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Fundamentals using C++**

**College Name:** **Kalindi College**

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## Practical File of 60 C++ Practice Programs

**Question1) Write a Program to *Print***  
***"Welcome to Programming world" in***  
***C++.***

***Ans)***

```
#include<iostream>

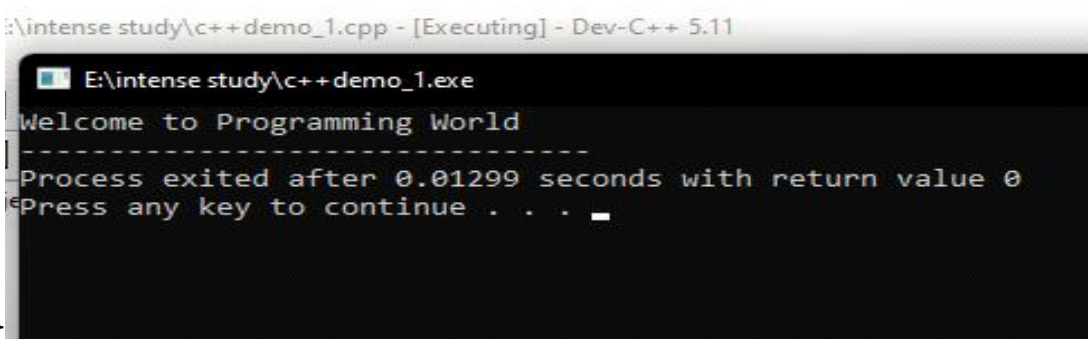
using namespace std;

int main()

{

cout<<"Welcome to Programming World";

return 0;
```



**Output:**

**Question2) Write a Program to make a calculator which perform following operations (+, -, /, \*, %).**

**Ans)**

```
#include <iostream>

using namespace std;

int main(){

    int num1;

    cout<<"Enter first no"<<endl;

    cin>>num1;

    int num2;

    cout<<"Enter second no"<<endl;

    cin>>num2;

    int sum,sub,mul,div,mod;

    sum=num1+num2;

    sub=num1-num2;

    mul=num1*num2;
```

```
div=num1/num2;

mod=num1%num2;

int choice;

cout<<"choose sum=1, sub=2, mul=3, div=4, mod=5"
    <<endl;

cin>>choice;

if (choice==1)
{
    cout<<"sum: "<<sum;
}

else if (choice==2)
{
    cout<<"subtraction: "<<sub;
}

else if (choice==3)
{
    cout<<"multiplication: "<<mul;
}
```

```

else if (choice==4)
{
cout<<"division: "<<div;
}

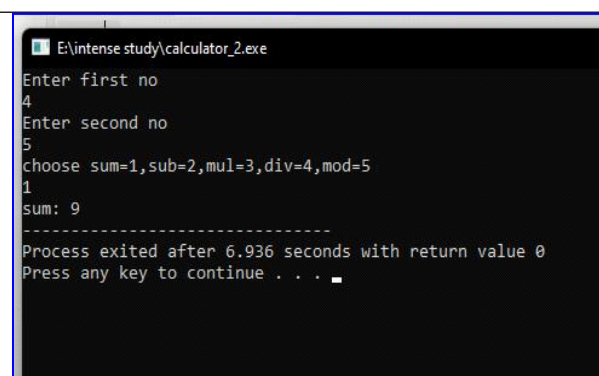
else if (choice==5){
cout<<"mod: "<<mod;
}

else{
cout<<"Invalid Option";
}

return 0;
}

```

## Output:

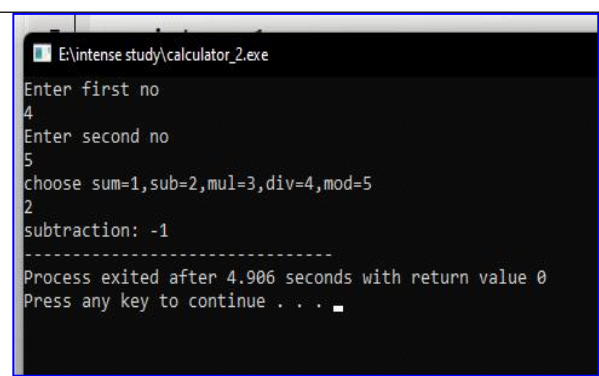


```

E:\intense study\calculator_2.exe
Enter first no
4
Enter second no
5
choose sum=1,sub=2,mul=3,div=4,mod=5
1
sum: 9
-----
Process exited after 6.936 seconds with return value 0
Press any key to continue . . .

```

**Choice=1**



```

E:\intense study\calculator_2.exe
Enter first no
4
Enter second no
5
choose sum=1,sub=2,mul=3,div=4,mod=5
2
subtraction: -1
-----
Process exited after 4.906 seconds with return value 0
Press any key to continue . . .

```

**Choice=2**

```
E:\intense study\calculator_2.exe
Enter first no
4
Enter second no
5
choose sum=1,sub=2,mul=3,div=4,mod=5
3
multiplication: 20
-----
Process exited after 4.771 seconds with return value 0
Press any key to continue . . .
```

**Choice=3**

```
E:\intense study\calculator_2.exe
Enter first no
5
Enter second no
4
choose sum=1,sub=2,mul=3,div=4,mod=5
4
division: 1
-----
Process exited after 6.082 seconds with return value 0
Press any key to continue . . .
```

**Choice=4**

```
E:\intense study\calculator_2.exe
Enter first no
5
Enter second no
4
choose sum=1,sub=2,mul=3,div=4,mod=5
5
mod: 1
-----
Process exited after 6.008 seconds with return value 0
Press any key to continue . . .
```

**Choice=5**

```
E:\intense study\calculator_2.exe
Enter first no
4
Enter second no
5
choose sum=1,sub=2,mul=3,div=4,mod=5
6
Invalid Option
-----
Process exited after 4.194 seconds with return value 0
Press any key to continue . . .
```

**Choice= except(1 , 2, 3,  
4, 5)**

**Question3) Write a Program to find the given number is odd or even number.**

**Ans)**

```
#include<iostream>

using namespace std;

int main(){

    int num;

    cout<<"Enter the number want to check, "<<endl;

    cin>>num;

    if (num%2==0){

        cout<<"**EVEN**"<<endl;

    }

    else{
```

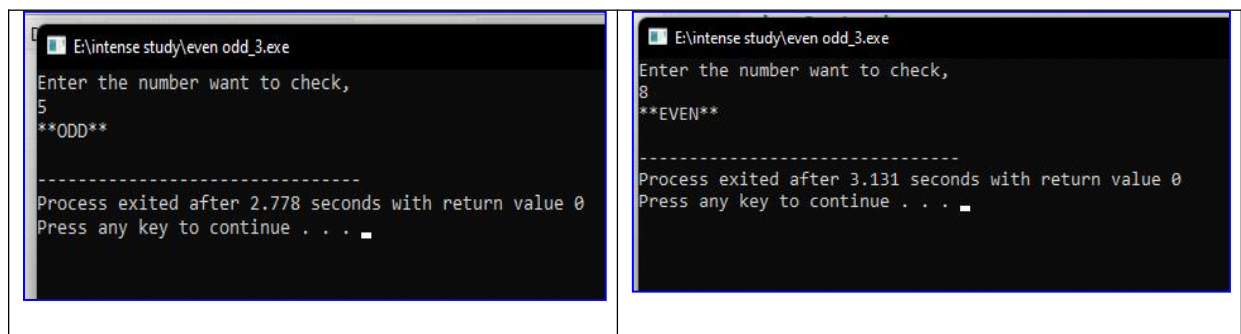
```
cout<<"**ODD**"<<endl;
```

```
}
```

```
return 0;
```

```
}
```

## Output:





**Question 4) Write a Program to find the number is divisible by 11 or not.**

**Ans)**

```
#include<iostream>

using namespace std;

int main(){

    int a;

    cout<<"Enter a number want to check, "
    <<endl;

    cin>>a;

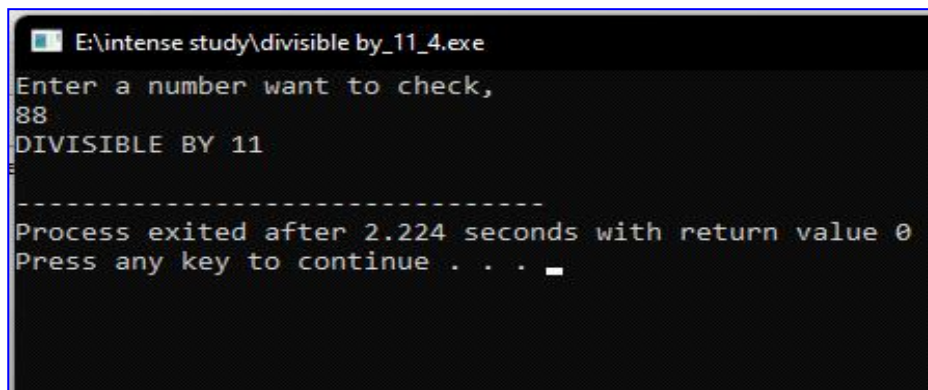
    if (a%11==0){

        cout<<"DIVISIBLE BY 11"<<endl;

    }
```

```
else{  
  
cout<<"NOT DIVISIBLE BY 11"<<endl;  
  
}  
  
return 0;  
  
}
```

## Output:



```
E:\intense study\divisible by_11_4.exe  
Enter a number want to check,  
88  
DIVISIBLE BY 11  
-----  
Process exited after 2.224 seconds with return value 0  
Press any key to continue . . .
```

**Question 5) Write a Program to Find the given number is prime or not.**

**Ans)**

```
#include<iostream>

using namespace std;

int main(){

int i=2;

int count=0;

int num;

cout<<"Enter the number want to check"<<endl;

cin>>num;


while(i<num){

if (num%i==0){

count=count+1;
```

```
}

i=i+1; //updating i

}

if(count==0){

cout<<"PRIME"<<endl;

}

else{

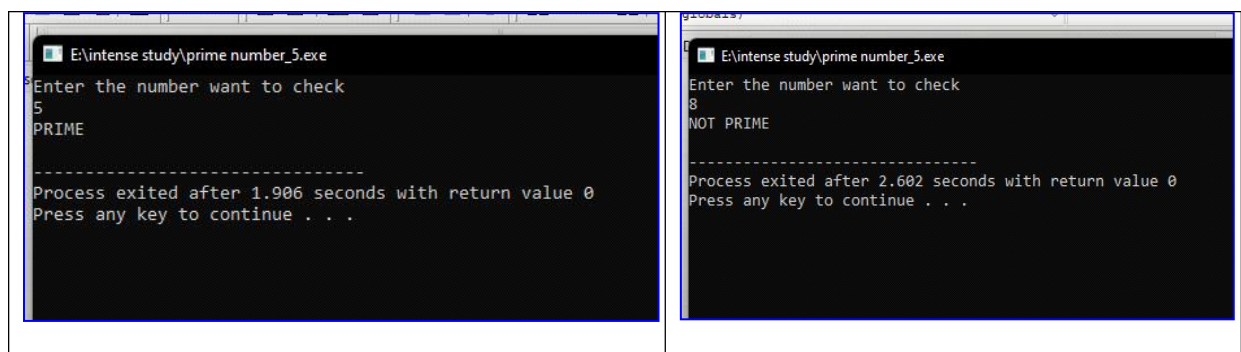
cout<<"NOT PRIME"<<endl;

}

return 0;

}
```

## Output:



**Question 6) Write a Program to Convert Celsius to Fahrenheit and vice versa.**

**Ans)**

```
#include<iostream>
```

```
using namespace std;
```

```
int main(){
```

```
int Fahr;
```

```
int Cels;
```

```
cout<<"\tHere you can convert temperature C to F or vice  
versa"<<endl;
```

```
int choice;
```

```

cout<<"Enter your choice:\n1) Convert fehrenite to
      celsius\n2) Convert celsius to fehrenite"<<endl;

cin>>choice;

if(choice==1){

cout<<"Enter the temperature in fahrenheit"<<endl;

cin>>Fahr;

Cels=(Fahr-32)*5/9;

cout<<"The temperature in Fahrenheit is "<<Fahr<<" F
      and now temperature in Celsius is "<<Cels<<" degree
      C"<<endl;

}

else{

cout<<"Enter the temperature in celcius"<<endl;

cin>>Cels;

Fahr=((9/5)*Cels)+32;

cout<<"the temp in Celsius is "<<Cels<<" degree C and
      now temperature in Fehrenite is "<<Fahr<<" F"
      <<endl;

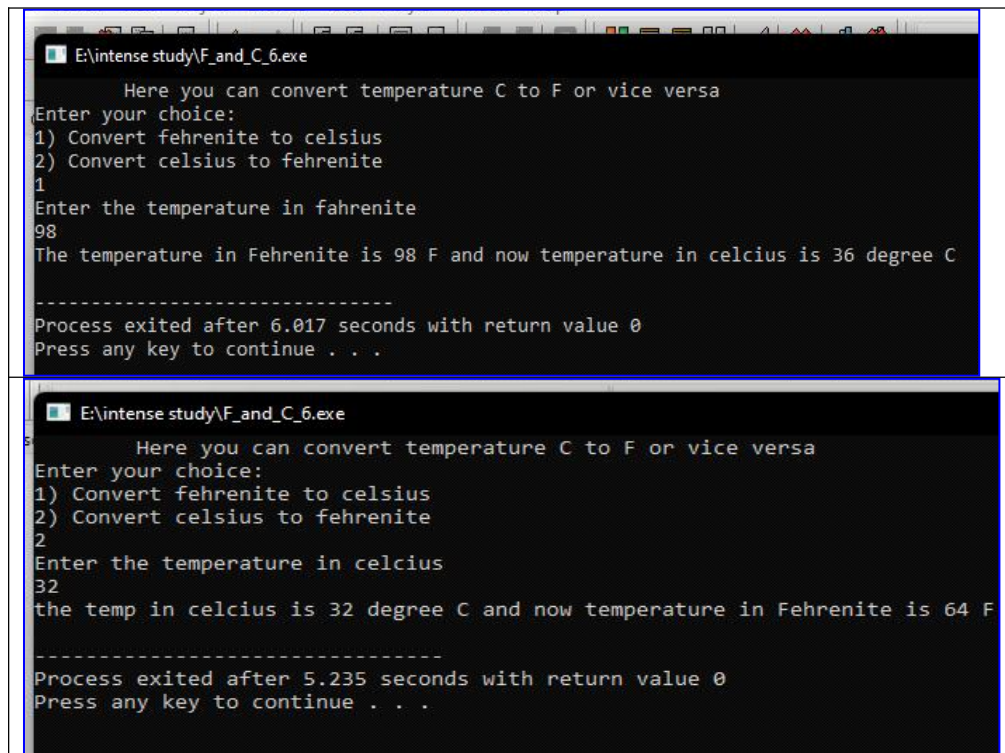
```

```
}
```

```
return 0;
```

```
}
```

## Output:



The image displays two screenshots of a Windows command prompt window titled "E:\intense study\F\_and\_C\_6.exe".

The first screenshot shows the program's execution for converting Fahrenheit to Celsius. The prompt asks the user to enter a choice (1 for Fahrenheit to Celsius, 2 for Celsius to Fahrenheit). The user enters '1'. Then, it asks for the temperature in Fahrenheit, and the user enters '98'. The program outputs: "The temperature in Fehrenite is 98 F and now temperature in celcius is 36 degree C". It then shows the process exit time and asks to press any key to continue.

The second screenshot shows the program's execution for converting Celsius to Fahrenheit. The prompt asks the user to enter a choice. The user enters '2'. Then, it asks for the temperature in Celsius, and the user enters '32'. The program outputs: "the temp in celcius is 32 degree C and now temperature in Fehrenite is 64 F". It then shows the process exit time and asks to press any key to continue.

```
E:\intense study\F_and_C_6.exe
      Here you can convert temperature C to F or vice versa
Enter your choice:
1) Convert fehrenite to celsius
2) Convert celsius to fehrenite
1
Enter the temperature in fahrenheit
98
The temperature in Fehrenite is 98 F and now temperature in celcius is 36 degree C
-----
Process exited after 6.017 seconds with return value 0
Press any key to continue . . .

E:\intense study\F_and_C_6.exe
      Here you can convert temperature C to F or vice versa
Enter your choice:
1) Convert fehrenite to celsius
2) Convert celsius to fehrenite
2
Enter the temperature in celcius
32
the temp in celcius is 32 degree C and now temperature in Fehrenite is 64 F
-----
Process exited after 5.235 seconds with return value 0
Press any key to continue . . .
```

**Question 7) Write a Program to Display pattern like that:**

**\***

**\* \***

**\* \* \***

**\* \* \* \***

**Ans)**

```
#include<iostream>
```

```
using namespace std;
```

```
int main(){
```

```
int n;
```

```
cout<<"Enter the number of rows "<<endl;
```



```
cin>>n;
```

```
for(int row=1;row<=n;row=row+1){
```

```
for(int column=0; column<row; column=column+1){
```

```
cout<<"* ";
```

```
}
```

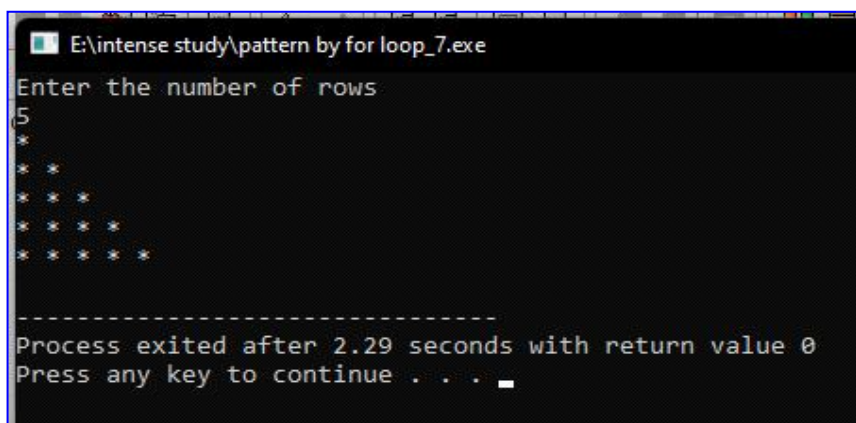
```
cout<<endl;
```

```
}
```

```
return 0;
```

```
}
```

**Output:**



```
E:\intense study\pattern by for loop_7.exe
Enter the number of rows
5
*
* *
* * *
* * * *
* * * * *

-----
Process exited after 2.29 seconds with return value 0
Press any key to continue . . . _
```

**Question 8) Write a Program to Display the given pattern:**

**1**

**2 2**

**3 3 3**

**4 4 4 4**

**5 5 5 5 5**

**Ans)**

```
#include<iostream>
```

```
using namespace std;
```

```
int main(){
```

```
int n;
```

```
cout<<"Enter the numbers of rows"<<endl;
```

```
cin>>n;

cout<<endl;

for(int row=1; row<=n; row++){

for(int column=0; column<row; column++){

cout<<row<<" ";

}

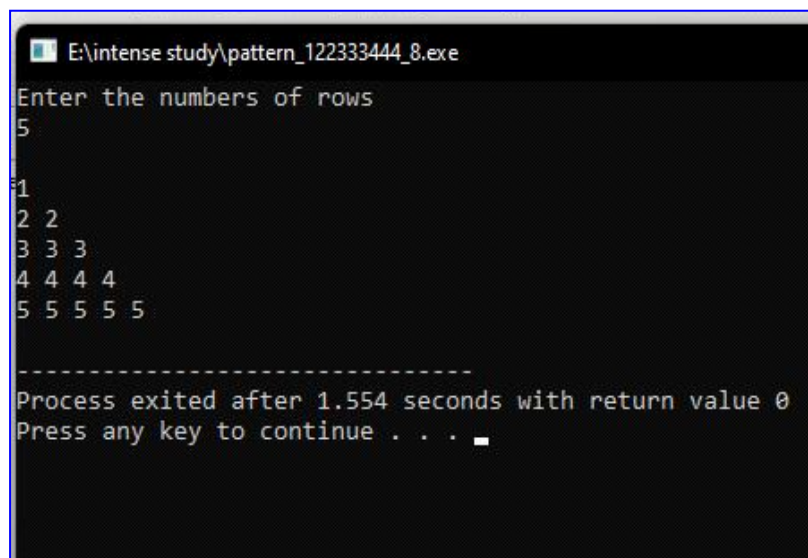
cout<<endl;

}

return 0;

}
```

