Assignment 3

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C programming

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Assignment 3

Q1. Write a C program to find the maximum and minimum elements in an array.

src > C q1.c > main()

```c
// Write a C program to find the maximum and minimum elements in an array.
#include <stdio.h>

int main()
{
    int n, i;

    printf("Enter 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 max = arr[0];
    int min = arr[0];

    for (i = 1; i < n; i++)
    {
```

```
22      for (i = 1; i < n; i++)
23      {
24          if (arr[i] > max)
25              max = arr[i];
26          if (arr[i] < min)
27              min = arr[i];
28      }
29
30      printf("Maximum element = %d\n", max);
31      printf("Minimum element = %d\n", min);
32
33      return 0;
34  }
```

```
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> cd "c:\Users\Acer\OneDrive\D
esktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q1.c -o q1 } ; if ($?) { .\q1 }
Enter number of elements: 4
Enter 4 elements:
2345
cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q1.c -o q1
 } ; if ($?) { .\q1 }
Maximum element = 4214911
Minimum element = 0
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git commit -m "assignment co
mpleted"
[main f8c29e3] assignment completed
```

```
mpleted"
[main f8c29e3] assignment completed
 1 file changed, 0 insertions(+), 0 deletions(-)
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git push origin main
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Delta compression using up to 12 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (4/4), 370 bytes | 370.00 KiB/s, done.
Total 4 (delta 3), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (3/3), completed with 3 local objects.
To github.com:C-programming-2025/assignment-3-array-string-and-functions-sonamrauniyar0-collab.git
   512b137..f8c29e3  main -> main
```

Q2. Implement a C program to reverse the elements of an array.

src > C q2.c > main()

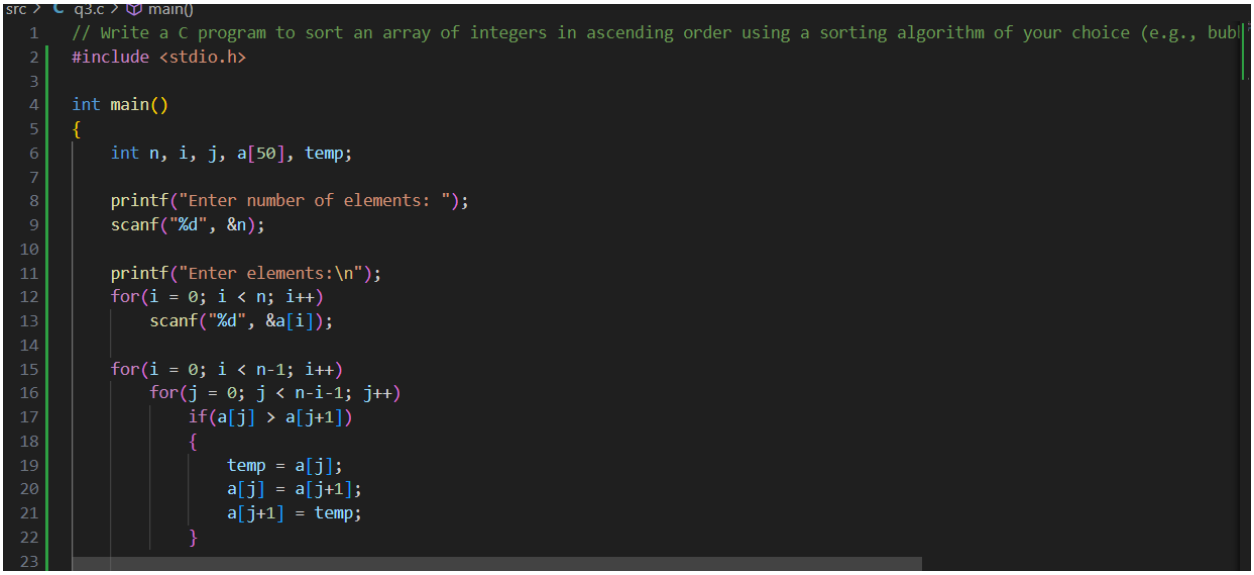
```c
// Implement a C program to reverse the elements of an array.
#include <stdio.h>

int main()
{
    int arr[5] = {1, 2, 3, 4, 5};
    int rev_arr[5];
    int index = 0;

    for(int i = 4; i >= 0; i--)
    {
        rev_arr[index] = arr[i];
        index++;
    }

    for(int i = 0; i < 5; i++)
    {
        printf("%d\n", rev_arr[i]);
    }

    return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

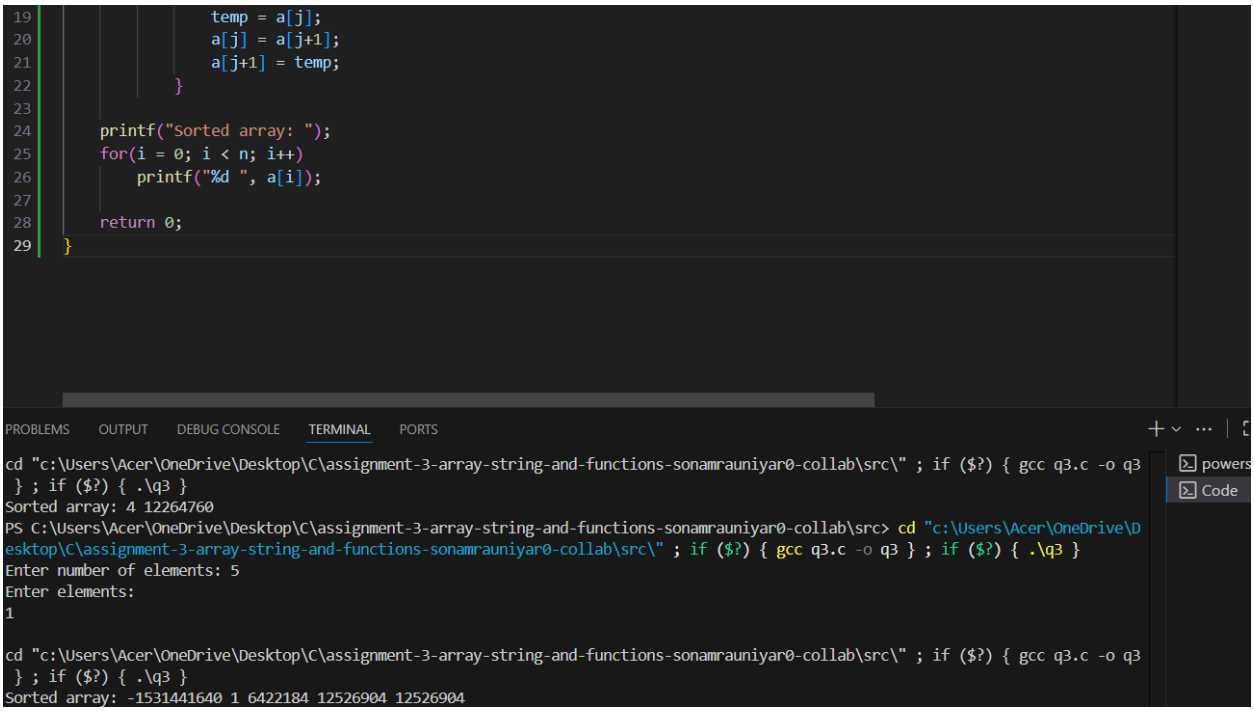
```
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab> cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q2.c -o q2 } ; if ($?) { .\q2 }
5
4
3
2
1
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git commit -m "assignment completed"
[main 512b137] assignment completed
 1 file changed, 0 insertions(+), 0 deletions(-)
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin main
```

```
1 file changed, 0 insertions(+), 0 deletions(-)
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin main
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Delta compression using up to 12 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (4/4), 526 bytes | 526.00 KiB/s, done.
Total 4 (delta 3), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (3/3), completed with 3 local objects.
To github.com:C-programming-2025/assignment-3-array-string-and-functions-sonamrauniyar0-collab.git
   88a9346..512b137  main -> main
```

Q3. Write a C program to sort an array of integers in ascending order using a sorting algorithm of your choice (e.g., bubble sort, selection sort, insertion sort).



