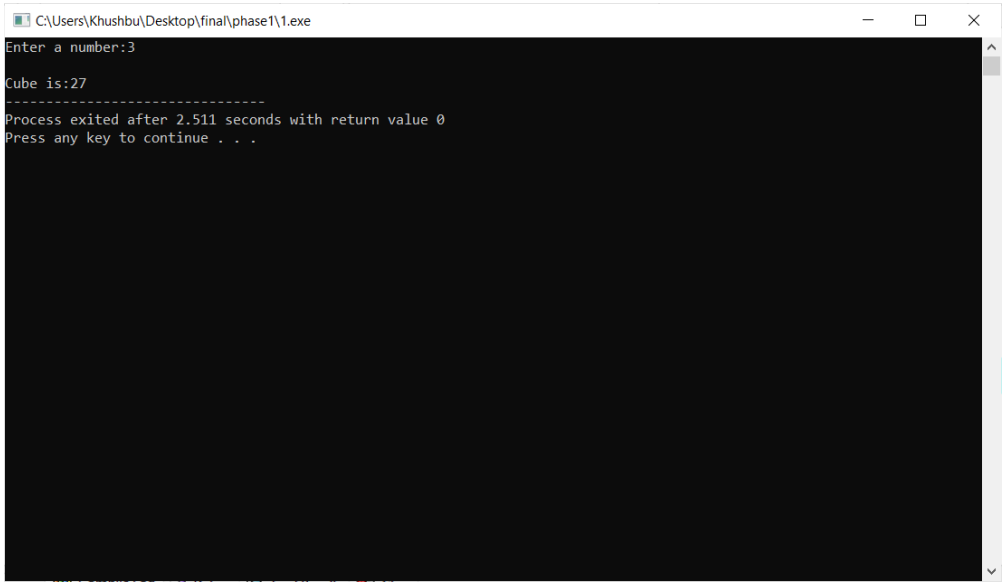
Phase :1

Aim : Meena face an isuue to perform a mathematical operation to find a cube of any number. Write a C++ Program which helps Meena to solve her issue.

Program :1

```
#include<iostream>
using namespace std;

class Cube {
        private :
                int n, cube;
        public:
           void getData() {
              cout << "Enter a number:";
              cin >>this->n;
            }

            void findCube() {
              cube = n * n * n;
            }

            void display() {

              cout << "\nCube is:" << cube;

            }
};

int main() {

   Cube c;

   c.getData();

   c.findCube();
   c.display();

   return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\1.exe
Enter a number:3
Cube is:27

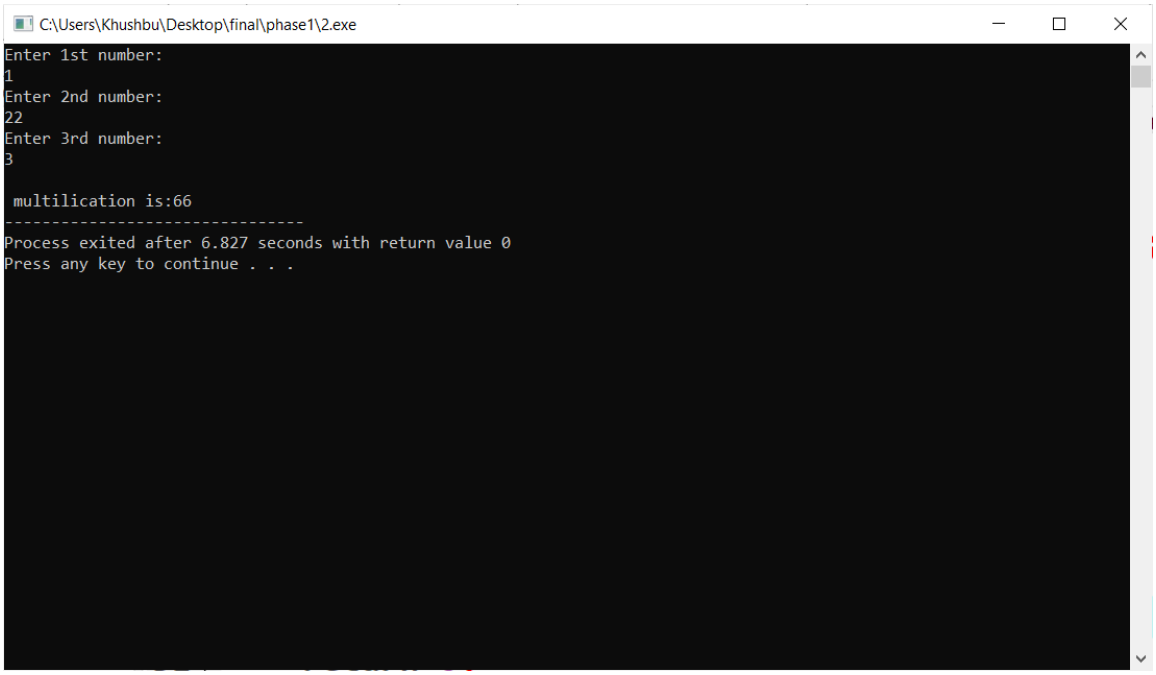
Process exited after 2.511 seconds with return value 0
Press any key to continue . . .

Aim : Sameer is too weak to find multiplication of any three numbers. Write a C++ Program which helps Sameer to solve his issue.

Program :2

```
#include<iostream>
using namespace std;

class Multiplication {
        private :
                int n, a,b,c;
        public:
           void setData() {
              cout << "Enter 1st number:"<<endl;
              cin >> this->a;
              cout << "Enter 2nd number:"<<endl;
              cin >> this->b;
              cout << "Enter 3rd number:"<<endl;
              cin >> this->c;
           }
           void getData() {
              n = a * b * c;
           }
           void display() {

              cout << "\n multilication is:" << n;

           }
};

int main() {
   Multiplication m;
   m.setData();
   m.getData();
   m.display();
   return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\2.exe
Enter 1st number:
1
Enter 2nd number:
22
Enter 3rd number:
3
multilication is:66
Process exited after 6.827 seconds with return value 0
Press any key to continue . . .

