

FUNCTIONS

1. Write a C program to find a cube of any number using a function.

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

```
int cube(int num)
```

```
{
```

```
return (num*num*num);
```

```
}
```

```
int main()
```

```
{
```

```
int n,res;
```

```
printf("\n Enter a number to find its cube : ");
```

```
scanf("%d",&n);
```

```
res=cube(n);
```

```
printf("\n Cube of %d is %d ",n,res);
```

```
return 0;
```

```
}
```

File Edit Selection View Go Run Terminal Help CubeFunc.c - Visual Studio Code

C: > Users > Arshiya > Desktop > C > CubeFunc.c > main()

```
1 #include<stdio.h>
2 int cube(int num)
3 {
4     return (num*num*num);
5 }
6 int main()
7 {
8     int n,res;
9     printf("\n Enter a number to find its cube : ");
10    scanf("%d",&n);
11    res=cube(n);
12    printf("\n Cube of %d is %d ",n,res);
13 }
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

PS C:\Users\Arshiya> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc tempCodeRunnerFile.c -o temp

Enter a number to find its cube : 5

Cube of 5 is 125

PS C:\Users\Arshiya\Desktop\C>

2. Write a C program to find the diameter, circumference, and area of a circle using functions.

```
#include<stdio.h>

float diameter(float rad)
{
    return 2*rad;
}

float circumference(float rad)
{
    return 2*3.14*rad;
}

float area(float rad)
{
    return 3.14*rad*rad;
}

int main()
{
```



```

float rad,dia,cir,ar;
printf("\n Enter the radius of circle : ");
scanf("%f",&rad);
dia=diameter(rad);
cir=circumference(rad);
ar=area(rad);
printf("\n Diameter of circle : %f",dia);
printf("\n Circumference of circle : %f",cir);
printf("\n Area of circle : %f",ar);
return 0;
}

```

The screenshot shows a Visual Studio Code interface with the following details:

- File Bar:** File, Edit, Selection, View, Go, Run, Terminal, Help. The title bar says "Circle.c - Visual Studio Code".
- Left Sidebar:** Icons for File Explorer, Search, Problems, and others.
- Central Area:** Shows the code editor with "Circle.c" open. The cursor is at line 26, which contains a closing brace "}".
- Bottom Navigation:** PROBLEMS, OUTPUT, TERMINAL (underlined), DEBUG CONSOLE.
- Terminal:**

```

PS C:\Users\Arshiya> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc tempCodeRunnerFile.c -o temp
Enter a number to find its cube : 5
Cube of 5 is 125
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc tempCodeRunnerFile
nnerFile }

Enter the radius of circle : 4
Diameter of circle : 8.000000
Circumference of circle : 25.120001
Area of circle : 50.240002
PS C:\Users\Arshiya\Desktop\C>

```
- Bottom Status Bar:** Shows icons for weather (26°), search, file operations, and other tools.

3. Write a C program to find the maximum and minimum between two numbers using functions.

```

#include<stdio.h>

int maxmin(int a,int b)
{
    int amax=0;

```

```
if(a>b)
{
amax=1;
}
else
{
amax=0;
}
return amax;
}

int main()
{
int a,b,res;
printf("\n Enter num 1 : ");
scanf("%d",&a);
printf("\n Enter num 2 : ");
scanf("%d",&b);
res=maxmin(a,b);
if(res==0)
{
printf("\n Maximum : %d and Minimum : %d",b,a);
}
else
{
printf("\n Maximum : %d and Minimum : %d",a,b);
}
return 0;
}
```

The screenshot shows a Visual Studio Code interface. The top menu bar includes File, Edit, Selection, View, Go, Run, Terminal, and Help. The title bar indicates the file is MaxMinFunc.c - Visual Studio Code. The left sidebar has icons for file operations like Open, Save, Find, and Run. The main editor window displays a C program named MaxMinFunc.c. The code defines a function maxmin that takes two integers a and b, initializes a variable amax to 0, and then compares a and b to set amax to 1 if a is greater than b, or 0 if b is greater than or equal to a. Below the editor are tabs for PROBLEMS, OUTPUT, TERMINAL, and DEBUG CONSOLE. The TERMINAL tab is active, showing command-line output for running the program and entering two numbers (56 and 9) to get the maximum and minimum values (56 and 9). The status bar at the bottom shows weather (20°C Cloudy), search, and other system icons.

```
1 #include<stdio.h>
2 int maxmin(int a,int b)
3 {
4     int amax=0;
5     if(a>b)
6     {
7         amax=1;
8     }
9     else
10    {
11        amax=0;
12    }
13 }
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

```
PS C:\Users\Arshiya> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc MaxMinFunc.c -o MaxMinFunc }

Enter num 1 : 56

Enter num 2 : 9

Maximum : 56 and Minimum : 9
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc MaxMinFunc.c -o Ma

Enter num 1 : 67

Enter num 2 : 32

Maximum : 67 and Minimum : 32
PS C:\Users\Arshiya\Desktop\C> 
```

4. Write a C program to check whether a number is even or odd using functions.

```
#include<stdio.h>

int oddeven(int n)

{
int flag=0;
if(n%2==0)
{
flag=1;
}
else
{
flag=0;
}
return flag;
}

int main()
```

```

{
int n,res;

printf("\n Enter a number :");

scanf("%d",&n);

res=oddeven(n);

if(res==0)

{

printf("\n %d is Odd",n);

}

else

{

printf("\n %d is Even",n);

}

return 0;
}

```

OddEvenFunc.c - Visual Studio Code

C: > Users > Arshya > Desktop > C > C OddEvenFunc.c > main()

30 }

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

PS C:\Users\Arshya\Desktop\C> cd "c:\Users\Arshya\Desktop\C\" ; if (\$?) { gcc MaxMinFunc.c -o MaxMinFunc

Enter num 1 : 67

Enter num 2 : 32

Maximum : 67 and Minimum : 32

PS C:\Users\Arshya\Desktop\C> cd "c:\Users\Arshya\Desktop\C\" ; if (\$?) { gcc OddEvenFunc.c -o OddEvenFunc

Enter a number : 23

23 is Odd

PS C:\Users\Arshya\Desktop\C> cd "c:\Users\Arshya\Desktop\C\" ; if (\$?) { gcc OddEvenFunc.c -o OddEvenFunc

Enter a number : 16

16 is Even

PS C:\Users\Arshya\Desktop\C>

X ⚡ 0 ⚡ 0

20°

Search

File Edit Selection View Go Run Terminal Help

```
#include<stdio.h>

int isPrime(int n)
{
    int i,isprime=0;
    if(n==0 || n==1)
    {
        printf("\n Neither prime nor composite!");
    }
    else
    {
        for(i=1;i<=n/2;i++)
        {
            if(n%i==0)
            {
                isprime=1;
            }
        }
        else
        {
            isprime=0;
        }
    }
    return isprime;
}

int isArmstrong(int n)
{
    int ld=0,pow=0,sum=0;
    int num=n;
    int isarmstrong=0;
    while(num!=0)
    {
        ld=num%10;
        pow=ld*ld*ld;
        sum+=pow;
        num/=10;
    }
    if(sum==n)
    {
        isarmstrong=1;
    }
    else
    {
        isarmstrong=0;
    }
    return isarmstrong;
}

int isPerfect(int n)
```

```
{  
int i,sum=0;  
  
int isperfect=0;  
  
for(i=1;i<=n/2;i++)  
{  
if(n%i==0)  
{  
sum+=i;  
}  
}  
  
if(sum==n)  
{  
isperfect=1;  
}  
else  
{  
isperfect=0;  
}  
return isperfect;  
}  
  
int main()  
{  
int n;  
  
int checkprime,checkarmstrong,checkperfect;  
printf("\n Enter a number : ");  
scanf("%d",&n);  
checkprime=isPrime(n);  
if(checkprime==0)  
{  
printf("\n %d is prime",n);  
}  
else if(checkprime==1)  
{  
printf("\n %d is not prime",n);  
}  
  
checkarmstrong=isArmstrong(n);  
if(checkarmstrong==1)  
{  
printf("\n %d is an armstrong number",n);  
}  
else if(checkarmstrong==0)  
{  
printf("\n %d is not an armstrong number",n);  
}  
  
checkperfect=isPerfect(n);  
if(checkperfect==1)  
{
```

```

printf("\n %d is a perfect number",n);
}

else if(checkperfect==0)
{
    printf("\n %d is not a perfect number",n);
}

return 0;
}

```

The screenshot shows the Visual Studio Code interface with the following details:

- File Bar:** File, Edit, Selection, View, Go, Run, Terminal, Help. The current file is "CheckPAP.c - Visual Studio Code".
- Left Sidebar:** Icons for Q2.c, Q3.c, Q4.c, SStudPer.c, Q1.c, and CheckPAP.c (highlighted).
- Terminal:**
 - Path: C: > Users > Arshiya > Desktop > C > CheckPAP.c > main()
 - Line 102: A brace expansion indicator { }.
 - Output from the terminal:
 - PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc OddEvenFunc.c -o OddEvenFunc
 - Enter a number : 23
 - 23 is Odd
 - PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc OddEvenFunc.c -o OddEvenFunc
 - Enter a number : 16
 - 16 is Even
 - PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc CheckPAP.c -o CheckPAP
 - Enter a number : 153
 - 153 is prime
 - 153 is an armstrong number
 - 153 is not a perfect number
 - PS C:\Users\Arshiya\Desktop\C>
- Bottom Bar:** Icons for weather (20°), Start button, Search, Task View, File Explorer, Git, PowerShell, Taskbar, and others.

6. Write a C program to find all prime numbers between given intervals using functions.

```

#include<stdio.h>

int checkPrime(int n)
{
    int j, flag=1;
    for(j=2;j<=n/2;j++)
    {
        if(n%j==0)

```

```
{  
flag=0;  
  
break;  
}  
  
}  
  
return flag;  
}  
  
int main()  
{  
  
int n1,n2,i,flag;  
  
printf("\n Enter num 1 : ");  
  
scanf("%d",&n1);  
  
printf("\n Enter num 2 : ");  
  
scanf("%d",&n2);  
  
if(n1>n2)  
{  
  
n1=n1+n2;  
  
n2=n1-n2;  
  
n1=n1-n2;  
}  
  
printf("\n Prime numbers between %d and %d are :",n1,n2);  
  
for(i=n1;i<=n2;i++)  
{  
  
flag=checkPrime(i);  
  
if(flag==1)  
{  
  
printf("%d ",i);  
}  
}  
  
return 0;  
}
```

The screenshot shows a Visual Studio Code interface with the following details:

- File Bar:** File, Edit, Selection, View, Go, Run, Terminal, Help.
- Title Bar:** CheckPrimeInterval.c - Visual Studio Code.
- Left Sidebar:** Icons for Copy, Paste, Find, Replace, Go To, Open, Save, and others.
- Terminal:** Shows a command-line session:
 - Path: C: > Users > Arshiya > Desktop > C > CheckPrimeInterval.c > main()
 - Line 38: }
 - Input: Enter num 2 : 19
 - Output: Prime numbers between 12 and 19 are : 13 17 19
 - Input: PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc tempCodeRunnerFile
 - Input: nnerFile }
 - Input: Enter num 1 : 9
 - Input: Enter num 2 : 19
 - Output: Prime numbers between 9 and 19 are : 11 13 17 19
 - Input: PS C:\Users\Arshiya\Desktop\C>
- Bottom Status Bar:** Shows weather (28°C, Partly sunny), search bar, and various icons for file operations, Git, and extensions.

7. Write a C program to print all Armstrong numbers between given intervals using functions.

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

float checkArmstrong(int num)
{
int rem, n=0,t;
float sum = 0.0;
t=num;
while(t)
{
    t=t/10;
    n++;
}
while(num)
{
rem=num%10;
```

```
sum=sum+pow(rem,n);

num=num/10;

}

return(sum);

}

int main()

{

int i,s,e,t;

printf("\n Enter start value of range : ");

scanf("%d",&s);

printf("\n Enter end value of range : ");

scanf("%d",&e);

if(s>e)

{

t=s;

s=e;

e=t;

}

printf("\n Armstrong numbers between %d and %d are \n ",s,e);

for(i=s;i<=e;i++)

{

if(i==checkArmstrong(i))

{

printf("%d is an Armstrong number \n",i);

}

}

return 0;

}
```

File Edit Selection View Go Run Terminal Help CheckArmstrong.c - Visual Studio Code

C: > Users > Arshiya > Desktop > C > C CheckArmstrong.c > checkArmstrong(int)

```
20 }
21 int main()
22 {
23     int i,s,e,t;
24     printf("\n Enter start value of range : ");
25     scanf("%d",&s);
26     printf("\n Enter end value of range : ");
27     scanf("%d",&e);
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Armstrong numbers between 100 and 500 are
153 is an Armstrong number
370 is an Armstrong number
371 is an Armstrong number
407 is an Armstrong number

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc CheckArmstrong.c -

Enter start value of range : 25

Enter end value of range : 100

Armstrong numbers between 25 and 100 are

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc CheckArmstrong.c -

Enter start value of range : 150

Enter end value of range : 300

Armstrong numbers between 150 and 300 are
153 is an Armstrong number

PS C:\Users\Arshiya\Desktop\C>

X ⚡ 0 ⚡ 0

1 Breaking news

8. Write a C program to print all perfect numbers between given intervals using functions.

```
#include<stdio.h>

int isPerfect(int n)

{
    int i,sum;
    sum=0;
    for(i=1;i<n;i++)
    {
        if(n%i==0)
        {
            sum+=i;
        }
    }
    if(sum==n)
    {
        return 1;
    }
}
```

```
{  
else  
return 0;  
}  
  
void printPerfect(int s, int e)  
{  
while(s<=e)  
{  
if(isPerfect(s))  
{  
printf("%d ",s);  
}  
s++;  
}  
}  
  
int main()  
{  
int s,e;  
printf("\n Enter start limit : ");  
scanf("%d",&s);  
printf("\n Enter end limit : ");  
scanf("%d",&e);  
printf("\n All perfect numbers between %d and %d are : ",s,e);  
printPerfect(s,e);  
return 0;  
}
```

File Edit Selection View Go Run Terminal Help PerfectInterval.c - Visual Studio Code

Q2.c Q3.c Q4.c SSudPer.c Q1.c CheckArmstrong.c

```
C: > Users > Arshiya > Desktop > C > PerfectInterval.c > printPerfect(int, int)
1 #include<stdio.h>
2 int isPerfect(int n)
3 {
4     int i,sum;
5     sum=0;
6     for(i=1;i<n;i++)
7     {
8         if(n%i==0)
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

```
Enter start value of range : 150
Enter end value of range : 300
Armstrong numbers between 150 and 300 are
153 is an Armstrong number
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc PerfectInterval.c }
Enter start limit : 5
Enter end limit : 19
All perfect numbers between 5 and 19 are : 6
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc PerfectInterval.c }
Enter start limit : 5
Enter end limit : 50
All perfect numbers between 5 and 50 are : 6 28
PS C:\Users\Arshiya\Desktop\C>
```

Outer Ring Road... Construction

9. Write a program in C to check whether two given strings are an anagram.