```c
// Write a C program to sort an array of integers in ascending order using a sorting algorithm of your choice (e.g., bubl
#include <stdio.h>

int main()
{
    int n, i, j, a[50], temp;

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

    printf("Enter elements:\n");
    for(i = 0; i < n; i++)
        scanf("%d", &a[i]);

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



```c
                temp = a[j];
                a[j] = a[j+1];
                a[j+1] = temp;
            }

    printf("Sorted array: ");
    for(i = 0; i < n; i++)
        printf("%d ", a[i]);

    return 0;
}
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q3.c -o q3
 } ; if ($?) { .\q3 }
Sorted array: 4 12264760
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> cd "c:\Users\Acer\OneDrive\D
esktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q3.c -o q3 } ; if ($?) { .\q3 }
Enter number of elements: 5
Enter elements:
1

cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q3.c -o q3
 } ; if ($?) { .\q3 }
Sorted array: -1531441640 1 6422184 12526904 12526904
```

```
[main 6a3d0b3] assignment completed
 2 files changed, 29 insertions(+), 1 deletion(-)
 create mode 100644 src/q3.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git push origin main
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
Delta compression using up to 12 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (5/5), 17.26 KiB | 1.23 MiB/s, done.
Total 5 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.
To github.com:C-programming-2025/assignment-3-array-string-and-functions-sonamrauniyar0-collab.git
   f8c29e3..6a3d0b3  main -> main
```

Q4. Implement a C program to find the second largest element in an array.

src > C q4.c > main(void)

```c
// Implement a C program to find the second largest element in an array.
#include <stdio.h>
#include <stdlib.h>

int main(void)
{
    int n;
    scanf("%d", &n);

    if (n < 2)
    {
        printf("Second largest does not exist.\n");
        return 0;
    }

    int *a = (int *)malloc(n * sizeof(int));

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

    int max1 = a[0];
```

src > C q4.c > main(void)

```
5   int main(void)
23      int max1 = a[0];
24      int max2 = a[1];
25
26      if (max2 > max1)
27      {
28          int t = max1;
29          max1 = max2;
30          max2 = t;
31      }
32
33      for (int i = 2; i < n; i++)
34
35
36      {
37          if (a[i] > max1)
38          {
39              max2 = max1;
40              max1 = a[i];
41          } else if (a[i] > max2 && a[i] < max1)
42          {
```

```
src > C q4.c > main(void)
  5  int main(void)
 33      for (int i = 2; i < n; i++)
 35      {
 36          if (a[i] > max1)
 37          {
 38              max2 = max1;
 39              max1 = a[i];
 40          } else if (a[i] > max2 && a[i] < max1)
 41          {
 42              max2 = a[i];
 43          }
 44      }
 45
 46      printf("Second largest element: %d\n", max2);
 47
 48      free(a);
 49      return 0;
 50  }
 51
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
q4.c:58:5: warning: incompatible implicit declaration of built-in function 'free'
     free(a);
     ^~~~
q4.c:58:5: note: include '<stdlib.h>' or provide a declaration of 'free'
cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q4.c -o q4
 } ; if ($?) { .\q4 }
Invalid input for number of elements.
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> cd "c:\Users\Acer\OneDrive\D
esktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q4.c -o q4 } ; if ($?) { .\q4 }
cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q4.c -o q4
 } ; if ($?) { .\q4 }
Second largest element: 0
```

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```
 2 files changed, 42 insertions(+), 1 deletion(-)
 create mode 100644 src/q4.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git push origin main
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
Delta compression using up to 12 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (5/5), 17.25 KiB | 1.33 MiB/s, done.
Total 5 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.
To github.com:C-programming-2025/assignment-3-array-string-and-functions-sonamrauniyar0-collab.git
   6a3d0b3..d59a395  main -> main
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>
```

Q5. Write a C program to merge two sorted arrays into a single sorted array.

src > C q5.c > main()

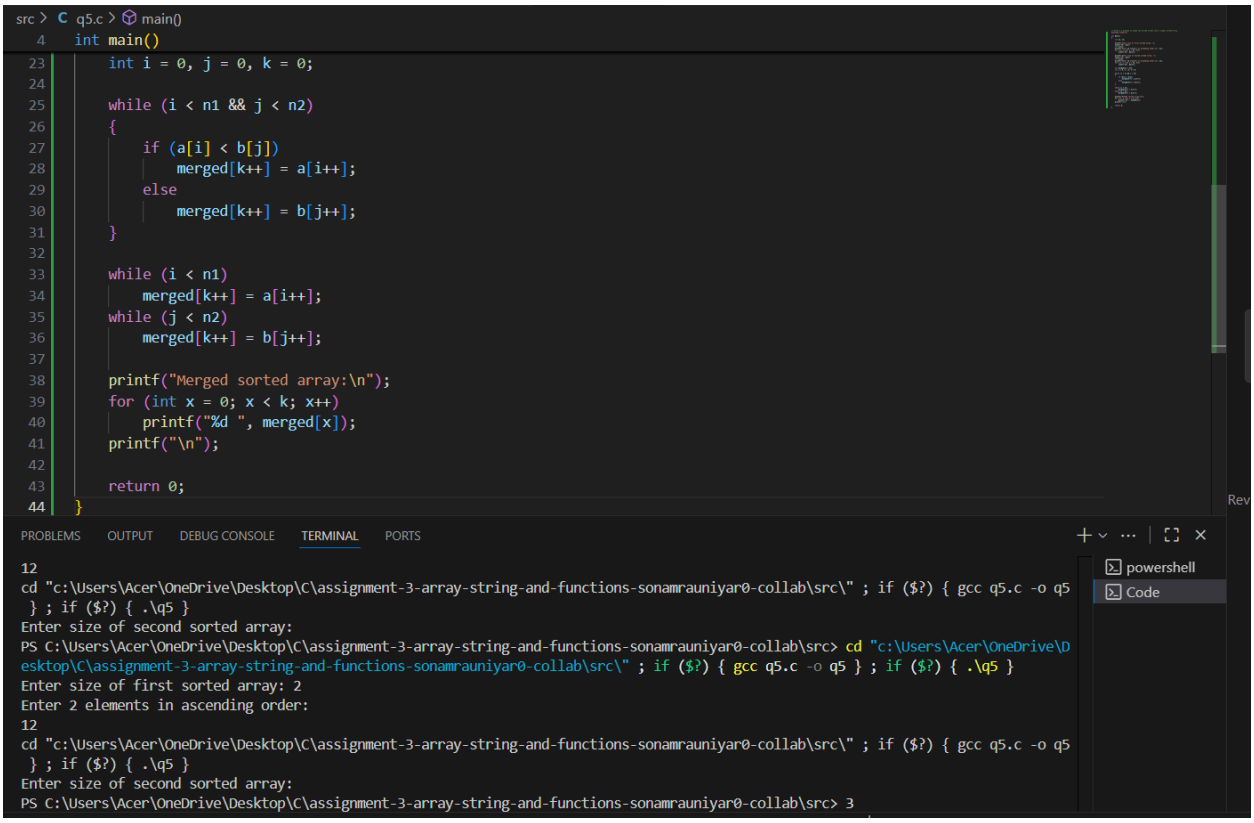
```c
// Write a C program to merge two sorted arrays into a single sorted array.
#include <stdio.h>

int main()
{
    int n1, n2;

    printf("Enter size of first sorted array: ");
    scanf("%d", &n1);
    int a[n1];
    printf("Enter %d elements in ascending order:\n", n1);
    for (int i = 0; i < n1; i++)
        scanf("%d", &a[i]);

    printf("Enter size of second sorted array: ");
    scanf("%d", &n2);
    int b[n2];
    printf("Enter %d elements in ascending order:\n", n2);
    for (int i = 0; i < n2; i++)
        scanf("%d", &b[i]);

    int merged[n1 + n2];
    int i = 0, j = 0, k = 0;
```



```
src > C q5.c > main()
  4  int main()
 23      int i = 0, j = 0, k = 0;
 24
 25      while (i < n1 && j < n2)
 26      {
 27          if (a[i] < b[j])
 28              merged[k++] = a[i++];
 29          else
 30              merged[k++] = b[j++];
 31      }
 32
 33      while (i < n1)
 34          merged[k++] = a[i++];
 35      while (j < n2)
 36          merged[k++] = b[j++];
 37
 38      printf("Merged sorted array:\n");
 39      for (int x = 0; x < k; x++)
 40          printf("%d ", merged[x]);
 41      printf("\n");
 42
 43      return 0;
 44  }
```