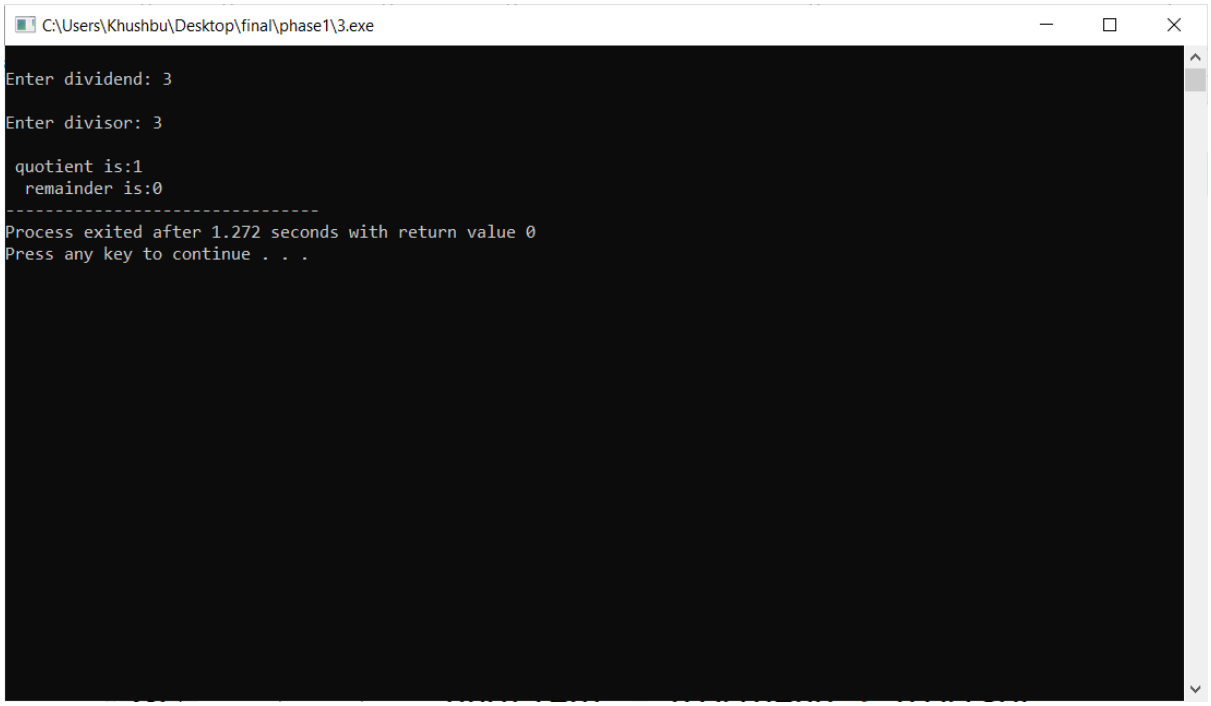
Aim :A student in a fifth class encounters a very easy math problem to find quotient and remainder. Write a C++ Program which provides a solution for this particular problem.

Program :3

```
#include<iostream>
using namespace std;

class quotient_remainder {
        private :
                int  divisor, dividend, quotient, remainder;
        public:


            void setData()
                  {
               cout <<endl<< "Enter dividend: ";
                     cin >> this->dividend;

                      cout <<endl<< "Enter divisor: ";
                      cin >> this->divisor;
            }
            void getquotient()
                  {
               quotient = dividend / divisor;
            }
            void getremainder()
                  {
               remainder = dividend % divisor;
            }

            void display()
                  {

               cout << "\n quotient is:" <<quotient ;
               cout << "\n  remainder is:" <<remainder ;
            }
};

int main()
 {
   quotient_remainder a;
a.setData();
a.getquotient();
a.getremainder();
a.display();
```

```
    return 0;
}
```

Output :



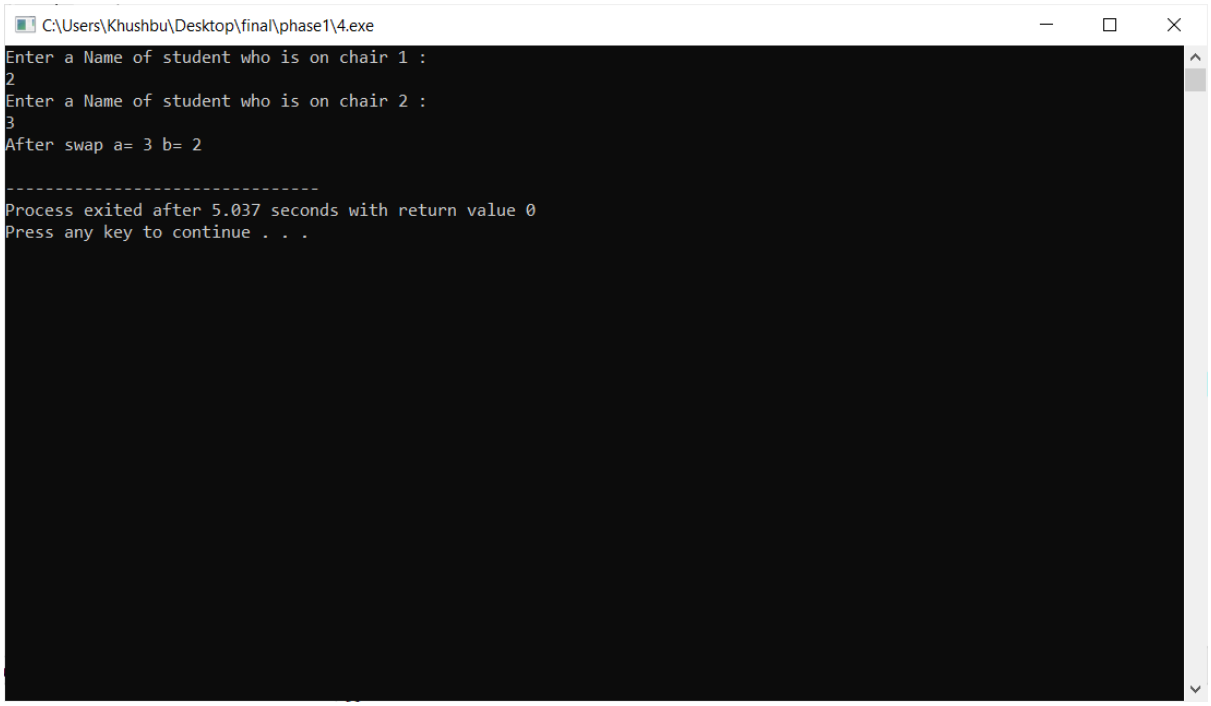
Aim : Two classmates wants to exchange their seating with each other. But the problem is that there are only two chairs in the small classroom which already aquires by them. Write a C++ Program which provides a solution for this particular problem.

Program :4

```
#include<iostream>
using namespace std;

class Swap {
        private :
                char  a[100],b[100];
                int i=0;
        public:
           void setData() {
              cout <<  "Enter a Name of student who is on chair 1 : "<<endl;
              gets(a);
              cout <<  "Enter a Name of student who is on chair 2 : "<<endl;
              gets(b);

           }
           void getData() {
             while(a[i]!=NULL>=b[i]!=NULL || a[i]!=NULL<=b[i]!=NULL ||
a[i]!=NULL==b[i]!=NULL)
                        {
                                {
                                        b[i]=a[i]+b[i]-(a[i]=b[i]);
                                        i++;
                                }
                        }


           }
           void display() {

                        cout<<"After swap a= "<<a<<" b= "<<b<<endl;

   }
};

int main() {
   Swap s;
s.setData();
s.getData();
s.display();
   return 0;
```

}

Output :


C:\Users\Khushbu\Desktop\final\phase1\4.exe
Enter a Name of student who is on chair 1 :
2
Enter a Name of student who is on chair 2 :
3
After swap a= 3 b= 2

