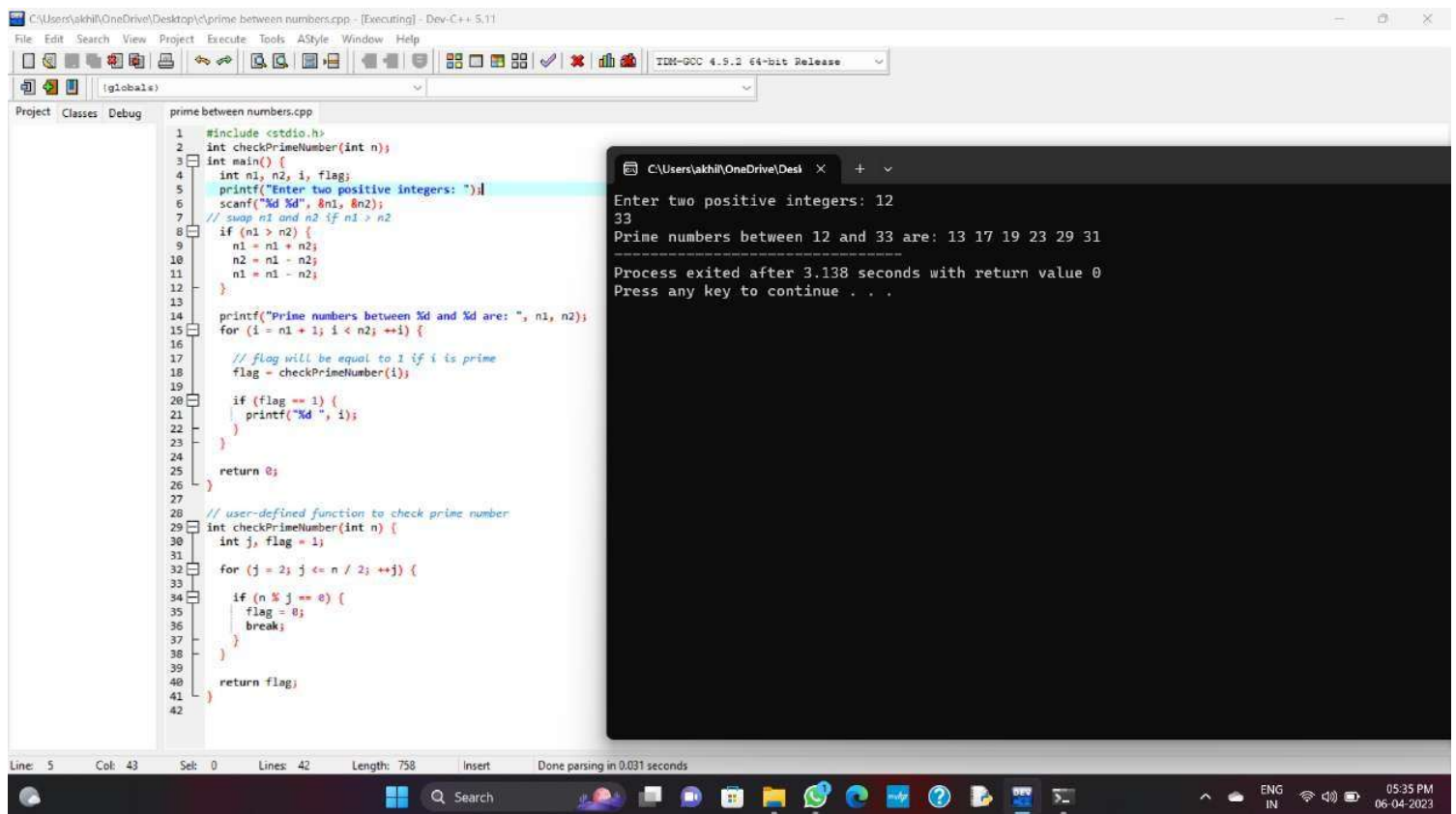


ASSIGNMENT – 3: C PROGRAMMING

COURSE CODE: CSA0268

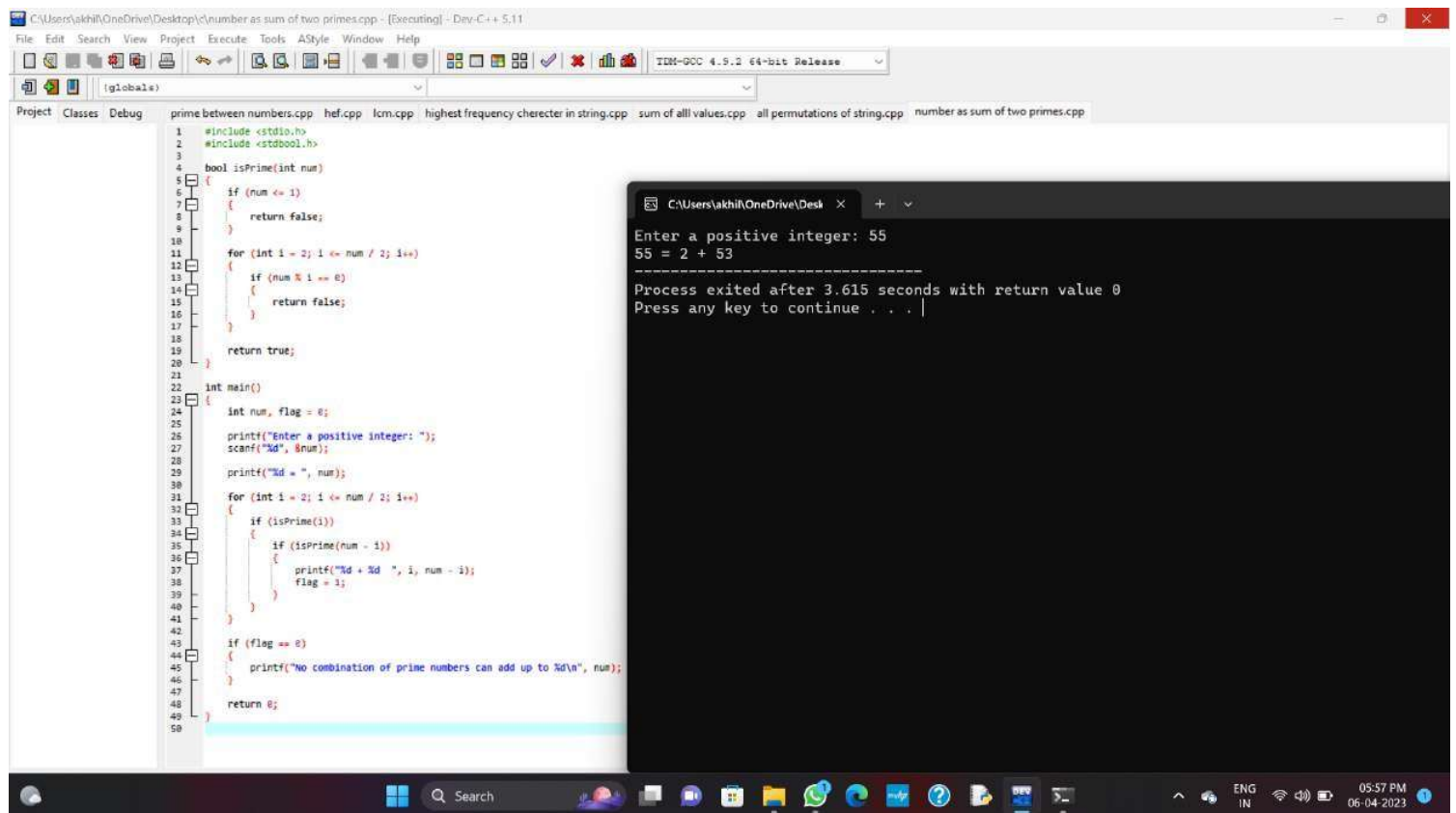
1.C Program to Display Prime Numbers Between Intervals Using Function



```
1 #include <stdio.h>
2 int checkPrimeNumber(int n);
3 int main() {
4     int n1, n2, i, flag;
5     printf("Enter two positive integers: ");
6     scanf("%d %d", &n1, &n2);
7     // swap n1 and n2 if n1 > n2
8     if (n1 > n2) {
9         n1 = n1 + n2;
10        n2 = n1 - n2;
11        n1 = n1 - n2;
12    }
13    printf("Prime numbers between %d and %d are: ", n1, n2);
14    for (i = n1 + 1; i < n2; ++i) {
15        // flag will be equal to 1 if i is prime
16        flag = checkPrimeNumber(i);
17        if (flag == 1) {
18            printf("%d ", i);
19        }
20    }
21    return 0;
22 }
23 // user-defined function to check prime number
24 int checkPrimeNumber(int n) {
25     int j, flag = 1;
26     for (j = 2; j <= n / 2; ++j) {
27         if (n % j == 0) {
28             flag = 0;
29             break;
30         }
31     }
32     return flag;
33 }
```

Enter two positive integers: 12 33
Prime numbers between 12 and 33 are: 13 17 19 23 29 31
Process exited after 3.138 seconds with return value 0
Press any key to continue . . .