```
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12
cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q5.c -o q5
 } ; if ($?) { .\q5 }
Enter size of second sorted array:
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> cd "c:\Users\Acer\OneDrive\D
esktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q5.c -o q5 } ; if ($?) { .\q5 }
Enter size of first sorted array: 2
Enter 2 elements in ascending order:
12
cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q5.c -o q5
 } ; if ($?) { .\q5 }
Enter size of second sorted array:
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> 3
```
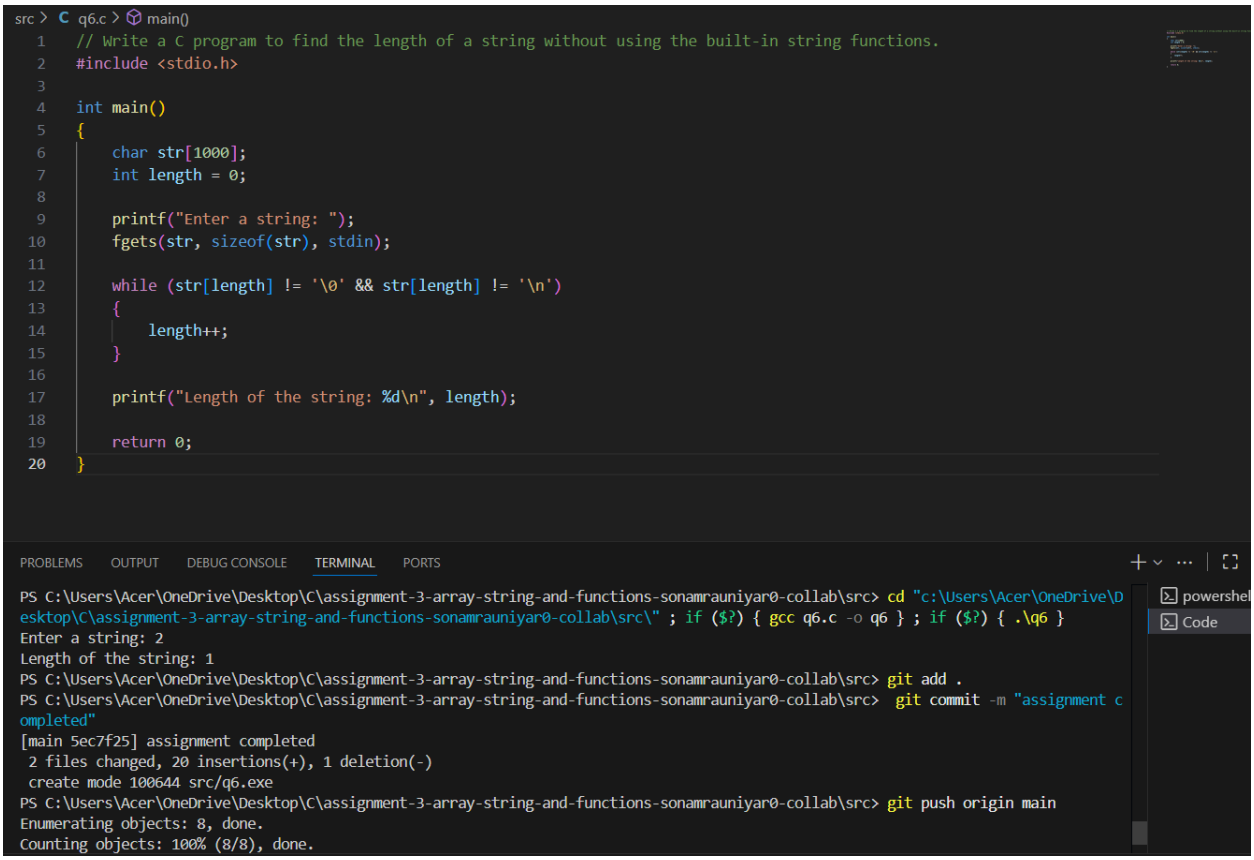

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

 2 files changed, 44 insertions(+), 1 deletion(-)
 create mode 100644 src/q5.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git push origin main
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
Delta compression using up to 12 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (5/5), 17.60 KiB | 1001.00 KiB/s, done.
Total 5 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.
To github.com:C-programming-2025/assignment-3-array-string-and-functions-sonamrauniyar0-collab.git
   d59a395..f834571  main -> main
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>
```

Q6. Write a C program to find the length of a string without using the built-in string functions.



```c
// Write a C program to find the length of a string without using the built-in string functions.
#include <stdio.h>

int main()
{
    char str[1000];
    int length = 0;

    printf("Enter a string: ");
    fgets(str, sizeof(str), stdin);

    while (str[length] != '\0' && str[length] != '\n')
    {
        length++;
    }

    printf("Length of the string: %d\n", length);

    return 0;
}
```

```
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q6.c -o q6 } ; if ($?) { .\q6 }
Enter a string: 2
Length of the string: 1
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git commit -m "assignment completed"
[main 5ec7f25] assignment completed
 2 files changed, 20 insertions(+), 1 deletion(-)
 create mode 100644 src/q6.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin main
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

Q7. Implement a C program to reverse a string.

src > C q7.c > main()

```c
// Implement a C program to reverse a string.
#include <stdio.h>

int main()
{
    char str[1000];
    int length = 0;

    printf("Enter a string: ");
    fgets(str, sizeof(str), stdin);

    while (str[length] != '\0' && str[length] != '\n')
    {
        length++;
    }


    for (int i = 0; i < length / 2; i++)
    {
        char temp = str[i];
        str[i] = str[length - i - 1];
        str[length - i - 1] = temp;
    }
```

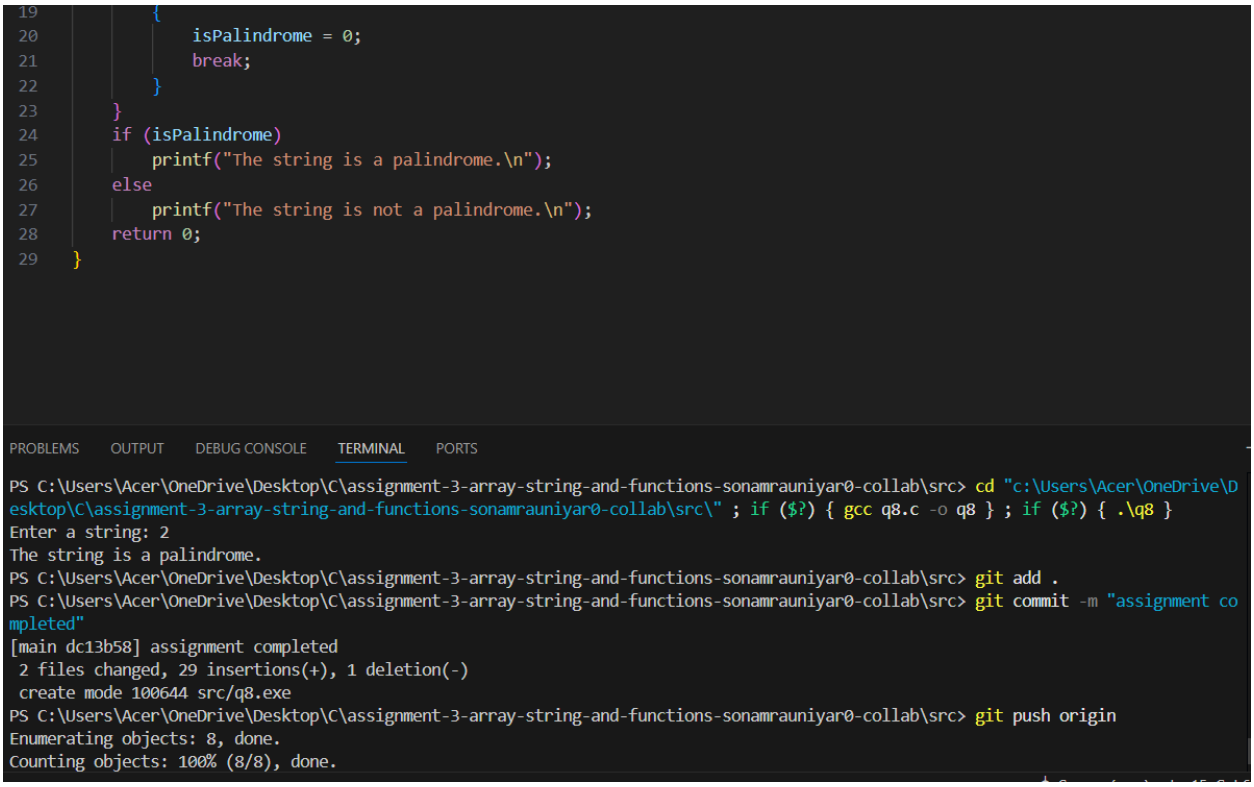
```c
    for (int i = 0; i < length / 2; i++)
    {
        char temp = str[i];
        str[i] = str[length - i - 1];
        str[length - i - 1] = temp;
    }