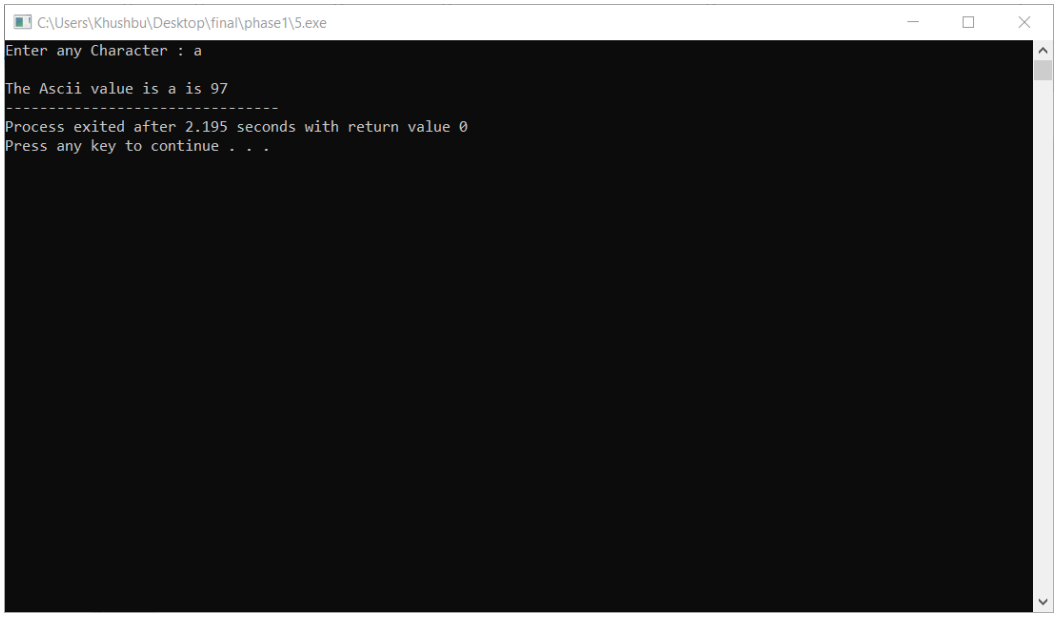
Process exited after 5.037 seconds with return value 0
Press any key to continue . . .

Aim : Two college collegues had argue with a ASCII value conversion method. Write a C++ Program which provides a solution for their issue.

Program :5

```
#include <iostream>
using namespace std;

class Ascii
{
        private :
                char c;

        public :
                void setData()
                {
                        cout << "Enter any Character : ";
                        cin >> c;
                   cout << endl << "The Ascii value is " << c << " is " << int(c);
                }
};

int main()
{
   Ascii a;

a.setData();
  return 0;
}
```

Output :

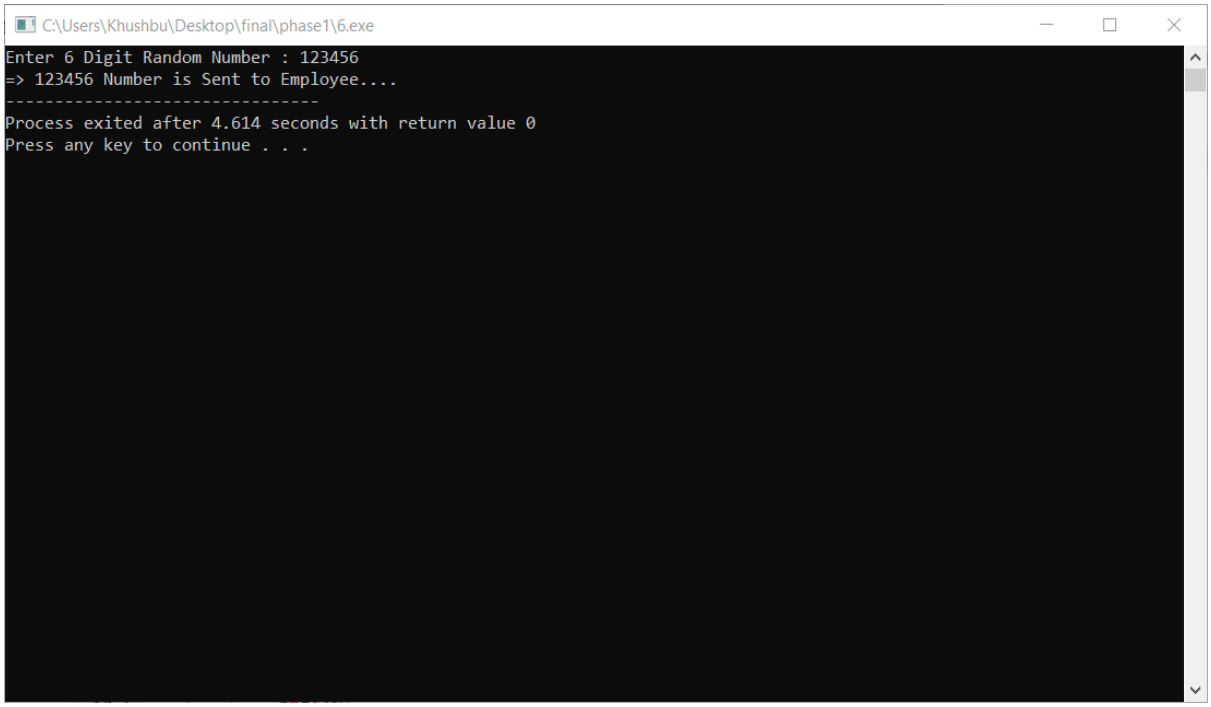


Aim : An IT company wants to generate random number of 6 digits long and send it to its employees. Write a C++ Program to help this IT company.