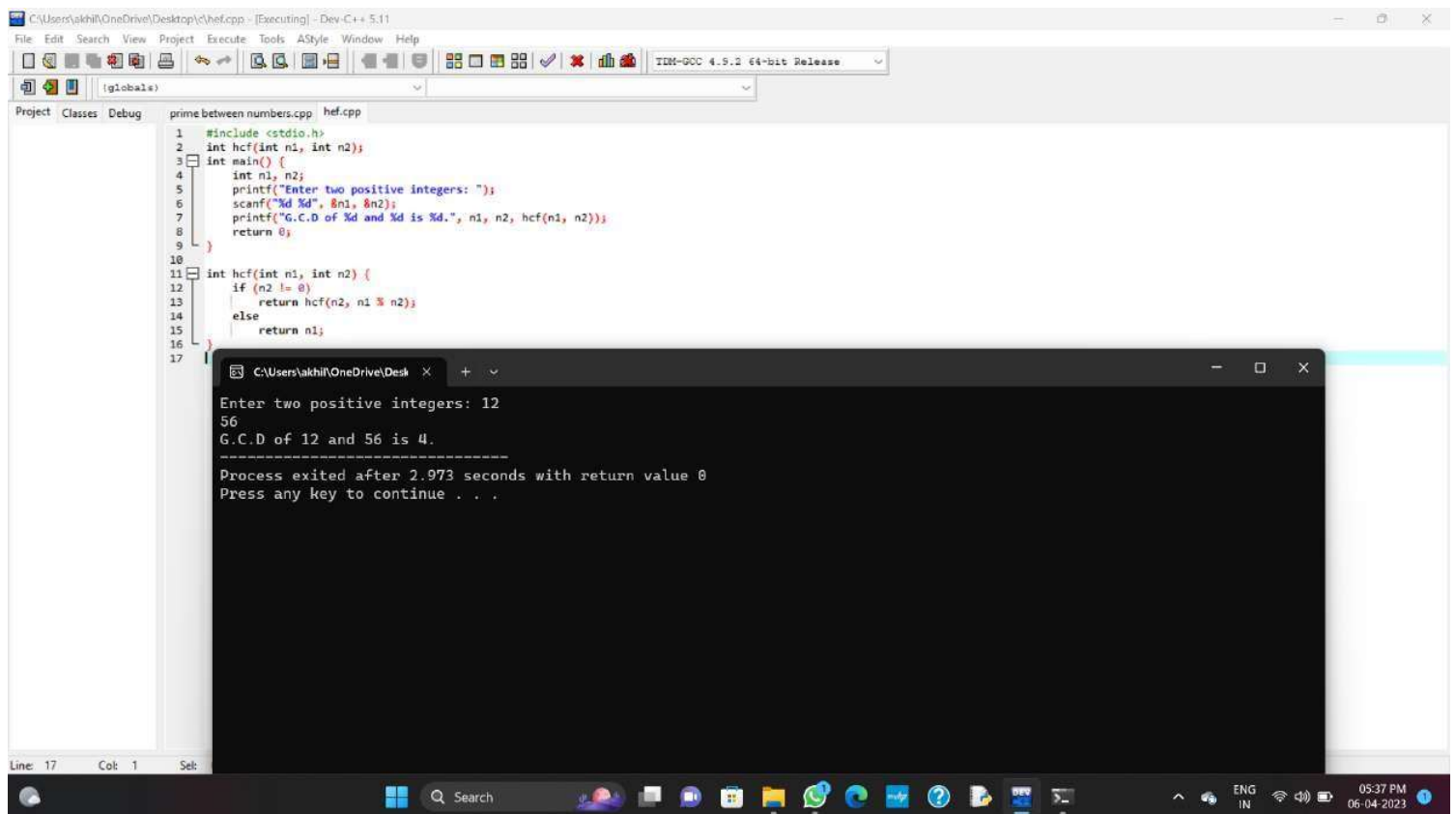
2.C Program to Check Whether a Number can be Expressed as Sum of Two Prime Numbers



```
1 #include <stdio.h>
2 #include <stdbool.h>
3
4 bool isPrime(int num)
5 {
6     if (num <= 1)
7     {
8         return false;
9     }
10
11     for (int i = 2; i <= num / 2; i++)
12     {
13         if (num % i == 0)
14         {
15             return false;
16         }
17     }
18
19     return true;
20 }
21
22 int main()
23 {
24     int num, flag = 0;
25
26     printf("Enter a positive integer: ");
27     scanf("%d", &num);
28
29     printf("%d = ", num);
30
31     for (int i = 2; i <= num / 2; i++)
32     {
33         if (isPrime(i))
34         {
35             if (isPrime(num - i))
36             {
37                 printf("%d + %d ", i, num - i);
38                 flag = 1;
39             }
40         }
41     }
42
43     if (flag == 0)
44     {
45         printf("No combination of prime numbers can add up to %d\n", num);
46     }
47
48     return 0;
49 }
```

```
Enter a positive integer: 55
55 = 2 + 53
-----
Process exited after 3.615 seconds with return value 0
Press any key to continue . . .
```

3.C Program to Find GCD of Two Numbers using Recursion



The screenshot displays a C++ IDE with a project named 'prime between numbers.cpp' and a file named 'hcf.cpp'. The code in 'hcf.cpp' implements a recursive function to find the GCD of two numbers. The main function prompts the user to enter two positive integers, reads them, and prints the GCD. The recursive function 'hcf' uses the Euclidean algorithm: if the second number is zero, it returns the first number; otherwise, it returns the GCD of the second number and the remainder of the first number divided by the second number.

```
1 #include <stdio.h>
2 int hcf(int n1, int n2);
3 int main() {
4     int n1, n2;
5     printf("Enter two positive integers: ");
6     scanf("%d %d", &n1, &n2);
7     printf("G.C.D of %d and %d is %d.", n1, n2, hcf(n1, n2));
8     return 0;
9 }
10
11 int hcf(int n1, int n2) {
12     if (n2 != 0)
13         return hcf(n2, n1 % n2);
14     else
15         return n1;
16 }
17
```

The execution output shows the user entering 12 and 56, resulting in a GCD of 4. The process exited after 2.973 seconds with a return value of 0.

```
Enter two positive integers: 12
56
G.C.D of 12 and 56 is 4.
-----
Process exited after 2.973 seconds with return value 0
Press any key to continue . . .
```

4. C Program to Find LCM of Two Numbers

The screenshot shows a Dev-C++ IDE with a C program to find the LCM of two numbers. The program is named `lcm.cpp` and is located at `C:\Users\akshil\OneDrive\Desktop\lcm.cpp`. The code is as follows:

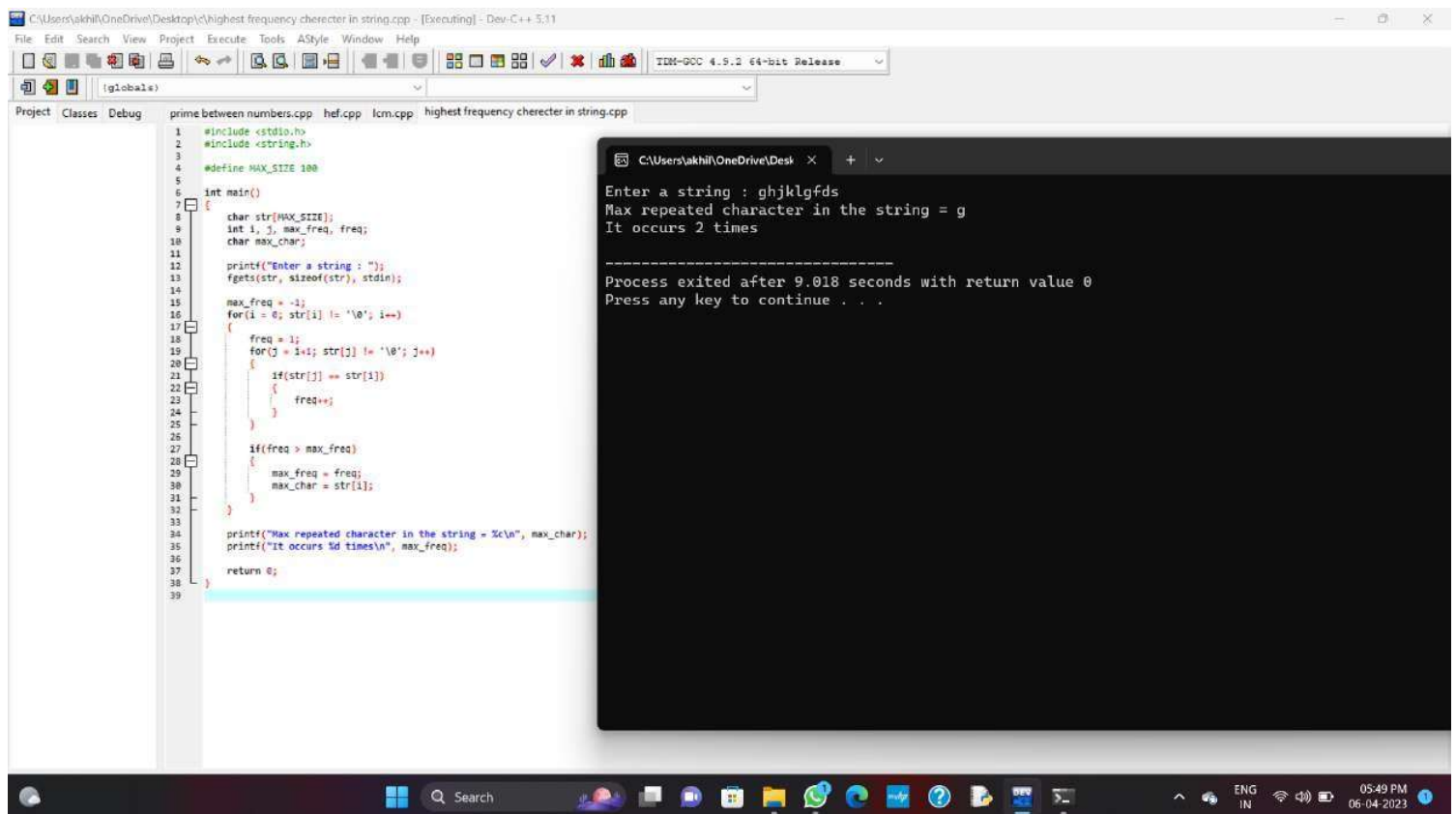
```
1 #include <stdio.h>
2
3 int main() {
4     int n1, n2, max;
5
6     printf("Enter two positive integers: ");
7     scanf("%d %d", &n1, &n2);
8
9     // maximum number between n1 and n2 is stored in max
10    max = (n1 > n2) ? n1 : n2;
11
12    while (1) {
13        if ((max % n1 == 0) && (max % n2 == 0)) {
14            printf("The LCM of %d and %d is %d.", n1, n2, max);
15            break;
16        }
17        ++max;
18    }
19    return 0;
20 }
```

The program is executed, and the output is shown in the console window:

```
Enter two positive integers: 12
55
The LCM of 12 and 55 is 660.
-----
Process exited after 3.756 seconds with return value 0
Press any key to continue . . .
```

The status bar at the bottom of the IDE shows "Line: 22, Col: 1, Sel: 0". The Windows taskbar at the bottom of the screen shows the time as 05:38 PM on 06-04-2023.