## Output:



```
E:\intense study\pattern_122333444_8.exe
Enter the numbers of rows
5
1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
-----
Process exited after 1.554 seconds with return value 0
Press any key to continue . . .
```

**Question 9) Write a Program to Find out the Factors of given number.**

**Ans)**

```
#include<iostream>
```

```
using namespace std;
```

```
int main(){
```

```
int num;
```

```
cout<<"Enter the number:"<<endl;
```

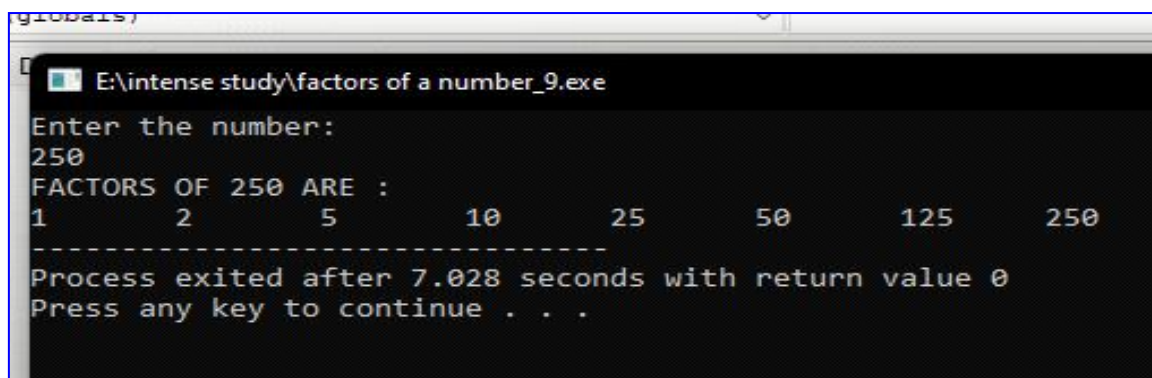
```
cin>>num;
```

```
cout<<"FACTORS OF "<<num<<" ARE : "<<endl;
```

```
for(int i=1;i<=num;i++){
```

```
if(num%i==0){  
  
cout<<i<<"\t";  
  
}  
  
}  
  
return 0;  
  
}
```

## Output:



The screenshot shows a Windows command prompt window with the title bar "E:\intense study\ factors of a number\_9.exe". The prompt is "C:\>". The user enters "250" in response to the prompt "Enter the number:". The program outputs "FACTORS OF 250 ARE :" followed by a list of factors: "1 2 5 10 25 50 125 250". A dashed line separates the output from the status message "Process exited after 7.028 seconds with return value 0". The prompt "Press any key to continue . . ." is displayed at the bottom.

```
E:\intense study\ factors of a number_9.exe  
C:\>  
Enter the number:  
250  
FACTORS OF 250 ARE :  
1 2 5 10 25 50 125 250  
-----  
Process exited after 7.028 seconds with return value 0  
Press any key to continue . . .
```

**Question 10) Write a Program to Find out the Area of a circle of the given Radius.**

**Ans)**

```
#include<iostream>
```

```
#define pi 3.14
```

```
using namespace std;
```

```
int main(){
```

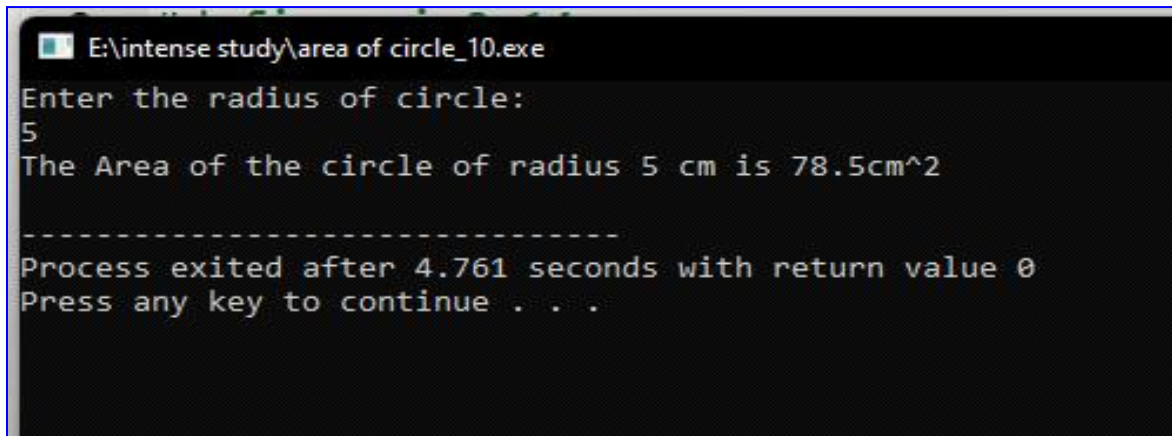
```
float radius;
```

```
cout<<"Enter the radius of circle: "<<endl;
```

```
cin>>radius;
```

```
float area;  
  
area=pi*radius*radius;  
  
cout<<"The Area of the circle of radius "<<radius<<" cm is  
    "<<area<<"cm^2"<<endl;  
  
return 0;  
  
}
```

## Output:



```
E:\intense study\area of circle_10.exe  
Enter the radius of circle:  
5  
The Area of the circle of radius 5 cm is 78.5cm^2  
-----  
Process exited after 4.761 seconds with return value 0  
Press any key to continue . . .
```

**Question 11) Write a Program to find out factorial of a number.**

**Ans)**

```
#include<iostream>

using namespace std;

int main(){

    int num;

    cout<<"Enter the number:"<<endl;

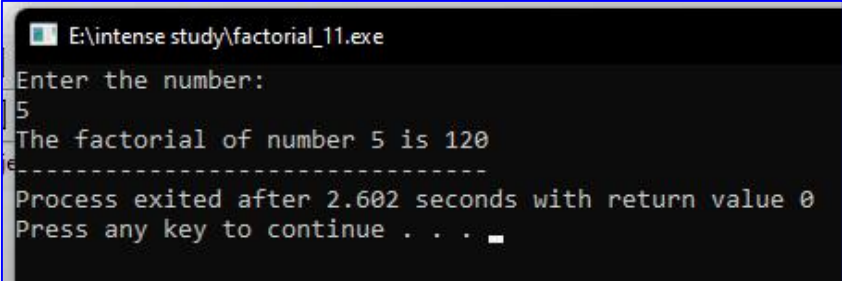
    cin>>num;

    int fac=1;
```



```
for(int i=1 ;i<=num;i++){  
  
    fac=fac*i;  
  
}  
  
cout<<"The factorial of number "<<num<<" is "<<fac;  
  
return 0;  
  
}
```

## Output:



```
E:\intense study\factorial_11.exe  
Enter the number:  
5  
The factorial of number 5 is 120  
-----  
Process exited after 2.602 seconds with return value 0  
Press any key to continue . . .
```

**Question 12) Write a Program to find surface area and volume of cylinder.**

**Ans)**

```
#include<iostream>
```

```
#define PI 3.14
```

```
using namespace std;
```

```
int main(){
```

```
    double r,h,A,V;
```

```
    cout<<"Enter the height of cylinder: "<<endl;
```

```
    cin>>h;
```

```
    cout<<"Enter the radius of cylinder: "<<endl;
```

```
cin>>r;

A=2*PI*r*h*(r+h);

cout<<"Area of cylinder we get : "<<A<<endl;

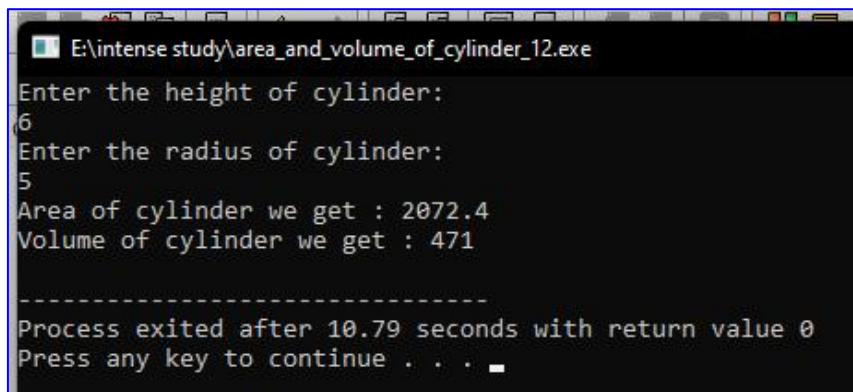
V= PI*r*r*h;

cout<<"Volume of cylinder we get : "<<V<<endl;

return 0;

}
```

## Output:



```
E:\intense study\area_and_volum_e_of_cylinder_12.exe
Enter the height of cylinder:
6
Enter the radius of cylinder:
5
Area of cylinder we get : 2072.4
Volume of cylinder we get : 471
-----
Process exited after 10.79 seconds with return value 0
Press any key to continue . . .
```

**Question 13) Write a Program to Find out the inputted letter is vowel , consonant,uppercase or lowercase.**

**Ans)**

```
#include<iostream>
```

```
using namespace std;
```

```
int main(){
```

```
    char letter;
```

```
    cout<<"Write a letter to be identified: "<<endl;
```

```
    cin>>letter;
```

```
if((letter=='a') || (letter=='e') || (letter=='i') || (letter=='o')
|| (letter=='u')){

    cout<<"LOWERCASE VOWEL "<<endl;

}

else if((letter=='A') || (letter=='E') || (letter=='I') ||
(letter=='O') || (letter=='U')){

    cout<<"UPPERCASE VOWEL"<<endl;

}

else if((letter>'A')&&(letter<='Z')&&(letter!='A')
&&(letter!='E')&&(letter!='I')&&(letter!='O')&&(letter!='
U')){

    cout<<"UPPERCASE CONSONENT"<<endl;

}

else{

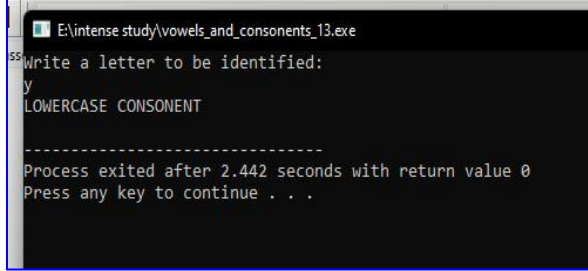
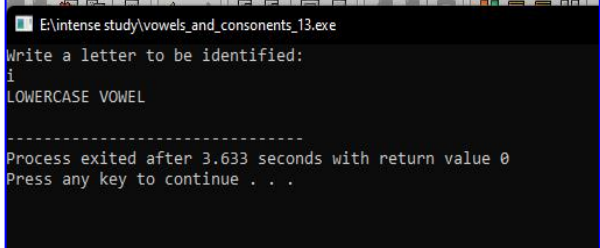
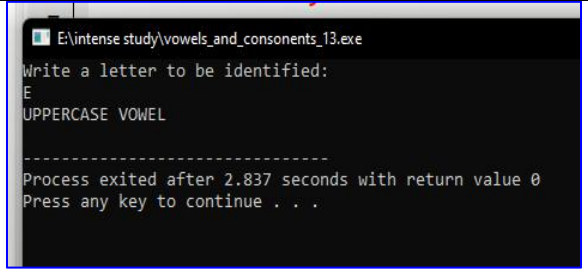
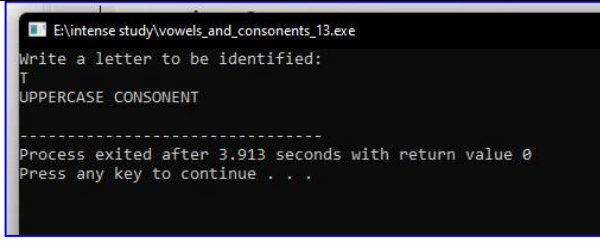
    cout<<"LOWERCASE CONSONENT"<<endl;

}

return 0;
```

}

## Output:

**Question 14) Write a Program to print sum and product of all numbers present in an integer.**

**Ans)**

```
#include<iostream>

using namespace std;

int main(){

    int num,i,sum=0;

    int choice;

    int pro=1;

    cout<<"Enter your choice:\n1) ADD digits\n2)
    PRODUCT digits"<<endl;

    cin>>choice;

    cout<<"Enter the no"<<endl;
```

```
cin>>num;

if (choice==1){
    while(num!=0){
        i=num%10;
        sum=sum+i;
        num=num/10;
    }
    cout<<"SUM: "<<sum<<endl;
}

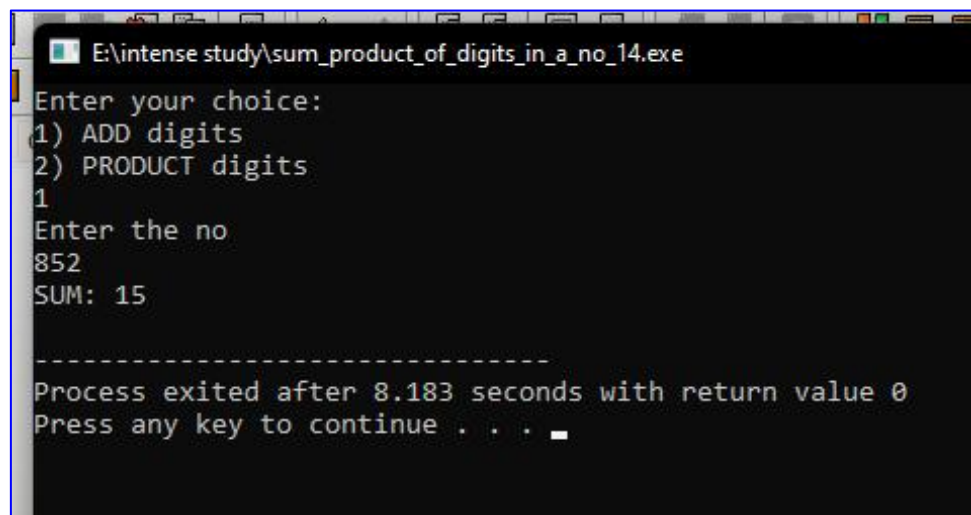
else{
    while(num!=0){
        i=num%10;
        pro=pro*i;
        num=num/10;
    }
    cout<<"PRODUCT "<<pro<<endl;
}

return 0;
```



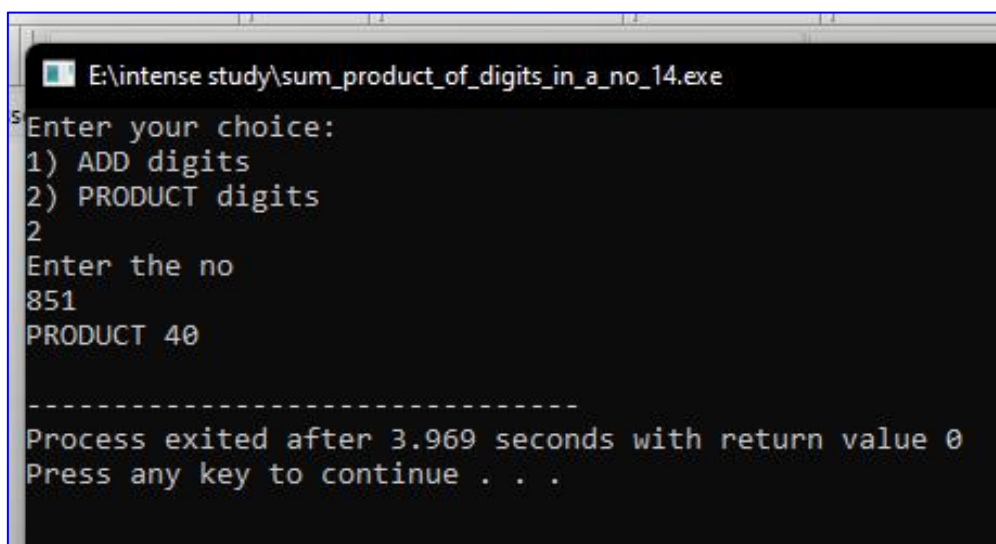
}

## Output:



```
E:\intense study\sum_product_of_digits_in_a_no_14.exe
Enter your choice:
1) ADD digits
2) PRODUCT digits
1
Enter the no
852
SUM: 15

-----
Process exited after 8.183 seconds with return value 0
Press any key to continue . . .
```



```
E:\intense study\sum_product_of_digits_in_a_no_14.exe
Enter your choice:
1) ADD digits
2) PRODUCT digits
2
Enter the no
851
PRODUCT 40

-----
Process exited after 3.969 seconds with return value 0
Press any key to continue . . .
```

**Question 15) Write a Program to reverse the given number.**

**Ans)**

```
#include <iostream>

using namespace std;

int main(){

    int n,i,rev=0;

    int n2;

    cout<<"Enter the number"<<endl;

    cin>>n;

    n2=n;

    while(n!=0){

        i=n%10;

        rev=rev*10+i;
```

```
        n=n/10;

    }

    cout<<"Original number is:"<<endl;

    cout<<n2<<endl;

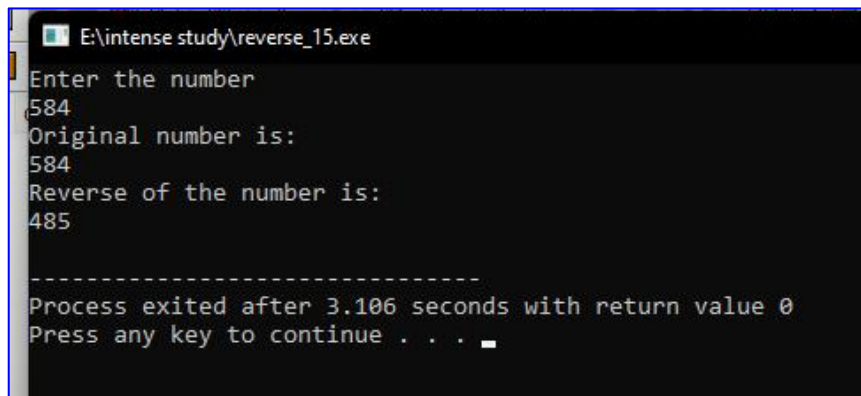
    cout<<"Reverse of the number is:"<<endl;

    cout<<rev<<endl;

    return 0;

}
```

## Output:



```
E:\intense study\reverse_15.exe
Enter the number
584
Original number is:
584
Reverse of the number is:
485

-----
Process exited after 3.106 seconds with return value 0
Press any key to continue . . .
```

**Question16) Write a Program to check that the given number is palindrome or not.**

**Ans)**

```
#include <iostream>

using namespace std;

int main(){

    int n,i,rev=0,n2;

    cout<<"Enter the number:"<<endl;

    cin>>n;

    n2=n;

    while(n!=0){

        i=n%10;

        rev=rev*10+i;

        n=n/10;
```

```

    }

    cout<<"Reverse of the number "<<n<<" is "<<rev<<endl;

    if (rev==n2){

        cout<<"PALINDROME"<<endl;

    }

    else{

        cout<<"NOT PALINDROME"<<endl;

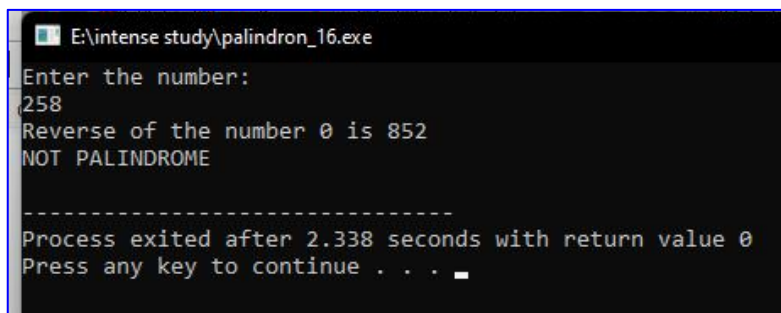
    }

    return 0;

}

```

## Output:

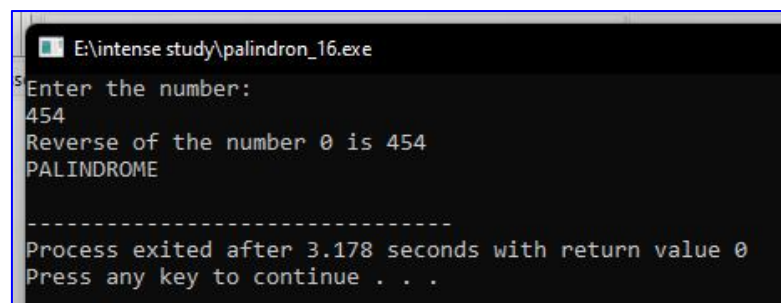


```

E:\intense study\palindron_16.exe
Enter the number:
258
Reverse of the number 0 is 852
NOT PALINDROME

-----
Process exited after 2.338 seconds with return value 0
Press any key to continue . . .