Program :6

```
#include <iostream>
#include <stdlib.h>
#include <time.h>
using namespace std;

class Employee
{
		public:
		void getData(int n,int l)
		{
				if(l==6)
				{
					cout << "=> " << n <<" Number is Sent to Employee....";
				}
				else
				{
					cout << "=> Please Enter 6 Digit Number!!";
				}
		}
};
int main()
{
		int n,a,l=0;
		cout << "Enter 6 Digit Random Number : ";
		cin >> n;
		a=n;
		while(a!=0)
		{
			a=a/10;
			l++;
		}
		Employee o1;
		o1.getData(n,l);
return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\6.exe
Enter 6 Digit Random Number : 123456
=> 123456 Number is Sent to Employee....

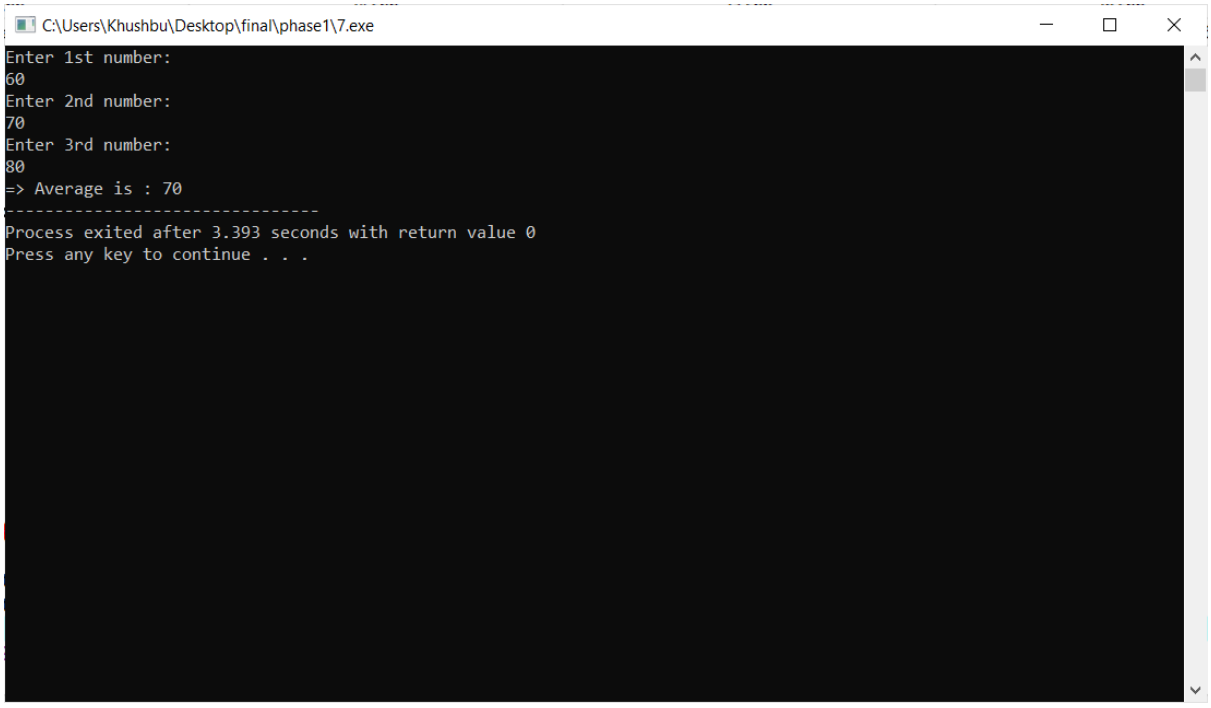
Process exited after 4.614 seconds with return value 0
Press any key to continue . . .

Aim : Priyank needs to find an average of three numbers to gain required passing marks in exam. Write a C++ Program to helps Priyank to solve his issue.

Program :7

```
#include<iostream>
using namespace std;

class Avg {
        private :
                float  a,b,c;
                   float n;


        public:

           void setData() {
              cout << "Enter 1st number:"<<endl;
              cin >> a;
              cout << "Enter 2nd number:"<<endl;
              cin >> b;
              cout << "Enter 3rd number:"<<endl;
              cin >> c;

           }
           void getData() {
               n = (a + b + c) / 3;
                        if(a<30 || b<30 || c<30)
                         {
                                 cout << "=> Sorry!! You are fail!!";
                     }
                                 else
                                 {
                                 cout << "=> Average is : " << n;
                                 }
           }
};

int main() {
   Avg a;
a.setData();
a.getData();

   return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\7.exe
Enter 1st number:
60
Enter 2nd number:
70
Enter 3rd number:
80
=> Average is : 70

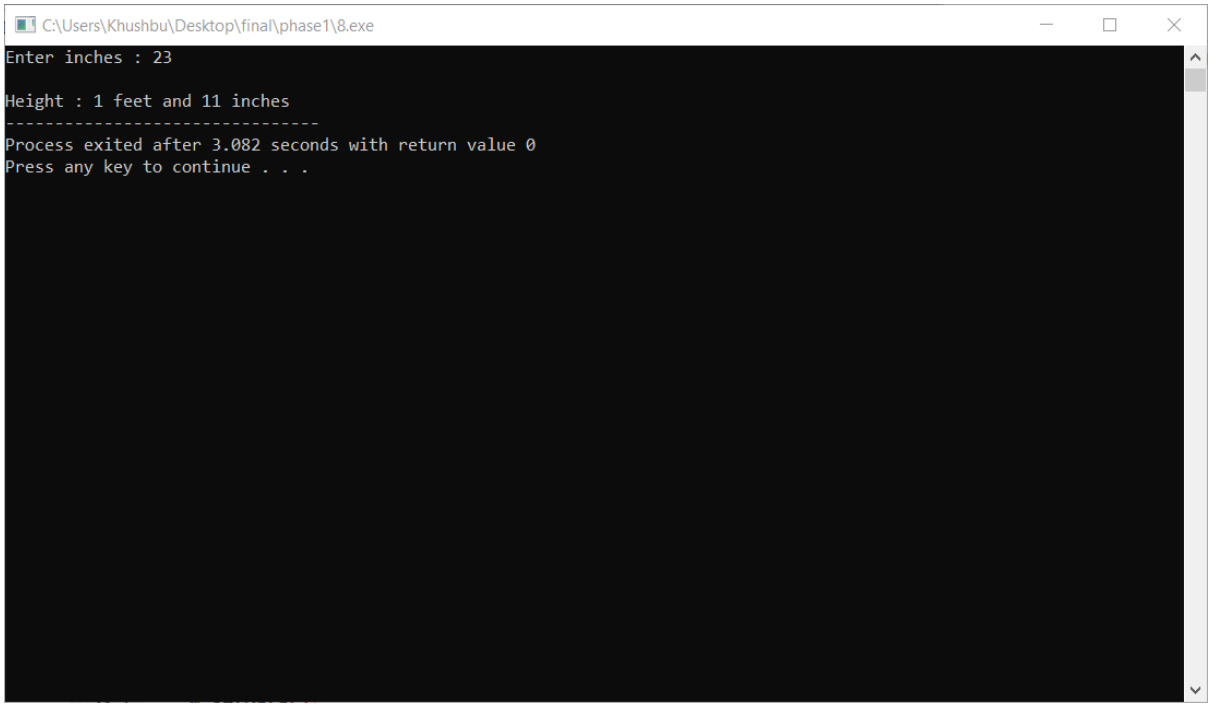
Process exited after 3.393 seconds with return value 0
Press any key to continue . . .

Aim :A sport coach needs to convert submitted participants' inches into feet and inches for height measurement. Write a C++ Program to provide a solution for this.