    printf("Reversed string: %s\n", str);

    return 0;
}
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

esktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q7.c -o q7 } ; if ($?) { .\q7 }
Enter a string: 3
Reversed string: 3

PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git commit -m "assignment c
ompleted"
[main 7efd771] assignment completed
 2 files changed, 28 insertions(+), 1 deletion(-)
 create mode 100644 src/q7.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin main
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

Q8. Write a C program to check if a given string is a palindrome.

src > C q8.c > main()

```c
// Write a C program to check if a given string is a palindrome.
#include <stdio.h>

int main()
{
    char str[1000];
    int length = 0, isPalindrome = 1;

    printf("Enter a string: ");
    fgets(str, sizeof(str), stdin);

    while (str[length] != '\0' && str[length] != '\n')
    {
        length++;
    }
    for (int i = 0; i < length / 2; i++)
    {
        if (str[i] != str[length - i - 1])
        {
            isPalindrome = 0;
            break;
        }
    }
```



```
        {
            isPalindrome = 0;
            break;
        }
    }
    if (isPalindrome)
        printf("The string is a palindrome.\n");
    else
        printf("The string is not a palindrome.\n");
    return 0;
}
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> cd "c:\Users\Acer\OneDrive\D
esktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q8.c -o q8 } ; if ($?) { .\q8 }
Enter a string: 2
The string is a palindrome.
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git commit -m "assignment co
mpleted"
[main dc13b58] assignment completed
 2 files changed, 29 insertions(+), 1 deletion(-)
 create mode 100644 src/q8.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

Q9. Implement a C program to count the occurrence of a specific character in a string.

src > C q9.c > main()

```c
// Implement a C program to count the occurrence of a specific character in a string.
#include <stdio.h>
int main()
{
    char str[1000], ch;
    int count = 0;
    printf("Enter a string: ");
    fgets(str, sizeof(str), stdin);
    printf("Enter the character to count: ");
    scanf("%c", &ch);
    for (int i = 0; str[i] != '\0' && str[i] != '\n'; i++)
    {
        if (str[i] == ch)
        {
            count++;
        }
    }
    printf("Character '%c' occurs %d times in the string.\n", ch, count);
    return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
esktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q9.c -o q9 } ; if ($?) { .\q9 }
Enter a string: 3
Enter the character to count: 12
Character '1' occurs 0 times in the string.
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git commit -m "assignment c
ompleted"
[main 24ffe6a] assignment completed
 2 files changed, 20 insertions(+), 1 deletion(-)
 create mode 100644 src/q9.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

Q10. Write a C program to concatenate two strings without using the built-in string functions.

src > C q10.c > main()

```c
// Write a C program to concatenate two strings without using the built-in string functions.
#include <stdio.h>

int main()
{
    char str1[1000], str2[1000];
    int i = 0, j = 0;

    printf("Enter first string: ");
    fgets(str1, sizeof(str1), stdin);

    printf("Enter second string: ");
    fgets(str2, sizeof(str2), stdin);
    while (str1[i] != '\0') {
        if (str1[i] == '\n') {
            str1[i] = '\0';
            break;
        }
        i++;
    }
    while (str2[j] != '\0' && str2[j] != '\n')
    {
        str1[i] = str2[j];
        i++;
        j++;
    }
    str1[i] = '\0';
    printf("Concatenated string: %s\n", str1);
    return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
esktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q10.c -o q10 } ; if ($?) { .\q10 }
Enter first string: 3
Enter second string: 4
Concatenated string: 34
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git commit -m "assignment c
ompleted"
[main 0540270] assignment completed
 2 files changed, 30 insertions(+), 1 deletion(-)
 create mode 100644 src/q10.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

Q11. Write a function named calculate Average that takes an array of integers as input and returns the average of the numbers.

src > C q11.c > main()

```c
// Write a function named calculateAverage that takes an array of integers as input and returns the average of the numbe
#include <stdio.h>

double calculateAverage(int arr[], int size)
{
    int sum = 0;
    for (int i = 0; i < size; i++) {
        sum += arr[i];
    }
    return (double)sum / size;
}

int main()
{
    int n;
    printf("Enter number of elements: ");
    scanf("%d", &n);
    if (n <= 0)
    {
        printf("Array size must be positive.\n");
        return 0;
    }
    int arr[n];
```

```c
        printf("Array size must be positive.\n");
        return 0;
    }
    int arr[n];
    printf("Enter %d elements:\n", n);
    for (int i = 0; i < n; i++)
    {
        scanf("%d", &arr[i]);
    }
    double avg = calculateAverage(arr, n);
    printf("Average of the array: %.2f\n", avg);
    return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
esktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q11.c -o q11 } ; if ($?) { .\q11 }
Enter number of elements: 2
Enter 2 elements:
34
cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q11.c -o q
11 } ; if ($?) { .\q11 }
Average of the array: 2107472.50
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git commit -m "assignment co
mpleted"
[main 752b2e7] assignment completed
 2 files changed, 32 insertions(+), 1 deletion(-)
 create mode 100644 src/q11.exe
```

```
[main 752b2e7] assignment completed
 2 files changed, 32 insertions(+), 1 deletion(-)
 create mode 100644 src/q11.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
Delta compression using up to 12 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (5/5), 17.41 KiB | 1.45 MiB/s, done.
Total 5 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.
To github.com:C-programming-2025/assignment-3-array-string-and-functions-sonamrauniyar0-collab.git
   0540270..752b2e7  main -> main
```

Q12. Write a function named is Palindrome that takes a string as input and returns 1 if it is a palindrome (reads the same forwards and backwards), and 0 otherwise.

src > C q12.c > main()

```c
//  Write a function named isPalindrome that takes a string as input and returns 1 if it is a palindrome (reads the same
#include <stdio.h>

int isPalindrome(char str[])
{
    int length = 0;

    while (str[length] != '\0' && str[length] != '\n')
    {
        length++;
    }
    for (int i = 0; i < length / 2; i++)
    {
        if (str[i] != str[length - i - 1])
        {
            return 0;
        }
    }
    return 1;
}
```

```c

int main()
{
    char str[1000];
    printf("Enter a string: ");
    fgets(str, sizeof(str), stdin);

    if (isPalindrome(str))
    {
        printf("The string is a palindrome.\n");
    } else
    {
        printf("The string is not a palindrome.\n");
    }
    return 0;
}
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q12.c -o q12 } ; if ($?) { .\q12 }
Enter a string: 5
The string is a palindrome.
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git commit -m "assignment completed"
[main 7cbfdb5] assignment completed
 2 files changed, 36 insertions(+), 1 deletion(-)
 create mode 100644 src/q12.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

Q13. Write a function named find Factorial that takes an integer as input and returns its factorial.