```



```

E:\intense study\palindron_16.exe
Enter the number:
454
Reverse of the number 0 is 454
PALINDROME

-----
Process exited after 3.178 seconds with return value 0
Press any key to continue . . .

```

**Question17) Write a Program to print the sum according the series of  $1/1+1/2+1/3+\dots+1/n$ .**

**Ans)**

```
#include<iostream>

using namespace std;

int main(){

    int num;

    int i=1;

    double sum=0.0;

    double d;

    cout<<"Enter the limit of the series "<<endl;

    cin>>num;

    while(i<=num){

        d=(double)1/i;
```

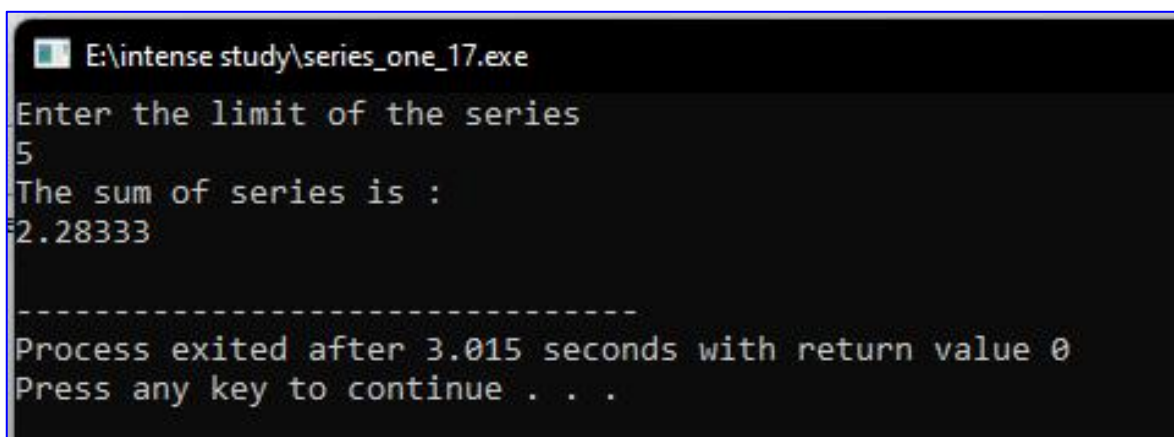
```
        sum=sum+d;

        i=i+1;
    }

    cout<<"The sum of series is :\n"<<sum<<endl;

    return 0;
}
```

## Output:



```
E:\intense study\series_one_17.exe
Enter the limit of the series
5
The sum of series is :
2.28333

-----
Process exited after 3.015 seconds with return value 0
Press any key to continue . . .
```

**Question18) Write a Program to print the sum of series of  $1-2+3-4+5-6+\dots+(n-1)-n$ .**

**Ans)**

```
#include<iostream>

using namespace std;

int main(){

    int num;

    cout<<"Enter the limit of series: "<<endl;

    cin>>num;

    int sum = 0;

    int i=1;

    for(int i=1; i<=num; i++){

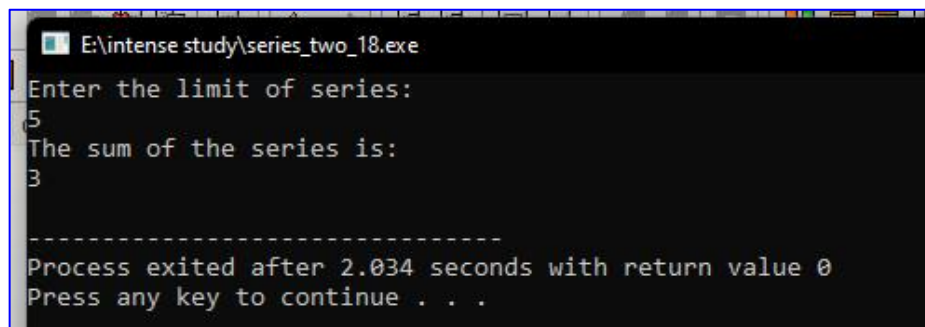
        if(i%2==0){

            sum=sum-i;
```



```
    }  
  
    else {  
  
        sum=sum+i;  
  
    }  
  
}  
  
cout<<"The sum of the series is:\n"<<sum<<endl;  
  
return 0;  
  
}
```

## Output:



```
E:\intense study\series_two_18.exe  
Enter the limit of series:  
5  
The sum of the series is:  
3  
-----  
Process exited after 2.034 seconds with return value 0  
Press any key to continue . . .
```

**Question19) Write a Program to print the sum of series of  $(1+1/0!)+(2+1/1!).....+(n+1/(n-1)!)$ .**

**Ans)**

```
#include<iostream>

using namespace std;

int main(){

    int num;

    cout<<"Enter the limit "<<endl;

    cin>>num;

    double sum=0.0;

    double d;

    int fact=1;

    int i=1;

    while(i<=num){
```

```
        d=(double)1/fact;

        sum=sum+i+d;

        i=i+1;

        fact=fact*(i-1);

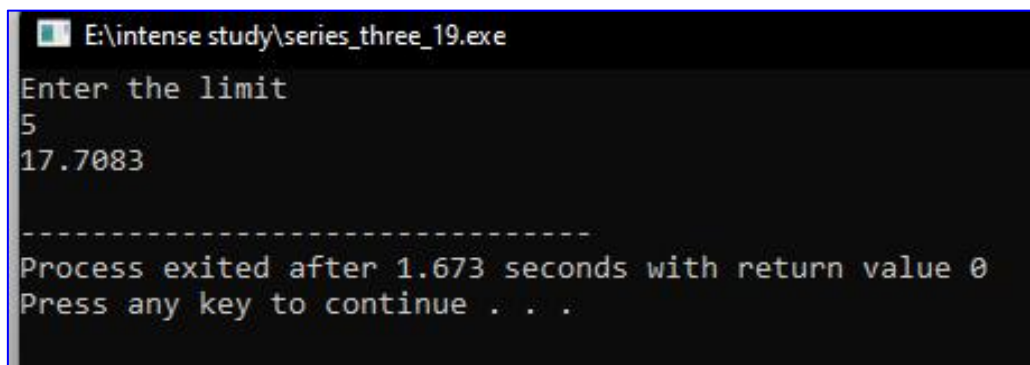
    }

    cout<<sum<<endl;

    return 0;

}
```

## Output:



```
E:\intense study\series_three_19.exe
Enter the limit
5
17.7083

-----
Process exited after 1.673 seconds with return value 0
Press any key to continue . . .
```

**Question20) Write a Program to print the sum according the series of  $1^3/2! + 2^3/3! + 3^3/4! + \dots + n^3/(n+1)!$ .**

**Ans)**

```
#include<iostream>

#include<cmath>

using namespace std;

int main(){

    int n;

    cout<<"Enter the limit "<<endl;

    cin>>n;

    double d;

    int i=1;

    double sum=0.0;
```

```
int a;

int fact=1;

while(i<=n){

    fact=fact*(i+1);

    a=pow(i,3);

    d=(double)a/fact;

    sum=sum+d;

    i=i+1;

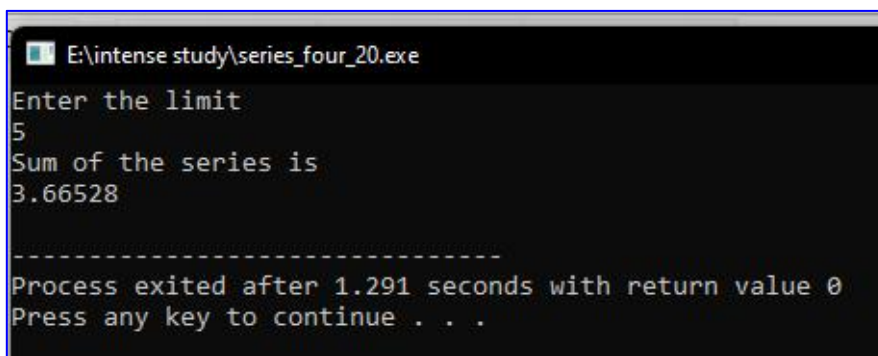
}

cout<<"Sum of the series is\n"<<sum<<endl;

return 0;

}
```

## Output:



```
E:\intense study\series_four_20.exe
Enter the limit
5
Sum of the series is
3.66528

-----
Process exited after 1.291 seconds with return value 0
Press any key to continue . . .
```

**Question21) Write a Program to print the sum according the series of  $1/1^1-1/2^2+1/3^3.....1/n^n$ .**

**Ans)**

```
#include<iostream>
```

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

```
using namespace std;
```

```
int main(){
```

```
    int n;
```

```
    cout<<"Enter the limit "<<endl;
```

```
    cin>>n;
```

```
    double d;
```

```
    int a;
```

```
    int i=1;
```

```
double sum=0.0;

while(i<=n){

    a=pow(i,i);

    d=(double)1/a;

    if(i%2==0){

        sum=sum-d;

    }

    else{

        sum=sum+d;

    }

    i=i+1;

}

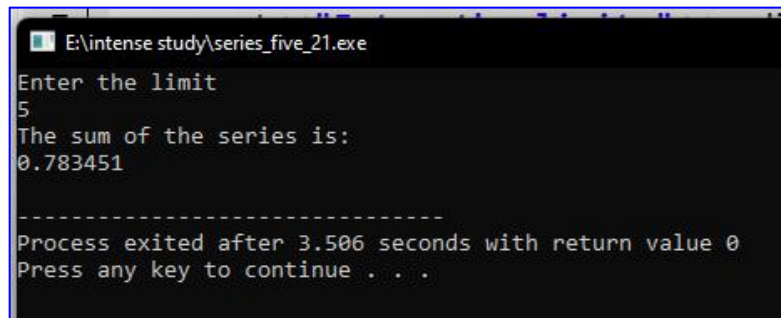
cout<<"The sum of the series is:\n";

cout<<sum<<endl;

return 0;

}
```

**Output:**



```
E:\intense study\series_five_21.exe
Enter the limit
5
The sum of the series is:
0.783451
-----
Process exited after 3.506 seconds with return value 0
Press any key to continue . . .
```

**Question22) Write a Program to print Fibonacci series.**

**Ans)**

```
#include<iostream>
```

```
using namespace std;
```

```
int main(){
```

```
    int x=0,y=1;
```

```
    int n;
```

```
    cout<<"Enter the the limit upto which want fibonacci
series"<<endl;
```

```
    cin>>n;
```

```
    cout<<"*****FIBONACCI
SERIES*****"<<"\n"<<endl;
```

```
    int i=1;
```



```
int sum=0;

cout<<0<<"\n"<<1<<endl;

while(i<=(n-2)){

    sum=x+y;

    x=y;

    y=sum;

    cout<<sum<<endl;

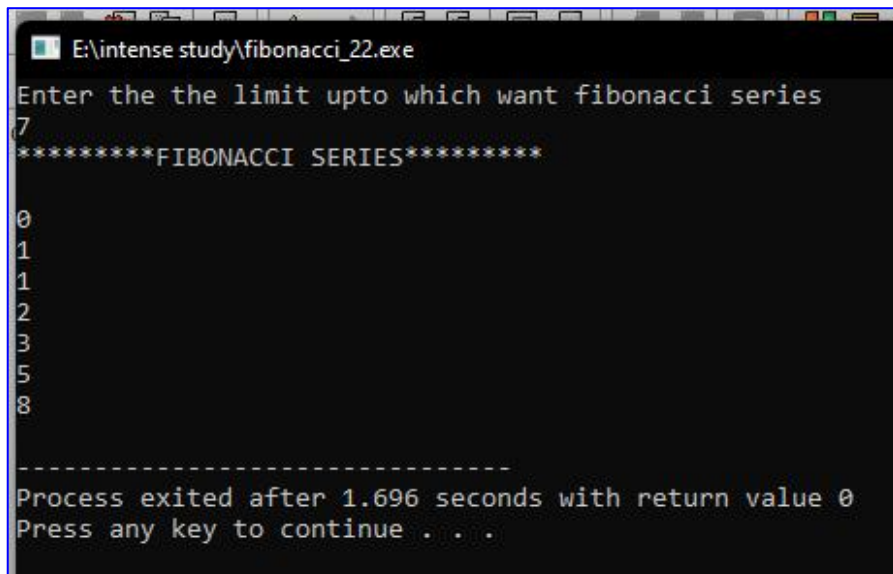
    i=i+1;

}

return 0;

}
```

## Output:



```
E:\intense study\fibonacci_22.exe
Enter the the limit upto which want fibonacci series
7
*****FIBONACCI SERIES*****
0
1
1
2
3
5
8
-----
Process exited after 1.696 seconds with return value 0
Press any key to continue . . .
```

**Question23) Write a Program to convert angle degree to radians and vice versa.**

**Ans)**

```
#include<iostream>
```

```
#define pi 3.14
```

```
using namespace std;
```

```
int main(){
```

```
    double degree,radian;
```

```
    int choice;
```

```
    cout<<"Enter your choice:\n 1)Convert degree to  
radians\n 2)Convert radians to degree"<<endl;
```

```
    cin>>choice;
```

```
    if(choice==1){
```

```
    cout<<"Enter the angle in degree "<<endl;

    cin>>degree;

    radian=pi/180*degree;

    cout<<"The angle in radian is " <<radian;

}

else{

    cout<<"Enter the angle in radian"<<endl;

    cin>>radian;

    degree=180/pi*radian;

    cout<<"The angle in degree is " <<degree;

}

return 0;

}
```

**Output:**

<pre>E:\intense study\convert_rad_degree_23.exe Enter your choice: 1)Convert degree to radians 2)Convert radians to degree 1 Enter the angle in degree 60 The angle in radian is 1.04667 ----- Process exited after 6.881 seconds with return v Press any key to continue . . .</pre>	<pre>E:\intense study\convert_rad_degree_23.exe Enter your choice: 1)Convert degree to radians 2)Convert radians to degree 2 Enter the angle in radian 1.57 The angle in degree is 90 ----- Process exited after 5.903 seconds with return Press any key to continue . . .</pre>
---	--

**Question24) Write a Program to check the number is Armstrong or not.**

**Ans)**

```
#include<iostream>
```

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

```
using namespace std;
```

```
int main(){
```

```
    int num;
```

```
    cout<<"Enter the no to check"<<endl;
```

```
cin>>num;

int cube;

int i;

int sum=0;

int n2=num;

while(num!=0){

    i=num%10;

    num=num/10;

    cube=pow(i,3);

    sum=sum+cube;

}

if(sum==n2){

    cout<<"ARMSTRONG\n"<<endl;

}

else{

    cout<<"NOT ARMSTRONG"<<endl;
```

```

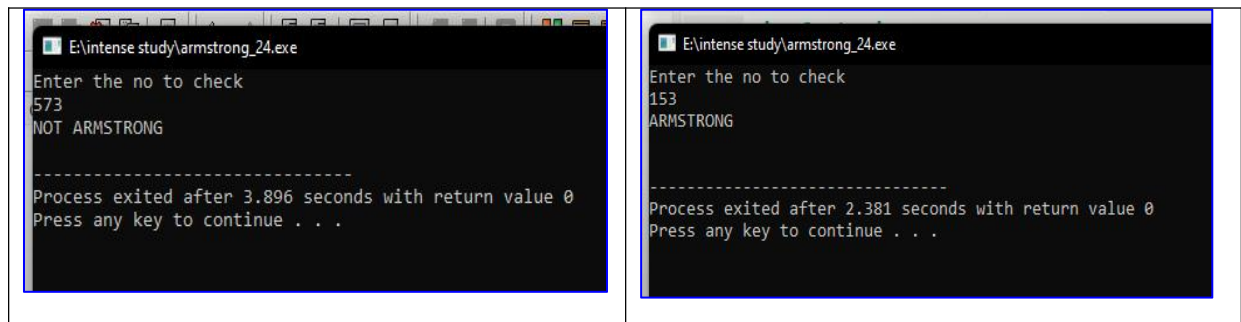
    }

    return 0;

}

```

## Output:



**Question25) Write a Program to make a function which check the given number is prime or not and use same to print the prime numbers upto 100.**

**Ans)**

```

#include<iostream>

using namespace std;

bool isprime(int num){

    for(int i=2;i<num;i++){

        if(num%i==0){

```

```

        return 0;
    }
}

return 1;
}

int main(){

    int num;

    cout<<"Enter the number you want to check whether
    prime or not: ";

    cin>>num;

    if(isprime(num)){

        cout<<"PRIME NUMBER"<<endl;

    }

    else{

        cout<<"NOT PRIME NUMBER"<<endl;

    }

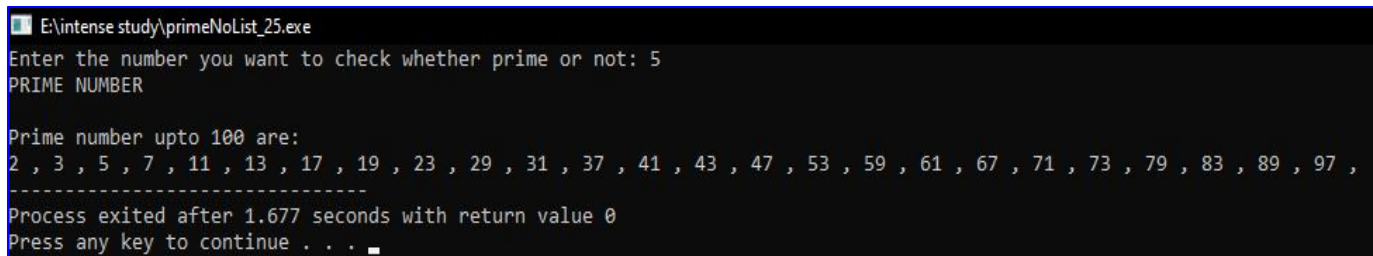
    cout<<"\nPrime number upto 100 are:"<<endl;

    for(int j=2;j<100;j++){

```

```
        if(isprime(j)){  
            cout<<j<<" , ";  
        }  
    }  
    return 0;  
}
```

## Output:



The screenshot shows a Windows command prompt window titled "E:\intense study\primeNoList\_25.exe". The user enters the number 5 when prompted. The program outputs the prime numbers up to 100, which are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, and 97. The program then exits after 1.677 seconds with a return value of 0.

```
E:\intense study\primeNoList_25.exe  
Enter the number you want to check whether prime or not: 5  
PRIME NUMBER  
  
Prime number upto 100 are:  
2 , 3 , 5 , 7 , 11 , 13 , 17 , 19 , 23 , 29 , 31 , 37 , 41 , 43 , 47 , 53 , 59 , 61 , 67 , 71 , 73 , 79 , 83 , 89 , 97 ,  
-----  
Process exited after 1.677 seconds with return value 0  
Press any key to continue . . .
```