5.C Program to Find Highest Frequency Character in a String

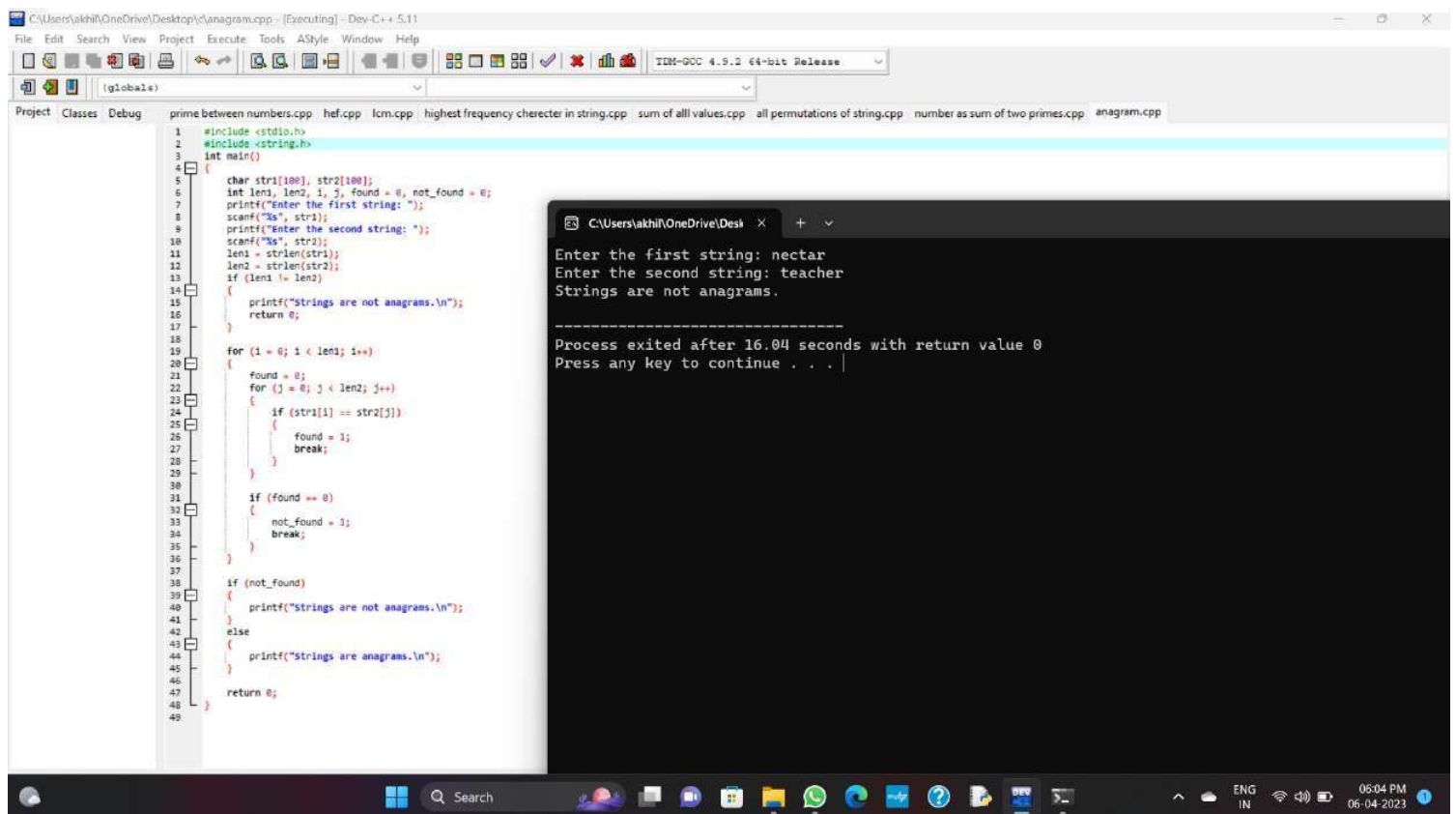


```
1 #include <stdio.h>
2 #include <string.h>
3
4 #define MAX_SIZE 100
5
6 int main()
7 {
8     char str[MAX_SIZE];
9     int i, j, max_freq, freq;
10    char max_char;
11
12    printf("Enter a string : ");
13    fgets(str, sizeof(str), stdin);
14
15    max_freq = -1;
16    for(i = 0; str[i] != '\0'; i++)
17    {
18        freq = 1;
19        for(j = i+1; str[j] != '\0'; j++)
20        {
21            if(str[j] == str[i])
22            {
23                freq++;
24            }
25        }
26
27        if(freq > max_freq)
28        {
29            max_freq = freq;
30            max_char = str[i];
31        }
32    }
33
34    printf("Max repeated character in the string = %c\n", max_char);
35    printf("It occurs %d times\n", max_freq);
36
37    return 0;
38 }
```

Enter a string : ghjklgfd
Max repeated character in the string = g
It occurs 2 times

Process exited after 9.018 seconds with return value 0
Press any key to continue . . .

6. **Anagram Program in C:** Two strings are said to be **anagrams** if they satisfy two conditions, the length of both strings must be equal to each other and second the strings must have the same set of characters.