Program :8

```
#include <iostream>
using namespace std;

class Measurement
{
	private :
		int i, f;

	public :
		void setData()
		{
			cout << "Enter inches : ";
			cin >>  i;
		}

		void display()
		{
			while (i >= 12)
			{
				i = i - 12;
				f++;
			}

			cout << endl << "Height : "    << f << " feet and " << i << " inches";
		}
};

int main()
{
   Measurement m;

   m.setData();
   m.display();
  return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\8.exe
Enter inches : 23
Height : 1 feet and 11 inches
Process exited after 3.082 seconds with return value 0
Press any key to continue . . .

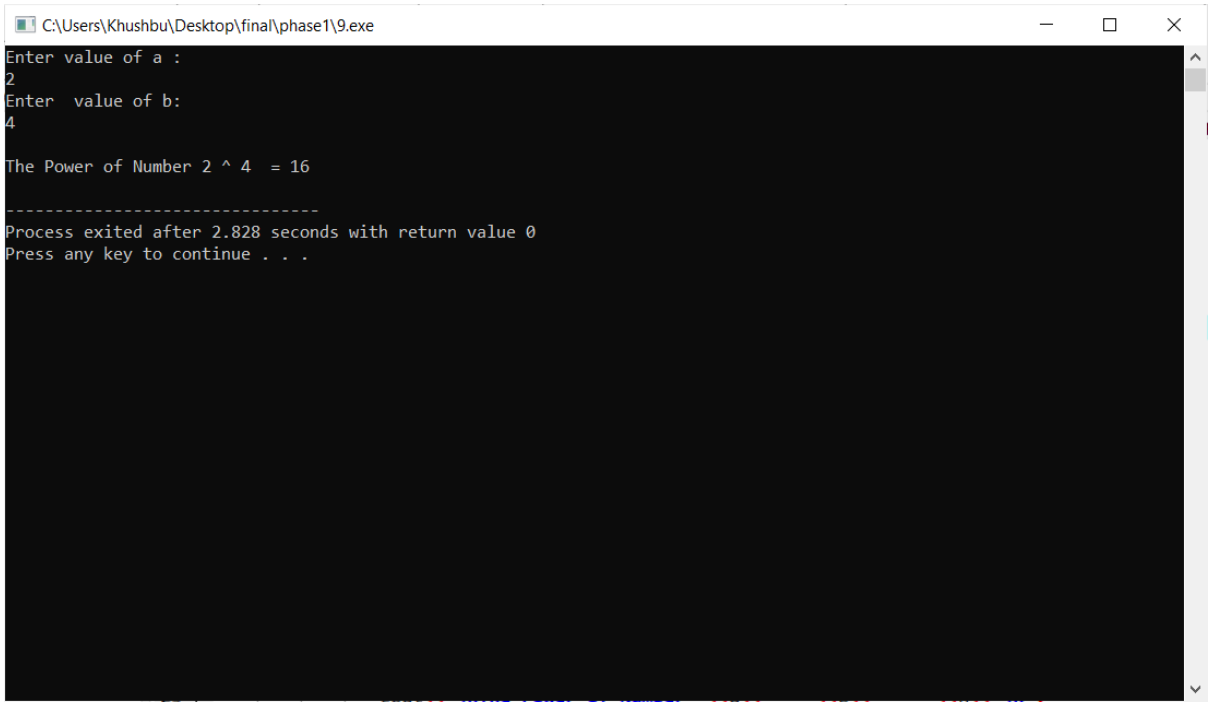
\

Aim : An innocent boy must have to solve that how to raise any number(Base) to power N for proving his common ability among all classmates. Write a C++ Program to provide a solution for this boy.

Program :9

```
#include<iostream>
#include<math.h>
using namespace std;

class Power {
                private :
                        int  a,b,n;

                public:

            void setData() {
               cout << "Enter value of a :"<<endl;
               cin >> a;
               cout << "Enter  value of b:"<<endl;
               cin >> b;

            }
            void getData() {
              n=pow(a,b);
            }
            void display() {

                 cout<<"\nThe Power of Number "<<a<<" ^ "<<b<<"  = "<<n<<"\n";

            }
};

int main() {
   Power p;
p.setData();
p.getData();
p.display();
   return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\9.exe
Enter value of a :
2
Enter value of b:
4
The Power of Number 2 ^ 4 = 16

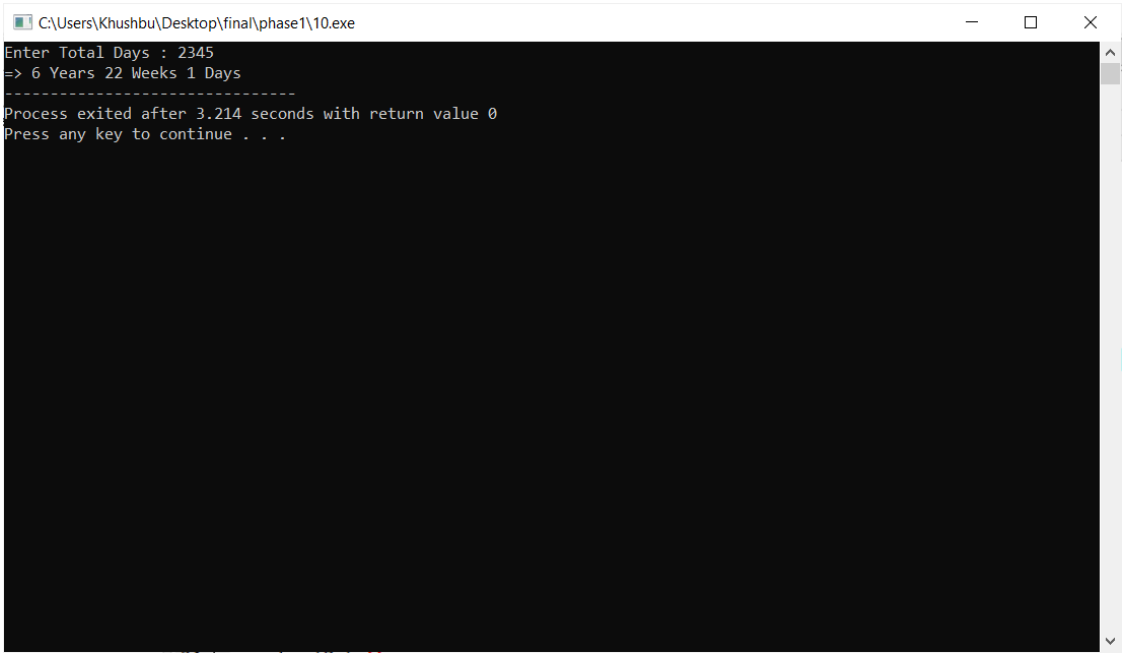
Process exited after 2.828 seconds with return value 0
Press any key to continue . . .

Aim :A brand new smart device which meant to convert total provided Days Into Years, Weeks and Days. But for some technical interruption, that device stops working properly. Write a C++ Program to provide a solution for this.