**Question26) Write a Program using function to find sum of first n natural numbers.**

**Ans)**

```
#include<iostream>

using namespace std;

int add(int n);

int main(){

    int num;

    cout<<"Enter the number:"<<endl;

    cin>>num;

    int x=add(num);

    cout<<"Sum of "<<num<<" terms is "<<x;

    return 0;

}

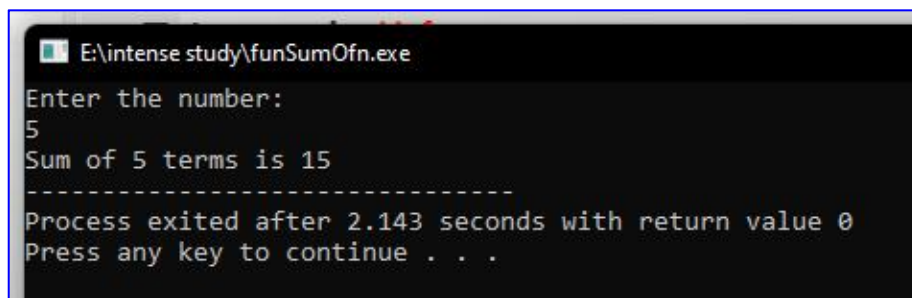
int add(int n){

    int add=0;

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

```
    add=add+i;  
  
}  
  
return add;  
  
}
```

## Output:



```
E:\intense study\funSumOfn.exe  
Enter the number:  
5  
Sum of 5 terms is 15  
-----  
Process exited after 2.143 seconds with return value 0  
Press any key to continue . . .
```

**Question27) Write a Program using function to compute the value of c as quotient of the square root of the sum of the square of a and square b & product of 4 and a for the input as a, b and output as c.**

**Ans)**

```
#include<iostream>
```

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

```
using namespace std;
```

```
double square(double a,double b);
```

```
int main(){
```

```
    double x;
```

```
    double y;
```

```
    cout<<"Enter the value of first no\n";
```

```
    cin>>x;
```

```
    cout<<"Enter the value of second no\n";
```

```
    cin>>y;
```

```
double d;  
  
d=square(x,y);  
  
cout<<"The Square Root function give:\n "<<d;  
  
return 0;  
  
}  
  
double square(double a,double b){  
  
    double c;  
  
    double i;  
  
    double e;  
  
    e=pow(a,2)+pow(b,2);  
  
    i=sqrt(e);  
  
    c=i/(4*a);  
  
    return c;  
  
}
```

## Output:

```
E:\intense study\sqrFun.exe
Enter the value of first no
4
Enter the value of second no
5
The Square Root function give:
0.400195
-----
Process exited after 4.434 seconds with return value 0
Press any key to continue . . .
```

**Question28) Write a Program function to compute the perimeter of a right triangle for the given the length of two sides a and b where side c is the hypotenuse.**

**Ans)**

```
#include<iostream>

#include<cmath>

using namespace std;

double perimeter(double a, double b);

int main(){

    double x;

    double y;

    cout<<"Enter the value of first side of triangle: "<<endl;

    cin>>x;

    cout<<"enter the value of second side of triangle: "<<endl;

    cin>>y;

    double d= perimeter(x,y);
```

```

cout<<"The    perimeter    of    right    angled    triangle
of:\nPerpendicular=\t"<<x<<"\n"<<"Base
="<<"\t"<<y<<"\nis "<<d<<" cm."<<endl;

return 0;

}

double perimeter(double a, double b){

    double sum;

    double c;

    double e;

    e=a*a+b*b;

    c=sqrt(e);

    sum=a+b+c;

    return sum;

}

```

## Output:

```
E:\intense study\perTriangle.exe
Enter the value of first side of triangle:
4
enter the value of second side of triangle:
3
The perimeter of right anled traingle of:
Perpendicular = 4
Base = 3
is 12 cm.

-----
Process exited after 3.178 seconds with return value 0
Press any key to continue . . .
```



**Question29) Write a Program to compute the sum of the following series using function:**

**$2/1+3/4+4/9+\dots+(n+1)/(n*n).$**

**Ans)**

```
#include <iostream>

using namespace std;

double series(int limit);

int main(){

    int n;

    cout<<"Enter the limit"<<endl;

    cin>>n;

    double serial = series(n);

    cout<<"*****The          SUM          of          series
2/1+3/4+4/9+.....(n+1)/(n*n) is*****"<<endl;

    cout<<serial;

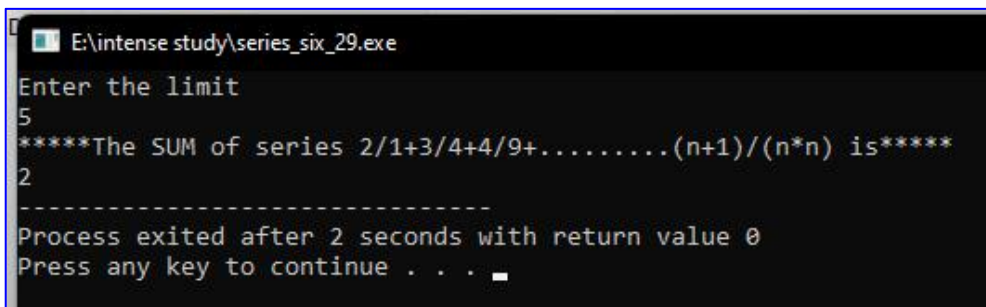
    return 0;

}

double series(int limit){
```

```
double d;  
  
double a;  
  
double sum=0.0;  
  
for(int i=1; i<=limit; i++){  
  
    a=i*i;  
  
    double inc=(double)i+1;  
  
    d=(double)inc/a;  
  
    sum=sum+d;  
  
    return sum;  
}  
}
```

## Output:



```
E:\intense study\series_six_29.exe  
Enter the limit  
5  
*****The SUM of series 2/1+3/4+4/9+.....(n+1)/(n*n) is*****  
2  
-----  
Process exited after 2 seconds with return value 0  
Press any key to continue . . . _
```

**Question30) Write a c++ function fact() to find the factorial of the given number, num and write a program to print factorial of first n even numbers using fact() function.**

**Ans)**

```
#include<iostream>

using namespace std;

void fact(int n);

int main(){

    int num;

    cout<<"Enter the number upto which you want
    factorial"<<endl;

    cin>>num;

    int f=1;

    for(int i=2; i<=num ; i++){

        f*=i;

    }

    cout<<"The factorial of "<<num<<" is "<<f<<endl;
```

```

        cout<<"The factorial of numbers upto "<<num<<"
        are:\n";

        fact(num);

    }

void fact(int n){

    int fac=1;

    for(int i=0; i<=2*n-1; i=i+2){

        for(int j=1; j<=i; j++){

            fac*=j;

        }

        cout<<"The factorial of "<<i<<" is "<<fac<<endl;

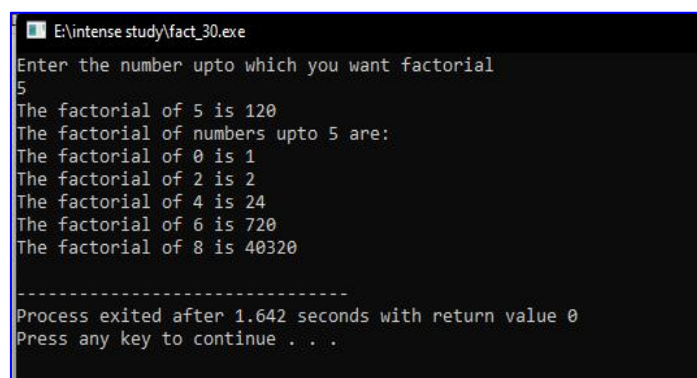
        fac=1;

    }

}

```

## OUTPUT



```

E:\intense study\fact_30.exe
Enter the number upto which you want factorial
5
The factorial of 5 is 120
The factorial of numbers upto 5 are:
The factorial of 0 is 1
The factorial of 2 is 2
The factorial of 4 is 24
The factorial of 6 is 720
The factorial of 8 is 40320

-----
Process exited after 1.642 seconds with return value 0
Press any key to continue . . .

```

**Question31) Write a c++ function star() to print a triangle of stars as follows (take number of lines from user): For example n=4.**

**\***

**\* \* \***

**\* \* \* \* \***

**\* \* \* \* \* \* \***

**Ans)**

```
#include<iostream>
```

```
using namespace std;
```

```
void star(int n);
```

```
int main(){
```

```
    int n;
```

```
    cout<<"Enter the number of rows:"<<endl;
```

```
    cin>>n;
```

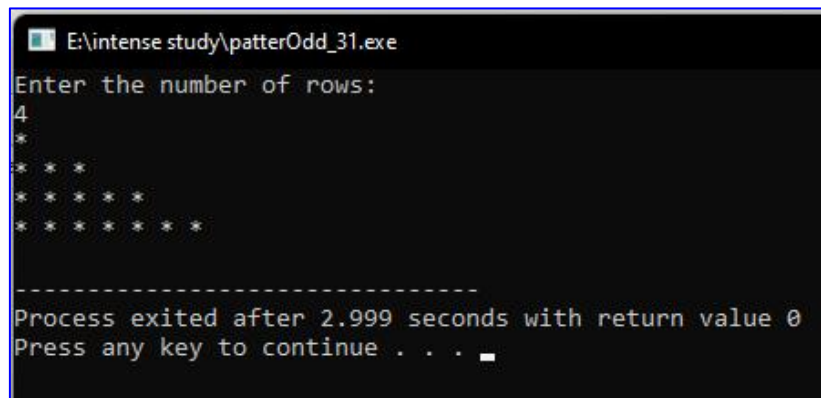
```
    star(n);
```

```
    return 0;
```

```
}
```

```
void star(int n){  
    for(int i=1; i<=n; i++){  
        for(int j=0; j<(2*i-1) ;j++){  
            cout<<"* ";  
        }  
        cout<<endl;  
    }  
}
```

## OUTPUT



```
E:\intense study\patterOdd_31.exe  
Enter the number of rows:  
4  
*  
* * *  
* * * * *  
* * * * * * *  
-----  
Process exited after 2.999 seconds with return value 0  
Press any key to continue . . .
```

**Question32) Write a program that swaps two numbers in which a function is passed address of two variables and then alter its contents. (parameters are pass by reference).**

**Ans)**

```
#include<iostream>

using namespace std;

void swap(int& x,int& y);

int main(){

    int a;

    int b;

    cout<<"Enter first no"<<endl;

    cin>>a;

    cout<<"Enter second no"<<endl;

    cin>>b;

    cout<<"Numbers before swapping:"<<endl;

    cout<<a<<" "<<b<<endl;

    swap(a,b);
```

```
cout<<"Numbers after swapping:"<<endl;

cout<<a<<" "<<b<<endl;

return 0;

}

void swap(int& x,int& y){

    int hold=x;

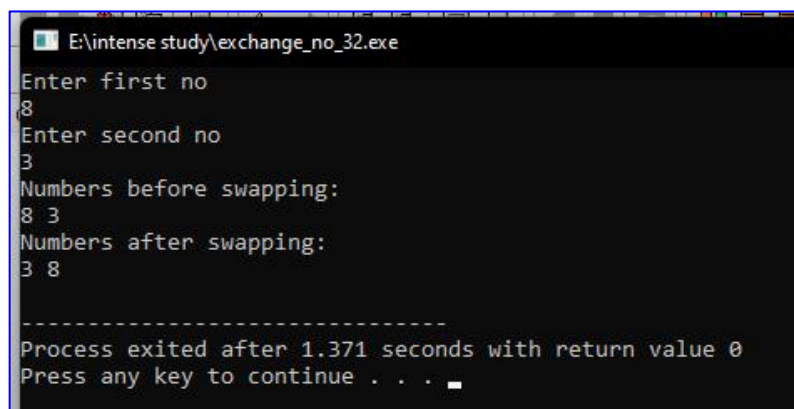
    x=y;

    y=hold;

    return;

}
```

## OUTPUT



```
E:\intense study\exchange_no_32.exe
Enter first no
8
Enter second no
3
Numbers before swapping:
8 3
Numbers after swapping:
3 8

-----
Process exited after 1.371 seconds with return value 0
Press any key to continue . . .
```



**Question33) Write a program to swap two numbers using pointers.**

**Ans)**

```
#include<iostream>

using namespace std;

int main(){

    int* p;

    int* q;

    int a,b;

    cout<<"Enter the two numbers: "<<endl;

    cin>>a>>b;

    p=&a;

    q=&b;

    cout<<"Before swapping numbers are: "<<endl;

    cout<<(*p)<<" "<<(*q)<<endl;

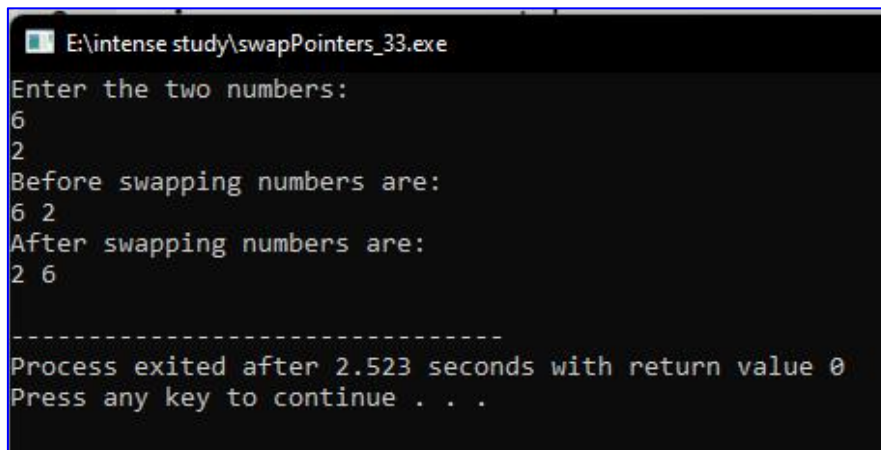
    int hold;

    hold=*p;

    *p=*q;
```

```
*q=hold;  
  
cout<<"After swapping numbers are: "<<endl;  
  
cout<<(*p)<<" "<<(*q)<<endl;  
  
return 0;  
  
}
```

## OUTPUT



```
E:\intense study\swapPointers_33.exe  
Enter the two numbers:  
6  
2  
Before swapping numbers are:  
6 2  
After swapping numbers are:  
2 6  
  
-----  
Process exited after 2.523 seconds with return value 0  
Press any key to continue . . .
```

**Question34) Write a program to swap two numbers using macros.**

**Ans)**

```
#include<iostream>

using namespace std;

#define SWAP(x,y) x ^= y ^= x ^= y

#define EXCHG(u,v,hold) hold=u; u=v; v=hold;

int main()
{
    int a,b,c,d,h;

    cout<<"Enter two numbers:";

    cin>>a>>b;

    cout << "Before SWAP Macro, The two numbers are " <<
a << " and " << b << endl;

    SWAP(a,b);

    cout << "After SWAP Macro, The two numbers are " << a
<< " and " << b << endl;
```

```
c=b;d=a;
```

```
cout << "Before EXCHG Macro, the two numbers are "
```

```
<< c << " and " << d << endl;;
```

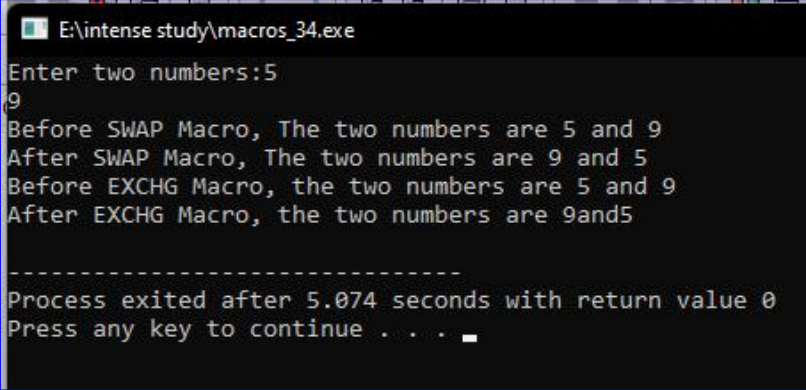
```
EXCHG(c,d,h);
```

```
cout << "After EXCHG Macro, the two numbers are " <<
```

```
c <<"and"<<d<<endl;
```

```
}
```

## OUTPUT



```
E:\intense study\macros_34.exe
Enter two numbers:5
9
Before SWAP Macro, The two numbers are 5 and 9
After SWAP Macro, The two numbers are 9 and 5
Before EXCHG Macro, the two numbers are 5 and 9
After EXCHG Macro, the two numbers are 9and5

-----
Process exited after 5.074 seconds with return value 0
Press any key to continue . . . . _
```

**Question35) Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.**

**Ans)**

```
#include<iostream>

#define PI 3.14

using namespace std;

double area(float rad);

double circumference(float rad);

int main(){

    float radius;

    cout<<"Enter the value of radius of circle:"<<endl;

    cin>>radius;

    double surface=area(radius);

    double perimeter=circumference(radius);
```

```
cout<<"The area of circle is: "<<surface<<endl;

cout<<"The circumference of circle is: "<<perimeter<<endl;

return 0;

}

double area(float rad){

    double s=PI*rad*rad;

    return s;

}

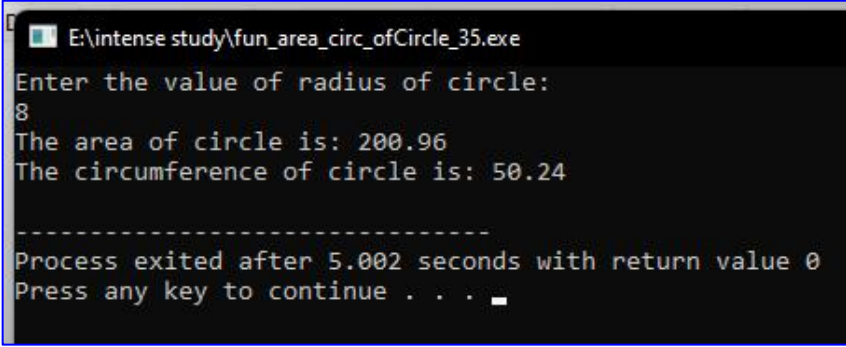
double circumference(float rad){

    double c=2*PI*rad;

    return c;

}
```

## OUTPUT



```
E:\intense study\fun_area_circ_ofCircle_35.exe
Enter the value of radius of circle:
8
The area of circle is: 200.96
The circumference of circle is: 50.24
-----
Process exited after 5.002 seconds with return value 0
Press any key to continue . . . _
```

**Question36) Write a program to search the given element in the array or not.**

**Ans)**

```
#include<iostream>

using namespace std;

int main(){

    int sise;

    cout<<"Enter the size of array:"<<endl;

    cin>>sise;

    int arr[sise];

    for(int j=0;j<sise;j++){

        cout<<"Enter " <<j<<" element of array:"<<endl;

        cin>>arr[j];

    }

    int num;

    cout<<"Enter the no want to search in the array:"<<endl;

    cin>>num;
```

```
for(int i=0; i<=size;i++){  
    if (arr[i]==num){  
        cout<<num<<" is present in the array "<<endl;  
        break;  
    }  
    else{  
        if(i>=size){  
            cout<<num<<" is not present in the array "<<endl;  
        }  
    }  
}  
return 0;  
}
```



## OUTPUT

```
E:\intense study\array_findValue_36.exe
Enter the size of array:
5
Enter 0 element of array:
4
Enter 1 element of array:
6
Enter 2 element of array:
9
Enter 3 element of array:
2
Enter 4 element of array:
3
Enter the no want to search in the array:
5
5 is not present in the array

-----
Process exited after 9.304 seconds with return value 0
Press any key to continue . . .
```

```
E:\intense study\array_findValue_36.exe
Enter the size of array:
5
Enter 0 element of array:
4
Enter 1 element of array:
9
Enter 2 element of array:
8
Enter 3 element of array:
3
Enter 4 element of array:
6
Enter the no want to search in the array:
8
8 is present in the array

-----
Process exited after 10.35 seconds with return value 0
Press any key to continue . . .
```

**Question37) Write a program to perform following actions on an array entered by the user:**

- i) Print the even-valued elements**
- ii) Print the odd-valued elements**
- iii) Calculate and print the sum and average of the elements of array**
- iv) Print the maximum and minimum element of array**
- v) Remove the duplicates from the array**
- vi) Print the array in reverse order**

**The program should present a menu to the user and ask for one of the options. The menu should also include options to re-enter array and to quit the program.**

**Ans)**