```
#include<stdio.h>

int checkAnagram(char str1[], char str2[])
{
int n1[26]={0}, n2[26]={0}, i=0;
while(str1[i]!='\0')
{
n1[str1[i]-'a']++;
i++;
}
i=0;
while(str2[i]!='\0')
{
n2[str2[i]-'a']++;
i++;
}
```

```
for(i=0;i<26;i++)
{
if(n1[i]!=n2[i])
{
return 0;
}
}

return 1;
}

int main()
{
char str1[100],str2[100];
int flag;
printf("\n Enter string 1 : ");
gets(str1);
printf("\n Enter string 2 : ");
gets(str2);
flag=checkAnagram(str1,str2);
if(flag==1)
{
printf("%s and %s are anagrams ",str1,str2);
}
else
{
printf("%s and %s are not anagrams ",str1,str2);
}
return 0;
}
```

The screenshot shows a Visual Studio Code interface. The top menu bar includes File, Edit, Selection, View, Go, Run, Terminal, and Help. The title bar indicates the file is "Anagram.c - Visual Studio Code". The left sidebar has icons for file operations like Open, Save, Find, and Settings. The main editor window displays the following C code:

```
C: > Users > Arshiya > Desktop > C > C Anagram.c > checkAnagram(char [], char [])
1 #include<stdio.h>
2 int checkAnagram(char str1[], char str2[])
3 {
4     int n1[26]={0}, n2[26]={0}, i=0;
5     while(str1[i]!='\0')
6     {
7         n1[str1[i]-'a']++;
8         i++;
9     }
10    i=0;
```

The status bar at the bottom shows tabs for PROBLEMS, OUTPUT, TERMINAL (which is selected), and DEBUG CONSOLE.

The terminal output shows the following:

```
Anagram.c:18:21: error: subscripted value is neither array nor pointer nor vector
18 |     if(n1[i]!=n2[i])
          ^
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc Anagram.c -o Anagr...
Enter string 1 : teacher
Enter string 2 : heather
teacher and heather are not anagrams
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc Anagram.c -o Anagr...
Enter string 1 : study
Enter string 2 : dusty
study and dusty are anagrams
PS C:\Users\Arshiya\Desktop\C> 
```

10. Write a C programming to find out the maximum and minimum of some values using a function which will return an array.

```
# include <stdio.h>
#define max 10
int *maxmin(int ar[], int v);
int main()
{
int arr[max];
int n,i,*p;
printf("Enter size of array:");
scanf("%d",&n);
printf("Input %d values\n", n);
for(i=0;i<n;i++)
scanf("%d",&arr[i]);
p=maxmin(arr,n);
printf("Minimum value is: %d\n",*p++);
printf("Maximum value is: %d\n",*p);
```

```
getch();  
}  
  
int *maxmin(int arra1[], int v)  
{  
    int i;  
  
    static int result_mm[2];  
    result_mm[0]=arra1[0];  
    result_mm[1]=arra1[0];  
    for (i=1;i<v;i++)  
    {  
        if(result_mm[0] > arra1[i])  
            result_mm[0]=arra1[i];  
        if(result_mm[1]< arra1[i])  
            result_mm[1]= arra1[i];  
    }  
    return result_mm;  
}
```

File Edit Selection View Go Run Terminal Help MaxMinArrayret.c - Visual Studio Code

SeriesSum.c BinarytoDecimalfunc.c DecimaltoBinaryfunc.c DecimaltoOctalfunc.c Octalto...
C: > Users > Arshiya > Desktop > C > C MaxMinArrayret.c > ...
20 | IT(result_mm[1]< arra1[i])
29 | result_mm[1]= arra1[i];
30 }
31 return result_mm;
32 }
33 }

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

8
76
Minimum value is: 3
Maximum value is: 76
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc MaxMinArrayret.c --
MaxMinArrayret.c: In function 'main':
MaxMinArrayret.c:16:2: warning: implicit declaration of function 'getch'; did you mean 'getc'? [-Wimplicit-function-declaration]
16 | getch();
| ^~~~~~
| getc
Enter size of array: 10
Input 10 values
1
23
45
32
7
89
9
89
5
4
Minimum value is: 1
Maximum value is: 89
PS C:\Users\Arshiya\Desktop\C>

7

11. Convert a binary number to an octal and vice versa using functions.

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

void decimaltooctal(int n){
int i=0;
int octalnum[32];//(0to31) //? what's should be good choice of array here.
while(n!=0){
octalnum[i]=n%8;
n = n/8;
i++;
}
printf("Octal number is: ");
for(int j=(i-1);j>=0;j--){
printf("%d", octalnum[j]);
}
}
```

```

int main(){
    int n;
    printf("Enter the binary number:");
    scanf("%d", &n);
    int i=0;int ans = 0;
    while(n!=0){
        int digit = n%10;
        ans = pow(2,i)*digit + ans; //formula.
        n =n/10;
        i++;
    }
    decimaltooctal(ans);
    return 0;
}

```

BinarytoOctalfunc.c - Visual Studio Code

B.cpp UserDefString.cpp Bank.cpp 11.cpp KilosPound.cpp MinMaxArray.c

C: > Users > Arshya > Desktop > C > C BinarytoOctalfunc.c > main()

```

28
29     while(n!=0){
30         int digit = n%10;
31         ans = pow(2,i)*digit + ans; //formula.
32         n =n/10;
33         i++;
34     }
35
36     decimaltoctal(ans);
37
38     return 0;
39 }
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

36 | decimaltoctal(and);
 | ^~~
 | ans

BinarytoOctalfunc.c:36:20: note: each undeclared identifier is reported only once for each function
PS C:\Users\Arshya\Desktop\C> cd "c:\Users\Arshya\Desktop\C\" ; if (\$?) { gcc BinarytoOctalfunc.
lfunc }
Enter the binary number:101
Octal number is: 5
PS C:\Users\Arshya\Desktop\C> cd "c:\Users\Arshya\Desktop\C\" ; if (\$?) { gcc BinarytoOctalfunc.
lfunc }
Enter the binary number:1001
Octal number is: 11
PS C:\Users\Arshya\Desktop\C> cd "c:\Users\Arshya\Desktop\C\" ; if (\$?) { gcc BinarytoOctalfunc.
lfunc }
Enter the binary number:10001
Octal number is: 21
PS C:\Users\Arshya\Desktop\C>

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27° Search ⌂ 🎙 📁 ⚡ Ps ⚡ ⚡ ⚡ ⚡ ⚡ ⚡

```
#include <stdio.h>

long long convert(int oct);

int main() {
    int oct;
    printf("Enter an octal number: ");
    scanf("%d", &oct);
    printf("%d in octal = %lld in binary", oct, convert(oct));
    return 0;
}

long long convert(int oct) {
    int dec = 0, i = 0;
    long long bin = 0;
    // converting octal to decimal
    while (oct != 0) {
        dec += (oct % 10) * pow(8, i);
        ++i;
        oct /= 10;
    }
    i = 1;
    // converting decimal to binary
    while (dec != 0) {
        bin += (dec % 2) * i;
        dec /= 2;
        i *= 10;
    }
    return bin;
}
```

The screenshot shows a Visual Studio Code interface. The top menu bar includes File, Edit, Selection, View, Go, Run, Terminal, and Help. The title bar indicates the file is OctaltoBinaryfunc.c - Visual Studio Code. The left sidebar has icons for file types (cpp, hpp, py, etc.) and other development tools. The main editor area displays the following C code:

```
20     oct /= 10;
21 }
22 i = 1;
23
24 // converting decimal to binary
25 while (dec != 0) {
26     bin += (dec % 2) * i;
27     dec /= 2;
28     i *= 10;
29 }
30 return bin;
31 }
```

The terminal below shows the execution of the program:

```
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc BinarytoOctalfunc.
1func }
Enter the binary number:101
Octal number is: 5
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc BinarytoOctalfunc.
1func }
Enter the binary number:1001
Octal number is: 11
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc BinarytoOctalfunc.
1func }
Enter the binary number:10001
Octal number is: 21
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc OctaltoBinaryfunc.
yfunc }
Enter an octal number: 21
21 in octal = 10001 in binary
PS C:\Users\Arshiya\Desktop\C>
```

The status bar at the bottom shows a weather icon (27°), a search bar, and various system icons.

12. Convert a binary number to a decimal and vice versa using functions.

```
#include <stdio.h>
#include <math.h>
// function prototype
int convert(long long);
int main() {
long long n;
printf("Enter a binary number: ");
scanf("%lld", &n);
printf("%lld in binary = %d in decimal", n, convert(n));
return 0;
}
// function definition
int convert(long long n) {
int dec = 0, i = 0, rem;
```

```

rem = n % 10;
n /= 10;
dec += rem * pow(2, i);
++i;
}
return dec;
}

```

BinarytoDecimalfunc.c - Visual Studio Code

OctaltoBinaryfunc.c SeriesSum.c BinarytoDecimalfunc.c

C: > Users > Arshiya > Desktop > C > BinarytoDecimalfunc.c > ...

```

16     int convert(long long n) {
17         int dec = 0, i = 0, rem;
18
19         while (n!=0) {
20             rem = n % 10;
21             n /= 10;
22             dec += rem * pow(2, i);
23             ++i;
24         }
25
26         return dec;
27     }
28

```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

SeriesSum.c: At top level:

SeriesSum.c:30:1: error: expected identifier or '(' before numeric constant
30 | 5; i++) {I;
| ^

SeriesSum.c:30:5: error: expected '=', ',', ';', 'asm' or '__attribute__' before '++' token
30 | 5; i++) {I;
| ^~

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc BinarytoDecimalfunc
Decimalfunc }

Enter a binary number: 10101
10101 in binary = 21 in decimal

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc BinarytoDecimalfunc
Decimalfunc }

Enter a binary number: 110
110 in binary = 6 in decimal

PS C:\Users\Arshiya\Desktop\C>

27°

Search

File Edit Selection View Go Run Terminal Help

```

#include<stdio.h>

long toBin(int);

int main()
{
long bno;
int dno;

printf("\n\n Function : convert decimal to binary :\n");
printf("-----\n");
printf(" Input any decimal number : ");

```

```
scanf("%d",&dno);
bno = toBin(dno);
printf("\n The Binary value is : %ld\n\n",bno);
return 0;
}

long toBin(int dno)
{
long bno=0,remainder,f=1;
while(dno != 0)
{
remainder = dno % 2;
bno = bno + remainder * f;
f= f* 10;
dno = dno / 2;
}
return bno;
}
```

The screenshot shows the Visual Studio Code interface with the following details:

- File Menu:** File, Edit, Selection, View, Go, Run, Terminal, Help.
- Title Bar:** DecimaltoBinaryfunc.c - Visual Studio Code
- Left Sidebar:** Icons for File, Find, Replace, Go To, Open, Save, and others.
- Code Editor:** Displays the file `DecimaltoBinaryfunc.c` with the following code:

```
C: > Users > Arshiya > Desktop > C > C DecimaltoBinaryfunc.c > toBin(int)
1 #include<stdio.h>
2
3 long toBin(int);
4
5 int main()
6 {
7     long bno;
8     int dno;
9     printf("\n\n Function : convert decimal to binary :\n");
10    printf("-----\n");
11    printf(" Input any decimal number : ");
12    scanf("%d",&dno);
13    bno = toBin(dno);
```
- Bottom Navigation:** PROBLEMS, OUTPUT, TERMINAL (underlined), DEBUG CONSOLE.
- Terminal Output:**

```
Function : convert decimal to binary :
-----
Input any decimal number : 101
The Binary value is : 1100101
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc DecimaltoBinaryfunc.oBinaryfunc }
```



```
Function : convert decimal to binary :
-----
Input any decimal number : 12
The Binary value is : 1100
PS C:\Users\Arshiya\Desktop\C>
```
- Bottom Status Bar:** Shows icons for weather (27°), search, file, video, folder, back, forward, PowerShell, Docker, Taskbar, and others.

13. Convert an octal Number to a decimal and vice versa using functions.

```
#include <stdio.h>
#include <math.h>
// function prototype
int convertDecimalToOctal(int decimalNumber);

int main() {
int decimalNumber;
printf("Enter a decimal number: ");
scanf("%d", &decimalNumber);
printf("%d in decimal = %d in octal", decimalNumber, convertDecimalToOctal(decimalNumber));
return 0;
}

// function to convert decimalNumber to octal
int convertDecimalToOctal(int decimalNumber) {
int octalNumber = 0, i = 1;
while (decimalNumber != 0) {
```

```
octalNumber += (decimalNumber % 8) * i;
decimalNumber /= 8;
i *= 10;
}
return octalNumber;
}
```

The screenshot shows the Visual Studio Code interface with a dark theme. On the left is a sidebar with various icons for file operations like copy, paste, search, and refresh. The main area displays a C file named `DecimaltoOctalfunc.c`. The code implements a function to convert a decimal number to octal. The terminal below shows the execution of the program and its output.

```
File Edit Selection View Go Run Terminal Help DecimaltoOctalfunc.c - Visual Studio Code

OctaltoBinaryfunc.c SeriesSum.c BinarytoDecimalfunc.c DecimaltoBinaryfunc.c Decimal

C: > Users > Arshiya > Desktop > C > C DecimaltoOctalfunc.c > convertDecimalToOctal(int)

18
19 // function to convert decimalNumber to octal
20 int convertDecimalToOctal(int decimalNumber) {
21     int octalNumber = 0, i = 1;
22
23     while (decimalNumber != 0) {
24         octalNumber += (decimalNumber % 8) * i;
25         decimalNumber /= 8;
26         i *= 10;
27     }
28
29     return octalNumber;
30 }
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

```
The Binary value is : 1100101

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc DecimaltoBinaryfunc.oBinaryfunc }

Function : convert decimal to binary :
-----
Input any decimal number : 12

The Binary value is : 1100

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc DecimaltoOctalfunc.ctalfunc }

Enter a decimal number: 12
12 in decimal = 14 in octal
PS C:\Users\Arshiya\Desktop\C>
```

X ⚡ 0 ⚡ 0

27° Search

```
#include <stdio.h>
#include <math.h>
// function prototype
long long convertOctalToDecimal(int octalNumber);
int main() {
int octalNumber;
printf("Enter an octal number: ");
scanf("%d", &octalNumber);
printf("%d in octal = %lld in decimal", octalNumber, convertOctalToDecimal(octalNumber));
return 0;
}
```

```

// function to convert octalNumber to decimal

long long convertOctalToDecimal(int octalNumber) {

int decimalNumber = 0, i = 0;

while(octalNumber != 0) {

decimalNumber += (octalNumber%10) * pow(8,i);

++i;

octalNumber/=10;

}

i = 1;

return decimalNumber;

}

```

OctaltoDecimalfunc.c - Visual Studio Code

C: > Users > Arshiya > Desktop > C > OctaltoDecimalfunc.c > ...

```

21     int decimalNumber = 0, i = 0;
22
23     while(octalNumber != 0) {
24         decimalNumber += (octalNumber%10) * pow(8,i);
25         ++i;
26         octalNumber/=10;
27     }
28
29     i = 1;
30
31     return decimalNumber;
32 }
33

```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Function : convert decimal to binary :

Input any decimal number : 12

The Binary value is : 1100

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc DecimaltoOctalfunc
ctalfunc }

Enter a decimal number: 12

12 in decimal = 14 in octal

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc OctaltoDecimalfunc
imalfunc }

Enter an octal number: 14

14 in octal = 12 in decimal

PS C:\Users\Arshiya\Desktop\C>

27° Search File Explorer Task View PowerShell Docker Taskbar Icons Start Task View

14. Write a program in C to find the sum of the series $1!/1+2!/2+3!/3+4!/4+5!/5$ using the function.

```
#include <stdio.h>

int factorial(int n) {
```

```

int i, f = 1;
for (i = 1; i <= n; i++) {
    f = f * i;
}
return f;
}

int main() {
    int i;
    float sum = 0;
    for (i = 1; i <= 5; i++) {
        sum = sum + (float)factorial(i) / i;
    }
    printf("Sum of the series = %f", sum);
    return 0;
}

```

Q14.c - Visual Studio Code

OctaltoBinaryfunc.c SeriesSum.c BinarytoDecimalfunc.c DecimaltoBinaryfunc.c DecimaltoC

C: > Users > Arshiy > Downloads > C Q14.c > ...

```

1 //Write a program in C to find the sum of the series 1!/1+2!/2+3!/3+4!/4+5!/5 using the
2
3 #include <stdio.h>
4
5
6 int factorial(int n) {

```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Function : convert decimal to binary :

Input any decimal number : 12

The Binary value is : 1100

PS C:\Users\Arshiy\Desktop\C> cd "c:\Users\Arshiy\Desktop\C\" ; if (\$?) { gcc DecimaltoOctalfunc
ctalfunc }
Enter a decimal number: 12
12 in decimal = 14 in octal
PS C:\Users\Arshiy\Desktop\C> cd "c:\Users\Arshiy\Desktop\C\" ; if (\$?) { gcc OctaltoDecimalfunc
imalfunc }
Enter an octal number: 14
14 in octal = 12 in decimal
PS C:\Users\Arshiy\Desktop\C> cd "c:\Users\Arshiy\Downloads\" ; if (\$?) { gcc Q14.c -o Q14 } ; i
Sum of the series = 34.000000
PS C:\Users\Arshiy\Downloads> cd "c:\Users\Arshiy\Downloads\" ; if (\$?) { gcc Q14.c -o Q14 } ; i
Sum of the series = 34.000000
PS C:\Users\Arshiy\Downloads>

X ⑧ 0 ▲ 0

27° Search

```
#include<stdio.h>

int power(int b, int e)
{
    if(e==0)
        return 1;
    else if(e>0)
        return b*power(b,e-1);
    else
        return 1/power(b,-e);
}

int main()
{
    int b,p,e;
    printf("\n Enter base : ");
    scanf("%d",&b);
    printf("\n Enter exponent : ");
    scanf("%d",&e);
    p=power(b,e);
    printf("\n %d ^ %d = %d",b,e,p);
    return 0;
}
```

The screenshot shows a Visual Studio Code interface with the following details:

- File Menu:** File, Edit, Selection, View, Go, Run, Terminal, Help.
- Title Bar:** PowerRec.c - Visual Studio Code.
- Left Sidebar:** Icons for File, Find, Replace, Go To, Open, Save, and others.
- Top Status Bar:** Shows tabs for Q2.c, Q3.c, Q4.c, SSstudPer.c, Q1.c, and PowerRec.c (highlighted).
- Code Editor:** Displays a C program for calculating powers using recursion.
- Terminal:** Shows command-line interactions for generating perfect numbers, calculating series sums, and running the PowerRec.c program.
- Bottom Status Bar:** Shows weather (28°C, Partly sunny), search, file, video, folder, settings, and other system icons.