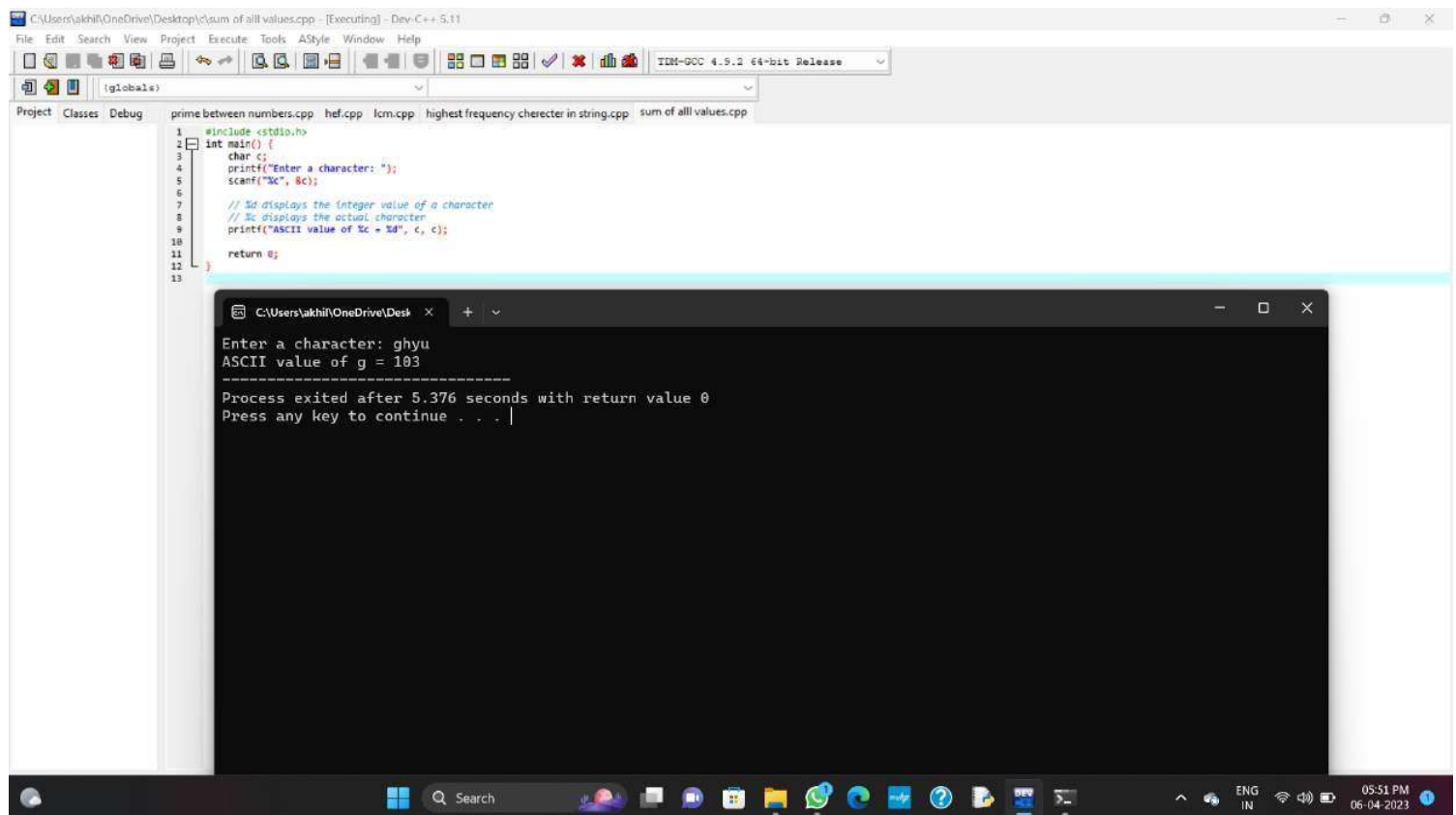
The screenshot displays a C++ IDE with the file `anagram.cpp` open. The code implements a function to check if two strings are anagrams by comparing their lengths and character sets. The execution window shows the program running with the inputs "nectar" and "teacher", resulting in the output "Strings are not anagrams." and a message indicating the process exited after 16.04 seconds.

```
1 #include <stdio.h>
2 #include <string.h>
3 int main()
4 {
5     char str1[100], str2[100];
6     int len1, len2, i, j, found = 0, not_found = 0;
7     printf("Enter the first string: ");
8     scanf("%s", str1);
9     printf("Enter the second string: ");
10    scanf("%s", str2);
11    len1 = strlen(str1);
12    len2 = strlen(str2);
13    if (len1 != len2)
14    {
15        printf("Strings are not anagrams.\n");
16        return 0;
17    }
18    for (i = 0; i < len1; i++)
19    {
20        found = 0;
21        for (j = 0; j < len2; j++)
22        {
23            if (str1[i] == str2[j])
24            {
25                found = 1;
26                break;
27            }
28        }
29        if (found == 0)
30        {
31            not_found = 1;
32            break;
33        }
34    }
35    if (not_found)
36    {
37        printf("Strings are not anagrams.\n");
38    }
39    else
40    {
41        printf("Strings are anagrams.\n");
42    }
43    return 0;
44 }
```

Enter the first string: nectar
Enter the second string: teacher
Strings are not anagrams.

Process exited after 16.04 seconds with return value 0
Press any key to continue . . .

7. C Program to Find the Sum of ASCII Value of All Characters in the String



The screenshot shows a C program in Dev-C++ 5.11. The program is titled "sum of all values.cpp" and is located at "C:\Users\akshil\OneDrive\Desktop\c\sum of all values.cpp". The code is as follows:

```
1 #include <stdio.h>
2 int main() {
3     char c;
4     printf("Enter a character: ");
5     scanf("%c", &c);
6
7     // %d displays the integer value of a character
8     // %c displays the actual character
9     printf("ASCII value of %c = %d", c, c);
10
11     return 0;
12 }
13
```

The program is executed, and the output is shown in a console window:

```
C:\Users\akshil\OneDrive\Desktop\c\sum of all values.cpp
Enter a character: ghyu
ASCII value of g = 103
-----
Process exited after 5.376 seconds with return value 0
Press any key to continue . . .
```

The Windows taskbar at the bottom shows the date and time as 05:51 PM on 06-04-2023.

The screenshot shows a C++ IDE with two windows. The left window displays the source code for a program that generates all permutations of the string "akhill". The right window shows the program's execution output.