src > C q13.c > main()

```c
// Write a function named findFactorial that takes an integer as input and returns its factorial.
#include <stdio.h>

unsigned long long findFactorial(int n)
{
    if (n < 0) {
        return 0;
    }
    unsigned long long fact = 1;
    for (int i = 1; i <= n; i++)
    {
        fact *= i;
    }

    return fact;
}

int main()
{
    int num;

    printf("Enter a non-negative integer: ");
    scanf("%d", &num);
```

```c
int main()
{
    int num;

    printf("Enter a non-negative integer: ");
    scanf("%d", &num);

    if (num < 0)
    {
        printf("Factorial is not defined for negative numbers.\n");
    }
    else
    {
        printf("Factorial of %d is %llu\n", num, findFactorial(num));
    }

    return 0;
}
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q13.c -o q13 } ; if ($?) { .\q13 }
Enter a non-negative integer: 5
Factorial of 5 is 120
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git commit -m "assignment completed"
[main 8ff0438] assignment completed
 2 files changed, 35 insertions(+), 1 deletion(-)
 create mode 100644 src/q13.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

Q14. Write a function named convert Temperature that takes a temperature value in Celsius and converts it to Fahrenheit. The function should return the converted temperature.

src > C q14.c > main()

```c
// Write a function named convertTemperature that takes a temperature value in Celsius and converts it to Fahrenheit.
#include <stdio.h>

double convertTemperature(double celsius)
{
    return (celsius * 9.0 / 5.0) + 32.0;
}

int main()
{
    double celsius;

    printf("Enter temperature in Celsius: ");
    scanf("%lf", &celsius);

    double fahrenheit = convertTemperature(celsius);
    printf("%.2f Celsius = %.2f Fahrenheit\n", celsius, fahrenheit);

    return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q14.c -o q14 } ; if ($?) { .\q14 }
Enter temperature in Celsius: 12
12.00 Celsius = 53.60 Fahrenheit
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git commit -m "assignment completed"
[main 623c275] assignment completed
 2 files changed, 20 insertions(+), 1 deletion(-)
 create mode 100644 src/q14.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

Sonam (now) Ln 20, Col 2

Q15. Write a function named count Occurrences that takes a string and a character as input and returns the number of times the character appears in the string.

src > C q15.c > main()

```c
// Write a function named countOccurrences that takes a string and a character as input and returns the number of times
#include <stdio.h>

int countOccurrences(char str[], char ch)
{
    int count = 0;
    for (int i = 0; str[i] != '\0' && str[i] != '\n'; i++)
    {
        if (str[i] == ch)
        {
            count++;
        }
    }
    return count;
}

int main()
{
    char str[1000], ch;

    printf("Enter a string: ");
    fgets(str, sizeof(str), stdin);
```

```c
int main()
{
    char str[1000], ch;

    printf("Enter a string: ");
    fgets(str, sizeof(str), stdin);

    printf("Enter the character to count: ");
    scanf("%c", &ch);

    int occurrences = countOccurrences(str, ch);
    printf("Character '%c' occurs %d times in the string.\n", ch, occurrences);

    return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
esktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q15.c -o q15 } ; if ($?) { .\q15 }
Enter a string: 4
Enter the character to count: 5
Character '5' occurs 0 times in the string.
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git commit -m "assignment co
mpleted"
[main 3f70227] assignment completed
 2 files changed, 31 insertions(+), 1 deletion(-)
 create mode 100644 src/q15.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

Q16. Write a function named reverse Array that takes an array of integers as input and reverses the order of the elements in the array.

```c
// Write a function named reverseArray that takes an array of integers as input and reverses the order of the elements i
#include <stdio.h>

void reverseArray(int arr[], int size)
{
    for (int i = 0; i < size / 2; i++)
    {
        int temp = arr[i];
        arr[i] = arr[size - i - 1];
        arr[size - i - 1] = temp;
    }
}
int main()
{
    int n;
    printf("Enter number of elements: ");
    scanf("%d", &n);
    int arr[n];
    printf("Enter %d elements:\n", n);
    for (int i = 0; i < n; i++)
    {
        scanf("%d", &arr[i]);
    }
    int n;
    printf("Enter number of elements: ");
    scanf("%d", &n);
    int arr[n];
    printf("Enter %d elements:\n", n);
    for (int i = 0; i < n; i++)
    {
        scanf("%d", &arr[i]);
    }
    reverseArray(arr, n);
    printf("Reversed array:\n");
    for (int i = 0; i < n; i++)
    {
        printf("%d ", arr[i]);
    }
    printf("\n");
    return 0;
}
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

esktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q16.c -o q16 } ; if ($?) { .\q16 }
Enter number of elements: 6
Enter 6 elements:
123456
cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q16.c -o q
16 } ; if ($?) { .\q16 }
Reversed array:
4199752 16 32 0 4214911 123456
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git commit -m "assignment c
ompleted"
[main 5f204c2] assignment completed
```

```
PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

 2 files changed, 32 insertions(+), 1 deletion(-)
 create mode 100644 src/q16.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
Delta compression using up to 12 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (5/5), 17.42 KiB | 743.00 KiB/s, done.
Total 5 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.
To github.com:C-programming-2025/assignment-3-array-string-and-functions-sonamrauniyar0-collab.git
   3f70227..5f204c2  main -> main
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>
                                                                    Sonam (now)
```

Q17. Write a function named calculate Power that takes two integers, base and exponent, as input and returns the result of raising the base to the exponent.

src > C q17.c > main()

```c
// Write a function named calculatePower that takes two integers, base and exponent, as input and returns the result of
#include <stdio.h>

long long calculatePower(int base, int exponent)
{
    long long result = 1;
    if (exponent < 0)
    {
        printf("Negative exponent not supported.\n");
        return -1;
    }
    for (int i = 0; i < exponent; i++)
    {
        result *= base;
    }
    return result;
}

int main()
{
    int base, exponent;

    printf("Enter base: ");
```

```c
    printf("Enter base: ");
    scanf("%d", &base);

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

    long long power = calculatePower(base, exponent);

    if (power != -1)
    {
        printf("%d raised to the power %d is %lld\n", base, exponent, power);
    }
    return 0;
}
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

esktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q17.c -o q17 } ; if ($?) { .\q17 }
Enter base: 2
Enter exponent: 3
2 raised to the power 3 is 8
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git commit -m "assignment c
ompleted"
[main 7043d9c] assignment completed
 2 files changed, 36 insertions(+), 1 deletion(-)
 create mode 100644 src/q17.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

Sonam (now) Ln 36, Col

Q18. Write a function named findPrimeNumbers that takes an integer n as input and prints all prime numbers from 1 to n.

src > C q18.c > main()

```c
// Write a function named findPrimeNumbers that takes an integer n as input and prints all prime numbers from 1 to n.#in

void findPrimeNumbers(int n) {
    if (n < 2) {
        printf("No prime numbers in this range.\n");
        return;
    }
    printf("Prime numbers from 1 to %d:\n", n);
    for (int i = 2; i <= n; i++) {
        int isPrime = 1;
        for (int j = 2; j * j <= i; j++) {
            if (i % j == 0) {
                isPrime = 0;
                break;
            }
        }
        if (isPrime) {
            printf("%d ", i);
        }
    }
    printf("\n");
}
```

```c
}

int main() {
    int n;
    printf("Enter a positive integer: ");
    if (scanf("%d", &n) != 1 || n < 1) {
        printf("Invalid input. Enter a positive integer.\n");
        return 1;
    }
    findPrimeNumbers(n);
    return 0;
}

```

```
q18.c:26:5: warning: incompatible implicit declaration of built-in function 'printf'
     printf("Enter a positive integer: ");
     ^~~~~~
q18.c:26:5: note: include '<stdio.h>' or provide a declaration of 'printf'
q18.c:27:9: warning: implicit declaration of function 'scanf' [-Wimplicit-function-declaration]
     if (scanf("%d", &n) != 1 || n < 1) {
         ^~~~~
q18.c:27:9: warning: incompatible implicit declaration of built-in function 'scanf'
q18.c:27:9: note: include '<stdio.h>' or provide a declaration of 'scanf'
Enter a positive integer: 2
Prime numbers from 1 to 2:
2
```

```
 create mode 100644 src/q18.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
Delta compression using up to 12 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (5/5), 17.38 KiB | 989.00 KiB/s, done.
Total 5 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.
To github.com:C-programming-2025/assignment-3-array-string-and-functions-sonamrauniyar0-collab.git
   7043d9c..1582637  main -> main
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>
                                                                                    Sonam (now)
```