16. Write a C program to print all natural numbers between 1 to n using recursion.

```
#include<stdio.h>

void printNum(int n)
{
    if(n>1)
        printNum(n-1);
    printf("%d ",n);
}

int main()
{
    int n;
    printf("\nEnter range till which you want the numbers to be printed : ");
    scanf("%d",&n);
    printf("\n Natural numbers from 1 to %d are : ",n);
    printNum(n);
    return 0;
}
```



Q2.c

Q3.c

Q4.c

SSstudPer.c

Q1.c

PowerRec.c

C: > Users > Arshiya > Desktop > C > PrintNumRec.c > main()

```
1 #include<stdio.h>
2 void printNum(int n)
3 {
4     if(n>1)
5         printNum(n-1);
6     printf("%d ",n);
7 }
8 int main()
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Sum of series 1!/1 + 2!/2 + 3!/3 + 4!/4 + 5!/5 : 0.000000

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc sumSeriesFact.c -o PowerRec

Sum of series 1!/1 + 2!/2 + 3!/3 + 4!/4 + 5!/5 : 0.000000

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc PowerRec.c -o PowerRec

Enter base : 4

Enter exponent : 3

4 ^ 3 = 64

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc PrintNumRec.c -o PrintNumRec

Enter range till which you want the numbers to be printed : 45

Natural numbers from 1 to 45 are : 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
42 43 44 45

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc PrintNumRec.c -o PrintNumRec

Enter range till which you want the numbers to be printed : 14

Natural numbers from 1 to 14 are : 1 2 3 4 5 6 7 8 9 10 11 12 13 14

PS C:\Users\Arshiya\Desktop\C>

X ⊗ 0 △ 0

1 28°C
Partly sunny



Search



17. Write a C program to print all even or odd numbers in a given range using recursion.

```
#include<stdio.h>

void printEvenOdd(int s,int e)
{
if(s>e)
{
return;
}
printf("%d ",s);
printEvenOdd(s+2,e);
}

int main()
{
int s,e;
printf("\nEnter start of range : ");
```

```

scanf("%d",&s);
printf("\n Enter end of range : ");
scanf("%d",&e);
printf("\n Even/Odd numbers between %d and %d are - ",s,e);
printEvenOdd(s,e);

return 0;
}

```

```

File Edit Selection View Go Run Terminal Help PrintEvenOddRec.c - Visual Studio Code

Q2.c Q3.c Q4.c SSstudPer.c Q1.c PowerRec.c X

C: > Users > Arshiya > Desktop > C > PrintEvenOddRec.c > main()
21 }

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Enter exponent : 3
4 ^ 3 = 64
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc PrintNumRec.c -o P
Enter range till which you want the numbers to be printed : 45
Natural numbers from 1 to 45 are : 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
42 43 44 45
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc PrintNumRec.c -o P
Enter range till which you want the numbers to be printed : 14
Natural numbers from 1 to 14 are : 1 2 3 4 5 6 7 8 9 10 11 12 13 14
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc tempCodeRunnerFile
nnerFile }

Enter start of range : 5
Enter end of range : 30
Even/Odd numbers between 5 and 30 are - 5 7 9 11 13 15 17 19 21 23 25 27 29
PS C:\Users\Arshiya\Desktop\C> 

```

Breaking news 0 0

Search

File Edit Selection View Go Run Terminal Help PrintEvenOddRec.c - Visual Studio Code

18. Write a C program to find the sum of all natural numbers between 1 to n using recursion.

```

#include<stdio.h>

int sumnum(int n)
{
if(n!=0)
return n+sumnum(n-1);
else
return n;
}

```

```

int main()
{
    int n;
    printf("\n Enter a number : ");
    scanf("%d",&n);
    printf("\n Sum from 1 to %d = %d ",n,sumnum(n));
    return 0;
}

```

SumNumRec.c - Visual Studio Code

C: > Users > Arshiya > Desktop > C > C SumNumRec.c > main()

16 }

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Natural numbers from 1 to 45 are : 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
42 43 44 45

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc PrintNumRec.c -o P

Enter range till which you want the numbers to be printed : 14

Natural numbers from 1 to 14 are : 1 2 3 4 5 6 7 8 9 10 11 12 13 14

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc tempCodeRunnerFile

nEnterFile }

Enter start of range : 5

Enter end of range : 30

Even/Odd numbers between 5 and 30 are - 5 7 9 11 13 15 17 19 21 23 25 27 29

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc tempCodeRunnerFile

nnerFile }

Enter a number : 9

Sum from 1 to 9 = 45

PS C:\Users\Arshiya\Desktop\C>

X ⊗ 0 △ 0

27°C Haze

Search

File Edit Selection View Go Run Terminal Help

19. Write a C program to find the sum of all even or odd numbers in a given range using

recursion.

```
#include<stdio.h>

int evenoddSum(int s, int e)
{
    if(s>e)
        return 0;
    else

```

```

return (s+evenoddSum(s+2,e));
}

int main()
{
int s,e,sum;
printf("\n Enter lower limit : ");
scanf("%d",&s);
printf("\n Enter upper limit : ");
scanf("%d",&e);
printf("\n Sum of even or odd numbers between %d and %d is %d ",s,e,evenoddSum(s,e));
return 0;
}

```

RevNumRec.c - Visual Studio Code

C: > Users > Arshiya > Desktop > C > RevNumRec.c > main()

26 }

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Even/Odd numbers between 5 and 30 are - 5 7 9 11 13 15 17 19 21 23 25 27 29

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc tempCodeRunnerFile }

Enter a number : 9

Sum from 1 to 9 = 45

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc tempCodeRunnerFile }

Enter lower limit : 3

Enter upper limit : 10

Sum of even or odd numbers between 3 and 10 is 24

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc tempCodeRunnerFile }

Enter any number : 8742

Reverse of 8742 is 2478

PS C:\Users\Arshiya\Desktop\C>

X ⚡ 0 ⚡ 0

27°C Haze

Search

File Edit Selection View Go Run Terminal Help

20. Write a C program to find the reverse of any number using recursion.

```
#include<stdio.h>

int rem,sum=0;

int rev(int n)
```

```
{  
if(n)  
{  
rem=n%10;  
sum=sum*10+rem;  
rev(n/10);  
}  
else  
{  
return 0;  
}  
return sum;  
}  
int main()  
{  
int n,revn;  
printf("\n Enter any number : ");  
scanf("%d",&n);  
revn=rev(n);  
printf("\n Reverse of %d is %d ",n,revn);  
return 0;  
}
```

The screenshot shows a Visual Studio Code interface with the following details:

- Top Bar:** File, Edit, Selection, View, Go, Run, Terminal, Help, RevNumRec.c - Visual Studio Code
- Left Sidebar:** Icons for File, Edit, Selection, View, Go, Run, Terminal, Help, and a search bar.
- File Explorer:** Shows files: SSstudPer.c, Q1.c, PowerRec.c, PrintNumRec.c, PrintEvenOddRec.c, and Sum.
- Terminal:** Displays a command-line session:
 - Path: C: > Users > Arshiya > Desktop > C > RevNumRec.c > main()
 - Line 26: }
 - Output:

```
Even/Odd numbers between 5 and 30 are - 5 7 9 11 13 15 17 19 21 23 25 27 29
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc tempCodeRunnerFile
nnerFile }

Enter a number : 9

Sum from 1 to 9 = 45
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc tempCodeRunnerFile
nnerFile }

Enter lower limit : 3

Enter upper limit : 10

Sum of even or odd numbers between 3 and 10 is 24
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc tempCodeRunnerFile
nnerFile }

Enter any number : 8742

Reverse of 8742 is 2478
PS C:\Users\Arshiya\Desktop\C>
```
 - Status Bar: Shows 0 errors, 0 warnings, and 0 info messages.
 - System Icons: Weather (27°C, Haze), Taskbar icons (Search, File Explorer, Task View, PowerShell, Docker, GitHub, Microsoft Edge, File Explorer, Microsoft Store, AI Assistant).

21. Write a C program to reverse a sentence using recursion.

```
#include<stdio.h>

void reverse()
{
char c;
scanf("%c",&c);
if(c!="\n")
{
reverse();
printf("%c",c);
}
}

int main()
{
printf("\n Enter a sentence : ");
reverse();
}
```

```
return 0;
}
```

```
File Edit Selection View Go Run Terminal Help
PalindromeRec.c - Visual Studio Code

Q2.c RevSentenceRec.c PalindromeRec.c X

C: > Users > Arshiya > Desktop > C > PalindromeRec.c > main()

1 #include<stdio.h>
2 int reverse(int n,int rev)
3 {
4     if(n==0)
5     {
6         return rev;
7     }
8     rev*=10;

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Reverse of 8742 is 2478
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc tempCodeRunnerFile
nnerFile }

Enter any number : 56

Reverse of 56 is 65
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc RevSentenceRec.c -o

Enter a sentence : Hello there !
! erehth olleH
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc PalindromeRec.c -o

Enter a number to check if it is palindrome : 343

343 is palindrome!
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc PalindromeRec.c -o

Enter a number to check if it is palindrome : 596

596 is not palindrome!
PS C:\Users\Arshiya\Desktop\C> 
```

22. Write a C program to check whether a number is a palindrome or not using recursion.

```
#include<stdio.h>

int reverse(int n,int rev)

{
if(n==0)
{
return rev;
}

rev*=10;

rev+=(n%10);

n=n/10;

return reverse(n,rev);
}

int main()
```

```

int n;

printf("\n Enter a number to check if it is palindrome :");

scanf("%d",&n);

int rev=reverse(n,0);

if(n==rev)

{

printf("\n %d is palindrome!",n);

}

else

{

printf("\n %d is not palindrome!",n);

}

return 0;
}

```

File Edit Selection View Go Run Terminal Help PalindromeRec.c - Visual Studio Code

Q2.c RevSentenceRec.c PalindromeRec.c X

C: > Users > Arshiya > Desktop > C > PalindromeRec.c > main()

```

1 #include<stdio.h>
2 int reverse(int n,int rev)
3 {
4     if(n==0)
5     {
6         return rev;
7     }
8     rev*=10;

```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Reverse of 8742 is 2478
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc tempCodeRunnerFile & .\tempCodeRunnerFile }

Enter any number : 56

Reverse of 56 is 65
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc RevSentenceRec.c & .\RevSentenceRec }

Enter a sentence : Hello there !
! ereht olleH
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc PalindromeRec.c & .\PalindromeRec }

Enter a number to check if it is palindrome : 343

343 is palindrome!
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc PalindromeRec.c & .\PalindromeRec }

Enter a number to check if it is palindrome : 596

596 is not palindrome!
PS C:\Users\Arshiya\Desktop\C>

27°C Haze Search

x ⊗ 0 △ 0

1 27°C Haze Search

Search

File Edit Selection View Go Run Terminal Help PalindromeRec.c - Visual Studio Code

Q2.c RevSentenceRec.c PalindromeRec.c X

C: > Users > Arshiya > Desktop > C > PalindromeRec.c > main()

```

1 #include<stdio.h>
2 int reverse(int n,int rev)
3 {
4     if(n==0)
5     {
6         return rev;
7     }
8     rev*=10;

```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Reverse of 8742 is 2478
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc tempCodeRunnerFile & .\tempCodeRunnerFile }

Enter any number : 56

Reverse of 56 is 65
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc RevSentenceRec.c & .\RevSentenceRec }

Enter a sentence : Hello there !
! ereht olleH
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc PalindromeRec.c & .\PalindromeRec }

Enter a number to check if it is palindrome : 343

343 is palindrome!
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc PalindromeRec.c & .\PalindromeRec }

Enter a number to check if it is palindrome : 596

596 is not palindrome!
PS C:\Users\Arshiya\Desktop\C>

x ⊗ 0 △ 0

27°C Haze Search

```
#include<stdio.h>
int sumdig(int n)
{
if(n==0)
return 0;
return ((n%10)+sumdig(n/10));
}
int main()
{
int n,sum;
printf("\nEnter a number : ");
scanf("%d",&n);
sum=sumdig(n);
printf("\n Sum of digits of %d is %d ",n,sum);
return 0;
}
```

SumDigRec.c - Visual Studio Code

C: > Users > Arshiya > Desktop > C > SumDigRec.c > main()

16 }

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

343 is palindrome!

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc PalindromeRec.c -o PalindromeRec

Enter a number to check if it is palindrome : 596

596 is not palindrome!

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc SumDigRec.c -o SumDigRec

Enter a number : 9034

Sum of digits of 9034 is 16

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc FactRec.c -o FactRec

Enter a number [>=0] : 5

Factorial of 5 is 120

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc NFiboRec.c -o NFiboRec

Enter a number to find nth fibonacci term : 8

Fibonacci term : 21

PS C:\Users\Arshiya\Desktop\C>

< X ⊗ 0 ⚠ 0

1 27°C Haze

Search

File Edit Selection View Go Run Terminal Help

24. Write a C program to find factorial of any number using recursion.