C++ Source Code

```
#include <stdio.h>
#include <string.h>

void swap(char *x, char *y)
{
    char temp;
    temp = *x;
    *x = *y;
    *y = temp;
}

void permute(char *str, int start, int end)
{
    if (start == end)
    {
        printf("%s\n", str);
    }
    else
    {
        for (int i = start; i <= end; i++)
        {
            swap((str + start), (str + i));
            permute(str, start + 1, end);
            swap((str + start), (str + i));
        }
    }
}

int main()
{
    char str[100];
    printf("Enter a string: ");
    scanf("%s", str);

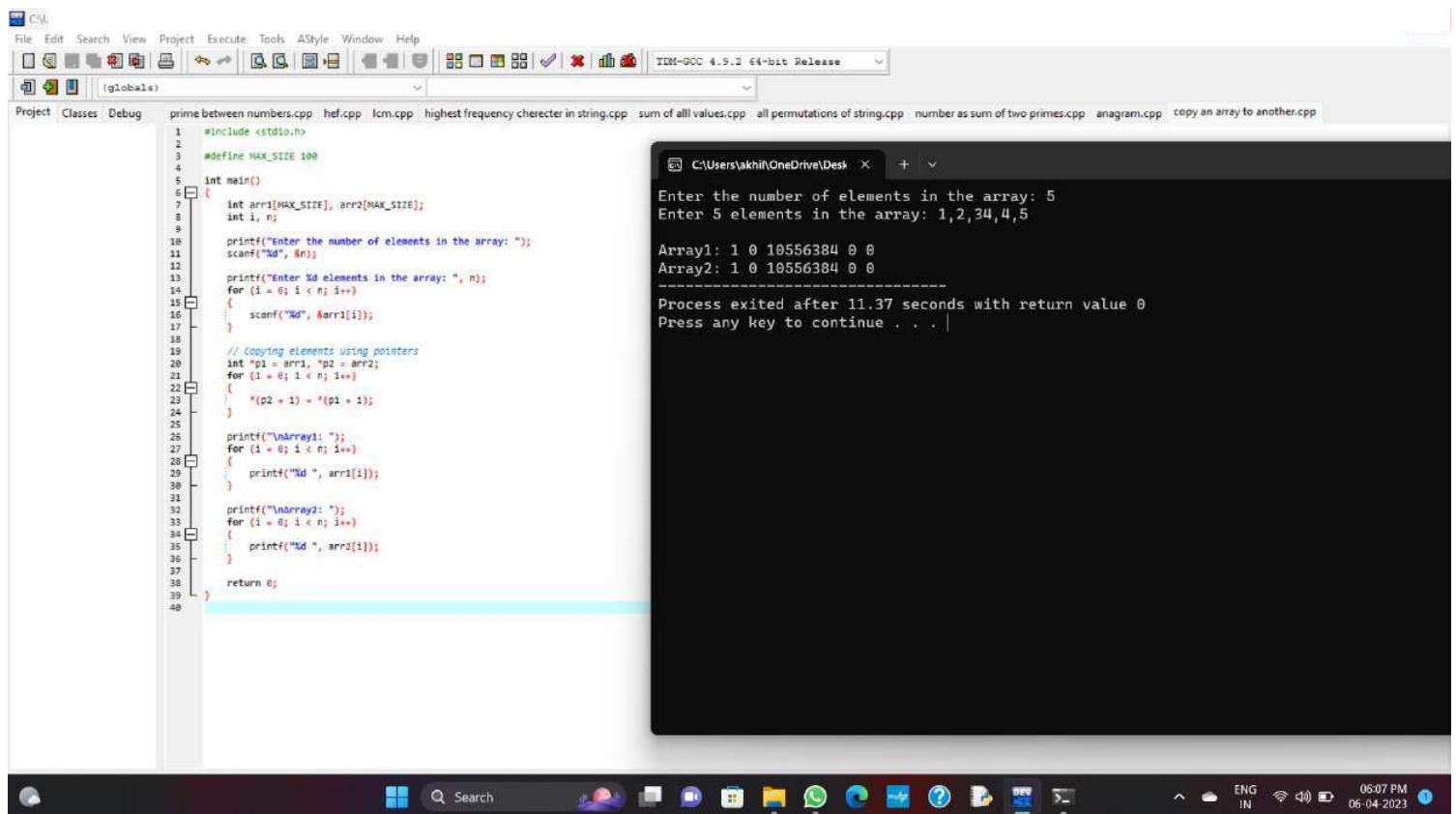
    printf("All possible permutations are:\n");
    permute(str, 0, strlen(str) - 1);

    return 0;
}
```

Program Output

```
Enter a string: akhill
All possible permutations are:
akhill
akhlil
akhlili
akhlilli
akhlilii
akihlll
akihlll
akilhlh
akilhlh
akilllh
akilllh
akillhl
akillhl
akilhhl
akilhhl
aklihhl
aklihhl
akllhii
akllhii
akllhih
akllhih
akllhil
akllhil
akllhli
akllhli
akllhil
akllhil
akhhill
akhhill
ahkhill
ahkhill
ahklili
ahklili
```

9. Write a C program to copy one array elements to another array using pointers. How to copy array elements from one array to another array using pointers. Logic to copy one array to another array using pointers in C programming.



```
1 #include <stdio.h>
2
3 #define MAX_SIZE 100
4
5 int main()
6 {
7     int arr1[MAX_SIZE], arr2[MAX_SIZE];
8     int i, n;
9
10    printf("Enter the number of elements in the array: ");
11    scanf("%d", &n);
12
13    printf("Enter %d elements in the array: ", n);
14    for (i = 0; i < n; i++)
15    {
16        scanf("%d", &arr1[i]);
17    }
18
19    // Copying elements using pointers
20    int *p1 = arr1, *p2 = arr2;
21    for (i = 0; i < n; i++)
22    {
23        *(p2 + i) = *(p1 + i);
24    }
25
26    printf("\nArray1: ");
27    for (i = 0; i < n; i++)
28    {
29        printf("%d ", arr1[i]);
30    }
31
32    printf("\nArray2: ");
33    for (i = 0; i < n; i++)
34    {
35        printf("%d ", arr2[i]);
36    }
37
38    return 0;
39 }
```