```
#include<iostream>
```

```
using namespace std;
```

```
void even(int si,int many[]);
```

```
void odd(int si,int many[]);
```

```
void sumAvg(int si,int many[]);

void maxMin(int si,int many[]);

void dup(int si,int many[]);

void rev(int si,int many[]);

int main(){

    int sise;

    cout<<"Enter the size of array:"<<endl;

    cin>>sise;

    int arr[sise];


    for(int j=0;j<sise;j++){

        cout<<"Enter " <<j<<" element of array:"<<endl;

        cin>>arr[j];

    }

    cout<<endl;

    cout<<"Your Original array is:"<<endl;

    for(int i=0;i<sise;i++){

        cout<<arr[i]<<" ";
```

```
}
```

```
char ch;
```

```
do{
```

```
    int choice;
```

```
    cout<<"\nEnter your choice : \n1 Print the even-valued  
    elements\n2 Print the odd-valued elements\n3  
    Calculate and print the sum and average of the elements  
    of array\n4 Print the maximum and minimum element  
    of array\n5 Remove the duplicates from the array\n6  
    Print the array in reverse order "<<endl;
```

```
    cin>>choice;
```

```
    int list;
```

```
    float set;
```

```
    int last;
```

```
    if (choice==1){
```

```
        even(sise,arr);
```

```
    }
```

```
    else if (choice==2){
```

```
        odd(sise,arr);
```

```
}

else if (choice==3){
    sumAvg(sise,arr);
}

else if (choice==4){
    maxMin(sise,arr);
}

else if (choice==5){
    dup(sise,arr);
}

else if(choice==6) {
    rev(sise,arr);
}

else{
    cout<<"INVALID CHOICE "<<endl;
}

cout<<"\n\nDo you want to choose more choices:
(y/n)"<<endl;
```

```

        cin>>ch;

    }while((ch=='y') || (ch=='Y'));
}

void even(int si,int many[]){

    cout<<"EVEN no are :"<<endl;

    for (int i=0;i<si;i++){

        if(many[i]%2==0){

            cout<<many[i]<<" ";

        }

    }

}

void odd(int si,int many[]){

    cout<<"ODD no are :"<<endl;

    for (int i=0;i<si;i++){

        if(many[i]%2!=0){

            cout<<many[i]<<" ";

        }

    }

}

```

```
}
```

```
void sumAvg(int si,int many[]){
```

```
    int sum=0;
```

```
    float avg;
```

```
    for(int i=0; i<si;i++){
```

```
        sum=sum+many[i];
```

```
    }
```

```
    avg=sum/si;
```

```
    cout<<"Sum of numbers in array "<<sum<<endl;
```

```
    cout<<"Average of numbers in array "<<avg<<endl;
```

```
    return;
```

```
}
```

```
void maxMin(int si,int many[]){
```

```
    int max = many[0];
```

```
    int min = many[0];
```

```
    for(int i=1; i<si; i++)
```

```
    {
```

```

    if(many[i] > max)
    {
        max = many[i];
    }

    else if(many[i] < min)
    {
        min = many[i];
    }
}

cout<<"MAXIMUM VALUE IS "<<max<<endl;
cout<<"MINIMUM VALUE IS "<<min<<endl;

return;

}

void dup(int si,int many[]){

    for(int i=0;i<si;++i){

        for(int j=i+1;j<si;j++){

            if(many[i]==many[j]){

```



```

        while(j<si){

            many[j]=many[j+1];

            j++;

        }

        --si;

    }

    else{

        continue;

    }

}

}

cout<<"Now the array after removing duplicate values
is:"<<endl;

for(int t=0; t<si; t++){

    cout<<many[t]<<" ";

}

}

void rev(int si,int many[]){

```

```
cout<<"Reversed array is:"<<endl;

for(int i=si-1;i>=0;i--){

    cout<<many[i]<<" ";

}

}
```

# OUTPUT

```
E:\intense study\excel_sheet_37.exe
Enter the size of array:
5
Enter 0 element of array:
2
Enter 1 element of array:
4
Enter 2 element of array:
3
Enter 3 element of array:
5
Enter 4 element of array:
1

Your Original array is:
2 4 3 5 1
Enter your choice :
1 Print the even-valued elements
2 Print the odd-valued elements
3 Calculate and print the sum and average of the elements of array
4 Print the maximum and minimum element of array
5 Remove the duplicates from the array
6 Print the array in reverse order
1
EVEN no are :
2 4

Do you want to choose more choices: (y/n)
n

-----
Process exited after 9.705 seconds with return value 0
Press any key to continue . . .
```

```
2 4 3 5 1
Enter your choice :
1 Print the even-valued elements
2 Print the odd-valued elements
3 Calculate and print the sum and average of the elements of array
4 Print the maximum and minimum element of array
5 Remove the duplicates from the array
6 Print the array in reverse order
2
ODD no are :
3 5 1

Do you want to choose more choices: (y/n)
n
```

```
Your Original array is:
2 4 3 5 1
Enter your choice :
1 Print the even-valued elements
2 Print the odd-valued elements
3 Calculate and print the sum and average of the elements of array
4 Print the maximum and minimum element of array
5 Remove the duplicates from the array
6 Print the array in reverse order
3
Sum of numbers in array 15
Average of numbers in array 3

Do you want to choose more choices: (y/n)
n

-----
Process exited after 13.71 seconds with return value 0
Press any key to continue . . .
```

```
Your Original array is:
2 4 3 5 1
Enter your choice :
1 Print the even-valued elements
2 Print the odd-valued elements
3 Calculate and print the sum and average of the elements of array
4 Print the maximum and minimum element of array
5 Remove the duplicates from the array
6 Print the array in reverse order
4
MAXIMUM VALUE IS 5
MINIMUM VALUE IS 1

Do you want to choose more choices: (y/n)
n
```

```
Your Original array is:
1 2 2 3 3
Enter your choice :
1 Print the even-valued elements
2 Print the odd-valued elements
3 Calculate and print the sum and average of the elements of array
4 Print the maximum and minimum element of array
5 Remove the duplicates from the array
6 Print the array in reverse order
5
Now the array after removing duplicate values is:
1 2 3

Do you want to choose more choices: (y/n)
n

-----
Process exited after 13.1 seconds with return value 0
Press any key to continue . . .
```

```
Your Original array is:
4 3 5 2 1
Enter your choice :
1 Print the even-valued elements
2 Print the odd-valued elements
3 Calculate and print the sum and average of the elements of array
4 Print the maximum and minimum element of array
5 Remove the duplicates from the array
6 Print the array in reverse order
6
Reversed array is:
1 2 5 3 4

Do you want to choose more choices: (y/n)
n

-----
Process exited after 14.12 seconds with return value 0
Press any key to continue . . .
```

**Question38) Write a function that check every element in the array A is equal to the corresponding element of array B.**

**Ans)**

```
#include<iostream>

using namespace std;

void compare(int A[],int B[]);

int main(){

    int X[5]={5,12,4,78,36};

    int Y[5]={5,12,4,78,36};

    cout<<"Array A is:\n "<<endl;

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

        cout<<X[i]<<" ";

    }

    cout<<"\nArray B is:\n "<<endl;

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

```

        cout<<Y[i]<<" ";

    }

    compare(X,Y);

    return 0;

}

void compare(int A[],int B[]){

    int c=0;

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

        if(A[i]!=B[i]){

            c++;

        }

    }

    if(c==0){

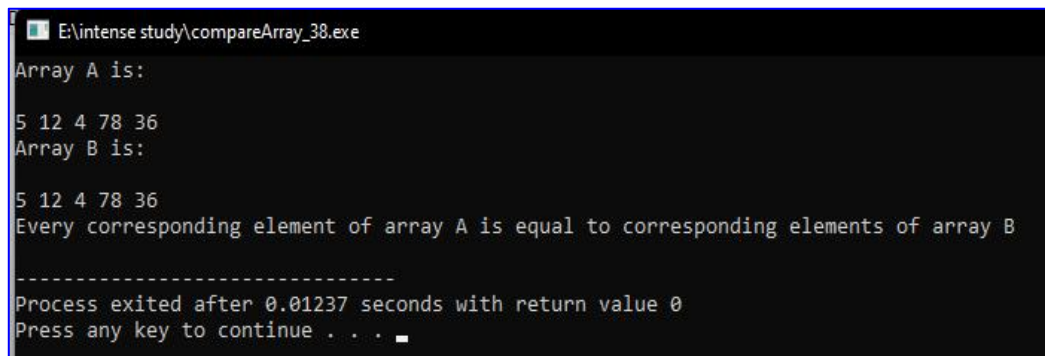
        cout<<"\nEvery corresponding element of array A is
        equal to corresponding elements of array B "<<endl;

    }

```

```
else{  
  
    cout<<"\nArray A is not equal to Array B"<<endl;  
  
}  
  
return;  
  
}
```

## OUTPUT



```
E:\intense study\compareArray_38.exe  
Array A is:  
5 12 4 78 36  
Array B is:  
5 12 4 78 36  
Every corresponding element of array A is equal to corresponding elements of array B  
-----  
Process exited after 0.01237 seconds with return value 0  
Press any key to continue . . .
```

**Question39) Write a program to merge a two ordered arrays into single ordered array.**

**Ans)**

```
#include<iostream>

using namespace std;

int main(){

    int A[5]={5,7,9,3,1},B[4]={4,2,6,8};

    int C[9];

    cout<<"Array A"<<endl;

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

        cout<<A[i]<<" ";

    }

    cout<<endl;

    cout<<"Array B"<<endl;

    for (int j=0; j<4; j++){

        cout<<B[j]<<" ";

    }

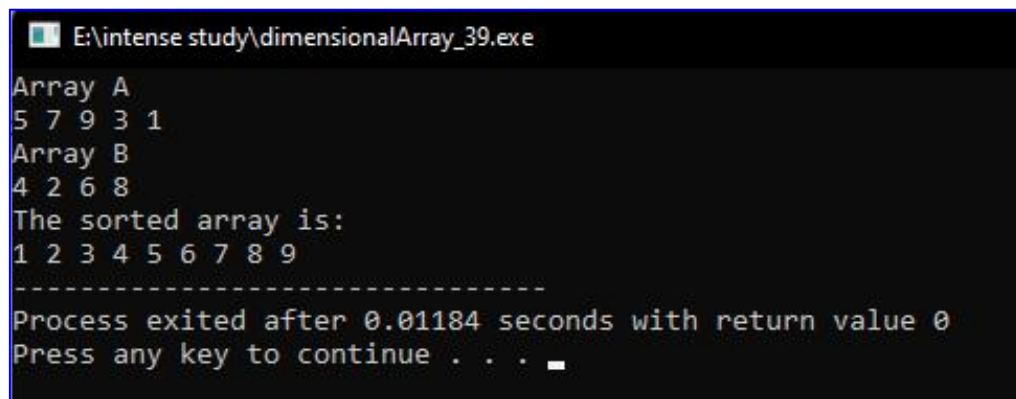
    int r=5;
```



```
for(int k=0; k<5; k++){  
    C[k]=A[k];  
}  
for(int l=0; l<4; l++){  
    C[r]=B[l];  
    r++;  
}  
for(int a=0; a<8; a++){  
    for(int b=a+1; b<9; b++){  
        if(C[b]<C[a]){  
            int hold;  
            hold = C[b];  
            C[b]=C[a];  
            C[a]=hold;  
        }  
    }  
}  
  
cout<<"\nThe sorted array is: "<<endl;
```

```
for(int m=0; m<9; m++){  
    cout<<C[m]<<" ";  
}  
  
return 0;  
}
```

## OUTPUT



```
E:\intense study\dimensionalArray_39.exe  
Array A  
5 7 9 3 1  
Array B  
4 2 6 8  
The sorted array is:  
1 2 3 4 5 6 7 8 9  
-----  
Process exited after 0.01184 seconds with return value 0  
Press any key to continue . . .
```

**Question40) Write a function that reverses the element of an array so that the last element becomes the first, the second from the last becomes the second, and so on. The function is to reverse the elements in place (without using another array).**

**Ans)**

```
#include<iostream>

using namespace std;

int main(){

    int num;

    cout<<"Enter the size of array:"<<endl;

    cin>>num;

    int arr[num];

    cout<<"Enter array elements:"<<endl;

    for(int i=0; i<num; i++){

        cin>>arr[i];

    }

    cout<<"The original array is:"<<endl;
```

```

for(int j=0; j<num; j++){

    cout<<arr[j]<<" ";

}

cout<<endl;

cout<<"The reversed array is:"<<endl;

for(int k=num-1; k>=0; k--){

    cout<<arr[k]<<" ";

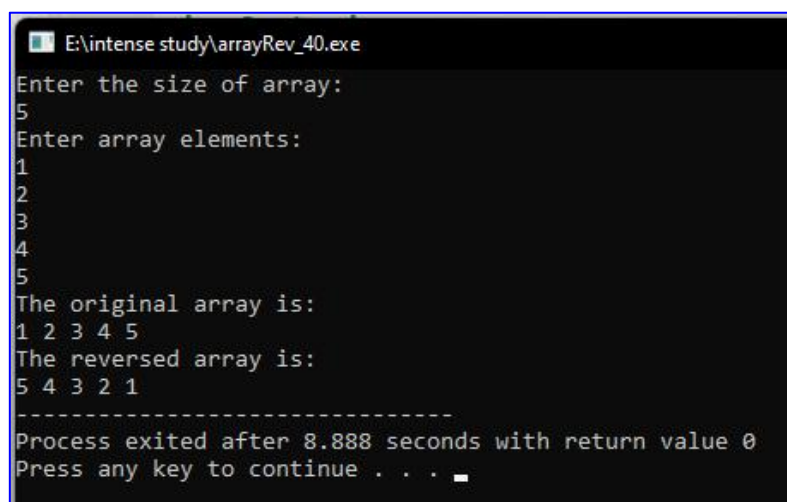
}

return 0;

}

```

## OUTPUT



```

E:\intense study\arrayRev_40.exe
Enter the size of array:
5
Enter array elements:
1
2
3
4
5
The original array is:
1 2 3 4 5
The reversed array is:
5 4 3 2 1
-----
Process exited after 8.888 seconds with return value 0
Press any key to continue . . .

```

**Question41) Write a program to find factorial of a number using recursion and iteration.**

**Ans)**

```
#include<iostream>

using namespace std;

int Rfactorial(int n){

    if(n<=1){

        return 1;

    }

    return n*Rfactorial(n-1);

}

int Ifactorial(int n){

    int fac=1;

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

        fac*=i;

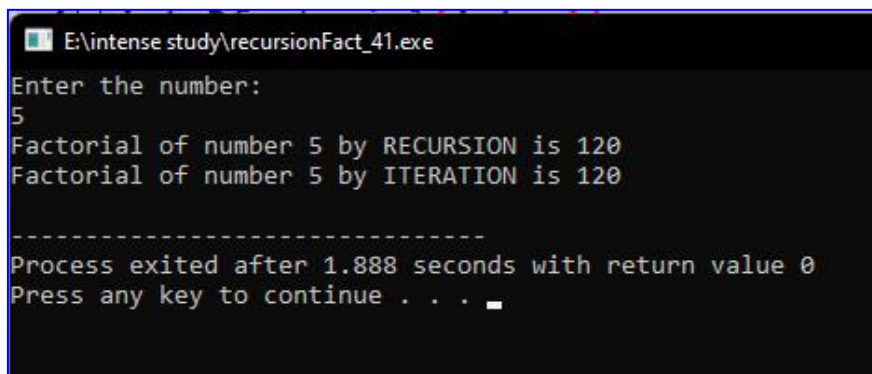
    }

    return fac;

}
```

```
int main(){  
  
    int a;  
  
    cout<<"Enter the number:"<<endl;  
  
    cin>>a;  
  
    cout<<"Factorial of number "<<a<<" by RECURSION is  
    "<<Rfactorial(a)<<endl;  
  
    cout<<"Factorial of number "<<a<<" by ITERATION is  
    "<<Ifactorial(a)<<endl;  
  
    return 0;  
  
}
```

## OUTPUT



```
E:\intense study\recursionFact_41.exe  
Enter the number:  
5  
Factorial of number 5 by RECURSION is 120  
Factorial of number 5 by ITERATION is 120  
-----  
Process exited after 1.888 seconds with return value 0  
Press any key to continue . . .
```

**Question42) Write a program to print Fibonacci series by recursion and iteration.**

**Ans)**

```
#include<iostream>

using namespace std;

int Rfibonacci(int n){

    if(n==0 || n==1){

        return 1;

    }

    else{

        return Rfibonacci(n-1)+Rfibonacci(n-2);

    }

}

int Ifibonacci(int n){

    int i=1;

    int sum=0;

    int x=0,y=1;

    while(i<=(n-2)){
```

```

        sum=x+y;

        x=y;

        y=sum;

        cout<<sum<<endl;

        i=i+1;

    }

    return sum;

}

int main(){

    int a;

    cout<<"Enter the number:"<<endl;

    cin>>a;

    cout<<"RECURSION"<<endl;

    for(int i=0; i<a-1; i++){

        cout<<Rfibonacci(i)<<endl;

    }

    cout<<"ITERATION"<<endl;

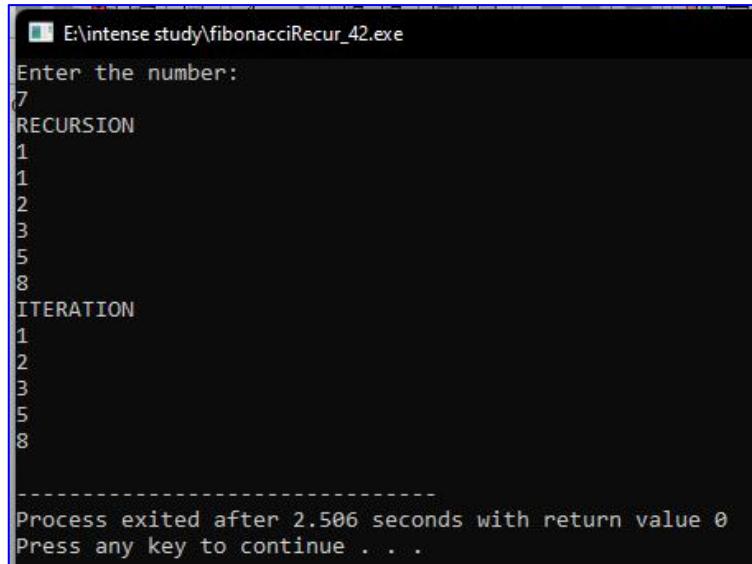
    Ifibonacci(a);

```



```
return 0;  
  
}
```

## OUTPUT



```
E:\intense study\fibonacciRecur_42.exe  
Enter the number:  
7  
RECURSION  
1  
1  
2  
3  
5  
8  
ITERATION  
1  
2  
3  
5  
8  
-----  
Process exited after 2.506 seconds with return value 0  
Press any key to continue . . .
```

**Question43) Write a program to calculate GCD of two numbers using recursion and iteration.**

**Ans)**

```
#include<iostream>

using namespace std;

int rGCD(int a, int b){

    if(a==b)

        return a;

    else if(a>b)

        return rGCD(a-b,b);

    else

        return rGCD(a,b-a);

}

int iGCD(int a, int b){

    int factor;

    if(a==b){

        return a;

    }
```

```
else if(a<b){  
    for(int i=1; i<=a; i++){  
        if((b%i==0)&&(a%i==0)){  
            factor=i;  
        }  
    }  
    return factor;  
}  
else{  
    for(int i=1; i<=b; i++){  
        if((a%i==0)&&(b%i==0)){  
            factor=i;  
        }  
    }  
    return factor;  
}
```

```

}

int main(){

    int a,b;

    cout<<"Enter two numbers:"<<endl;

    cin>>a>>b;

    cout<<"USING RECURSION"<<endl;

    cout<<"The  greatest  common  factor  of "<<a<<"  and
    "<<b<<" is "<<rGCD(a,b)<<endl;

    cout<<"USING ITERATION"<<endl;

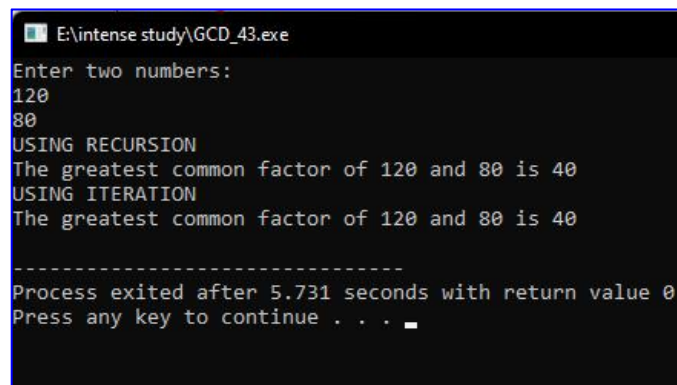
    cout<<"The  greatest  common  factor  of "<<a<<"  and
    "<<b<<" is "<<iGCD(a,b)<<endl;

    return 0;

}