```
#include<stdio.h>

int fact(int n)
{
    if(n>=1)
        return n*fact(n-1);
    else
        return 1;
}

int main()
{
    int n;
    printf("\n Enter a number [>=0] : ");
    scanf("%d",&n);
    printf("\n Factorial of %d is %d ",n,fact(n));
    return 0;
}
```

File Edit Selection View Go Run Terminal Help SumDigRec.c - Visual Studio Code

Q2.c RevSentenceRec.c PalindromeRec.c SumDigRec.c FactRec.c N

C: > Users > Arshiya > Desktop > C > C SumDigRec.c > main()

16 }

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

343 is palindrome!

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc PalindromeRec.c -o PalindromeRec

Enter a number to check if it is palindrome : 596

596 is not palindrome!

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc SumDigRec.c -o SumDigRec

Enter a number : 9034

Sum of digits of 9034 is 16

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc FactRec.c -o FactRec

Enter a number [>=0] : 5

Factorial of 5 is 120

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc NFiboRec.c -o NFiboRec

Enter a number to find nth fibonacci term : 8

Fibonacci term : 21

PS C:\Users\Arshiya\Desktop\C>

X ⚡ 0 ⚠ 0

1 27°C Haze

Search

File Edit Selection View Go Run Terminal Help SumDigRec.c - Visual Studio Code

Q2.c RevSentenceRec.c PalindromeRec.c SumDigRec.c FactRec.c N

C: > Users > Arshiya > Desktop > C > C SumDigRec.c > main()

16 }

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

343 is palindrome!

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc PalindromeRec.c -o PalindromeRec

Enter a number to check if it is palindrome : 596

596 is not palindrome!

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc SumDigRec.c -o SumDigRec

Enter a number : 9034

Sum of digits of 9034 is 16

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc FactRec.c -o FactRec

Enter a number [>=0] : 5

Factorial of 5 is 120

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc NFiboRec.c -o NFiboRec

Enter a number to find nth fibonacci term : 8

Fibonacci term : 21

PS C:\Users\Arshiya\Desktop\C>

X ⚡ 0 ⚠ 0

1 27°C Haze

Search

25. Write a C program to generate nth Fibonacci term using recursion.

```
#include<stdio.h>

int fibo(int n)
{
if(n==0)
{
return 0;
}
else if(n==1)
{
return 1;
}
else
{
return fibo(n-1)+fibo(n-2);
}
```

```

int main()
{
    int n,result;
    printf("\n Enter a number to find nth fibonacci term : ");
    scanf("%d",&n);
    result=fibo(n);
    printf("\n Fibonacci term : %d ",result);
    return 0;
}

```

The screenshot shows the Visual Studio Code interface with several tabs open at the top: Q2.c, RevSentenceRec.c, PalindromeRec.c, SumDigRec.c (active), FactRec.c, and N... Below the tabs, the file path is displayed as C: > Users > Arshiya > Desktop > C > SumDigRec.c > main(). The terminal tab is active, showing the following command-line session:

```

343 is palindrome!
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc PalindromeRec.c -o PalindromeRec
Enter a number to check if it is palindrome : 596
596 is not palindrome!
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc SumDigRec.c -o SumDigRec
Enter a number : 9034
Sum of digits of 9034 is 16
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc FactRec.c -o FactRec
Enter a number [>=0] : 5
Factorial of 5 is 120
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc NFiboRec.c -o NFiboRec
Enter a number to find nth fibonacci term : 8
Fibonacci term : 21
PS C:\Users\Arshiya\Desktop\C>

```

The status bar at the bottom shows weather information (27°C, Haze), a search bar, and several icons for extensions or services.

26. Write a C program to find GCD (HCF) of two numbers using recursion.

```

#include<stdio.h>
int gcd(int a, int b)
{
    if(b==0)
        return a;
}

```

```

else
return gcd(b,a%b);
}

int main()
{
int n1,n2,hcf;
printf("\n Enter num 1 :");
scanf("%d",&n1);
printf("\n Enter num 2 :");
scanf("%d",&n2);
hcf=gcd(n1,n2);
printf("\n GCD of %d and %d is %d ",n1,n2,hcf);
return 0;
}

```

The screenshot shows the Visual Studio Code interface with the following details:

- File Bar:** File, Edit, Selection, View, Go, Run, Terminal, Help.
- Title Bar:** HCFRec.c - Visual Studio Code
- Left Sidebar:** Includes icons for file operations (New, Open, Save, Find, Replace, Go To, Copy, Paste, Delete), a search icon, a refresh icon, a refresh icon with a gear, a refresh icon with a play button, a refresh icon with a square, and a refresh icon with a gear.
- Tab Bar:** Q2.c, NFiboRec.c, HCFRec.c (highlighted), LCMRec.c.
- Status Bar:** C: > Users > Arshiya > Desktop > C > HCFRec.c > main()
- Terminal:**

```

Enter a number to find nth fibonacci term : 8
Fibonacci term : 21
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc HCFRec.c -o HCFRec
Enter num 1 : 15
Enter num 2 : 3
GCD of 15 and 3 is 3
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc LCMRec.c -o LCMRec
Enter num 1 : 3
Enter num 2 : 15
LCM of 3 and 15 found recursively is 15
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc PrintArrayRec.c -o Print
PrintArrayRec.c: In function 'printArray':
PrintArrayRec.c:8:9: error: too few arguments to function 'printf'
     8 |         printf()
          |         ^
In file included from PrintArrayRec.c:1:

```
- Bottom Status Bar:** Shows weather (28°C, Haze), system icons (Windows Start, Search, Task View, File Explorer, Task Manager, PowerShell, Docker, Microsoft Edge, Taskbar icons).

27. Write a C program to find LCM of two numbers using recursion.

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

```
int lcm(int a, int b)
{
    static int c=1;
    if(c%a==0 && c%b==0)
    {
        return c;
    }
    c++;
    lcm(a,b);
}
int main()
{
    int a,b,result;
    printf("\n Enter num 1 : ");
    scanf("%d",&a);
    printf("\n Enter num 2 : ");
    scanf("%d",&b);
    result=lcm(a,b);
    printf("\n LCM of %d and %d found recursively is %d ",a,b,result);
    return 0;
}
```



```
printArray(arr, 0, N);
return 0;
}

void printArray(int arr[], int start, int len)
{
if(start >= len)
return;
printf("%d, ", arr[start]);
printArray(arr, start + 1, len);
}
```

File Edit Selection View Go Run Terminal Help DispArrayRec.c - Visual Studio Code

Diagram.c DMDB.cpp UserDefString.cpp Bank.cpp 11.cpp KilosPound.cpp

C: > Users > Arshiya > Desktop > C > DispArrayRec.c > ...

23 }
24
25 void printArray(int arr[], int start, int len)
26 {
27
28 if(start >= len)
29 return;
30
31
32 printf("%d, ", arr[start]);
33 printArray(arr, start + 1, len);
34 }
35

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Enter 5 elements in array: 12
3
45
23
1
Minimum element in array = 1
Maximum element in array = 45
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc DispArrayRec.c -o DispArrayRec

Enter size of the array: 6
Enter elements in the array: 12
3
4
56
7
89
Elements in the array: 12, 3, 4, 56, 7, 89,
PS C:\Users\Arshiya\Desktop\C>

23° Search File Explorer GitHub Project Home MATLAB Google Sheets

29. Write a C program to find sum of elements of array using recursion.

```
#include<stdio.h>

int findarrSum(int arr[], int n)
{
if(n<=0)
{
```

```
return 0;
}

return (findarrSum(arr,n-1)+arr[n-1]);
}

int main()
{
    int arr[100], n,i;
    printf("\n Enter the size of array : ");
    scanf("%d",&n);
    printf("\n Enter array elements : ");
    for(i=0;i<n;i++)
    {
        printf("\n Enter element arr[%d] : ",i);
        scanf("%d",&arr[i]);
    }
    printf("\n Sum of array : %d",findarrSum(arr,n));
    return 0;
}
```

File Edit Selection View Go Run Terminal Help FindArrSum.c - Visual Studio Code

Q2.c NFiboRec.c LCMRec.c FindArrSum.c X

C: > Users > Arshiya > Desktop > C > FindArrSum.c > main()

23 }

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

```
PrintArrayRec.c:8:9: error: too few arguments to function 'printf'
    8 |         printf();
      |         ^
In file included from PrintArrayRec.c:1:
c:\mingw\include\stdio.h:462:38: note: declared here
  Enter array elements :
  Enter element arr[0] : 2
  Enter element arr[1] : 3
  Enter element arr[2] : 0
  Enter element arr[3] : 5
  Enter element arr[4] : 5
  Enter element arr[5] : 1
  Enter element arr[6] : 0
  Enter element arr[7] : 0
  Enter element arr[8] : 5
  Enter element arr[9] : 2
  Sum of array : 23
PS C:\Users\Arshiya\Desktop\C>
```

X ⚡ 0 ⚡ 0

28°C Haze

Search

File Explorer

Terminal

Output

Problems

FindArrSum.c

30. Write a C program to find maximum and minimum elements in array using recursion.

```
#include <stdio.h>

#define MAX_SIZE 100

int maximum(int array[], int index, int len);
int minimum(int array[], int index, int len);

int main()
{
    int array[MAX_SIZE], N, max, min;
    int i;

    printf("Enter size of the array: ");
    scanf("%d", &N);

    printf("Enter %d elements in array: ", N);
    for(i=0; i<N; i++)
    {
        scanf("%d", &array[i]);
    }
```

```
max = maximum(array, 0, N);
min = minimum(array, 0, N);
printf("Minimum element in array = %d\n", min);
printf("Maximum element in array = %d\n", max);
return 0;
}

int maximum(int array[], int index, int len)
{
    int max;
    if(index >= len-2)
    {
        if(array[index] > array[index + 1])
            return array[index];
        else
            return array[index + 1];
    }
    max = maximum(array, index + 1, len);
    if(array[index] > max)
        return array[index];
    else
        return max;
}

int minimum(int array[], int index, int len)
{
    int min;
    if(index >= len-2)
    {
        if(array[index] < array[index + 1])
            return array[index];
        else
            return array[index + 1];
    }
    min = minimum(array, index + 1, len);
    if(array[index] < min)
        return array[index];
    else
        return min;
}
```

File Edit Selection View Go Run Terminal Help MinMaxArray.c - Visual Studio Code

pLow.c Anagram.c DMDB.cpp UserDefString.cpp Bank.cpp 11.cpp

```
C: > Users > Arshiya > Desktop > C > C MinMaxArray.c > ...
57         return array[index];
58     else
59         return array[index + 1];
60 }
61 min = minimum(array, index + 1, len);
62
63 if(array[index] < min)
64     return array[index];
65 else
66     return min;
67 }
68 
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

```
3> Display books by author.
4> Display no. of books by title.
5> Display total no. of books in library.
6> Issue a book.
7> Exit.

Please select an option from menu : 7
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc MinMaxArray.c -o M
Enter size of the array: 5
Enter 5 elements in array: 12
3
45
23
1
Minimum element in array = 1
Maximum element in array = 45
PS C:\Users\Arshiya\Desktop\C>
```

23° Search

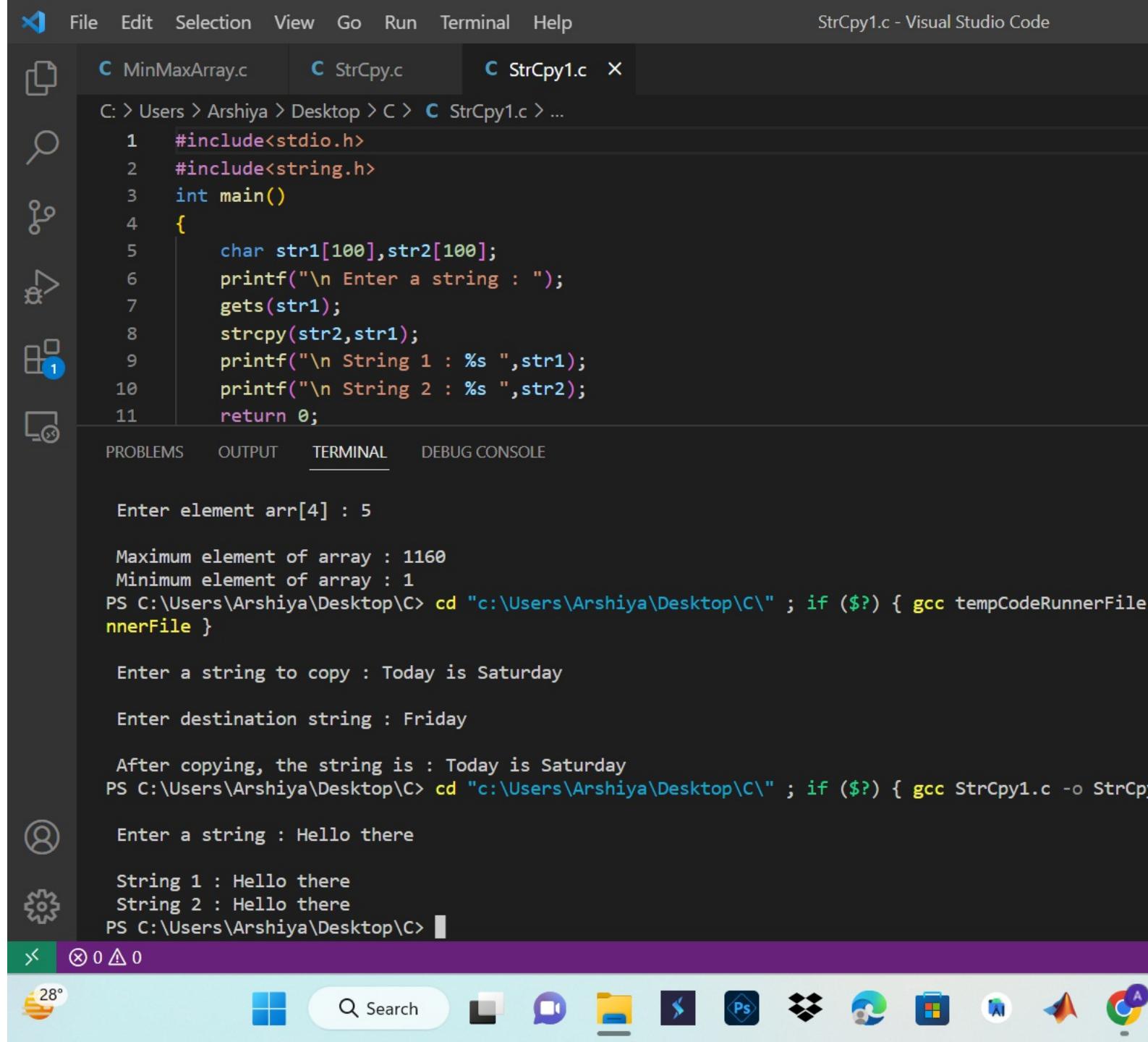
STRINGS

1. String Copy

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

int main()
{
char s1[100],s2[100];
int c=0;
printf("\n Enter a string to copy : ");
gets(s1);
printf("\n Enter destination string : ");
gets(s2);
while(s1[c]!='0')
{
    s2[c]=s1[c];
    c++;
}
```

```
s2[c]='\0';  
  
printf("\n After copying, the string is : %s ",s2);  
  
return 0;  
}
```



The screenshot shows a Visual Studio Code interface with the following details:

- File Explorer:** Shows a folder structure: C: > Users > Arshiya > Desktop > C > StrCopy1.c > ...
- Code Editor:** The active file is StrCopy1.c, containing the following C code:

```
1 #include<stdio.h>  
2 #include<string.h>  
3 int main()  
4 {  
5     char str1[100],str2[100];  
6     printf("\n Enter a string : ");  
7     gets(str1);  
8     strcpy(str2,str1);  
9     printf("\n String 1 : %s ",str1);  
10    printf("\n String 2 : %s ",str2);  
11    return 0;
```
- Terminal:** The terminal output shows the execution of the program:

```
Enter element arr[4] : 5  
  
Maximum element of array : 1160  
Minimum element of array : 1  
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc tempCodeRunnerFile  
nnerFile }  
  
Enter a string to copy : Today is Saturday  
  
Enter destination string : Friday  
  
After copying, the string is : Today is Saturday  
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc StrCopy1.c -o StrCp  
y1  
  
Enter a string : Hello there  
  
String 1 : Hello there  
String 2 : Hello there  
PS C:\Users\Arshiya\Desktop\C>
```
- Bottom Bar:** Includes icons for weather (28°), search, file, video, folder, settings, and others.