Program :10

```
#include<iostream>
using namespace std;
class Day
{
	private:
		int total_day,d,w,y;
	public:
		void setData()
		{
			cout << "Enter Total Days : ";
			cin >> total_day;
		}
		void getData()
		{
			y=total_day/365;
			w=(total_day%365)/7;
			d=(total_day%365)%7;
			cout << "=> " << y <<" Years " << w <<" Weeks " << d <<" Days";
		}
};
int main()
{
	Day d;
	d.setData();
	d.getData();
	return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\10.exe
Enter Total Days : 2345
=> 6 Years 22 Weeks 1 Days

Process exited after 3.214 seconds with return value 0
Press any key to continue . . .

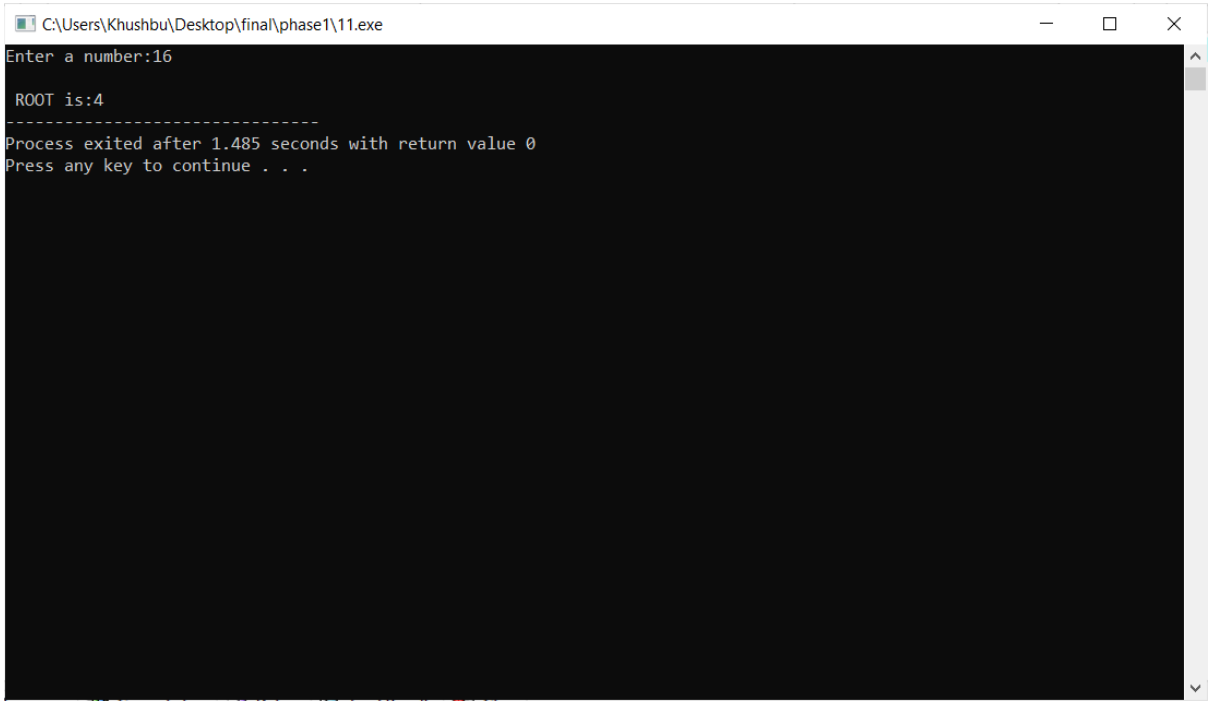
Aim : Raman have an idea to impress his Computer Teacher by solving Square Root of a number without using any programming library. Write a C++ Program to help Raman.

Program :11

```
#include<iostream>
using namespace std;

class Root {
        private :
                int number,i=0;
                float  root=1;

public:


   void getData() {
      cout << "Enter a number:";
      cin >> number;
   }

   void findCube() {
      while (1)
            {
               i = i + 1;
               root = (number / root + root) / 2;
               if (i == number + 1)
                        {
                                break;
                        }
            }
   }

   void display() {

      cout << "\n ROOT is:" << root;

   }
};

int main() {

   Root r;

r.getData();

r.findCube();
r.display();
```

```
    return 0;
}
```

Output :

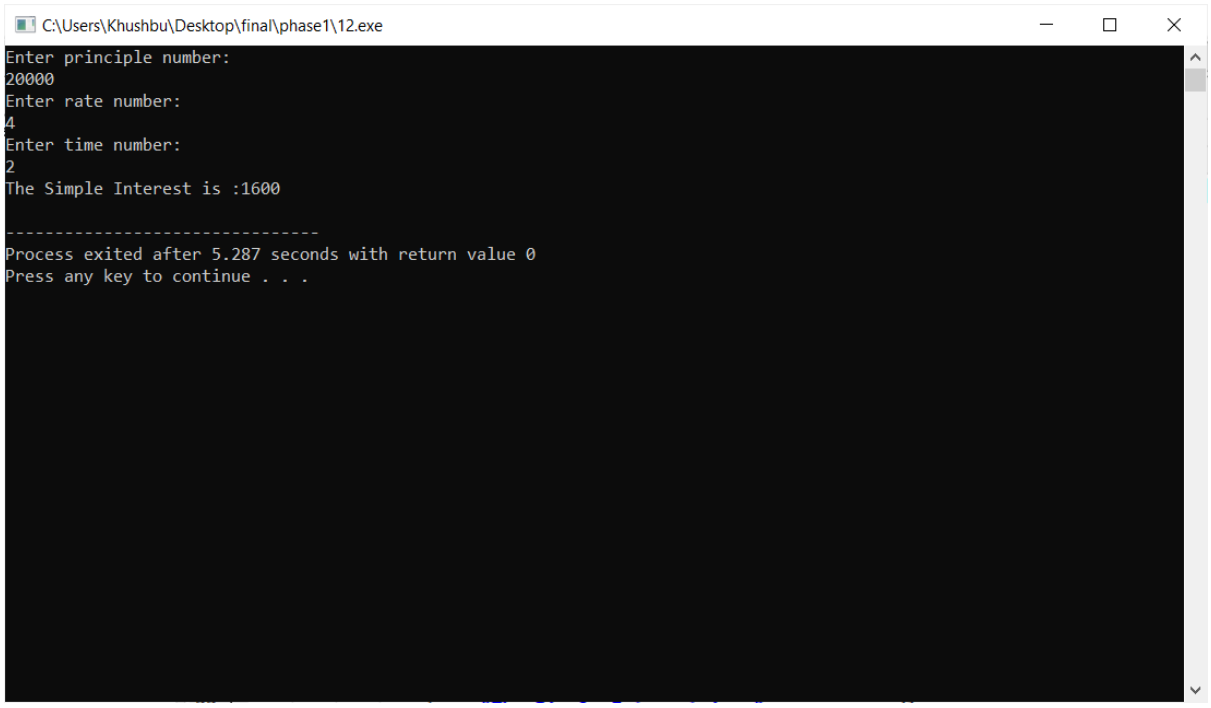


Aim :A math teacher wants to teach how to find a Simple Interest. Write a C++ Program to provide a solution for this.

Program :12

```
#include<iostream>
using namespace std;

class Interest {
        private :
        int  a,b,c;
           float n;
        public:
           void setData() {
              cout << "Enter principle number:"<<endl;
              cin >> a;
              cout << "Enter rate number:"<<endl;
              cin >> b;
              cout << "Enter time number:"<<endl;
              cin >> c;
           }
           void getData() {
              n = (a*b*c)/100;;
           }
           void display() {

               cout << "The Simple Interest is :"  << n << endl;

           }
};

int main() {
   Interest i;
   i.setData();
   i.getData();
   i.display();
   return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\12.exe
Enter principle number:
20000
Enter rate number:
4
Enter time number:
2
The Simple Interest is :1600