```

## OUTPUT



```

E:\intense study\GCD_43.exe
Enter two numbers:
120
80
USING RECURSION
The greatest common factor of 120 and 80 is 40
USING ITERATION
The greatest common factor of 120 and 80 is 40
-----
Process exited after 5.731 seconds with return value 0
Press any key to continue . . . _

```

**Question44) Write a program to create a text file by taking input from user, save the file and read back the contents of the file and display on the screen.**

**Ans)**

```
#include<iostream>
```

```
#include<fstream>
```

```
#include<cstdlib>
```

```
using namespace std;
```

```
int main()
```

```
{
```

```
    ofstream filetxt;
```

```
    cout<<"Begin File creation\n";
```

```
    filetxt.open("book.txt");
```

```
    if(!filetxt)
```

```
    {
```

```
        cerr<<"Error 100 opening output file book.txt";
```

```
        exit(100);
```

```

    }

    char ch;

    while(cin.get(ch))
        filetxt.put(ch);

    filetxt.close();

    cout<<"\nEnd file creation";

    ifstream ftext;

    cout<<"\nReading the File\n";

    ftext.open("book.txt");

    if(!ftext){

        cerr<<"Error    100    opening    input    file
book.txt"<<endl;

        exit(100);

    }


    while(ftext.get(ch))

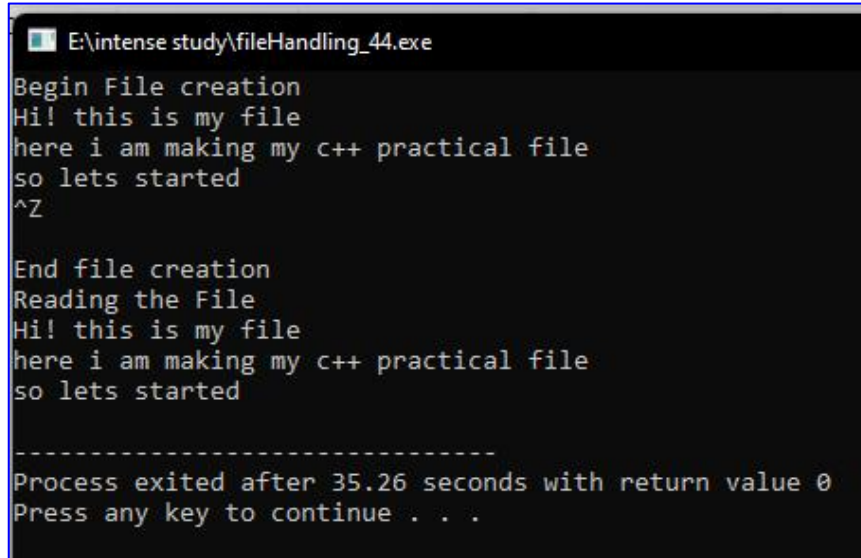
        cout<<ch;

    ftext.close();

```

```
return 0;  
  
}
```

## OUTPUT



```
E:\intense study\fileHandling_44.exe  
Begin File creation  
Hi! this is my file  
here i am making my c++ practical file  
so lets started  
^Z  
  
End file creation  
Reading the File  
Hi! this is my file  
here i am making my c++ practical file  
so lets started  
  
-----  
Process exited after 35.26 seconds with return value 0  
Press any key to continue . . .
```

**Question45) Write a program to copy content of one text file into another text file by removing all white-spaces.**

**Ans)**

```
#include<iostream>

#include<fstream>

#include<cstdlib>

using namespace std;

int main(){

    ifstream ftxt;

    ofstream ctxt;

    ctxt.open("utxt.txt");

    ftxt.open("book.txt");

    if(!ftxt){

        cerr<<"Error 100 in opening book.txt\n";

        exit(100);

    }

    if(!ctxt){
```



```
        cerr<<"Error 100 in opening book.txt\n";

        exit(100);

    }

    char ch;

    int counter=0;

    while(ftxt.get(ch)){

        ctxt.put(ch);

        counter++;

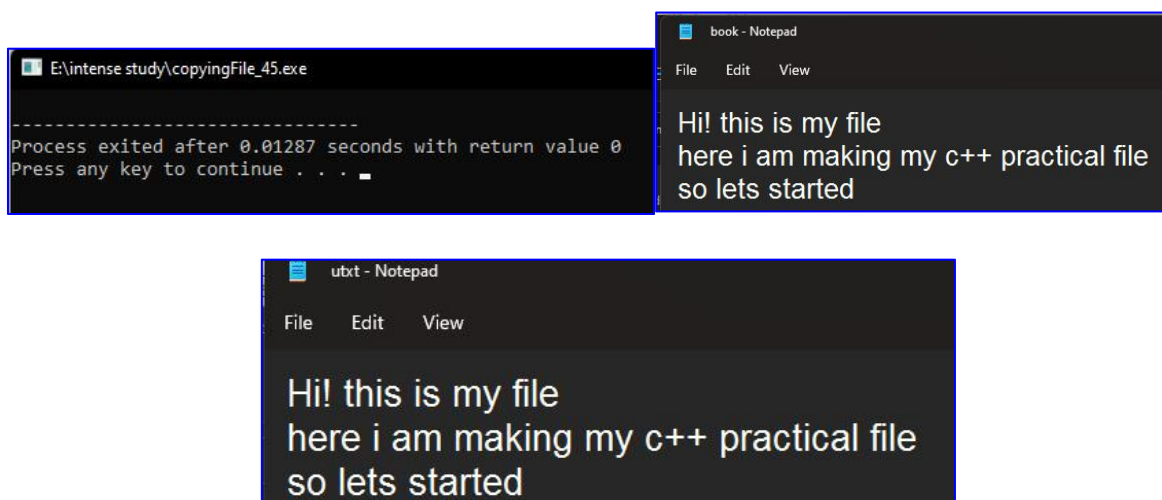
    }

    ftxt.close();

    ctxt.close();

}
```

## OUTPUT



**Question46) Write a function that reverse the elements of an array in place. The function must accept only one pointer and return void.**

**Ans)**

```
#include<iostream>

using namespace std;

void reverse(int arr[]){

    int *ptr;

    int num;

    cout<<"Enter the size of the array: ";

    cin>>num;

    cout<<"The array is:\n";

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

    {

        cin>>arr[i];

    }

    ptr=&arr[num-1];
```

```

        cout<<"Reverse of the array using pointers: ";

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

        {

            cout<<*ptr<<" ";

            *ptr--;

        }

    }

int main(){

    int n;

    int arr[n];

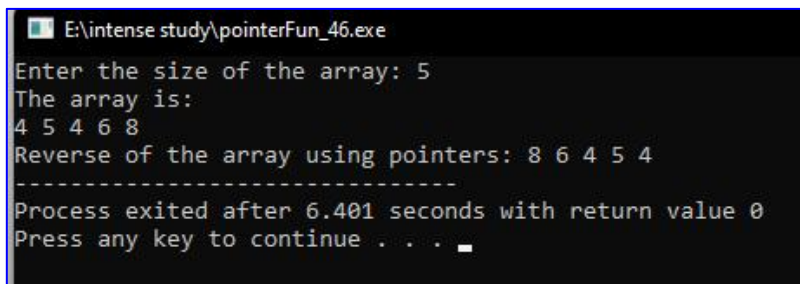
    reverse(arr);

    return 0;

}

```

## OUTPUT



```

E:\intense study\pointerFun_46.exe
Enter the size of the array: 5
The array is:
4 5 4 6 8
Reverse of the array using pointers: 8 6 4 5 4
-----
Process exited after 6.401 seconds with return value 0
Press any key to continue . . . _

```

**Question47) Create Matrix class with default, parameterized and copy constructor. Write a menu-driven program to perform following Matrix operations(3x3 array i implementation):**

**a) Sum**

**b) Difference**

**c) Product**

**d) Transpose**

**Ans)**

```
#include<iostream>
```

```
using namespace std;
```

```
class Matrix
```

```
{
```

```
    private:
```

```
        int a[3][3];
```

```
        int b[3][3];
```

```
        int c[3][3];
```

public:

```
Matrix(){  
    for(int i=0;i<3;i++)  
        for(int j=0;j<3;j++)  
            a[i][j]=0,b[i][j]=0;  
}
```

```
Matrix(int x){                                //parameterized  
constructor  
    for(int i=0;i<3;i++)  
        for(int j=0;j<3;j++)  
            a[i][j]=x,b[i][j]=x;  
}
```

```
Matrix(const Matrix& m) {                    //parameterized  
constructor  
    for(int i=0;i<3;i++)
```

```
        for(int j=0;j<3;j++)
        {
            a[i][j]=m.a[i][j];
            b[i][j]=m.b[i][j];
        }
    }
```

```
void input(int x[3][3]) {
    for(int i=0;i<3;i++)
        for(int j=0;j<3;j++)
            a[i][j]=x[i][j],b[i][j]=x[i][j];
}
```

```
void output(){
    cout<<"\nThe matrix a is "<<endl;
    for(int i=0;i<3;i++)
    {
        for(int j=0;j<3;j++)
```

```
        cout<<" "<<a[i][j];

        cout<<endl;

    }

    cout<<"The matrix b is "<<endl;

    for(int i=0;i<3;i++)

    {

        for(int j=0;j<3;j++)

            cout<<" "<<b[i][j];

        cout<<endl;

    }

}
```

```
void sum(){

    cout<<"The sum of matrix a and matrix b is

"<<endl;

    for(int i=0;i<3;i++)

    {

        for(int j=0;j<3;j++)
```

```

        {
            c[i][j]=a[i][j]+b[i][j];
            cout<<" "<<c[i][j];
        }
        cout<<endl;
    }
}

```

```

void product(){
    cout<<"The product of matrix a and matrix
b is "<<endl;
    for(int i=0;i<3;i++)
    {
        for(int j=0;j<3;j++)
        {
            c[i][j]=a[i][j]*b[i][j];
            cout<<" "<<c[i][j];
        }
    }
}

```



```
        cout<<endl;
    }
}
```

```
void difference(){
    cout<<"the difference of the matrix a and b
is: "<<endl;
    for(int i=0;i<3;i++){
        for(int j=0;j<3;j++){
            c[i][j]=a[i][j]-b[i][j];
            cout<<c[i][j]<<" ";
        }
        cout<<endl;
    }
}
```

```
void transpose(){
```

```
cout<<"the transpose of the matrix is:  
"<<endl;
```

```
cout<<"the transpose of the matrix a is : ";
```

```
for(int i=0;i<3;i++){
```

```
    for(int j=0;j<3;j++){
```

```
        c[i][j]=a[j][i];
```

```
    }
```

```
    cout<<endl;
```

```
}
```

```
for(int i=0;i<3;i++){
```

```
    for(int j=0;j<3;j++){
```

```
        cout<<c[i][j]<<" ";
```

```
    }
```

```
    cout<<endl;
```

```
}
```

```
cout<<"the transpose of the matrix b is : ";
```

```
for(int i=0;i<3;i++){
```

```
        for(int j=0;j<3;j++){
            c[i][j]=b[j][i];
        }
        cout<<endl;
    }
    for(int i=0;i<3;i++){
        for(int j=0;j<3;j++){
            cout<<c[i][j]<<" ";
        }
        cout<<endl;
    }

}

};
```

Matrix sun()

```
{
```

```
    cout<<"\nCopy constructor is called when the object  
is returned from Function";
```

```
    Matrix m;  
  
    m.output();  
  
    return m;  
  
}
```

```
int main(){  
  
    Matrix m1;  
  
    int arr[3][3]={{1,2,3},{4,5,6},{7,8,9}};  
  
    m1.input(arr);  
  
    m1.output();  
  
    Matrix m4(m1);  
  
    m4.output();  
  
    cout<<"1 sum"<<endl;  
  
    cout<<"2 product"<<endl;  
  
    cout<<"3 difference"<<endl;  
  
    cout<<"4 transpose"<<endl;
```

```
int n;

cout<<"enter your choice: ";

cin>>n;

switch(n){

    case 1: cout<<"sum"<<endl;

            m4.sum();

            break;


    case 2: cout<<"product"<<endl;

            m4.product();

            break;


    case 3: cout<<"difference"<<endl;

            m4.difference();

            break;


    case 4: cout<<"transpose"<<endl;

            m4.transpose();
```

```
break;
```

```
default: cout<<"enter a valid choice";
```

```
break;
```

```
}
```

```
return 0;
```

```
}
```

# OUTPUT

```
E:\intense study\matrixClass_47.exe
1 2 3
4 5 6
7 8 9
The matrix b is
1 2 3
4 5 6
7 8 9

The matrix a is
1 2 3
4 5 6
7 8 9
The matrix b is
1 2 3
4 5 6
7 8 9
1 sum
2 product
3 difference
4 transpose
enter your choice: 1
sum
The sum of matrix a and matrix b is
2 4 6
8 10 12
14 16 18

-----
Process exited after 2.088 seconds with return value 0
Press any key to continue . . .

E:\intense study\matrixClass_47.exe
1 2 3
4 5 6
7 8 9
The matrix b is
1 2 3
4 5 6
7 8 9

The matrix a is
1 2 3
4 5 6
7 8 9
The matrix b is
1 2 3
4 5 6
7 8 9
1 sum
2 product
3 difference
4 transpose
enter your choice: 2
product
The product of matrix a and matrix b is
1 4 9
16 25 36
49 64 81

-----
Process exited after 1.474 seconds with r
Press any key to continue . . .

E:\intense study\matrixClass_47.exe
1 2 3
4 5 6
7 8 9
The matrix b is
1 2 3
4 5 6
7 8 9
1 sum
2 product
3 difference
4 transpose
enter your choice: 4
transpose
the transpose of the matrix is:
the transpose of the matrix a is :

1 4 7
2 5 8
3 6 9
the transpose of the matrix b is :

1 4 7
2 5 8
3 6 9

-----
Process exited after 2.205 seconds with r
Press any key to continue . . .

E:\intense study\matrixClass_47.exe
1 2 3
4 5 6
7 8 9
The matrix b is
1 2 3
4 5 6
7 8 9

The matrix a is
1 2 3
4 5 6
7 8 9
The matrix b is
1 2 3
4 5 6
7 8 9
1 sum
2 product
3 difference
4 transpose
enter your choice: 3
difference
the difference of the matrix a and b is:
0 0 0
0 0 0
0 0 0

-----
Process exited after 2.384 seconds with ret
Press any key to continue . . .
```

**Question48) Create Matrix1 class using templates. Write a menu-driven program to perform following Matrix operations (2x2 array implementation): a) Sum b) Difference c) Product d) Transpose.**

**Ans)**

```
#include<iostream>
using namespace std;
const int r=2,c=2;
template <class t>
class matrix{
    private:
        t m[r][c];
        t mm[r][c];
    public:
        void get_value(){
            cout<<"Enter  "<<r<<"*"<<c<<"  values  in
first matrix: "<<endl;
            for(int i=0;i<r;i++){
                for(int j=0;j<c;j++){
                    cin>>m[i][j];
                }
            }
        }
    };
```



```
}
```

```
cout<<"\nEnter "<<r<<"*"<<c<<" values in  
second matrix: "<<endl;
```

```
for(int i=0;i<r;i++){  
    for(int j=0;j<c;j++){  
        cin>>mm[i][j];  
    }  
}
```

```
}
```

```
void add(){  
    t p[r][c];  
    cout<<"Addition of 2 martices are: "<<endl;  
    for(int i=0;i<r;i++){  
        for(int j=0;j<c;j++){  
            p[i][j]=m[i][j]+mm[i][j];  
            cout<<p[i][j]<<" ";  
        }  
        cout<<endl;  
    }  
}
```

```

void sub(){
    t p[r][c];
    cout<<"subtraction of 2 matrices are:
" << endl;
    for(int i=0;i<r;i++){
        for(int j=0;j<c;j++){
            p[i][j]=m[i][j]-mm[i][j];
            cout<<p[i][j]<<" ";
        }
        cout<<endl;
    }
}

```

```

void mul(){
    t p[r][c];
    cout<<"Multiplication of 2 matrices are:
" << endl;
    for(int i=0;i<r;i++){
        for(int j=0;j<c;j++){
            p[i][j]=0;
            for(int k=0;k<c;k++){

```

```

        p[i][j] += (m[i][j]*mm[i][j]);
    }
}

}

for(int i=0;i<r;i++){
for(int j=0;j<c;j++){
    cout<<" "<<p[i][j]<<" ";
}
cout<<endl;
}

}

void transpose(){
    t p[r][c];
    cout<<"transpose of first matrix: "<<endl;
    for(int i=0;i<r;i++){
        for(int j=0;j<c;j++){
            p[j][i]=m[i][j];
        }
    }
    for(int i=0;i<r;i++){

```

```
        for(int j=0;j<c;j++){
            cout<<p[i][j]<<" ";
        }
        cout<<endl;
    }
```

```
cout<<"\n\ntranspose of second matrix: ";
```

```
for(int i=0;i<r;i++){
    for(int j=0;j<c;j++){
        p[j][i]=mm[i][j];
    }
}
for(int i=0;i<r;i++){
    for(int j=0;j<c;j++){
        cout<<p[i][j]<<" ";
    }
    cout<<endl;
}
```

```
}
```

```
};
```

```
int main(){
```

```
matrix<int>m1;
m1.get_value();
int choice;
while(1){
    cout<<"press 1 for sum"<<endl;
    cout<<"press 2 for difference"<<endl;
    cout<<"press 3 for product"<<endl;
    cout<<"press 4 for transpose"<<endl;
    cout<<"press 5 to exit"<<endl;
    cin>>choice;
    switch(choice){
        case 1:
            m1.add();
            break;
        case 2:
            m1.sub();
            break;
        case 3:
            m1.mul();
            break;
        case 4:
```

```
        m1.transpose();
        break;
    case 5:
        cout<<"program halted by the user";
        exit(0);
    default:
        cout<<"invalid choice"<<endl;
        break;
    }
}
return 0;
}
```

## OUTPUT

```
E:\intense study\templates_48.exe
Enter 2*2 values in first matrix:
1
2
4
5
Enter 2*2 values in second matrix:
3
4
8
9
press 1 for sum
press 2 for difference
press 3 for product
press 4 for transpose
press 5 to exit
1
Addition of 2 martices are:
4 6
12 14
press 1 for sum
press 2 for difference
press 3 for product
press 4 for transpose
press 5 to exit
2
subtraction of 2 martices are:
-2 -2
-4 -4
press 1 for sum
press 2 for difference
press 3 for product
press 4 for transpose
press 5 to exit
3
Multiplication of 2 martices are:
6 16
64 90
press 1 for sum
press 2 for difference
press 3 for product
press 4 for transpose
press 5 to exit
4
transpose of first matrix:
1 4
2 5
transpose of second matrix: 3 8
4 9
```

```
E:\intensity\templates_48.exe
6 16
64 90
press 1 for sum
press 2 for difference
press 3 for product
press 4 for transpose
press 5 to exit
4
transpose of first matrix:
1 4
2 5

transpose of second matrix: 3 8
4 9
press 1 for sum
press 2 for difference
press 3 for product
press 4 for transpose
press 5 to exit
5
program halted by the user
-----
Process exited after 15.98 seconds with return value 0
Press any key to continue . . .
```

**Question49) Write a function that checks whether a given string is Palindrome or not. Use this function to find whether the string entered by user is Palindrome or not.**

**Ans)**

```
#include<iostream>
#include<string>
using namespace std;
void palind(string s);
int main(){
    string str;
    cout<<"Enter the string : " << endl;
    cin>>str;
    palind(str);
    return 0;
}
void palind(string s){
    int flag=0;
    for(int i=0; i<s.length(); i++){
        if(s[i] !=s[s.length()-i-1])
        {
            flag=1;
```

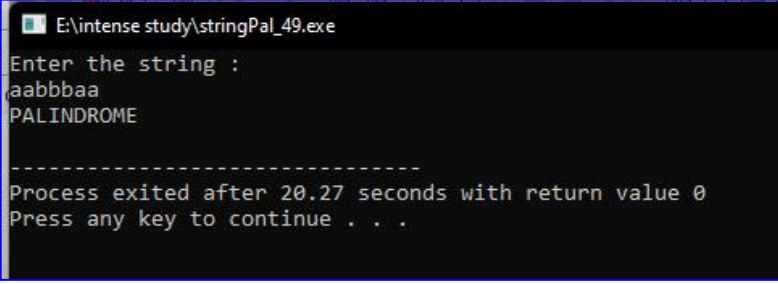


```

        break;
    }
}
if(flag==0){
    cout<<"PALINDROME"<<endl;
}
else
    cout<<"NOT PALINDROME"<<endl;
return ;
}

```

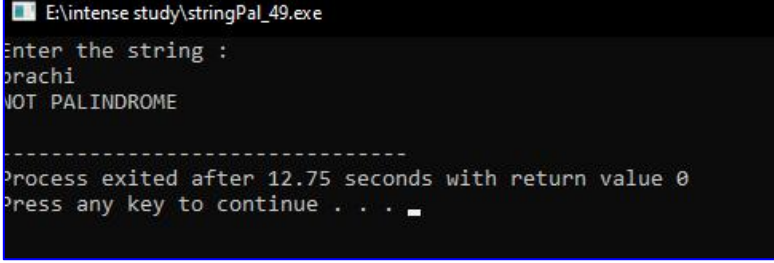
## OUTPUT



```

E:\intense study\stringPal_49.exe
Enter the string :
aabbbaa
PALINDROME
-----
Process exited after 20.27 seconds with return value 0
Press any key to continue . . .