```
#include<stdio.h>  
  
#include<string.h>  
  
int main()  
{  
char str1[100],str2[100];  
printf("\n Enter a string : ");  
gets(str1);  
strcpy(str2,str1);  
printf("\n String 1 : %s ",str1);  
printf("\n String 2 : %s ",str2);  
return 0;
```



File Edit Selection View Go Run Terminal Help

StrCpy1.c - Visual Studio Code



C MinMaxArray.c



C StrCpy.c



C StrCpy1.c X



```
C: > Users > Arshiya > Desktop > C > C StrCpy1.c > ...
1 #include<stdio.h>
2 #include<string.h>
3 int main()
4 {
5     char str1[100],str2[100];
6     printf("\n Enter a string : ");
7     gets(str1);
8     strcpy(str2,str1);
9     printf("\n String 1 : %s ",str1);
10    printf("\n String 2 : %s ",str2);
11    return 0;
```



PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Enter element arr[4] : 5

Maximum element of array : 1160

Minimum element of array : 1

```
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc tempCodeRunnerFile
nnerFile }
```

Enter a string to copy : Today is Saturday

Enter destination string : Friday

After copying, the string is : Today is Saturday

```
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc StrCpy1.c -o StrCp
```

Enter a string : Hello there

String 1 : Hello there

String 2 : Hello there

```
PS C:\Users\Arshiya\Desktop\C> █
```

X ⊗ 0 △ 0



Search



2. String Compare

```
#include<stdio.h>
#include<string.h>
int main()
{
char str1[100],str2[100];
int i=0;
printf("\n Enter the first string : ");
gets(str1);
printf("\n Enter the second string : ");
gets(str2);
for(i=0;str1[i]==str2[i] && str1[i]!='\0';i++);
if(str1[i]<str2[i])
{
printf("\n String 1 is less than String 2");
```

```

}
else if(str1[i]>str2[i])
{
    printf("\n String 2 is less than String 1");
}
else
{
    printf("\n String 1 and String 2 are same!");
}
return 0;
}

```

StrCmp.c - Visual Studio Code

File Edit Selection View Go Run Terminal Help

MinMaxArray.c StrCmp.c X StrCmp1.c

C: > Users > Arshiya > Desktop > C > StrCmp.c > main()

25 }

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

```

String 1 : Hello there
String 2 : Hello there
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc tempCodeRunnerFile
nnerFile }

Enter the first string : Hello there

Enter the second string : whats up

String 1 is less than String 2
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc StrCmp1.c -o StrCm

Enter the first string : today is

Enter the second string : Today

Comparison Result : 1
PS C:\Users\Arshiya\Desktop\C> []

```

x ⑧ 0 △ 0

28°  Search          

```

#include<stdio.h>
#include<string.h>
int main()
{
char str1[100],str2[100];

```

```

int i=0,result;
printf("\n Enter the first string : ");
gets(str1);
printf("\n Enter the second string : ");
gets(str2);
result=strcmp(str1,str2);
printf("\n Comparison Result : %d ",result);
return 0;
}

```

The screenshot shows the Visual Studio Code interface with the following details:

- File Bar:** File, Edit, Selection, View, Go, Run, Terminal, Help.
- Title Bar:** StrCmp.c - Visual Studio Code
- Left Sidebar:** Includes icons for file operations (New, Open, Save, Find, Replace, etc.), a search bar, a refresh icon, and a tab bar showing MinMaxArray.c, StrCmp.c (active), and StrCmp1.c.
- Terminal Tab:** Active, showing the command line path: C: > Users > Arshiya > Desktop > C > StrCmp.c > main()
- Terminal Content:**

```

String 1 : Hello there
String 2 : Hello there
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc tempCodeRunnerFile
nnerFile }

Enter the first string : Hello there

Enter the second string : whats up

String 1 is less than String 2
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc StrCmp1.c -o StrCm

Enter the first string : today is

Enter the second string : Today

Comparison Result : 1
PS C:\Users\Arshiya\Desktop\C> 
```
- Bottom Status Bar:** Shows icons for file operations, a search bar, and various extensions like Ps, Git, and others.

3. String Length

```

#include<stdio.h>

int main()
{
char str1[100];
int count=0;
printf("\n Enter string to check length : ");

```

```

gets(str1);

while(str1[count]!='\0')
{
    count++;
}

printf("\n Length of string is : %d ",count);

return 0;
}

```

StrLen1.c - Visual Studio Code

C: > Users > Arshiya > Desktop > C > StrLen1.c > ...

```

1 #include<stdio.h>
2 #include<string.h>
3 int main()
4 {
5     char str1[100];
6     int length;
7     printf("\n Enter string to check length : ");
8     gets(str1);
9     length=strlen(str1);
10    printf("\n Length of string is : %d ",length);
11    return 0;

```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

String 1 is less than String 2
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc StrCmp1.c -o StrCm

Enter the first string : today is

Enter the second string : Today

Comparison Result : 1
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc StrLen.c -o StrLen

Enter string to check length : hello

Length of string is : 5
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc StrLen1.c -o StrLen

Enter string to check length : there

Length of string is : 5
PS C:\Users\Arshiya\Desktop\C>

28°

Search

File Edit Selection View Go Run Terminal Help

```

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

int main()
{
char str1[100];
int length;
printf("\n Enter string to check length : ");
gets(str1);

```

```
length=strlen(str1);

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

return 0;

}
```

The screenshot shows a Visual Studio Code interface with the following details:

- Top Bar:** File, Edit, Selection, View, Go, Run, Terminal, Help.
- Title Bar:** StrLen1.c - Visual Studio Code
- Left Sidebar:** Includes icons for File Explorer, Search, Problems, and others.
- File Explorer:** Shows files: MinMaxArray.c, StrCmp.c, StrCmp1.c, StrLen.c, and StrLen1.c (the active file).
- Code Editor:** Displays the content of StrLen1.c:

```
1 #include<stdio.h>
2 #include<string.h>
3 int main()
4 {
5     char str1[100];
6     int length;
7     printf("\n Enter string to check length : ");
8     gets(str1);
9     length=strlen(str1);
10    printf("\n Length of string is : %d ",length);
11    return 0;
```
- Terminal:** Shows command-line interactions:

```
String 1 is less than String 2
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc StrCmp1.c -o StrCmp1
Enter the first string : today is
Enter the second string : Today
Comparison Result : 1
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc StrLen.c -o StrLen
Enter string to check length : hello
Length of string is : 5
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if ($?) { gcc StrLen1.c -o StrLen1
Enter string to check length : there
Length of string is : 5
PS C:\Users\Arshiya\Desktop\C>
```
- Bottom Status Bar:** Shows file status (0 changes, 0 errors), system temperature (28°), and various system icons.

4. String Concatenate

```
#include<stdio.h>

int main()

{
    char str1[100],str2[100];

    int len,i;

    printf("\n Enter string 1 :");

    gets(str1);

    printf("\n Enter string 2 :");

    gets(str2);

    len=0;

    while(str1[len]!='0')
```

```

len++;
}

for(i=0;str2[i]!='\0';i++,len++)
{
    str1[len]=str2[i];
}

str1[len]='\0';

printf("\n After Concatenation : ");

puts(str1);
}

```

StrCat1.c - Visual Studio Code

C: > Users > Arshiya > Desktop > C > StrCat1.c > ...

```

1 #include<stdio.h>
2 #include<string.h>
3 int main()
4 {
5     char str1[100],str2[100];
6     printf("\n Enter string 1 : ");
7     gets(str1);
8     printf("\n Enter string 2 : ");
9     gets(str2);
10    strcat(str1,str2);
11    printf("\n Concatenated Result is : %s ",str1);

```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Enter string to check length : there

Length of string is : 5

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc StrCat.c -o StrCat }

Enter string 1 : today is

Enter string 2 : a good day

After Concatenation : today is a good day

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc StrCat1.c -o StrCat1 }

Enter string 1 : it is a

Enter string 2 : good day

Concatenated Result is : it is a good day

PS C:\Users\Arshiya\Desktop\C>

28°

Search

File Edit Selection View Go Run Terminal Help

```

#include<stdio.h>
#include<string.h>
int main()
{
char str1[100],str2[100];

```

```

printf("\n Enter string 1 : ");
gets(str1);

printf("\n Enter string 2 : ");
gets(str2);

strcat(str1,str2);

printf("\n Concatenated Result is : %s ",str1);

return 0;
}

```

StrCat1.c - Visual Studio Code

C: > Users > Arshiya > Desktop > C > StrCat1.c > ...

```

1 #include<stdio.h>
2 #include<string.h>
3 int main()
4 {
5     char str1[100],str2[100];
6     printf("\n Enter string 1 : ");
7     gets(str1);
8     printf("\n Enter string 2 : ");
9     gets(str2);
10    strcat(str1,str2);
11    printf("\n Concatenated Result is : %s ",str1);

```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Enter string to check length : there

Length of string is : 5

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc StrCat.c -o StrCat }

Enter string 1 : today is

Enter string 2 : a good day

After Concatenation : today isa good day

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc StrCat1.c -o StrCat1 }

Enter string 1 : it is a

Enter string 2 : good day

Concatenated Result is : it is a good day

PS C:\Users\Arshiya\Desktop\C>

28°  Search            

STRUCTURE

1. Enter the marks of 5 students in Chemistry, Mathematics and Physics (each out of 100) using a

structure named Marks having elements roll no., name, chem_marks, maths_marks and

phy_marks and then display the percentage of each student.

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

```
struct Marks
```

```
{
```

```
int roll_no;
```

```
char name[50];

int chem_marks,maths_marks,phy_marks;

};

int main()

{

struct Marks m[5];

for(int i=0;i<5;i++)

{

printf("\n Student %d ",i+1);

printf("\n Enter roll no. : ");

scanf("%d",&m[i].roll_no);

printf("\n Enter name : ");

scanf("%s",&m[i].name);

printf("\n Enter marks in chemistry : ");

scanf("%d",&m[i].chem_marks);

printf("\n Enter marks in maths : ");

scanf("%d",&m[i].maths_marks);

printf("\n Enter marks in physics : ");

scanf("%d",&m[i].phy_marks);

}

for(int i=0;i<5;i++)

{

printf("\n Student %d ",i+1);

float percentage = (m[i].chem_marks+m[i].maths_marks+m[i].phy_marks)/3;

printf("\n Percentage = %f",percentage);

}

return 0;

}
```



C MinMaxArray.c

C StrCmp.c

C StrCmp1.c

C StrLen.c

C StrLen1.c

C StrCat.c

C: > Users > Arshiya > Desktop > C > C SSstudPer.c > main()

```
1 #include<stdio.h>
2 struct Marks
3 {
4     int roll_no;
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Concatenated Result is : it is a good day

PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C\" ; if (\$?) { gcc SSstudPer.c -o SS

Student 1

Enter roll no. : 1

Enter name : Ankit

Enter marks in chemistry : 23

Enter marks in maths : 45

Enter marks in physics : 66

Student 2

Enter roll no. : 2

Enter name : Harsh

Enter marks in chemistry : 34

Enter marks in maths : 88

Enter marks in physics : 90

Student 3

Enter roll no. : 3

X ⚡ 0 ⚡ 0



Search



File Edit Selection View Go Run Terminal Help SStudPer.c - Visual Studio Code

MinMaxArray.c StrCmp.c StrCmp1.c StrLen.c StrLen1.c StrCat.c

```
C: > Users > Arshiya > Desktop > C > C SStudPer.c > main()
1 #include<stdio.h>
2 struct Marks
3 {
4     int roll no.
5 }
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

```
Student 3
Enter roll no. : 3

Enter name : Saksham

Enter marks in chemistry : 91

Enter marks in maths : 44

Enter marks in physics : 80

Student 4
Enter roll no. : 4

Enter name : Sachin

Enter marks in chemistry : 11

Enter marks in maths : 14

Enter marks in physics : 78

Student 5
Enter roll no. : 5

Enter name : Vaibhav

Enter marks in chemistry : 65
```

28°  Search           

File Edit Selection View Go Run Terminal Help SStudPer.c - Visual Studio Code

MinMaxArray.c StrCmp.c StrCmp1.c StrLen.c StrLen1.c StrCat.c

C: > Users > Arshiya > Desktop > C > SStudPer.c > main()

```
1 #include<stdio.h>
2 struct Marks
3 {
4     int roll_no;
5 }
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Enter marks in chemistry : 11

Enter marks in maths : 14

Enter marks in physics : 78

Student 5

Enter roll no. : 5

Enter name : Vaibhav

Enter marks in chemistry : 65

Enter marks in maths : 45

Enter marks in physics : 80

Student 1

Percentage = 44.000000

Student 2

Percentage = 70.000000

Student 3

Percentage = 71.000000

Student 4

Percentage = 34.000000

Student 5

Percentage = 63.000000

PS C:\Users\Arshiya\Desktop\C>

X ⚡ 0 ⚡ 0

28°  Search         

2. Write a program to add, subtract and multiply two complex numbers using structures to

function.

```
#include<stdio.h>

// Defining Structure :

struct complex{
    float real;
    float img;
};

// Main Function :

int main(){

    struct complex a, b, res , add, sub ;

    printf("Enter the Real and Imaginary part of first complex number :\n");
    scanf("%f%f",&a.real,&a.img);

    printf("Enter the Real and Imaginary part of Second complex number :\n");
    scanf("%f%f",&b.real,&b.img);

    // Addition :
```

```

add.real = a.real+b.real;
add.img = a.img+b.img;
printf("Addition = %0.2f + i %0.2fn",add.real,add.img);
// Subtraction :
sub.real = a.real-b.real;
sub.img = a.img-b.img;
printf("Subtraction = %0.2f + i %0.2fn",sub.real,sub.img);
//Multiplication :
res.real=(a.real*b.real-a.img*b.img);
res.img = (a.real*b.img+a.img*b.real);
printf("Multiplication = %0.2f + i %0.2fn ",res.real,res.img);
return 0;
}

```

File Edit Selection View Go Run Terminal Help Q2.c - Visual Studio Code

C: > Users > Arshiya > Downloads > C: Q2.c > ...

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Enter the Real and Imaginary part of Second complex number :
2
5
Addition = 14.00 + i 8.00
Subtraction = 10.00 + i -2.00
Multiplication = 9.00 + i 66.00

PS C:\Users\Arshiya\Downloads> cd "c:\Users\Arshiya\Downloads\" ; if (\$?) { gcc tempCodeRunnerFile
nnerFile }
Enter the Real and Imaginary part of first complex number :
1
2
Enter the Real and Imaginary part of Second complex number :
3
12
Addition = 4.00 + i 14.00
Subtraction = -2.00 + i -10.00
Multiplication = -21.00 + i 18.00

PS C:\Users\Arshiya\Downloads>

3. Write a structure to store the roll no., name, age (between 11 to 14) and address of students

(more than 10). Store the information of the students.

1 - Write a function to print the names of all the students having age 14.

2 - Write another function to print the names of all the students having even roll no.