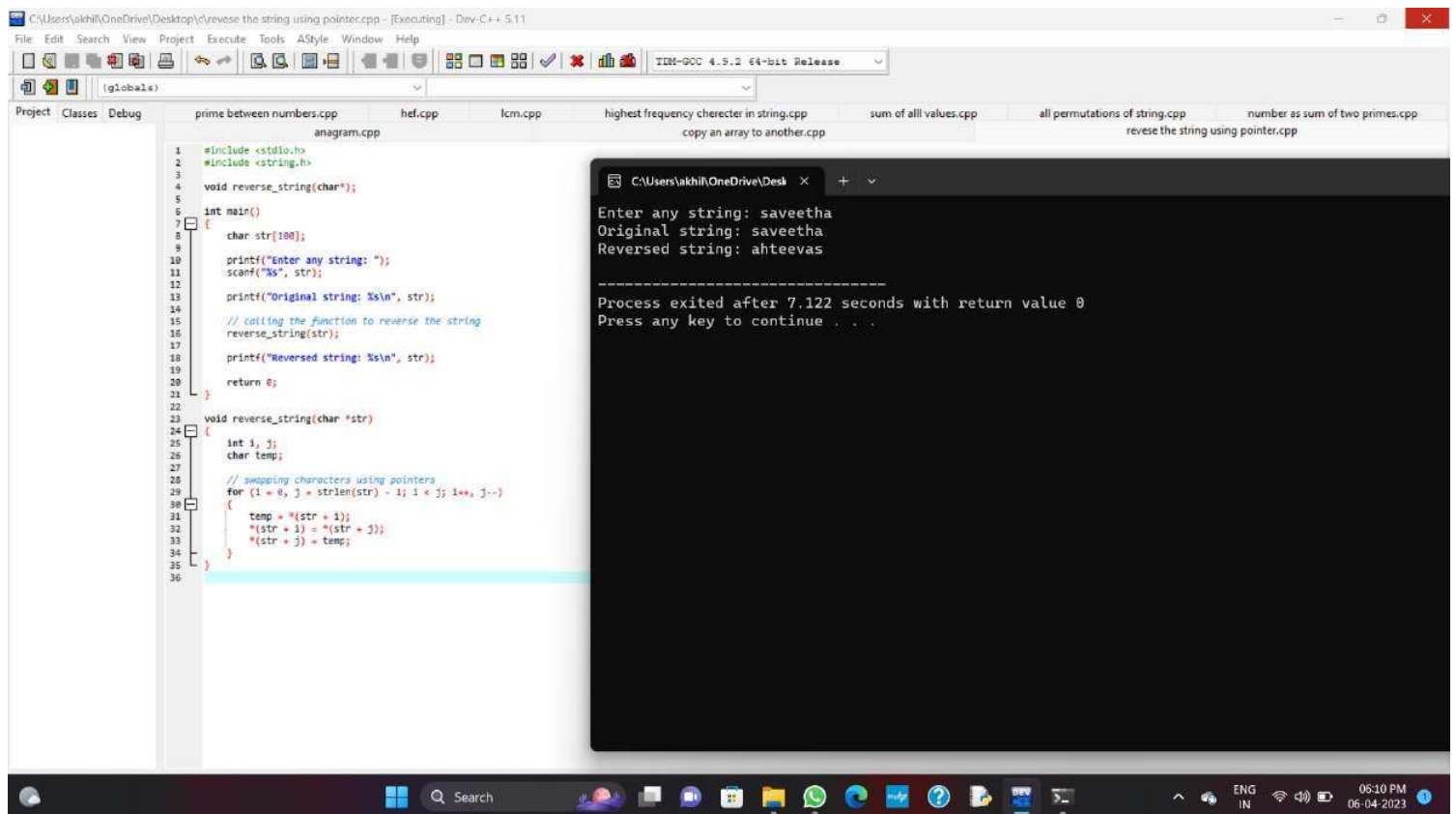
Output:

```
Enter the number of elements in the array: 5
Enter 5 elements in the array: 1,2,3,4,5

Array1: 1 0 10556384 0 0
Array2: 1 0 10556384 0 0

Process exited after 11.37 seconds with return value 0
Press any key to continue . . .
```

10. Write a C Program to reverse string using pointers and function.



```
C:\Users\akhi\OneDrive\Desktop\reverse the string using pointer.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TIM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug prime between numbers.cpp hef.cpp lcm.cpp highest frequency cherecter in string.cpp sum of alll values.cpp all permutations of string.cpp number as sum of two primes.cpp
anagram.cpp copy an array to another.cpp reverse the string using pointer.cpp
1 #include <stdio.h>
2 #include <string.h>
3
4 void reverse_string(char*);
5
6
7 int main()
8 {
9     char str[100];
10    printf("Enter any string: ");
11    scanf("%s", str);
12
13    printf("Original string: %s\n", str);
14
15    // calling the function to reverse the string
16    reverse_string(str);
17
18    printf("Reversed string: %s\n", str);
19
20    return 0;
21 }
22
23 void reverse_string(char *str)
24 {
25     int i, j;
26     char temp;
27
28     // swapping characters using pointers
29     for (i = 0, j = strlen(str) - 1; i < j; i++, j--)
30     {
31         temp = *(str + i);
32         *(str + i) = *(str + j);
33         *(str + j) = temp;
34     }
35 }
36
Enter any string: saveetha
Original string: saveetha
Reversed string: ahteevas
-----
Process exited after 7.122 seconds with return value 0
Press any key to continue . . .
```