```



```

E:\intense study\stringPal_49.exe
Enter the string :
brachi
NOT PALINDROME
-----
Process exited after 12.75 seconds with return value 0
Press any key to continue . . .

```

**Question50) Write a that prints a table indicating the number of occurrences of each alphabet in the text entered as command line arguments.**

**Ans)**

```
#include<iostream>
#include<string.h>
using namespace std;
int main (int argc, char *argv [])
{
    int i;
    int count=0;
    for (int i=0; i<argc; i++)
        cout<<argv[i]<<" ";
    for (char k='a'; k<='z'; k++)
    {
        for (i=0; i<argc; i++)
        {
            for (int j=0; argv[i][j] != '\0'; j++)
            {
                if(isupper(argv[i][j]))
                    argv[i][j] =tolower(argv[i][j]);
```

```
        if(argv[i][j] ==k)
            count++;
    }
}
if(count>0)
    cout<<"\n"<<k<<" occurs "<<count<<" times.";
    count=0;
}
cout<<"\nEnd";
return 0;
}
```

**OUTPUT**

```
C:\Users\Dell\OneDrive\Desktop\c++ op\q50.exe
c occurs 2 times.
d occurs 3 times.
e occurs 7 times.
i occurs 1 times.
k occurs 1 times.
l occurs 2 times.
n occurs 1 times.
o occurs 3 times.
p occurs 2 times.
q occurs 1 times.
r occurs 2 times.
s occurs 3 times.
t occurs 1 times.
u occurs 1 times.
v occurs 1 times.
x occurs 1 times.
End
```

**Question 51) Write a menu driven program to perform following operations on C strings:**

- a) Show address of each character in string**
- b) Concatenate two strings without using strcat function.**
- c) Concatenate two strings using strcat function.**
- d) Compare two strings**
- e) Calculate length of the string (use pointers)**
- f) Convert all lowercase characters to uppercase (toupper function)**
- g) Convert all uppercase characters to lowercase (tolower function)**
- h) Calculate number of vowels**
- i) Reverse the string**

**Ans)**

```
#include <iostream>
```

```
#include <string>
```

```
#include <cstring>
```

```
#include <cctype>
```

```
using namespace std;
```

```
string getString();  
void choice(int num);  
void AdrsChar(string s);  
void concatenate(string s1, string s2);  
void concatFun(void);  
void compare(string s1, string s2);  
int lenPointer(char *ptr);  
void LowerToUpper(string str);  
void UppertoLower(string str);  
int vowel(string str);  
void reverse(string str);  
int main()  
{  
    int n;  
    choice(n);  
    return 0;  
}  
void choice(int num)
```

```

{
    char dec;

    cout << "Enter your choice:\n1. Show address of each
character in string\n2. Concatenate two strings without
using strcat function.\n3. Concatenate two strings
using strcat function.\n4. Compare two strings\n5.
Calculate length of the string (use pointers)\n6.
Convert all lowercase characters to uppercase
(toupper function)\n7. Convert all uppercase
characters to lowercase (tolower function)\n8.
Calculate number of vowels\n9. Reverse the string"
<< endl;

    cin >> num;

    do
    {
        if (num == 1)
        {
            string s;

            s = getString();

```

```
        AdrsChar(s);
    }
    else if (num == 2)
    {
        string s;

        s = getString();

        string str2;

        cout << "Enter second string:" << endl;

        cin >> str2;

        concatenate(s, str2);
    }
    else if (num == 3)
    {
        concatFun();
    }
    else if (num == 4)
    {
        string s;
```



```

    s = getString();

    string str2;

    cout << "Enter second string:" << endl;

    cin >> str2;

    compare(s, str2);
}

else if (num == 5)
{

    char strr[100];

    cout << "Enter the string:" << endl;

    cin >> strr;

    int length;

    length = lenPointer(strr);

    cout << "Length of string is:" << length << endl;

}

else if (num == 6)
{

```

```
char s[100];

cout << "Enter the string" << endl;

cin >> s;

LowerToUpper(s);

}

else if (num == 7)

{

char s[100];

cout << "Enter the string" << endl;

cin >> s;

UppertoLower(s);

}

else if (num == 8)

{

string s;

s = getString();

int c;

c = vowel(s);
```

```
        cout << c;
    }
    else if (num == 9)
    {
        string s;

        s = getString();

        reverse(s);
    }
    else
    {
        cout << "INVALID CHOICE" << endl;
    }

    cout << "\nDo you want to choose again(y/n)" <<
endl;

    cin >> dec;

} while (dec == 'Y' || dec == 'y');
}

void AdrsChar(string s)
```

```
{  
    string *ptr;  
    ptr = &s;  
    cout << "Adress of your given string is:" << endl;  
    cout << ptr << endl;  
    return;  
}  
  
void concatenate(string s1, string s2)  
{  
    cout << "The string after concatenation is:" << endl;  
    cout << (s1 + s2);  
    return;  
}  
  
void concatFun()  
{  
    char str[100];  
    char str2[100];  
    cout << "Enter string:" << endl;
```

```
    cin >> str;

    cout << "Enter second string:" << endl;

    cin >> str2;

    cout << "The string after concatenation using strcat
function is:" << endl;

    cout << strcat(str, str2);

    return;
}

void compare(string s1, string s2)
{
    if (s1 != s2)
    {
        cout << "STRINGS ARE NOT EQUAL" << endl;
    }
    else
    {
        cout << "STRINGS ARE EQUAL" << endl;
    }
}
```

```
        return;
    }
    int lenPointer(char *ptr)
    {

        int len = 0;
        while (*ptr != '\0')
        {
            len++;
            ptr++;
        }
        return len;
    }

    string getString()
    {
        string s;
        cout << "Enter the string:" << endl;
        cin >> s;
```

```
    return s;
}

void LowerToUpper(string str)
{
    char ss;
    for (int i = 0; i < str.length(); i++)
    {
        ss = toupper(str[i]);
        cout << ss;
    }

    return;
}

void UppertoLower(string str)
{
    char ss;
    for (int i = 0; i < str.length(); i++)
    {
```

```
        ss = tolower(str[i]);

        cout << ss;

    }

    return;

}

int vowel(string str)

{

    int count = 0;

    cout << "The total number of vowels in the given
    string are:\n";

    for (int i = 0; i < str.length(); i++)

    {

        if (str[i] == 'A' || str[i] == 'O' || str[i] == 'I' || str[i] == 'E'
        || str[i] == 'U' || str[i] == 'o' || str[i] == 'a' || str[i] == 'e'
        || str[i] == 'i' || str[i] == 'u')

        {

            count++;

        }

    }

}
```



```

    }

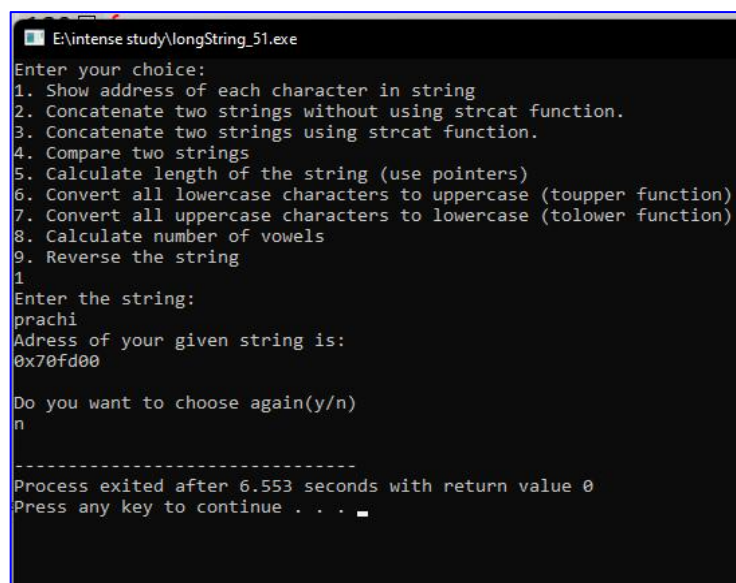
    return count;
}

void reverse(string str)
{
    cout<<"Reverse of the string is : "<<endl;
    for(int i=str.length(); i>=0; i--){
        cout<<str[i];
    }

    return;
}

```

## OUTPUT



```

E:\intense study\longString_51.exe
Enter your choice:
1. Show address of each character in string
2. Concatenate two strings without using strcat function.
3. Concatenate two strings using strcat function.
4. Compare two strings
5. Calculate length of the string (use pointers)
6. Convert all lowercase characters to uppercase (toupper function)
7. Convert all uppercase characters to lowercase (tolower function)
8. Calculate number of vowels
9. Reverse the string
1
Enter the string:
prachi
Adress of your given string is:
0x70fd00

Do you want to choose again(y/n)
n

-----
Process exited after 6.553 seconds with return value 0
Press any key to continue . . .

```

9. Reverse the String

```
2
Enter the string:
prachi
Enter second string:
aggarwal
The string after concatenation is:
prachiaggarwal
Do you want to choose again(y/n)
n
```

9. Reverse the String

```
4
Enter the string:
prachi
Enter second string:
prachi
STRINGS ARE EQUAL

Do you want to choose again(y/n)
n

-----
Process exited after 12.48 seconds with
Press any key to continue . . .
```

9. Reverse the String

```
3
Enter string:
prachi
Enter second string:
aggarwal
The string after concatenation using strcat function is:
prachiaggarwal
Do you want to choose again(y/n)
n
```

9. Reverse the String

```
5
Enter the string:
prachi
Length of string is:6

Do you want to choose again(y/n)
n
```

7

```
Enter the string
PRACHI
prachi
Do you want to choose again(y/n)
N
```

9. Reverse the String

```
6
Enter the string
prachi
PRACHI
Do you want to choose again(y/n)
n
```

9

```
Enter the string:
prachi
Reverse of the string is :
ihcarp
Do you want to choose again(y/n)
```

8

```
Enter the string:
hello
The total number of vowels in the given string are:
2
Do you want to choose again(y/n)
n
```

9. REVERSE THE STRING

```
11
INVALID CHOICE

Do you want to choose again(y/n)
n

-----
Process exited after 3.866 seconds with
Press any key to continue . . .
```

**Question52) Write a program to define a function 'Area' that calculate the area of a triangle, rectangle and square. Use overloaded functions for calculating area.**

**Ans)**

```
#include<iostream>

#include<cmath>

using namespace std;

float area(float a, float b, float c);

float area(float a);

float area(float a, float b);

int main()

{

    float l,b;

    cout<<"Enter the length of rectangle:"<<endl;

    cin>>l;

    cout<<"Enter the breath of rectangle:"<<endl;

    cin>>b;
```

```
float ar;
```

```
ar=area(l,b);
```

```
cout<<"Area of the rectangle is: "<<ar<<endl;
```

```
float a;
```

```
cout<<"Enter the side of square:"<<endl;
```

```
cin>>a;
```

```
float arr;
```

```
arr=area(a);
```

```
cout<<"Area of the square is: "<<arr<<endl;
```

```
float x,y,z;
```

```
cout<<"Enter the first side:"<<endl;
```

```
cin>>x;
```

```
cout<<"Enter the second side:"<<endl;
```

```
cin>>y;
```

```
cout<<"Enter the third side:"<<endl;
```

```
cin>>z;
```

```
float arrr;
```

```
arrr=area(x,y,z);
```

```

    cout<<"Area of the Triangle is: "<<arr<<endl;

    return 0;

}

float area(float a,float b,float c)
{
    int sp;

    sp=(a+b+c)/2;

    int hf;

    hf=sp*(sp-a)*(sp-b)*(sp-c);

    int area;

    area=sqrt(hf);

    return area;

}

float area(float a, float b)
{
    float c;

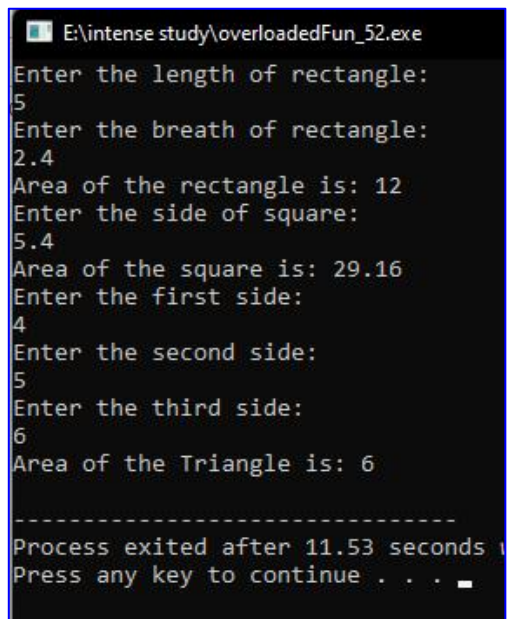
    c=a*b;

    return c;
}

```

```
}  
  
float area(float a)  
{  
  
    float sq;  
  
    sq=a*a;  
  
    return sq;  
}
```

## OUTPUT



```
E:\intense study\overloadedFun_52.exe  
Enter the length of rectangle:  
5  
Enter the breath of rectangle:  
2.4  
Area of the rectangle is: 12  
Enter the side of square:  
5.4  
Area of the square is: 29.16  
Enter the first side:  
4  
Enter the second side:  
5  
Enter the third side:  
6  
Area of the Triangle is: 6  
  
-----  
Process exited after 11.53 seconds  
Press any key to continue . . .
```

**Question53) Write a program to define a function 'Area' that calculate the area of a triangle, rectangle and square. Use overloaded functions for calculating area.**

**Ans)**

```
#include <iostream>
```

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

```
using namespace std;
```

```
class Triangle{
```

```
    private:
```

```
        float h;
```

```
        float b;
```

```
        float side_a;
```

```
        float side_b;
```

```
        float side_c;
```

```
    public:
```

```
void getData(float height ,float base ,float a ,float b ,float  
c){  
  
    h=height;  
  
    b=base;  
  
    side_a=a;  
  
    side_b=b;  
  
    side_c=c;  
  
}
```

```
void printDetails () const{  
  
    cout<<"The HEIGHT and BASE of traingle are:  
"<<h<<"and"<<b<<endl;  
  
    cout<<"The SIDES of triangle are "<<side_a<<" ,  
"<<side_b<<" and "<<side_c<<endl;  
  
}
```

```
void area(float a, float b, float c){  
  
    float p=0.0;  
  
    p=a + b + c;  
  
    cout<<"PERIMETER: "<<p<<endl;
```



```

        float q=p*(1/2);

        float area;

        area = sqrt(q*(q-a)*(q-b)*(q-c));

        cout<<"AREA: "<<area;

    }

    void area(float h ,float b){

        float x=0.0;

        x = (1/2)*h*b;

        cout<<"AREA by second method: "<<x;

    }

    void operator = (const Triangle &t){

    int height=t.h;

    int base=t.b;

    int a=t.side_a;

    int b=t.side_b;

    int c=t.side_c;

    }

```

```

friend bool operator == ( const Triangle &tr , const
Triangle &tr1 ){

    if( tr.side_a == tr1.side_a && tr.side_b ==
    tr1.side_b && tr.side_c == tr1.side_c && tr.h
    == tr1.h && tr.b == tr1.b){

return 1;

        }

        else {

            return 0;

        }

    }

};

```

```

int main(){

    float height ,base ,a, b ,c;

    cout<<"Enter the HEIGHT and BASE and SIDES: ";

    cin>>height>>base>>a>>b>>c;

```

```
Triangle Tr;

Tr.getData(height ,base ,a ,b ,c);

Tr.printDetails();

cout<<endl;

Tr.area(a,b,c);

cout<<endl;

Tr.area(height ,base);

cout<<endl;

Triangle Tr1;

cout<<"The another triangle is: "<<endl;

cin>>height>>base>>a>>b>>c;

Tr1.getData(height ,base ,a,b,c);

Tr1.printDetails();

Tr1.area(a,b,c);

cout<<endl;

Tr1.area(height, base);

cout<<endl;

if(Tr==Tr1){
```

```

        cout<<"Area of both triangle are EQUAL";

    }

    else{

        cout<<"Area of both triangle are NOT EQUAL";

    }

    return 0;

}

```

## OUTPUT

```

E:\intense_study\intense study\Triangle_class_53.exe
Enter the HEIGHT and BASE and SIDES: 5
2
2
1
4
The HEIGHT and BASE of traingle are: 5and0
The SIDES of triangle are 2 , 2 and 4
PERIMETER: 7
AREA: -0
AREA by second method: 0
The another triangle is:
8
9
7
3
4
The HEIGHT and BASE of traingle are: 8and0
The SIDES of triangle are 7 , 9 and 4
PERIMETER: 14
AREA: -0
AREA by second method: 0
Area of both triangle are NOT EQUAL
-----

```

**Question54) Create a class Box containing length, breath and height. Include following methods in it:**

**a) Calculate surface Area**

**b) Calculate Volume**

**c) Increment, Overload ++ operator (both prefix & post fix)**

**d) Decrement, Overload -- operator (both prefix & post fix)**

**e) Overload operator == (to check equality of two boxes), as a friend function**

**f) Overload Assignment operator**

**g) Check if it is a Cube or cuboid**

**Write a program which takes input from the user for length, breath and height to test the above class.**

**Ans)**

```
#include<iostream>
```

```
using namespace std;
```

```
class Box{
```

```
    float length;
```

```
float breath;
```

```
float height;
```

```
public:
```

```
    void getData(float l, float b, float h){
```

```
        length=l;
```

```
        breath=b;
```

```
        height=h;
```

```
    }
```

```
    void printDetails() const{
```

```
        cout<<"Length: "<<length<<endl;
```

```
        cout<<"Breath: "<<breath<<endl;
```

```
        cout<<"Height: "<<height<<endl;
```

```
    }
```

```
    void area(float l,float b, float h){
```

```
        float area;
```

```
        area=(2*(l*b + b*h + h*l));
```

```
        cout<<"AREA: "<<area<<endl;
```

```
    }
```

```
void volume(float l,float b, float h){
```

```
    float vol;
```

```
    vol=l*b*h;
```

```
    cout<<"VOLUME: "<<vol<<endl;
```

```
}
```

```
void operator =(const Box& bb){
```

```
    float l=bb.length;
```

```
    float b=bb.breath;
```

```
    float h=bb.height;
```

```
}
```

```
friend bool operator ==(const Box& b1, const Box&  
b2){
```

```
    if(b1.length== b2.length  &&  b1.breath==  
b2.breath && b1.height==b2.height)
```

```
        return 1;
```

```
    else
```

```
        return 0;
```

```
}
```

```
void operator ++(){
```

```
    ++length;
```

```
    ++breath;
```

```
    ++height;
```

```
}
```

```
void operator ++(int){
```

```
    length++;
```

```
    breath++;
```

```
    height++;
```

```
}
```

```
void operator --(){
```

```
    --length;
```

```
    --breath;
```

```
    --height;
```

```
}
```

```
void operator --(int){
```

```
    length--;
```

```
    breath--;
```



```

        height--;
    }

    void cube_notCube(){

        if(length==breath && breath==length)

            cout<<"It is a CUBE"<<endl;

        else

            cout<<"It is NOT a CUBE"<<endl;

    }

};

int main()

{

    Box B;

    float a,b,c;

    cout<<"Enter length, breath, height of box"<<endl;

    cin>>a>>b>>c;

    B.getData(a,b,c);

    B++;

    ++B;