3 - Write another function to display the details of the student whose roll no is given (i.e., roll no. entered by the user).

```
#include<stdio.h>

// Defining Structure :

struct Student {
    int roll_no;
    int age;
    char name[30];
    char address[100];
};

// Function to print the names of all the students having age 14.

void checkAge( struct Student student[],int n){
    int i;
    printf("Students whose age is 14\n");
    for(i=0;i<n;i++)
    {
        if(student[i].age==14)
            printf("Name : %s\n",student[i].name);
        printf("-----\n");
    }
}

// Function to print the names of all the students having even roll no.

void checkRoll(struct Student student[],int n){
    int i;
    printf("Students with Even Roll No.\n");
    for(i=0;i<n;i++)
    {
        if(student[i].roll_no%2==0)
            printf("Name : %s\n",student[i].name);
    }
}

//Function to display the details of the student whose roll no is given (i.e. roll no. entered by the user).

void details( struct Student student[], int n){
    printf("Enter Roll No. : \n");
    int roll,i;
    scanf("%d",&roll);
    printf(" Student Details of given roll No:");
    for(i=0;i<n;i++)
    {
        if(student[i].roll_no==roll)
        {
            printf("Roll No. : %d\n",student[i].roll_no);
            printf("Name : %s\n",student[i].name);
            printf("Name : %d\n",student[i].age);
            printf("Name : %s\n",student[i].address);
        }
    }
}
```

```
}
```

// Main Function :

```
int main(){
    int n, i;
    printf("Enter Number of Students : ");
    scanf("%d",&n);
    struct Student student[n];
    for(i=0;i<n;i++){
        printf("Student %d\n",i+1);
        printf("Enter Roll No. :\n");
        scanf("%d",&student[i].roll_no);
        printf("Enter Name of Student :\n");
        scanf("%s",&student[i].name);
        printf("Enter Age of Student :\n");
        scanf("%d",&student[i].age);
        printf("Enter Address of Student :\n ");
        scanf("%s",&student[i].address);
    }
    checkAge(student,n);
    checkRoll(student,n);
    details(student,n);
    return 0;
}
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

```
Enter Number of Students : 5
Student 1
Enter Roll No. :
1
Enter Name of Student :
Sachin
Enter Age of Student :
21
Enter Address of Student :
abc
Student 2
Enter Roll No. :
2
Enter Name of Student :
Vaibhav
Enter Age of Student :
23
Enter Address of Student :
def
Student 3
Enter Roll No. :
3
Enter Name of Student :
Saksham
Enter Age of Student :
14
Enter Address of Student :
Aditya
Enter Age of Student :
34
Enter Address of Student :
jk1
Student 5
Enter Roll No. :
5
Enter Name of Student :
```

✖ ⚡ 0 ⚠ 0



Search



File Edit Selection View Go Run Terminal Help

Q3.c - Visual Studio Code

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

```
Aditya
Enter Age of Student :
34
Enter Address of Student :
jk1
Student 5
Enter Roll No. :
5
Enter Name of Student :
Priyansh
Enter Age of Student :
22
Enter Address of Student :
mno
Students whose age is 14
-----
-----
Name : Saksham
-----
-----
Students with Even Roll No.
Name : Vaibhav
Name : Aditya
Enter Roll No. :
3
    Student Details of given roll No:Roll No. : 3
Name : Saksham
Name : 14
Name : ghi
PS C:\Users\Arshiya\Downloads> █
```

4. Write a structure to store the name, account number and balance of customers (more than 10)

and store their information.

1 - Write a function to print the names of all the customers having a balance of less than \$200.

2 - Write a function to add \$100 to the balance of all the customers having more than \$1000 in their balance and then print the incremented value of their balance.

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

```
//Defining Structure of program :
```

```
struct Bank {
```

```
int acc_no;
```

```
char name[30];
```

```
float bal;
```

```
} b[10];
```

```
// 1. Write a function to print the names of all the customers having a balance of less than $200.
```

```
void check(struct Bank b[10], int n)
```

```
{
```

```
int i;
```

```

printf("\nCustomer's Balance Whose Balance is < $200\n");
printf("-----\n");
for(i=0;i<n;i++)
{
if(b[i].bal<200)
{
printf("Account Number : %d\n",b[i].acc_no);
printf("Name : %s\n",b[i].name);
printf("Balance : %f\n",b[i].bal);
printf("-----\n");
}
}
}

/* 2. Write a function to add $100 to the balance of all the customers having more than $1000 in
their balance and then print the incremented value of their balance.*/
int update( struct Bank b[],int n)
{
int i;
for ( i=0;i<n;i++)
{
if(b[i].bal>=1000)
{
printf("Customer's Balance Whose balance is > $1000 %d\n",i+1);
printf("Account Number : %d\n",b[i].acc_no);
printf("Name : %s\n",b[i].name);
printf("Balance $ : %f\n",b[i].bal);
printf("Update Balance $ : %f\n",b[i].bal+100);
printf("-----\n");
}
}
}

// Main Function :
int main()
{
int i;
for(i=0;i<10;i++)
{
printf("Enter the detail of the Customer %d\n",i+1);
printf("-----\n");
printf("Enter Account Number : ");
scanf("%d",&b[i].acc_no);
printf("Enter the Customer Name : ");
scanf("%s",&b[i].name);
printf("Enter the balance of the Customer : ");
scanf("%f",&b[i].bal);
printf("-----\n");
}
check(b,10);
}

```

```
update(b,10);  
return 0;  
}
```

The screenshot shows a Visual Studio Code interface with the following details:

- File Bar:** File, Edit, Selection, View, Go, Run, Terminal, Help.
- Title Bar:** Q4.c - Visual Studio Code
- Left Sidebar:** Icons for File, Find, Replace, Search, Problems, Output, Terminal, and Debug Console.
- Terminal Tab:** Active tab, showing the command line path: C: > Users > Arshiya > Downloads > Q4.c > ...
- Code Editor:** Line 68: printf("Enter the balance of the Customer : ");
- Output Panel:** Displays the execution of a C program that prompts for 6 customer details (Account Number, Customer Name, Balance). The output is as follows:

```
Enter the detail of the Customer 1
-----
Enter Account Number : 101
Enter the Customer Name : Hitesh
Enter the balance of the Customer : 23000
-----
Enter the detail of the Customer 2
-----
Enter Account Number : 102
Enter the Customer Name : Rahul
Enter the balance of the Customer : 2000
-----
Enter the detail of the Customer 3
-----
Enter Account Number : 103
Enter the Customer Name : Kiran
Enter the balance of the Customer : 34000
-----
Enter the detail of the Customer 4
-----
Enter Account Number : 104
Enter the Customer Name : Minal
Enter the balance of the Customer : 200
-----
Enter the detail of the Customer 5
-----
Enter Account Number : 105
Enter the Customer Name : Kirti
Enter the balance of the Customer : 9000
-----
Enter the detail of the Customer 6
```
- Bottom Status Bar:** Shows icons for weather (27°), search, file operations, and extensions like Ps, Dots, and others.

The screenshot shows a Visual Studio Code interface with the following details:

- Top Bar:** File, Edit, Selection, View, Go, Run, Terminal, Help, Q4.c - Visual Studio Code
- Left Sidebar:** Icons for File Explorer, Search, Problems, Terminal, and Debug Console.
- Terminal Tab:** Q4.c is selected.
- Terminal Content:** Displays the output of a C program. The program prompts for 10 customer details, each consisting of an account number, name, and balance. The output is as follows:

```
C: > Users > Arshiya > Downloads > C Q4.c > ...
68 | printf("Enter the balance of the Customer : ");
PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Enter the detail of the Customer 6
-----
Enter Account Number : 106
Enter the Customer Name : Priyal
Enter the balance of the Customer : 1200
-----
Enter the detail of the Customer 7
-----
Enter Account Number : 107
Enter the Customer Name : Bini
Enter the balance of the Customer : 3500
-----
Enter the detail of the Customer 8
-----
Enter Account Number : 108
Enter the Customer Name : Chirag
Enter the balance of the Customer : 1245
-----
Enter the detail of the Customer 9
-----
Enter Account Number : 109
Enter the Customer Name : Lio
Enter the balance of the Customer : 56
-----
Enter the detail of the Customer 10
-----
Enter Account Number : 110
Enter the Customer Name : Palak
Enter the balance of the Customer : 122
-----
```
- Bottom Status Bar:** Shows icons for weather (27°), file operations, search, and various extensions like Figma, GitHub, and MATLAB.

The screenshot shows a Visual Studio Code interface with the following details:

- File Bar:** File, Edit, Selection, View, Go, Run, Terminal, Help.
- Title Bar:** Q4.c - Visual Studio Code
- Editor:** Shows files SStudPer.c, Q2.c, Q3.c, and Q4.c. Q4.c is the active file.
- Terminal:** Displays the output of a C program. The output includes:
 - Customer's Balance Whose Balance is < \$200
 - Account Number : 109
 - Name : Lio
 - Balance : 56.000000
 - Customer's Balance Whose balance is > \$1000 1
 - Account Number : 101
 - Name : Palak
 - Balance \$: 122.000000
 - Customer's Balance Whose balance is > \$1000 2
 - Account Number : 102
 - Name : Hitesh
 - Balance \$: 23000.000000
 - Update Balance \$: 23100.000000
 - Customer's Balance Whose balance is > \$1000 3
 - Account Number : 103
 - Name : Rahul
 - Balance \$: 2000.000000
 - Update Balance \$: 2100.000000
 - Customer's Balance Whose balance is > \$1000 4
 - Account Number : 104
 - Name : Chirag
 - Balance \$: 1245.000000
 - Update Balance \$: 1345.000000
- Bottom Bar:** Shows icons for weather (27°), search, file, camera, folder, PS, task manager, user, Microsoft Store, and other developer tools.

5. Let us work on the menu of a library. Create a structure containing book information like accession number, name of author, book title and flag to know whether book is issued or not.

Create a menu in which the following can be done.

1 - Display book information

2 - Add a new book

3 - Display all the books in the library of a particular author

4 - Display the number of books of a particular title

5 - Display the total number of books in the library

6 - Issue a book (If we issue a book, then its number gets decreased by 1 and if we add a book, its number gets increased by 1)

```
#include<stdio.h>
#include<string.h> //for strcmp()
#include<stdlib.h> //for system("cls") {works in dev c++}
int total_books = 0;
int current_books_count = 0;
struct library
```

```
{  
int accession_number;  
  
char author[50];  
  
char title[50];  
  
int issue_flag; // 0 => Available | 1 => Issued  
}  
  
book[200];  
  
int display_book_info()  
{  
  
int i=0,book_no=0,found_flag = 0;  
printf("Please enter accession_number : ");  
scanf("%d",&book_no);  
  
for(i=0 ; i < total_books ; i++)  
{  
  
if(book[i].accession_number == book_no)  
{  
  
printf("\n\tAccession no : %d",book[i].accession_number);  
printf("\n\tAuthor : %s",book[i].author);  
printf("\n\tTitle : %s",book[i].title);  
printf("\n\tStatus : ");  
  
if(book[i].issue_flag)  
printf("Issued\n");  
else  
printf("Available\n");  
  
found_flag = 1;  
break;  
}  
}  
  
if(!found_flag)  
{  
  
printf("\nNo book found with accession no. : %d\n",book_no);  
i = -1;  
}  
  
return i;  
}  
  
void add_new_book()  
{  
  
printf("\nPlease enter accession no. : ");  
fflush(stdin);  
scanf("%d",& book[total_books].accession_number);  
printf("Please enter name of the Author : ");  
fflush(stdin);  
fgets(book[total_books].author, sizeof(book[total_books].author),stdin);  
printf("Please enter book title : ");  
fflush(stdin);  
fgets(book[total_books].title, sizeof(book[total_books].title),stdin);  
book[total_books].issue_flag = 0;  
}
```

```
total_books++;

current_books_count++;

}

int disp_by_author()

{

int i=0,found_flag = 0;

char author[50];

printf("Please enter name of the author : ");

fflush(stdin);

fgets(author, sizeof(author),stdin);

for(i=0 ; i < total_books ; i++)

{

if(strcmp(book[i].author,author))

{

printf("\n\tAccession no. : %d", book[i].accession_number);

printf("\n\tAuthor : %s",book[i].author);

printf("\tTitle : %s",book[i].title);

printf("\tStatus : ");

if(book[i].issue_flag)

printf("Issued\n");

else

printf("Available\n");

found_flag = 1;

break;

}

}

if(!found_flag)

{

printf("\nNo book found with Author name : %s",author);

i = -1;

}

return i;

}

int disp_by_title()

{

int i=0,found_flag = 0;

char title[50];

printf("Please enter book title : ");

fflush(stdin);

fgets(title, sizeof(title),stdin);

for(i=0 ; i < total_books ; i++)

{

if(strcmp(book[i].title,title))

{

printf("\n\tAccession no. : %d", book[i].accession_number);

printf("\n\tAuthor : %s",book[i].author);

printf("\tTitle : %s",book[i].title);

}
```

```
printf("tStatus : ");

if(book[i].issue_flag)

printf("Issued\n");

else

printf("Available\n");

found_flag = 1;

break;

}

}

if(!found_flag)

{

printf("\nNo book found with book title : %s",title);

i = -1;

}

return i;

}

int issue_book()

{

int i,search_num=0, choice=0,found_flag = 0;

char search_quary[50],issue_choice;

again:

printf("\nSearch book by : ");

printf("\n1> Title.");

printf("\n2> Author.");

printf("\n3> Accession no.");

printf("\n4> Back to menu.\n");

printf("\nPlease enter your choice : ");

scanf("%d",&choice);

switch(choice)

{

case 1:

i = disp_by_title();

break;

case 2:

i = disp_by_author();

break;

case 3:

i = display_book_info();

break;

case 4:

return 0;

default:

{

printf("Please enter valid choice.");

goto again;

}

}

}
```

```
if(i>= 0)
found_flag = 1;
if(found_flag)
{
if(book[i].issue_flag)
printf("\nSorry book is issued.\n");
else
{
flush(stdin);
printf("Do you want to issue this book (Y/N) : ");
scanf("%c",& issue_choice);
if(issue_choice == 'Y' || issue_choice == 'y')
{
book[i].issue_flag = 1;
current_books_count--;
printf("\nBook issued Successfully.");
}
}
}
else
{
printf("\nNo record found with given quary.");
goto again;
}
}

int main()
{
int choice;
char next;
while(1)
{
system("cls");
printf("_____ MENU _____");
printf("\n1> Display book information.");
printf("\n2> Add a new book.");
printf("\n3> Display books by author.");
printf("\n4> Display no. of books by title.");
printf("\n5> Display total no. of books in library.");
printf("\n6> Issue a book.");
printf("\n7> Exit.\n");
printf("\nPlease select an option from menu : ");
scanf("%d",& choice);
switch(choice)
{
case 1:
display_book_info();
break;
```

```
case 2:  
add_new_book();  
break;  
case 3:  
disp_by_author();  
break;  
case 4:  
disp_by_title();  
break;  
case 5:  
printf("\nTotal no. of books currently in library : %d\n",current_books_count);  
break;  
case 6:  
issue_book();  
break;  
case 7:  
exit(0);  
break;  
default:  
printf("\nPlease select a valid option from menu.\n\n");  
}  
printf("\nFor next press enter : ");  
fflush(stdin);  
scanf("%c",& next);  
}  
return 0;  
}
```

File Edit Selection View Go Run Terminal Help SLibrary.c - Visual Studio Code

ow.c C Anagram.c C DMDB.cpp C UserDefString.cpp C Bank.cpp C 11.cpp

C: > Users > Arshiya > Desktop > C > C SLibrary.c > ...
226 case 4:
227 disp_by_title();
...

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

-----MENU-----
1> Display book information.
2> Add a new book.
3> Display books by author.
4> Display no. of books by title.
5> Display total no. of books in library.
6> Issue a book.
7> Exit.

Please select an option from menu : 1
Please enter accession_number : 12

Accession no : 12
Author : WERT
Title : ABCD
Status : Available

For next press enter : █

23°

Search

CLASSES AND FILES

1. Write a C++ program to get and display the details of staff name and designation in a class, department, salary in another class, and awards in the third class using Inheritance.