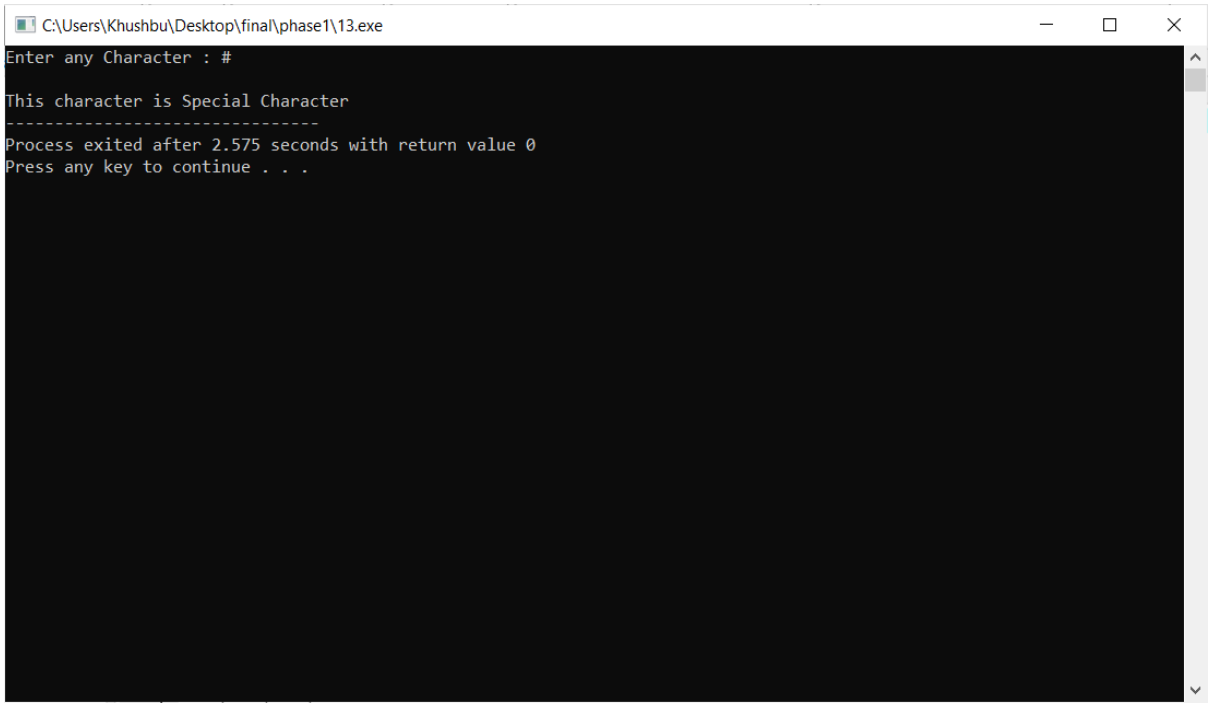
Process exited after 5.287 seconds with return value 0
Press any key to continue . . .

Aim :A fourth standard student forced by his teacher to dentify if a given Character is Uppercase, Lowercase, Digit or Special Character. Write a C++ Program to help that student.

Program :13

```
#include<iostream>
using namespace std;

class Check
{
        private :
           char s;

        public :
           void setData()
                {
              cout << "Enter any Character : ";
              cin >>s;
           }

           void display()
                {
        if(s >= 'A' && s <='Z')
                cout << endl << "This character is Uppercase";
              else if(s >= 'a' && s <='z')
                cout << endl << "This character is Lowercase";
                        else if(s >= '0' && s <='9')
                cout << endl << "This character is Digit";
                        else
                                cout << endl << "This character is Special Character";

           }
};

int main()
{
   Check c;

   c.setData();
   c.display();

  return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\13.exe
Enter any Character : #
This character is Special Character

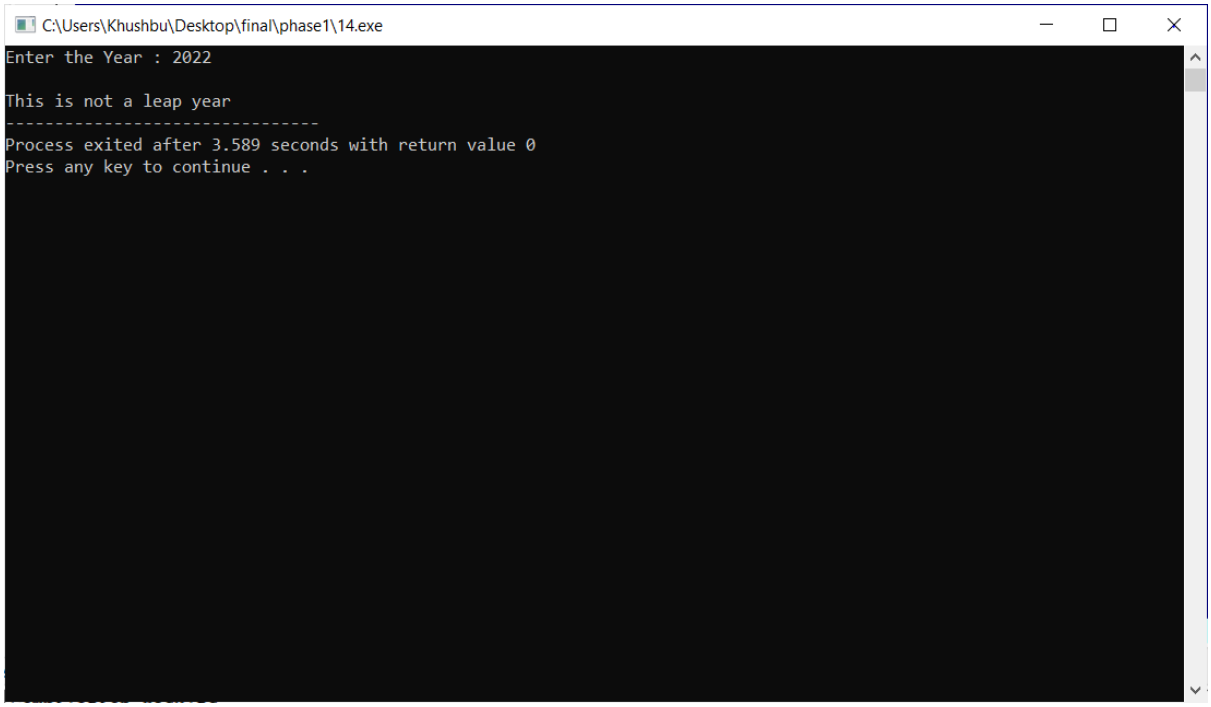
Process exited after 2.575 seconds with return value 0
Press any key to continue . . .

Aim : Gaurav must have to teach his little 5 years old baby to check whether a given year is leap year or not. Write a C++ Program to provide a solution for Gaurav.

Program :14

```
#include<iostream>
using namespace std;

class Leapyear
{
        private :
           int n;

        public :
           void setData()
                {
              cout << "Enter the Year : ";
              cin >>  n;
           }

           void display()
                {
              if (n % 4 == 0)
                                cout << endl << "This is a leap year";
                        else
                                cout << endl << "This is not a leap year";
           }
};

int main()
{
   Leapyear l;

   l.setData();
   l.display();

  return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\14.exe
Enter the Year : 2022
This is not a leap year