Q19. Write a function named calculateFactorialSeries that takes an integer n as input and prints the factorial series up to n.

src > C q19.c > main()

```c
// Write a function named calculateFactorialSeries that takes an integer n as input and prints the factorial series up
#include <stdio.h>

void calculateFactorialSeries(int n) {
    if (n < 0) {
        printf("Factorial series is not defined for negative numbers.\n");
        return;
    }

    unsigned long long factorial = 1;
    printf("Factorial series up to %d:\n", n);

    for (int i = 1; i <= n; i++) {
        factorial *= i;
        printf("%llu ", factorial);
    }
    printf("\n");
}

int main() {
    int n;
    printf("Enter a non-negative integer: ");
```

```c
int main() {
    int n;
    printf("Enter a non-negative integer: ");
    if (scanf("%d", &n) != 1 || n < 0) {
        printf("Invalid input. Enter a non-negative integer.\n");
        return 1;
    }
    calculateFactorialSeries(n);
    return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
esktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q19.c -o q19 } ; if ($?) { .\q19 }
Enter a non-negative integer: 3
Factorial series up to 3:
1 2 6
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git commit -m "assignment c
ompleted"
[main 3352274] assignment completed
 2 files changed, 29 insertions(+), 1 deletion(-)
 create mode 100644 src/q19.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

Sonam (now) Ln 29, Col 2

Q20. Write a function named calculateGCD that takes two integers as input and returns their greatest common divisor (GCD).

src > C q20.c > main()

```c
// Write a function named calculateGCD that takes two integers as input and returns their greatest common divisor (GCD).
#include <stdio.h>

int calculateGCD(int a, int b) {
    if (a < 0) a = -a;
    if (b < 0) b = -b;

    while (b != 0) {
        int temp = b;
        b = a % b;
        a = temp;
    }
    return a;
}

int main() {
    int num1, num2;

    printf("Enter two integers: ");
    if (scanf("%d %d", &num1, &num2) != 2) {
        printf("Invalid input.\n");
        return 1;
    }

    printf("Enter two integers: ");
    if (scanf("%d %d", &num1, &num2) != 2) {
        printf("Invalid input.\n");
        return 1;
    }

    int gcd = calculateGCD(num1, num2);
    printf("GCD of %d and %d is %d\n", num1, num2, gcd);

    return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
Enter two integers: 12
cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q20.c -o q
20 } ; if ($?) { .\q20 }
Invalid input.
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git commit -m "assignment c
ompleted"
[main df3c8aa] assignment completed
 2 files changed, 29 insertions(+), 1 deletion(-)
 create mode 100644 src/q20.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

Sonam (59 seconds ago) Ln 30, Col 2

Q21. Write a recursive function named calculate Factorial that takes an integer n as input and returns its factorial.

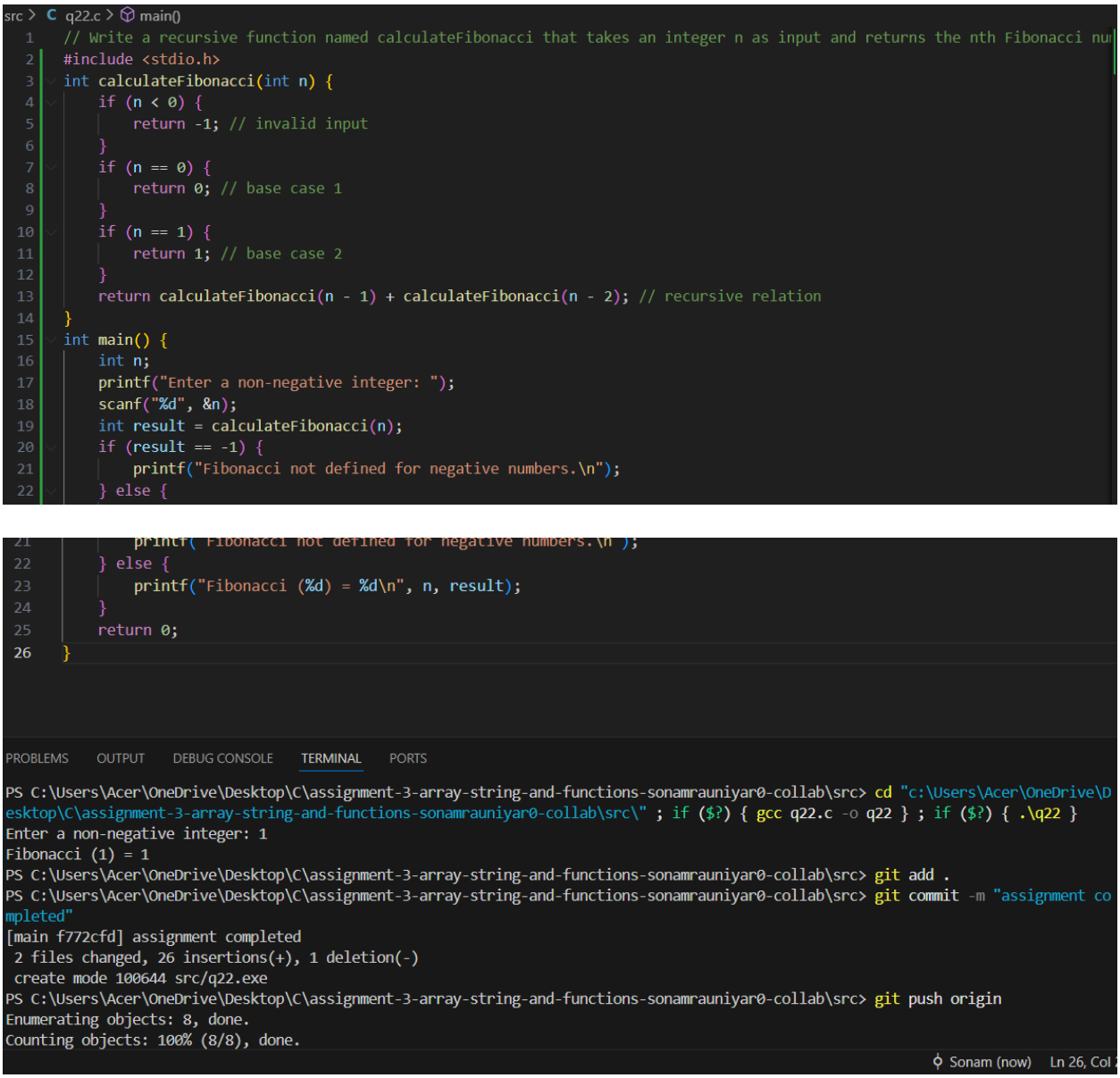
src > C q21.c > ...

```c
// Write a recursive function named calculateFactorial that takes an integer n as input and returns its factorial.
#include <stdio.h>
int calculateFactorial(int n) {
    if (n < 0) {
        return -1;
    }
    if (n == 0 || n == 1) {
        return 1;
    }
    return n * calculateFactorial(n - 1);
}
int main() {
    int n;
    printf("Enter a non-negative integer: ");
    scanf("%d", &n);
    int result = calculateFactorial(n);
    if (result == -1) {
        printf("Factorial of negative numbers is not defined.\n");
    } else {
        printf("Factorial of %d = %d\n", n, result);
    }
    return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q21.c -o q21 } ; if ($?) { .\q21 }
Enter a non-negative integer: 3
Factorial of 3 = 6
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git commit -m "assignment completed"
[main 04393a2] assignment completed
 3 files changed, 29 insertions(+), 1 deletion(-)
 create mode 100644 src/q21.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 10, done.
Counting objects: 100% (10/10), done.
```