```
#include <iostream>
#include <string>

using namespace std;

class Staff {
protected:
    string name;
    string designation;
public:
    void getDetails() {
        cout << "Enter the name of the staff member: ";
        getline(cin, name);
        cout << "Enter the designation of the staff member: ";
        getline(cin, designation);
    }
}
```

```
void displayDetails() {  
    cout << "Name: " << name << endl;  
    cout << "Designation: " << designation << endl;  
}  
};  
  
class Department : public Staff {  
protected:  
    string department;  
public:  
    void getDepartment() {  
        cout << "Enter the department name: ";  
        getline(cin, department);  
    }  
    void displayDepartment() {  
        cout << "Department: " << department << endl;  
    }  
};  
  
class Salary : public Staff {  
protected:  
    float salary;  
public:  
    void getSalary() {  
        cout << "Enter the salary: ";  
        cin >> salary;  
    }  
    void displaySalary() {  
        cout << "Salary: " << salary << endl;  
    }  
};  
  
class Award : public Staff {  
protected:  
    string award;  
public:  
    void getAward() {  
        cout << "Enter the award: ";  
        getline(cin, award);  
    }  
    void displayAward() {  
        cout << "Award: " << award << endl;  
    }  
};  
  
int main() {  
    Department d;  
    d.getDetails();  
    d.getDepartment();  
    cout << endl;  
    d.displayDetails();
```

```
d.displayDepartment();  
cout << endl;  
  
Salary s;  
s.getDetails();  
s.getSalary();  
cout << endl;  
s.displayDetails();  
s.displaySalary();  
cout << endl;  
  
Award a;  
a.getDetails();  
a.getAward();  
cout << endl;  
a.displayDetails();  
a.displayAward();  
cout << endl;  
  
return 0;  
}
```

File Edit Selection View Go Run Terminal Help Inheritance.cpp - Visual Studio Code

C MaxMinArrayret.c Inheritance.cpp X

C: > Users > Arshiya > Desktop > C++ > Inheritance.cpp > ...

```
78     cout << endl;
79     return 0;
80 }
81 
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

```
PS C:\Users\Arshiya> cd "c:\Users\Arshiya\Desktop\C++\" ; if ($?) { g++ Inheritance.cpp -o Inherit
Enter the name of the staff member: Ashish
Enter the designation of the staff member: Manager
Enter the department name: HR

Name: Ashish
Designation: Manager
Department: HR

Enter the name of the staff member: Kiran
Enter the designation of the staff member: Manager
Enter the salary: 23000

Name: Kiran
Designation: Manager
Salary: 23000

Enter the name of the staff member: Enter the designation of the staff member: Priti
Enter the award: We

Name:
Designation: Priti
Award: We

PS C:\Users\Arshiya\Desktop\C++> 
```

x ⚠ 0 Breaking news Search

2. Write a Program to design a class to represent a matrix. The class should have the functionality to insert and retrieve the elements of the matrix. Also, create two functions to add and multiply elements of two matrices.

```
#include <iostream>

using namespace std;

class Matrix {

private:
int rows;
int cols;
int **data;

public:
// Constructor
Matrix(int rows, int cols) {
this->rows = rows;
this->cols = cols;
data = new int*[rows];
for (int i = 0; i < rows; i++) {
data[i] = new int[cols];
}
```

```
{}

// Set the element at position (i,j) to val
void setElement(int i, int j, int val) {
    data[i][j] = val;
}

// Get the element at position (i,j)
int getElement(int i, int j) {
    return data[i][j];
}

// Add two matrices and return the result
Matrix add(Matrix other) {
    Matrix result(rows, cols);
    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < cols; j++) {
            result.setElement(i, j, data[i][j] + other.getElement(i, j));
        }
    }
    return result;
}

// Multiply two matrices and return the result
Matrix multiply(Matrix other) {
    Matrix result(rows, other.cols);
    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < other.cols; j++) {
            int sum = 0;
            for (int k = 0; k < cols; k++) {
                sum += data[i][k] * other.getElement(k, j);
            }
            result.setElement(i, j, sum);
        }
    }
    return result;
}

// Display the matrix
void display() {
    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < cols; j++) {
            cout << data[i][j] << " ";
        }
        cout << endl;
    }
}

// Destructor
~Matrix() {
    for (int i = 0; i < rows; i++) {
        delete[] data[i];
    }
}
```

```
delete[] data;
}

};

int main() {
    int rows1, cols1, rows2, cols2;
    cout << "Enter the number of rows in Matrix 1: ";
    cin >> rows1;
    cout << "Enter the number of columns in Matrix 1: ";
    cin >> cols1;
    Matrix m1(rows1, cols1);
    cout << "Enter the elements of Matrix 1:" << endl;
    for (int i = 0; i < rows1; i++) {
        for (int j = 0; j < cols1; j++) {
            int val;
            cin >> val;
            m1.setElement(i, j, val);
        }
    }

    cout << "Enter the number of rows in Matrix 2: ";
    cin >> rows2;
    cout << "Enter the number of columns in Matrix 2: ";
    cin >> cols2;
    Matrix m2(rows2, cols2);
    cout << "Enter the elements of Matrix 2:" << endl;
    for (int i = 0; i < rows2; i++) {
        for (int j = 0; j < cols2; j++) {
            int val;
            cin >> val;
            m2.setElement(i, j, val);
        }
    }

    // Display the matrices
    cout << "Matrix 1:" << endl;
    m1.display();
    cout << "Matrix 2:" << endl;
    m2.display();

    // Add the matrices and display the result
    if (rows1 == rows2 && cols1 == cols2) {
        Matrix result = m1.add(m2);
        cout << "Sum of Matrix 1 and Matrix 2:" << endl;
        result.display();
    } else {
        cout << "Matrices cannot be added because they have different dimensions." << endl;
    }

    // Multiply the matrices and display the result
    if (cols1 == rows2) {
```

```

Matrix result = m1.multiply(m2);

cout << "Product of Matrix 1 and Matrix 2:" << endl;
result.display();
}

else {
    cout << "Matrices cannot be multiplied because the number of columns in Matrix 1 is not equal to the number of rows in Matrix 2." << endl;
}
}

```

```

Enter the number of rows in Matrix 1: 3
Enter the number of columns in Matrix 1: 2
Enter the elements of Matrix 1:
1
2
3
4
5
6
Enter the number of rows in Matrix 2: 2
Enter the number of columns in Matrix 2: 3
Enter the elements of Matrix 2:
7
8
9
1
2
3
Matrix 1:
1 2
3 4
5 6
Matrix 2:
7 8 9
1 2 3
Matrices cannot be added because they have different dimensions.
Product of Matrix 1 and Matrix 2:
9 12 15
25 32 39
41 52 63

```

3. Write a class representing bank accounts. The class should have the following data members: Customer Name, Account Number, Type of Account (Savings/Current, etc), and Account Balance. The class should allow basic operations like creating a new account, deposit an amount, withdraw money after checking the balance, display account details.

```

#include <iostream>
#include <string>
using namespace std;
class Bank_accounts
{
    string name;
    int acc_n;
    string acc_type;
    double balance;
public:
    //creating a constructor
    Bank_accounts()

```

```
{  
name = "JON DOE";  
acc_n = 55555;  
acc_type = "SAVING";  
balance = 0.00;  
}  
  
void setter_details()  
{  
  
cout << endl  
<< "Enter the name -> ";  
cin >> name;  
  
cout << endl  
<< "Enter Account number -> ";  
cin >> acc_n;  
  
cout << endl  
<< "Enter the account type -> ";  
cin >> acc_type;  
  
cout << endl  
<< "Enter the amount to deposit -> ";  
cin >> balance;  
}  
  
void getter_details()  
{  
  
cout << endl  
<< "CUSTOMER NAME: " << name << endl  
<< "ACCOUNT NUMBER: " << acc_n << endl  
<< "ACCOUNT TYPE: " << acc_type << endl  
<< "BALANCE: " << balance << endl  
  
<< endl  
<< "*****" << endl  
<< endl;  
}  
  
void deposit(float amt)  
{  
  
balance = balance + amt;  
  
cout << "The new balance is -> " << balance;  
}  
  
void withdraw(float amt)  
{  
  
if (balance - amt < 0)  
{  
  
cout << endl  
<< "Insufficient Balance!" << endl;  
  
return;  
}  
  
balance = balance - amt;  
  
cout << "The remaining balance is -> " << balance;
```

```
}

void check_balance()
{
    cout << endl
    << "The current balance is -> " << balance << endl;
}

int acc_number()
{
    return acc_n;
}

friend void operations(Bank_accounts);
};

void operations(Bank_accounts object[])
{
    int choice;
    int repeat;
    double amt;
    int number;
    int i = 0;
    int flag = 0;

    do
    {
        cout << endl
        << "1. Create New account" << endl
        << "2 Login" << endl
        << "3. Exit" << endl;

        cout << "Enter your choice -> ";
        cin >> choice;

        switch (choice)
        {
            case 1:
                cout << endl
                << "Enter the details " << endl;
                object[i].setter_details();
                i++;
                break;

            case 2:
                cout << endl
                << "Please enter your account number -> ";
                cin >> number;
                for (int j = 0; j < i; j++)
                {
                    flag = 0;
                    if (number == object[j].acc_number())
                    {
                        do
                        {
```

```
flag = 1;

cout << endl
<< "***** LOGIN SUCCESSFULLY *****" << endl;

cout << "t1. Display Details" << endl
<< "t2. Check Balance" << endl
<< "t3. Cash Withdraw" << endl
<< "t4. Cash Deposit" << endl;

cout << "Enter your choice -> ";
cin >> choice;

switch (choice)
{
    case 1:
        object[j].getter_details();
        break;
    case 2:
        object[j].check_balance();
        break;
    case 3:
        cout << endl
        << "Enter the amount to withdraw -> ";
        cin >> amt;
        object[j].withdraw(amt);
        break;
    case 4:
        cout << endl
        << "Enter the amount to deposit -> ";
        cin >> amt;
        object[j].deposit(amt);
        break;
    default:
        break;
}

cout << endl << "Press 1 to continue -> ";
cin >> repeat;
} while (repeat == 1);

break;
}

}

if(flag == 0)
{
    cout << endl
    << "***** NO RECORD FOUND! *****" << endl;
}

default:
exit(0);
}

} while (1);
```

```
int main()
{
    Bank_accounts object[5];
    operations(object);
}
```

File Edit Selection View Go Run Terminal Help Bank.cpp - Visual Studio Code

jdPer.c Q2.c VolumeFuncOverl.cpp UpLow.c Anagram.c DMDB.cpp

C: > Users > Arshiyा > Desktop > C++ > Bank.cpp > main()

153 } exit(0);
154 }
155
156 } while (1);

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

1. Create New account
2 Login
3. Exit
Enter your choice -> 1

Enter the details

Enter the name -> ABC

Enter Account number -> 893

Enter the account type -> Saving

Enter the amount to deposit -> 23444

1. Create New account
2 Login
3. Exit
Enter your choice -> 2

Please enter your account number -> 893

***** LOGIN SUCCESSFULLY *****

1. Display Details
2. Check Balance
3. Cash Withdraw

23°  Search          

```
C: > Users > Arshiya > Desktop > C++ > Bank.cpp > main()
153         exit(0);
154     }
155
156 } while (1);

PROBLEMS    OUTPUT    TERMINAL    DEBUG CONSOLE

Please enter your account number -> 893
*****
LOGIN SUCCESSFULLY *****
1. Display Details
2. Check Balance
3. Cash Withdraw
4. Cash Deposit
Enter your choice -> 2

The current balance is -> 23444

Press 1 to continue -> 1

*****
LOGIN SUCCESSFULLY *****
1. Display Details
2. Check Balance
3. Cash Withdraw
4. Cash Deposit
Enter your choice -> 4

Enter the amount to deposit -> 1111
The new balance is -> 24555
Press 1 to continue -> 1

*****
LOGIN SUCCESSFULLY *****
1. Display Details
2. Check Balance
```

4. Write a program to sort two numbers using call by reference. Smallest number should be output first.

```
#include <iostream>

using namespace std;

void sortTwoNumbers(int& num1, int& num2) {
if(num1 > num2) {
swap(num1, num2);
}
}

int main() {
int num1, num2;
cout << "Enter two numbers: ";
cin >> num1 >> num2;
sortTwoNumbers(num1, num2);
cout << "Sorted numbers: " << num1 << ", " << num2 << endl;
return 0;
}
```

Enter two numbers: 23

44

Sorted numbers: 23, 44

5. Create two classes KILOS and POUNDS which store the value of weights. KILOS stores weight in kilograms and grams and POUNDS in pounds and ounces. Write a program using friend function to add weight of a KILOS object to weight of POUNDS object. Store the result as POUNDS object. (Use 1 pound = 16 ounces, 1 ounce = 28 grams)

```
#include <iostream>
#include <cmath>
using namespace std;
class Pound;
class Kilo
{
    float kg;
    float gram;
public:
    //creating a constructor
    Kilo()
    {
        kg = 10.00;
        gram = 500.00;
    }
    float get_kg()
    {
        cout << endl
        << endl
        << "***** WEIGHT IN KILOGRAM ***** " << endl
        << endl;
        cout << endl
        << "Enter the number of kg -> ";
        cin >> kg;
        return kg;
    }
    float get_gram()
    {
        cout << endl
        << "Enter the grams -> ";
        cin >> gram;
        return gram;
    }
    void set_data()
    {
        cout << endl
        << "Kg: " << kg << " and Gm: " << gram << endl;
    }
    friend void conversion(Kilo, Pound);
};
class Pound
```

```
{\nfloat pound;\n\nfloat ounce;\n\npublic:\n//creating a constructor\n\nPound()\n{\n    pound = 10.00;\n    ounce = 500.00;\n}\n\nfloat get_pound()\n{\n    cout << endl\n    << endl\n    << "***** WEIGHT IN POUNDS ***** " << endl\n    << endl;\n\n    cout << endl\n    << "Enter the number of pound -> ";\n    cin >> pound;\n\n    return pound;\n}\n\nfloat get_ounce()\n{\n    cout << endl\n    << "Enter the ounce -> ";\n    cin >> ounce;\n\n    return ounce;\n}\n\nvoid set_data()\n{\n    cout << endl\n    << "pound: " << pound << " and ounce: " << ounce << endl;\n}\n\nfriend void conversion(Kilo, Pound);\n};\n\nvoid conversion(Kilo k, Pound p)\n{\n    int choice;\n    int temp1,temp2;\n\n    do\n    {\n        cout << endl\n        << "1. kg-gm to lbs-oz convertor" << endl\n        << "2. lbs-oz to kg-gm convertor" << endl\n        << "3. Exit" << endl\n        << "Enter your choice -> ";\n        cin >> choice;\n\n        if(choice == 1)\n        {\n            cout << endl\n            cout << "Enter weight in kg: ";\n            cin >> weight;\n\n            cout << endl\n            cout << "Enter number of gm: ";\n            cin >> gm;\n\n            cout << endl\n            cout << "Enter weight in lbs: ";\n            cin >> weight;\n\n            cout << endl\n            cout << "Enter number of oz: ";\n            cin >> oz;\n\n            cout << endl\n            cout << "Weight in lbs-oz is: ";\n            cout << weight;\n            cout << endl\n            cout << "Weight in kg-gm is: ";\n            cout << weight;\n            cout << endl\n            cout << "Number of gm is: ";\n            cout << gm;\n            cout << endl\n            cout << "Number of oz is: ";\n            cout << oz;\n            cout << endl;\n\n            cout << endl\n            cout << "Do you want to continue? (y/n) ";\n            cin >> choice;\n\n            if(choice != 'y')\n                break;\n        }\n\n        else if(choice == 2)\n        {\n            cout << endl\n            cout << "Enter weight in lbs: ";\n            cin >> weight;\n\n            cout << endl\n            cout << "Enter number of oz: ";\n            cin >> oz;\n\n            cout << endl\n            cout << "Enter weight in kg: ";\n            cin >> weight;\n\n            cout << endl\n            cout << "Enter number of gm: ";\n            cin >> gm;\n\n            cout << endl\n            cout << "Weight in kg-gm is: ";\n            cout << weight;\n            cout << endl\n            cout << "Weight in lbs-oz is: ";\n            cout << weight;\n            cout << endl\n            cout << "Number of gm is: ";\n            cout << gm;\n            cout << endl\n            cout << "Number of oz is: ";\n            cout << oz;\n            cout << endl;\n\n            cout << endl\n            cout << "Do you want to continue? (y/n) ";\n            cin >> choice;\n\n            if(choice != 'y')\n                break;\n        }\n\n        else if(choice == 3)\n        {\n            cout << endl\n            cout << "Exiting..." << endl;\n            break;\n        }\n\n        else\n        {\n            cout << endl\n            cout << "Invalid choice! Please enter again." << endl;\n        }\n    }\n}
```

```
switch (choice)
{
    case 1:
        temp1 = k.get_kg();
        temp2 = k.get_gram();
        p.pound = temp1 * (2.20462);
        p.ounce = temp2 * (0.035274);
        p.set_data();
        break;
    case 2:
        temp1 = p.get_pound();
        temp2 = p.get_ounce();
        k.kg = temp1 * (0.453592);
        k.gram = temp2 * (28.3495);
        k.set_data();
        default:
            exit(0);
}
} while (1);
}

int main()
{
    Kilo k;
    Pound p;
    conversion(k, p);
    return 0;
}
```