```

```
B.printDetails();
```

```
B.area(a,b,c);
```

```
B.volume(a,b,c);
```

```
B.cube_notCube();
```

```
cout<<endl;
```

```
Box B1;
```

```
cout<<"Enter length, breath, height of box"<<endl;
```

```
cin>>a>>b>>c;
```

```
B1.getData(a,b,c);
```

```
--B1;
```

```
B1--;
```

```
B1.printDetails();
```

```
B1.area(a,b,c);
```

```
B1.volume(a,b,c);
```

```
B1.cube_notCube();
```

```
cout<<endl;
```

```
if(B==B1){
```

```
    cout<<"Boxes have equal dimensions:"<<endl;
```

```

    }

    else{

        cout<<"Boxes have not equal dimensions:"<<endl;

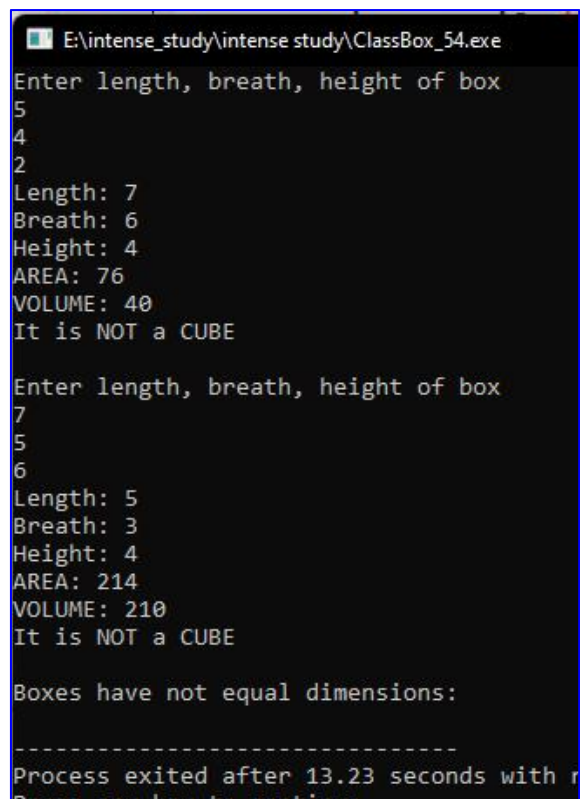
    }

    return 0;

}

```

## OUTPUT



```

E:\intense_study\intense study\ClassBox_54.exe
Enter length, breath, height of box
5
4
2
Length: 7
Breath: 6
Height: 4
AREA: 76
VOLUME: 40
It is NOT a CUBE

Enter length, breath, height of box
7
5
6
Length: 5
Breath: 3
Height: 4
AREA: 214
VOLUME: 210
It is NOT a CUBE

Boxes have not equal dimensions:
-----
Process exited after 13.23 seconds with r
Press any key to continue

```

**Question55) Create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Create 10 students and store them in a file.**

**Ans)**

```
#include<iostream>

#include<fstream>

#include<cstdlib>

#include<iomanip>

using namespace std;

int main(){

    ofstream record;

    record.open("student.txt");

    if(!record){

        cerr<<"Error 100 in opening file student.txt\n";

        exit(100);

    }

    cout<<"Record of students:\n";

    string st;
```

```

st="Rollno      Name      Class      Year Total Marks\n";

record<<st;

char ch;

while(cin.get(ch)){

    record.put(ch);

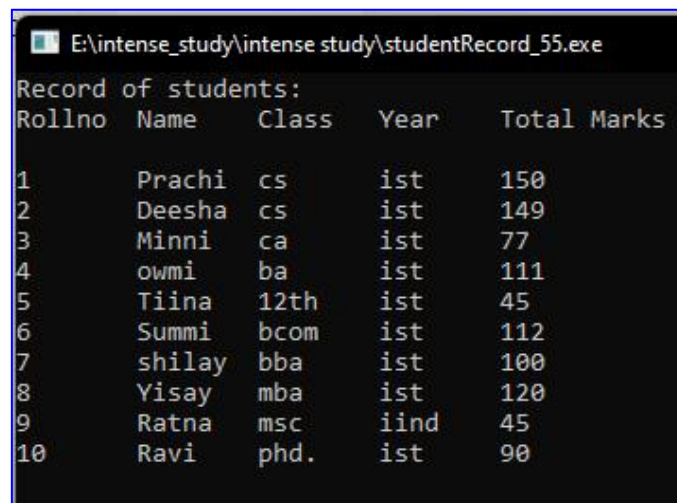
}

return 0;

}

```

## OUTPUT



Record of students:				
Rollno	Name	Class	Year	Total Marks
1	Prachi	cs	ist	150
2	Deesha	cs	ist	149
3	Minni	ca	ist	77
4	owmi	ba	ist	111
5	Tiina	12th	ist	45
6	Summi	bcom	ist	112
7	shilay	bba	ist	100
8	Yisay	mba	ist	120
9	Ratna	msc	iind	45
10	Ravi	phd.	ist	90

**Question56) Write a program to retrieve the student information from file created in previous question and print it in following format:**

**Roll No. Name Marks**

**Ans)**

```
#include<iostream>
```

```
#include<fstream>
```

```
#include<cstdlib>
```

```
using namespace std;
```

```
int main(){
```

```
    ifstream in;
```

```
    in.open("student.txt");
```

```
    if(!in){
```

```
        cerr<<"Error 100 in opening file student.txt"<<endl;
```

```
        exit(100);
```

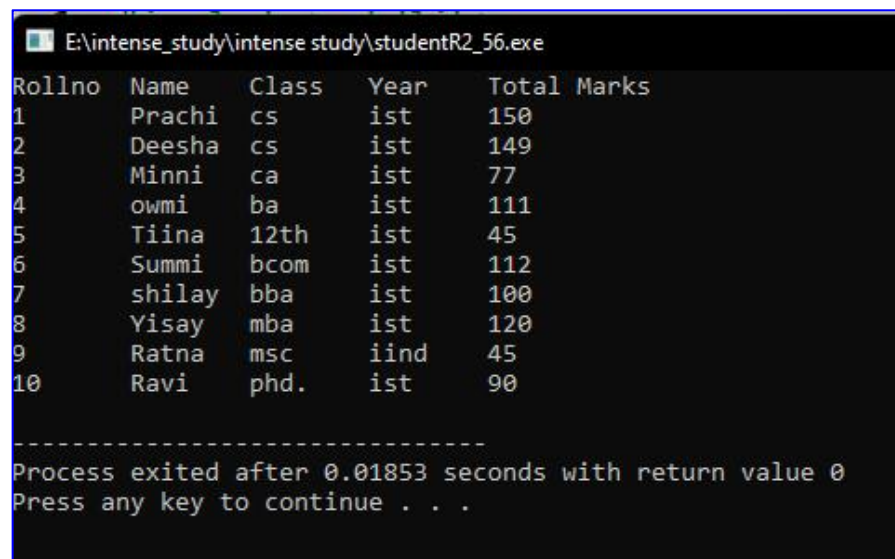
```
    }
```

```
    char ch;
```

```
    while(in.get(ch)){
```

```
        cout.put(ch);  
  
    }  
  
    return 0;  
  
}
```

## OUTPUT



```
E:\intense_study\intense study\studentR2_56.exe  
Rollno  Name    Class  Year   Total Marks  
1      Prachi  cs     ist    150  
2      Deesha  cs     ist    149  
3      Minni   ca     ist    77  
4      owmi    ba     ist    111  
5      Tiina   12th   ist    45  
6      Summi   bcom   ist    112  
7      shilay  bba    ist    100  
8      Yisay   mba    ist    120  
9      Ratna   msc    iind    45  
10     Ravi    phd.    ist    90  
  
-----  
Process exited after 0.01853 seconds with return value 0  
Press any key to continue . . .
```

**Question57) Create the Person class. Create some objects of this class (by taking information from the user). Inherit the class Person to create two classes Teacher and Student class. Maintain the respective information in the classes and create, display and delete objects of these two classes (Use Runtime Polymorphism).**

**Ans)**

```
#include<iostream>
```

```
#include<string>
```

```
using namespace std;
```

```
class Person
```

```
{
```

```
    protected:
```

```
        int age;
```

```
        string name;
```

```
        string subject;
```

```
    public:
```

```
        virtual void display() const =0;
```



```
};
```

```
class Student: public Person{
```

```
    private:
```

```
        int clas;
```

```
        int marks;
```

```
    public:
```

```
        Student(string n, int a, string sub,int c, int m){
```

```
            name=n;
```

```
            age=a;
```

```
            subject=sub;
```

```
            clas=c;
```

```
            marks=m;
```

```
        }
```

```
        void display() const{
```

```
            cout<<"Name: "<<name<<endl;
```

```
            cout<<"Class: "<<clas<<endl;
```

```
            cout<<"Age: "<<age<<endl;
```

```
        cout<<"Subject: "<<subject<<endl;

        cout<<"Marks: "<<marks<<endl;

    }

};

class Teacher: public Person{

    private:

        int salary;

    public:

        Teacher(string n, int a, string sub,int c){

            name=n;

            age=a;

            subject=sub;

            salary=c;

        }

        void display() const{

            cout<<"Name: "<<name<<endl;

            cout<<"Salary: "<<salary<<endl;

            cout<<"Age: "<<age<<endl;
```

```
        cout<<"Subject: "<<subject<<endl;

    }

};

int main(){

    Teacher t("Krishna mam", 34, "Hindi", 95000);

    Teacher *tt;

    tt=&t;

    tt->display();

    cout<<endl;

    Student s("Ravina", 14, "Hindi",6,99);

    Student *ss;

    ss=&s;

    ss->display();

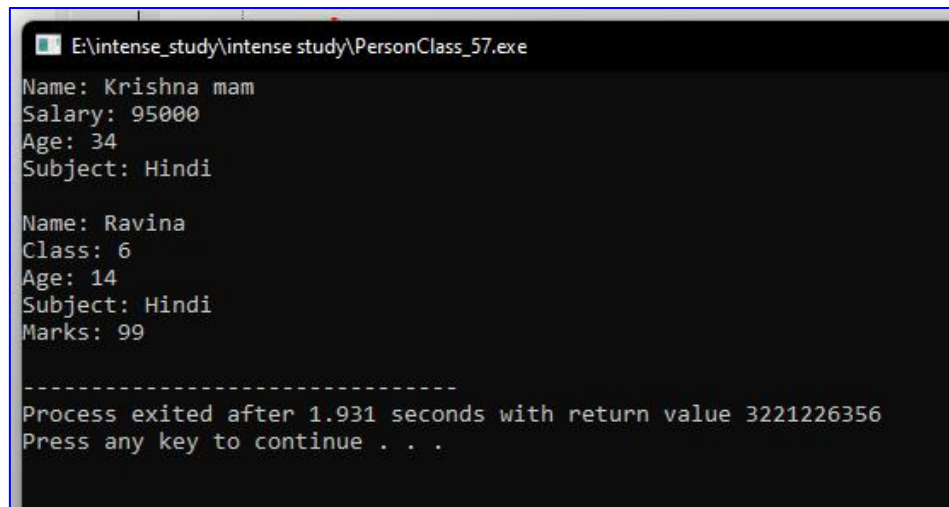
    delete ss;

    delete tt;

    return 0;

}
```

## OUTPUT



```
E:\intense_study\intense study\PersonClass_57.exe
Name: Krishna mam
Salary: 95000
Age: 34
Subject: Hindi

Name: Ravina
Class: 6
Age: 14
Subject: Hindi
Marks: 99

-----
Process exited after 1.931 seconds with return value 3221226356
Press any key to continue . . .
```

**Question58) Find the grade of a student from the marks in 4 subjects using switch statement.**

**Ans)**

```
#include<iostream>
```

```
using namespace std;
```

```
class Grade
```

```
{
```

```
    private:
```

```
        int markA;
```

```
        int markB;
```

```
        int markC;
```

```
        int markD;
```

```
    public:
```

```
        void getData(int a, int b, int c, int d){
```

```
            markA=a;
```

```
            markB=b;
```

```
            markC=c;
```

```
            markD=d;
```

```
}
```

```
void printDetails() const{
```

```
    cout<<"*****Subject Marks*****";
```

```
    cout<<"\nMarks1: "<<markA<<endl;
```

```
    cout<<"Marks2: "<<markB<<endl;
```

```
    cout<<"Marks3: "<<markC<<endl;
```

```
    cout<<"Marks4: "<<markD<<endl;
```

```
}
```

```
void grade(){
```

```
    int total= (markA+markB+markC+markD)/40;
```

```
    switch(total){
```

```
        case 10: cout<<"A+";
```

```
                break;
```

```
        case 9:
```

```
            cout<<"A";
```

```
            break;
```

```
        case 8:
```

```
            cout<<"B";
```

```
        break;
```

```
    case 7:
```

```
        cout<<"C";
```

```
        break;
```

```
    case 6:
```

```
        cout<<"D";
```

```
        break;
```

```
    case 5:
```

```
        cout<<"E";
```

```
        break;
```

```
    default:
```

```
        cout<<"*FAIL*";
```

```
        break;
```

```
    }
```

```
}
```

```
};
```

```
int main(){
```

```
    Grade g;
```

```
int w,x,y,z;

cout<<"Enter marks of 4 subjects:"<<endl;

cin>>w;

cin>>x;

cin>>y;

cin>>z;

cout<<endl;

g.getData(w,x,y,z);

cout<<endl;

g.printDetails();

cout<<"\nFinal GRADE:"<<endl;

g.grade();

return 0;

}
```

**OUTPUT**



```
E:\intense_study\intense study\grade_58.exe
Enter marks of 4 subjects:
60
50
100
90

*****Subject Marks*****
Marks1: 60
Marks2: 50
Marks3: 100
Marks4: 90

Final GRADE:
C
-----
Process exited after 9.672 seconds with return value 0
Press any key to continue . . .
```

**Question59) Write a that prints a table indicating the number of occurrences of each alphabet in the text entered as command line arguments.**

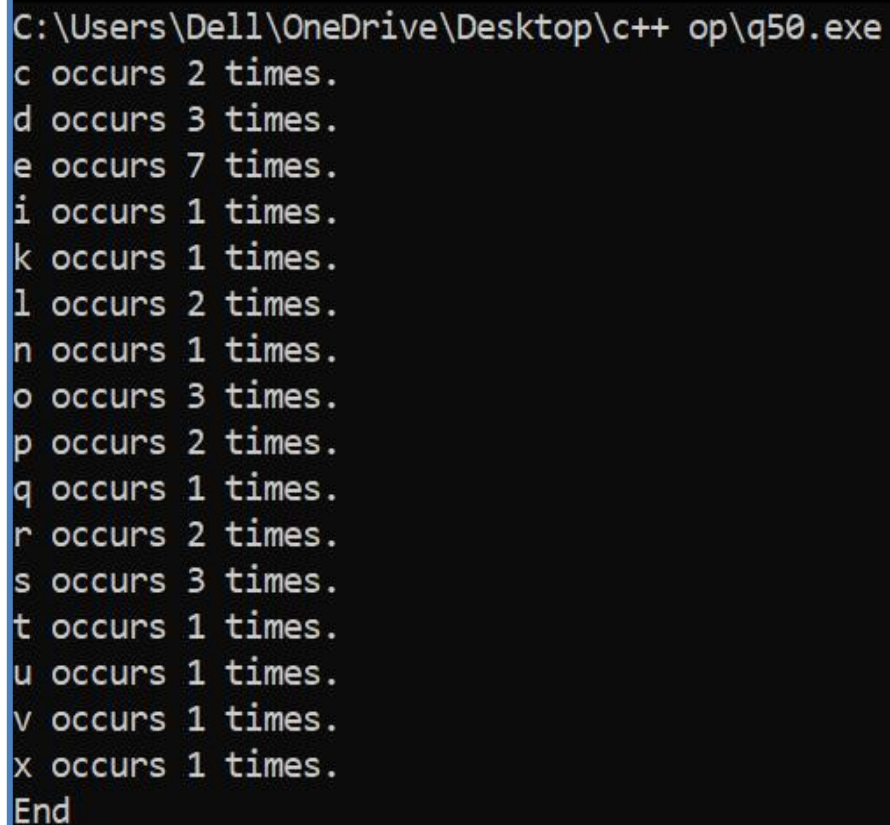
**Ans)**

```
#include<iostream>
#include<string.h>
using namespace std;
int main (int argc, char *argv [])
{
    int i;
    int count=0;
    for (int i=0; i<argc; i++)
        cout<<argv[i]<<" ";
    for (char k='a'; k<='z'; k++)
    {
        for (i=0; i<argc; i++)
        {
            for (int j=0; argv[i][j] != '\0'; j++)
            {
                if(isupper(argv[i][j]))
                    argv[i][j] =tolower(argv[i][j]);
```

```

        if(argv[i][j] ==k)
            count++;
    }
}
if(count>0)
    cout<<"\n"<<k<<" occurs "<<count<<" times.";
    count=0;
}
cout<<"\nEnd";
return 0;
}

```



The screenshot shows the output of a C++ program. The first line is the command prompt path: C:\Users\Dell\OneDrive\Desktop\c++ op\q50.exe. Below this, each character from 'c' to 'x' is listed with its occurrence count. For example, 'c' occurs 2 times, 'd' occurs 3 times, 'e' occurs 7 times, and so on. The output ends with the word 'End'.

```

C:\Users\Dell\OneDrive\Desktop\c++ op\q50.exe
c occurs 2 times.
d occurs 3 times.
e occurs 7 times.
i occurs 1 times.
k occurs 1 times.
l occurs 2 times.
n occurs 1 times.
o occurs 3 times.
p occurs 2 times.
q occurs 1 times.
r occurs 2 times.
s occurs 3 times.
t occurs 1 times.
u occurs 1 times.
v occurs 1 times.
x occurs 1 times.
End

```

**Question60)WAP to compute the square of a number using function prototype: int mysqr(int no); The input value n given to this function must be tested for validity and if found negative, this program should raise an exception that must be caught**

**Ans)**

```
#include<iostream>
```

```
#include<string>
```

```
using namespace std;
```

```
int mysqr(int no);
```

```
int main(){
```

```
    int num;
```

```
    cout<<"Enter the number:"<<endl;
```

```
    cin>>num;
```

```
    mysqr(num);
```

```
    return 0;
```

```
}
```

```
int mysqr(int no){
```

```
try{
    if(no<0){
        throw no;
    }
    else{
        cout<<"The square of number
is::"<<(no*no)<<endl;

    }
}

catch(int exp){
    cout<<"Negative Number : EXCEPTION occur"<<endl;
}

return no;

}
```

**OUTPUT**

E:\intense\_study\intense study\excepltion\_60.exe

Enter the number:

5

The square of number is::25

-----

Process exited after 2.21 seconds with return value 0

Press any key to continue . . .

E:\intense\_study\intense study\excepltion\_60.exe

Enter the number:

-8

Negative Number : EXCEPTION occur

-----

Process exited after 3.066 seconds with return value 0

Press any key to continue . . .