Q22. Write a recursive function named calculate Fibonacci that takes an integer n as input and returns the nth Fibonacci number. The Fibonacci sequence starts with 0 and 1, and each subsequent number is the sum of the two preceding numbers.



```c
// Write a recursive function named calculateFibonacci that takes an integer n as input and returns the nth Fibonacci nu
#include <stdio.h>
int calculateFibonacci(int n) {
    if (n < 0) {
        return -1; // invalid input
    }
    if (n == 0) {
        return 0; // base case 1
    }
    if (n == 1) {
        return 1; // base case 2
    }
    return calculateFibonacci(n - 1) + calculateFibonacci(n - 2); // recursive relation
}
int main() {
    int n;
    printf("Enter a non-negative integer: ");
    scanf("%d", &n);
    int result = calculateFibonacci(n);
    if (result == -1) {
        printf("Fibonacci not defined for negative numbers.\n");
    } else {
        printf("Fibonacci (%d) = %d\n", n, result);
    }
    return 0;
}
```

```
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q22.c -o q22 } ; if ($?) { .\q22 }
Enter a non-negative integer: 1
Fibonacci (1) = 1
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git commit -m "assignment completed"
[main f772cfd] assignment completed
 2 files changed, 26 insertions(+), 1 deletion(-)
 create mode 100644 src/q22.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

Q23. Write a recursive function named calculateGCD that takes two integers a and b as input and returns their greatest common divisor (GCD).

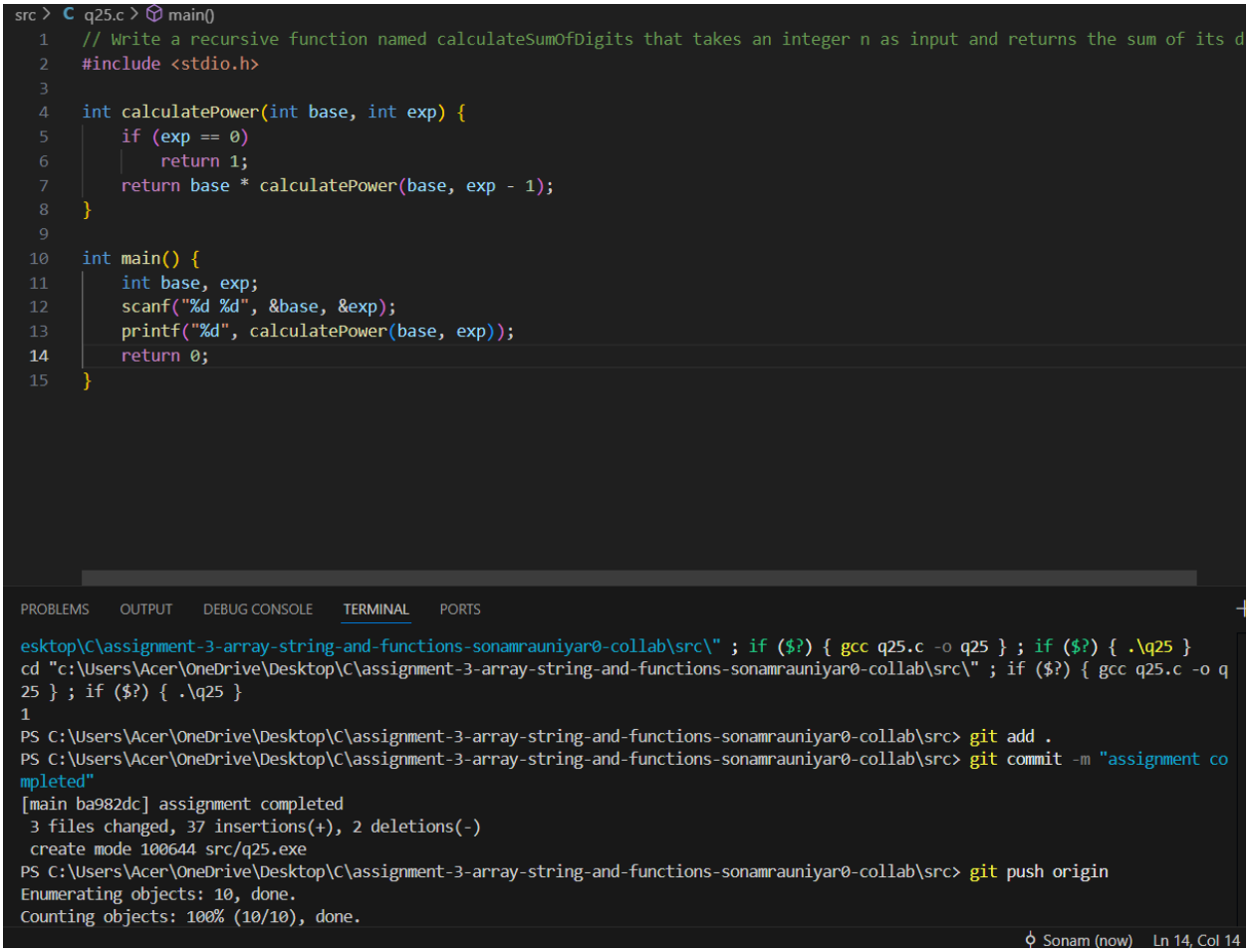
src > C q23.c > main()

```c
// Write a recursive function named calculateGCD that takes two integers a and b as input and returns their greatest co
#include <stdio.h>

int calculateGCD(int a, int b) {
    if (b == 0) {
        return a;
    }
    return calculateGCD(b, a % b);
}
int main() {
    int a, b;
    printf("Enter two integers: ");
    scanf("%d %d", &a, &b);
    int gcd = calculateGCD(a, b);
    printf("GCD of %d and %d is %d\n", a, b, gcd);
    return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
Enter two integers: 23
cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q23.c -o q
23 } ; if ($?) { .\q23 }
GCD of 23 and 8924768 is 1
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git commit -m "assignment co
mpleted"
[main 8a22493] assignment completed
 2 files changed, 17 insertions(+), 1 deletion(-)
 create mode 100644 src/q23.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

Q24. Write a recursive function named calculate Power that takes two integers base and exponent as input and returns the result of raising the base to the exponent.



```
src > C q25.c > main()
1  // Write a recursive function named calculateSumOfDigits that takes an integer n as input and returns the sum of its d
2  #include <stdio.h>
3
4  int calculatePower(int base, int exp) {
5      if (exp == 0)
6          return 1;
7      return base * calculatePower(base, exp - 1);
8  }
9
10 int main() {
11     int base, exp;
12     scanf("%d %d", &base, &exp);
13     printf("%d", calculatePower(base, exp));
14     return 0;
15 }
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

esktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q25.c -o q25 } ; if ($?) { .\q25 }
cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q25.c -o q
25 } ; if ($?) { .\q25 }
1
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git commit -m "assignment co
mpleted"
[main ba982dc] assignment completed
 3 files changed, 37 insertions(+), 2 deletions(-)
 create mode 100644 src/q25.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 10, done.
Counting objects: 100% (10/10), done.
```

Q25. Write a recursive function named calculateSumOfDigits that takes an integer n as input and returns the sum of its digits.

src > C q26.c > reverseString(char [], int)

```c
// Write a recursive function named reverseString that takes a string as input and returns the reversed string.
#include <stdio.h>

void reverseString(char str[], int index) {
    if (str[index] == '\0')
        return;
    reverseString(str, index + 1);
    putchar(str[index]);
}

int main() {
    char str[100];

    printf("Enter a string: ");
    scanf("%s", str);

    reverseString(str, 0);
    return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q26.c -o q26 } ; if ($?) { .\q26 }
Enter a string: 2
2
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git commit -m "assignment completed"
[main 01e76a6] assignment completed
 2 files changed, 19 insertions(+), 1 deletion(-)
 create mode 100644 src/q26.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

Sonam (now) Ln 5, Col 31

Q26. Write a recursive function named reverse String that takes a string as input and returns the reversed string.

src > C q26.c > reverseString(char [], int)

```c
// Write a recursive function named reverseString that takes a string as input and returns the reversed string.
#include <stdio.h>

void reverseString(char str[], int index) {
    if (str[index] == '\0')
        return;
    reverseString(str, index + 1);
    putchar(str[index]);
}

int main() {
    char str[100];

    printf("Enter a string: ");
    scanf("%s", str);

    reverseString(str, 0);
    return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q26.c -o q26 } ; if ($?) { .\q26 }
Enter a string: 2
2
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git commit -m "assignment completed"
[main 01e76a6] assignment completed
 2 files changed, 19 insertions(+), 1 deletion(-)
 create mode 100644 src/q26.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

Q27. Write a recursive function named print Triangle that takes an integer n as input and prints a triangle of asterisks (*) with n rows.