File Edit Selection View Go Run Terminal Help KilosPound.cpp - Visual Studio Code

VolumeFuncOverl.cpp UpLow.c Anagram.c DMDB.cpp UserDefString.cpp

C: > Users > Arshiya > Desktop > C++ > KilosPound.cpp > main()

108 default:

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

2. lbs-oz to kg-gm convertor
3. Exit
Enter your choice -:> 1

***** WEIGHT IN KILOGRAM *****

Enter the number of kg -> 20
Enter the grams -> 2
pound: 44.0924 and ounce: 0.070548

1. kg-gm to lbs-oz convertor
2. lbs-oz to kg-gm convertor
3. Exit
Enter your choice -:> 2

***** WEIGHT IN POUNDS *****

Enter the number of pound -> 34
Enter the ounce -> 5
Kg: 15.4221 and Gm: 141.747
PS C:\Users\Arshiya\Desktop\C++>

X ⚡ 0 ⚡ 0

23°  Search          

6. Write an overloaded volume function to calculate the volume of a cube (side*side*side), a cuboid (l*b*h), and a circle.

```
#include<iostream>

using namespace std;

int getVolume(int side)
{
    return side*side*side;
}

float getVolume(float radius)
{
    return (4/3)*(3.14)*radius*radius*radius;
}

float getVolume(float length, float breadth, float height)
{
    return length*breadth*height;
}

int main()
```

```
{  
while(1)  
{  
int choice;  
int t1,t2,t3,side;  
float radius;  
cout<<"\n 1.Volume of cube \n 2.Volume of cuboid \n 3.Volume of sphere \n 4.Exit";  
cout<<"\n Enter your choice :";  
cin>>choice;  
switch(choice)  
{  
case 1 :  
cout<<"\n Enter length of side of cube :";  
cin>>side;  
cout<<"\n Volume of cube is :"<<getVolume(side);  
break;  
case 2 :  
cout<<"\n Enter length of cuboid :";  
cin>>t1;  
cout<<"\n Enter breadth of cuboid :";  
cin>>t2;  
cout<<"\n Enter height of cuboid :";  
cin>>t3;  
cout<<"\n Volume of cuboid is :"<<getVolume(t1,t2,t3);  
break;  
case 3 :  
cout<<"\n Enter radius of sphere :";  
cin>>radius;  
cout<<"\n Volume of sphere is :"<<getVolume(radius);  
break;  
default :  
exit(0);  
}  
}  
return 0;  
}
```

File Edit Selection View Go Run Terminal Help VolumeFuncOverl.cpp - Visual Studio Code

C: > Users > Arshiya > Desktop > C++ > VolumeFuncOverl.cpp > main()

29 cin>>side;

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

1. Volume of cube
2. Volume of cuboid
3. Volume of sphere
4. Exit
Enter your choice : 1

Enter length of side of cube : 2

Volume of cube is : 8
1. Volume of cube
2. Volume of cuboid
3. Volume of sphere
4. Exit
Enter your choice : 2

Enter length of cuboid : 2

Enter breadth of cuboid : 3

Enter height of cuboid : 2

Volume of cuboid is : 12
1. Volume of cube
2. Volume of cuboid
3. Volume of sphere
4. Exit
Enter your choice : 3

Enter radius of sphere : 2

Volume of sphere is : 25.12

x ⑧ 0 ⚠ 0

7. Write a box class with class member's length, breadth, height, and a function to calculate the volume of the box. Constructor should be passed arguments for length, breadth, and height. Also, define a second constructor which takes default height value of 10.

```
#include<iostream>

using namespace std;

class Box

{

int length;

int breadth;

int height;

public :

int volume;

Box()

{

height=10;

length=10;

breadth=10;

}
```

```
Box(int length, int breadth, int height)

{
this->length=length;
this->breadth=breadth;
this->height=height;
}

Box(int length, int breadth)

{
this->length=length;
this->breadth=breadth;
height=10;
}

void calVolume()

{
cout<<"\n Enter the length of box : ";
cin>>length;
cout<<"\n Enter the breadth of box : ";
cin>>breadth;
cout<<"\n Enter the height of box : ";
cin>>height;
volume=length*breadth*height;
cout<<"\n Volume of the box is : "<<volume;
}

};

int main()

{
Box b(10,15,20);
b.calVolume();
return 0;
}
```

The screenshot shows the Visual Studio Code interface. The top menu bar includes File, Edit, Selection, View, Go, Run, Terminal, and Help. The title bar indicates the file is "BoxClass.cpp - Visual Studio Code". The left sidebar contains icons for various extensions or features. The main area has tabs for SStudPer.c, Q2.c, Q3.c, Q4.c, SLibrary.c, and BoxClass.cpp (which is currently selected). Below the tabs is a breadcrumb navigation bar showing the file path: C: > Users > Arshiya > Desktop > C++ > BoxClass.cpp > main(). A line number 45 and a brace icon are also present. The bottom navigation bar includes PROBLEMS, OUTPUT, TERMINAL (which is underlined), and DEBUG CONSOLE. The terminal window displays the following text:

```
PS C:\Users\Arshiya\Desktop\C> cd "c:\Users\Arshiya\Desktop\C++\" ; if ($?) { g++ BoxClass.cpp -o BoxClass
Enter the length of box : 3
Enter the breadth of box : 4
Enter the height of box : 5
Volume of the box is : 60
PS C:\Users\Arshiya\Desktop\C++>
```

8. Design a Point class with coordinates x and y representing point on the plane (use constructors). Design a Polar class that represents class using polar coordinates radius(r) and angle(a). Write a program which takes input data for a Point object and performs type conversion so as to convert the Point data into Polar data. Use the following formulas where required:

```
x = r * cos(a);
y = r * sin(a);
a = atan(y/x);
r = sqrt(x*x + y*y);

#include <iostream>
#include <cmath>

using namespace std;

class Point {

private:
    double x;
    double y;

public:
    // Constructor with two arguments for x and y coordinates
    Point(double xCoord, double yCoord) {
```

```

x = xCoord;
y = yCoord;
}

// Getter functions for x and y coordinates

double getX() { return x; }

double getY() { return y; }

};

class Polar {

private:

double r;

double a;

public:

// Constructor with two arguments for radius and angle

Polar(double radius, double angle) {

r = radius;

a = angle;

}

// Getter functions for radius and angle

double getR() { return r; }

double getA() { return a; }

};

// Function to convert a Point object to a Polar object

Polar convertToPolar(Point p) {

double r = sqrt(p.getX() * p.getX() + p.getY() * p.getY());

double a = atan(p.getY() / p.getX());

return Polar(r, a);

}

int main() {

// Create a Point object with coordinates (3, 4)

Point p(3, 4);

// Convert the Point object to a Polar object

Polar polar = convertToPolar(p);

// Print the polar coordinates

cout << "Polar coordinates: (" << polar.getR() << ", " << polar.getA() << ")" << endl;

return 0;

}

```

Polar coordinates: (5, 0.927295)

9. Create two classes DM and DB which store the values of distance. DM stores distance in meters and centimeters. DB stores distance in feet and inches. Write a program that can read values for the class object and add one object of DM with another object of DB. Use a friend function to carry out the addition operation and this function will display answers in meters and centimeters.

```

#include<iostream>

using namespace std;

class DM {

public:

int meters;

int centi;

//creating a constructor of DM class

```

DM()

{

meters = 0;

centi = 0;

}

};

class DB :public DM{

int feet;

int inches;

public:

friend void addition(DB &feet_object);

};

void addition(DB &feet_object)

{

int m;

int c;

int f;

int i;

cout<<"Enter distance in meters -> ";

cin>>m;

cout<<"Enter distance in inches -> ";

cin>>i;

cout<<"Enter distance in feet -> ";

cin>>f;

cout<<"Enter distance in centimeters -> ";

cin>>c;

feet_object.feet = f;

feet_object.meters = m;

feet_object.centi = c;

feet_object.inches = i;

//adding feet to meters and centimeters to inches

float op1 = feet_object.meters * (3.28084) + feet_object.feet;

float op2 = feet_object.inches + feet_object.centi * (0.393701);

cout<<endl<<"Final result(in feet and centimeter) is -> "<<op1<< " and "<<op2;

}

int main()

{

DM meter_object;

DB feet_object;

cout<<endl<<"Enter the details...."<<endl;

addition(feet_object);

return 0;

}

File Edit Selection View Go Run Terminal Help DMDB.cpp - Visual Studio Code

SStudPer.c Q2.c VolumeFuncOverl.cpp UpLow.c Anagram.c 3.cpp

C: > Users > Arshiya > Desktop > C++ > DMDB.cpp > ... 56 |

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

```
Enter the details....  
Enter distance in meters -> 12  
Enter distance in inches -> 5  
Enter distance in feet -> 8  
Enter distance in centimeters -> 45  
  
Final result(in feet and centimeter) is -> 47.3701 and 22.7165  
PS C:\Users\Arshiya\Desktop\C++> cd "c:\Users\Arshiya\Desktop\C++\" ; if ($?) { g++ DMDB.cpp -o DMDB  
  
Enter the details....  
Enter distance in meters -> 1  
Enter distance in inches -> 1  
Enter distance in feet -> 1  
Enter distance in centimeters -> 1  
  
Final result(in feet and centimeter) is -> 4.28084 and 1.3937  
PS C:\Users\Arshiya\Desktop\C++> []
```

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24°



Search



10. Define a class String that could work as a user-defined string type. Include constructors that will enable us to create an uninitialized string.

```
#include<iostream>  
  
#include "string.h"  
  
using namespace std;  
  
class test_string{  
  
char characters[75];  
  
public:  
  
//creating a constructor  
  
test_string()  
  
{  
  
cout<<"The default constructor is called....."<<endl;  
  
strcpy(characters,"This is a test string!");  
  
}  
  
void get_string()  
  
{  
  
cout<<endl<<"Please enter the required string! -> ";
```

```

fgets(characters,75,stdin);
}

void display()
{
printf("\nSTRING IS -> %s\n",characters);
}
};

int main()
{
test_string object;
object.display();
object.get_string();
object.display();

return 0;
}

```

UserDefString.cpp - Visual Studio Code

C: > Users > Arshiy > Desktop > C++ > UserDefString.cpp > main()

```

1 #include<iostream>
2 #include "string.h"
3 using namespace std;
4 class test_string{
5     char characters[75];
6     public:
7         //creating a constructor
8         test_string()
9     {
10         cout<<"The default constructor is called..... "<<endl;

```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Final result(in feet and centimeter) is -> 47.3701 and 22.7165
PS C:\Users\Arshiy\Desktop\C++> cd "c:\Users\Arshiy\Desktop\C++\" ; if (\$?) { g++ DMDB.cpp -o DMDB
Enter the details....
Enter distance in meters -> 1
Enter distance in inches -> 1
Enter distance in feet -> 1
Enter distance in centimeters -> 1

Final result(in feet and centimeter) is -> 4.28084 and 1.3937
PS C:\Users\Arshiy\Desktop\C++> cd "c:\Users\Arshiy\Desktop\C++\" ; if (\$?) { g++ UserDefString.cpp -o UserDefString
} ; if (\$?) { g++ UserDefString.cpp -o UserDefString
The default constructor is called.....

STRING IS -> This is a test string!
Please enter the required string! -> hey there
STRING IS -> hey there
PS C:\Users\Arshiy\Desktop\C++>

23° Search

FILES

1. Write a C program to count characters, words, and lines in a text file.

```
#include <stdio.h>
#include <stdlib.h>
int main()
{
FILE *fp;
char filename[100], ch;
int chars = 0, words = 0, lines = 0;
printf("Enter the filename: ");
scanf("%os", filename);
fp = fopen(filename, "r");
if(fp == NULL)
{
printf("Error opening file.\n");
exit(1);
}
while ((ch = fgetc(fp)) != EOF)
{
chars++;
if(ch == ' ' || ch == '\n' || ch == '\t')
{
words++;
}
if(ch == '\n')
{
lines++;
}
}
if(chars > 0)
{
words++;
lines++;
}
printf("Characters: %d\n", chars);
printf("Words: %d\n", words);
printf("Lines: %d\n", lines);
fclose(fp);
return 0;
}
```

OUTPUT :

Enter the filename: sample.txt

Characters: 102

Words: 16

Lines: 3

2. Write a C program to merge two files into a third file.

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

```

int main()
{
FILE *f1, *f2, *f3;
char filename1[100], filename2[100], filename3[100];
char ch;
printf("Enter the first filename: ");
scanf("%s", filename1);
printf("Enter the second filename: ");
scanf("%s", filename2);
printf("Enter the third filename: ");
scanf("%s", filename3);
f1 = fopen(filename1, "r");
f2 = fopen(filename2, "r");
f3 = fopen(filename3, "w");
if(f1 == NULL || f2 == NULL || f3 == NULL)
{
    printf("Error opening files.\n");
    exit(1);
}
while ((ch = fgetc(f1)) != EOF)
{
    fputc(ch, f3);
}
while ((ch = fgetc(f2)) != EOF)
{
    fputc(ch, f3);
}
printf("Files merged successfully.\n");
fclose(f1);
fclose(f2);
fclose(f3);
return 0;
}

```

OUTPUT :

Enter the first filename: file1.txt

Enter the second filename: file2.txt

Enter the third filename: merged.txt

Files merged successfully.

3. Write a C program to remove empty lines from a text file.

```

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

#define BUFFER_SIZE 1000

int main()
{
FILE *fp1, *fp2;
char buffer[BUFFER_SIZE];

```

```

char filename[100];
printf("Enter the filename:");
scanf("%s", filename);
fp1 = fopen(filename, "r");
fp2 = fopen("temp.txt", "w");
if(fp1 == NULL || fp2 == NULL)
{
    printf("Error opening files.\n");
    exit(1);
}
while (fgets(buffer, BUFFER_SIZE, fp1) != NULL)
{
    if(strcmp(buffer, "\n") != 0)
    {
        fputs(buffer, fp2);
    }
}
fclose(fp1);
fclose(fp2);
remove(filename);
rename("temp.txt", filename);
printf("Empty lines removed successfully.\n");
return 0;
}

```

OUTPUT :

Enter the filename: input.txt

Empty lines removed successfully.

4. Write a C program to convert uppercase to lowercase characters and vice versa in a text file

```

#include <stdio.h>
#include <stdlib.h>
int main()
{
FILE *fp1, *fp2;
char ch;
char filename[100];
printf("Enter the filename: ");
scanf("%s", filename);
fp1 = fopen(filename, "r");
fp2 = fopen("temp.txt", "w");
if(fp1 == NULL || fp2 == NULL)
{
    printf("Error opening files.\n");
    exit(1);
}
while ((ch = fgetc(fp1)) != EOF)
{
    if(ch >= 'a' && ch <= 'z')

```

```
{  
ch = ch - 'a' + 'A'; // convert lowercase to uppercase  
}  
  
else if(ch >= 'A' && ch <= 'Z')  
{  
ch = ch - 'A' + 'a'; // convert uppercase to lowercase  
}  
fputc(ch, fp2);  
}  
fclose(fp1);  
fclose(fp2);  
remove(filename);  
rename("temp.txt", filename);  
printf("Case converted successfully.\n");  
return 0;  
}
```

OUTPUT :

Enter the filename: input.txt

Case converted successfully.