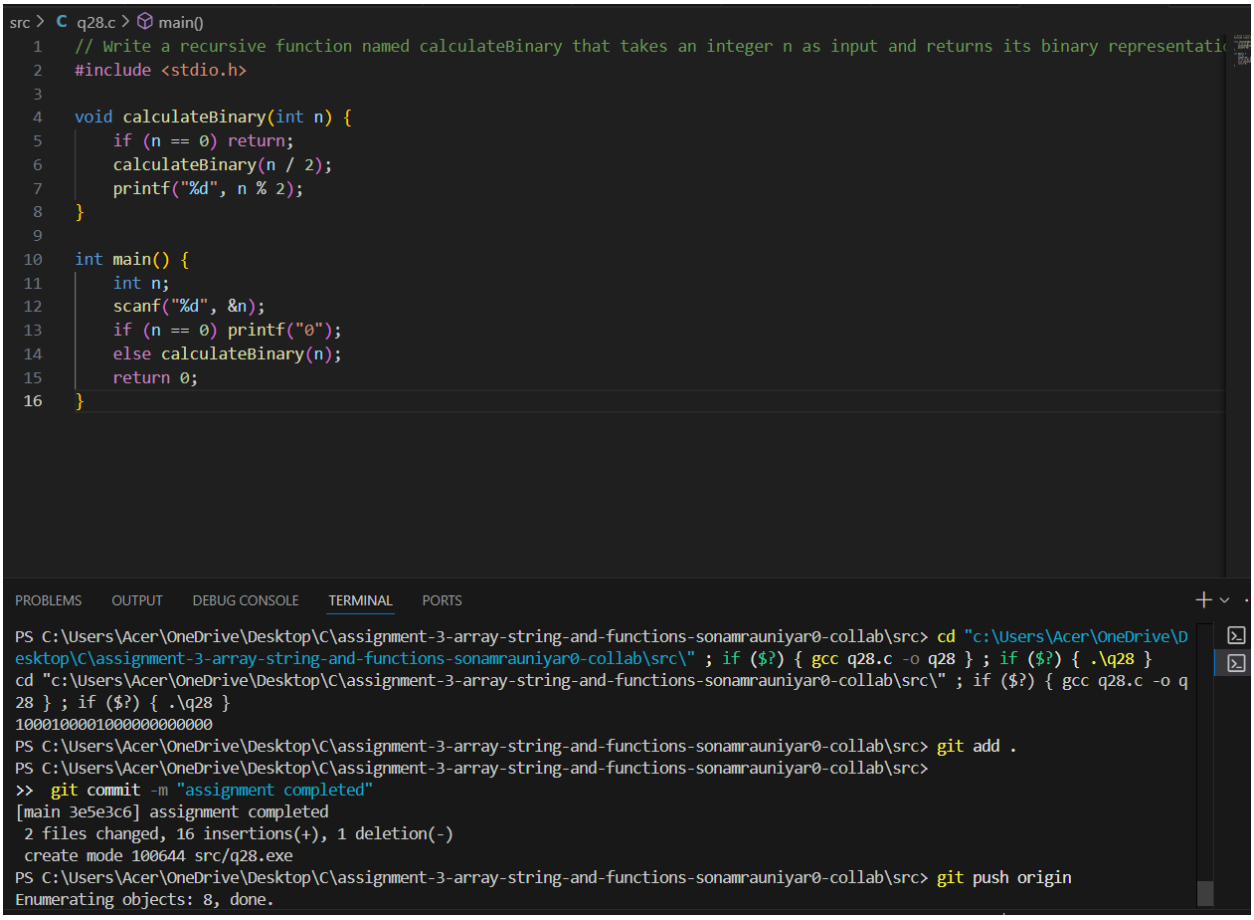
src > C q27.c > main()

```c
#include <stdio.h>

void printTriangle(int n) {
    if (n == 0) return;

    printTriangle(n - 1);

    for(int i = 0; i < n; i++)
        printf("*");
    printf("\n");
}

int main() {
    int n;
    scanf("%d", &n);
    printTriangle(n);
    return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q27.c -o q27 } ; if ($?) { .\q27 }
cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q27.c -o q27 } ; if ($?) { .\q27 }
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git commit -m "assignment completed"
[main 41460b4] assignment completed
 2 files changed, 19 insertions(+), 1 deletion(-)
 create mode 100644 src/q27.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

Q28. Write a recursive function named calculate Binary that takes an integer n as input and returns its binary representation as a string.



```
src > C q28.c > main()
1  // Write a recursive function named calculateBinary that takes an integer n as input and returns its binary representati
2  #include <stdio.h>
3
4  void calculateBinary(int n) {
5      if (n == 0) return;
6      calculateBinary(n / 2);
7      printf("%d", n % 2);
8  }
9
10 int main() {
11     int n;
12     scanf("%d", &n);
13     if (n == 0) printf("0");
14     else calculateBinary(n);
15     return 0;
16 }
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> cd "c:\Users\Acer\OneDrive\D
esktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q28.c -o q28 } ; if ($?) { .\q28 }
cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q28.c -o q
28 } ; if ($?) { .\q28 }
10001000010000000000
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>
>>  git commit -m "assignment completed"
[main 3e5e3c6] assignment completed
 2 files changed, 16 insertions(+), 1 deletion(-)
 create mode 100644 src/q28.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
```

Q30. Write a recursive function named count Occurrences that takes a string and a character as input and returns the number of times the character appears in the string.

src > C q29.c > main()

```c
#include <stdio.h>

int isPalindrome(char str[], int start, int end) {
    if (start >= end) return 1;
    if (str[start] != str[end]) return 0;
    return isPalindrome(str, start + 1, end - 1);
}

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

    if (isPalindrome(str, 0, strlen(str) - 1))
        printf("Palindrome\n");
    else
        printf("Not a palindrome\n");

    return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> cd "c:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q29.c -o q29 } ; if ($?) { .\q29 }
Enter a string: 3
Palindrome
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git commit -m "assignment completed"
[main 5a9dcb6] assignment completed
 2 files changed, 22 insertions(+), 1 deletion(-)
 create mode 100644 src/q29.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

Sonam (now) Ln 22, Col 2

Q30. Write a recursive function named count Occurrences that takes a string and a character as input and returns the number of times the character appears in the string.

src > C q30.c > main()

```c
//  Write a recursive function named countOccurrences that takes a string and a character as input and returns the numbe
#include <stdio.h>

int countOccurrences(char str[], char ch, int index) {
    if (str[index] == '\0') return 0;
    if (str[index] == ch)
        return 1 + countOccurrences(str, ch, index + 1);
    else
        return countOccurrences(str, ch, index + 1);
}

int main() {
    char str[100], ch;

    printf("Enter a string: ");
    scanf("%s", str);

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

    int count = countOccurrences(str, ch, 0);

    int count = countOccurrences(str, ch, 0);

    printf("'%c' occurs %d times in \"%s\".\n", ch, count, str);
    return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
esktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src\" ; if ($?) { gcc q30.c -o q30 } ; if ($?) { .\q30 }
Enter a string: 2
Enter a character to count: 3
'3' occurs 0 times in "2".
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git add .
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src>  git commit -m "assignment c
ompleted"
[main 3bd8774] assignment completed
 2 files changed, 25 insertions(+), 1 deletion(-)
 create mode 100644 src/q30.exe
PS C:\Users\Acer\OneDrive\Desktop\C\assignment-3-array-string-and-functions-sonamrauniyar0-collab\src> git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

Sonam (now) Ln 25, Col 2