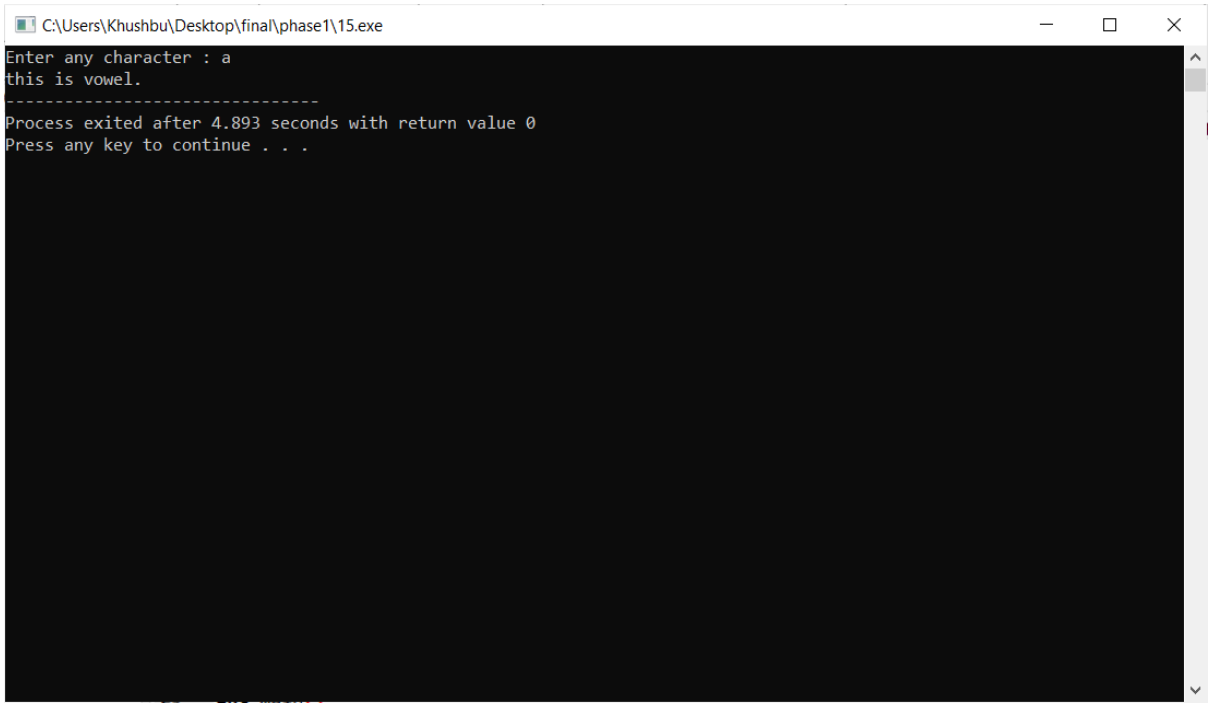
Process exited after 3.589 seconds with return value 0
Press any key to continue . . .

Aim : Aaryan is constantly trying to Check Whether a character is Vowel or Consonant. But for some unknown reason he just cannot remember difference between vowel and consonant. Write a C++ Program to provide a better solution to Aaryan.

Program :15

```
#include<iostream>
using namespace std;

class Vovel_Constant
{
        private :
           char c;
        int l_vowel, u_vowel;
        public :
           void setData()
                {
              cout << "Enter any character : ";
              cin >> c;
           }

           void display()
                {
              l_vowel = (c == 'a' || c == 'e' || c == 'i' || c == 'o' || c == 'u');
                        u_vowel = (c == 'A' || c == 'E' || c == 'I' || c == 'O' || c == 'U');


                  if (l_vowel || u_vowel)
                     cout<<"this is vowel.";
                  else
                     cout<<"this is consonant.";
           }
};

int main()
{
   Vovel_Constant  vc;

vc.setData();
vc.display();

  return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\15.exe
Enter any character : a
this is vowel.

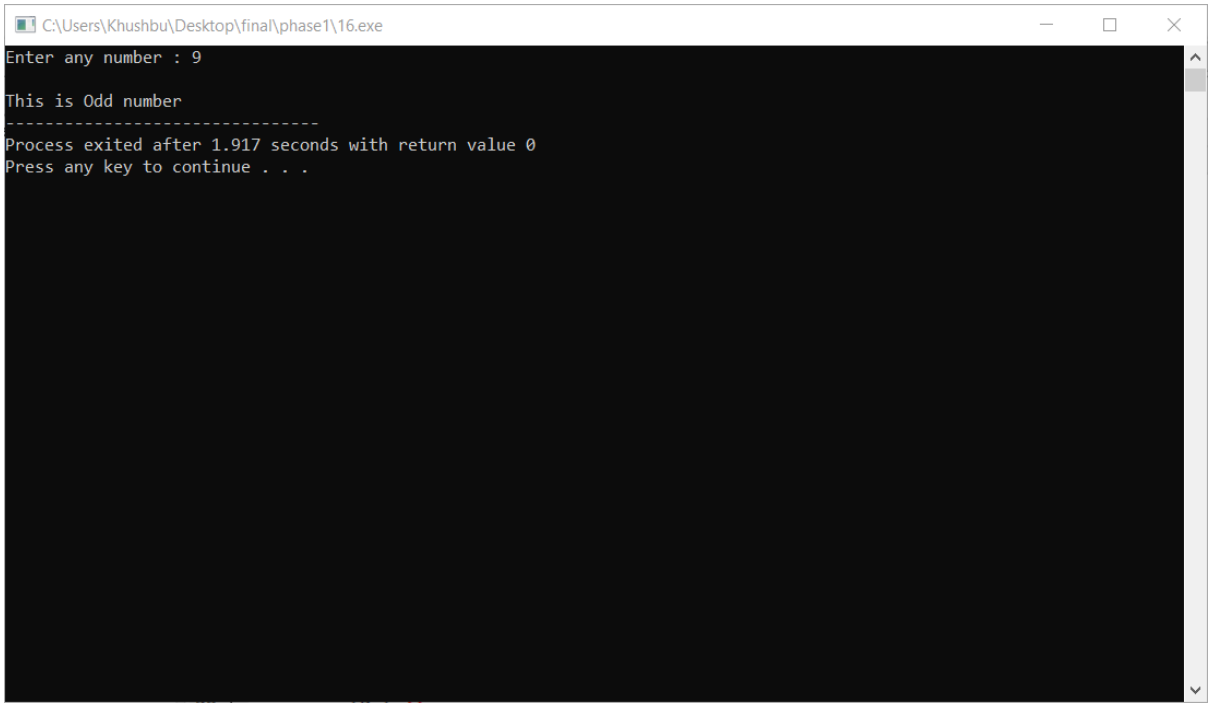
Process exited after 4.893 seconds with return value 0
Press any key to continue . . .

Aim : Two friends are playing a game in which they have to check whether a given number is Even or Odd. Help them to Write a C++ Program for that.

Program :16

```
#include<iostream>
using namespace std;

class Odd_Even
{
        private :
           int n;

        public :
           void setData()
                {
              cout << "Enter any number : ";
              cin >> n;
           }

           void display()
                {
                if(n % 2 == 0)
                                cout << endl << "This is Even number";
                        else
                                cout << endl << "This is Odd number";
           }
};

int main()
{
   Odd_Even oe;

oe.setData();
oe.display();

  return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\16.exe
Enter any number : 9
This is Odd number

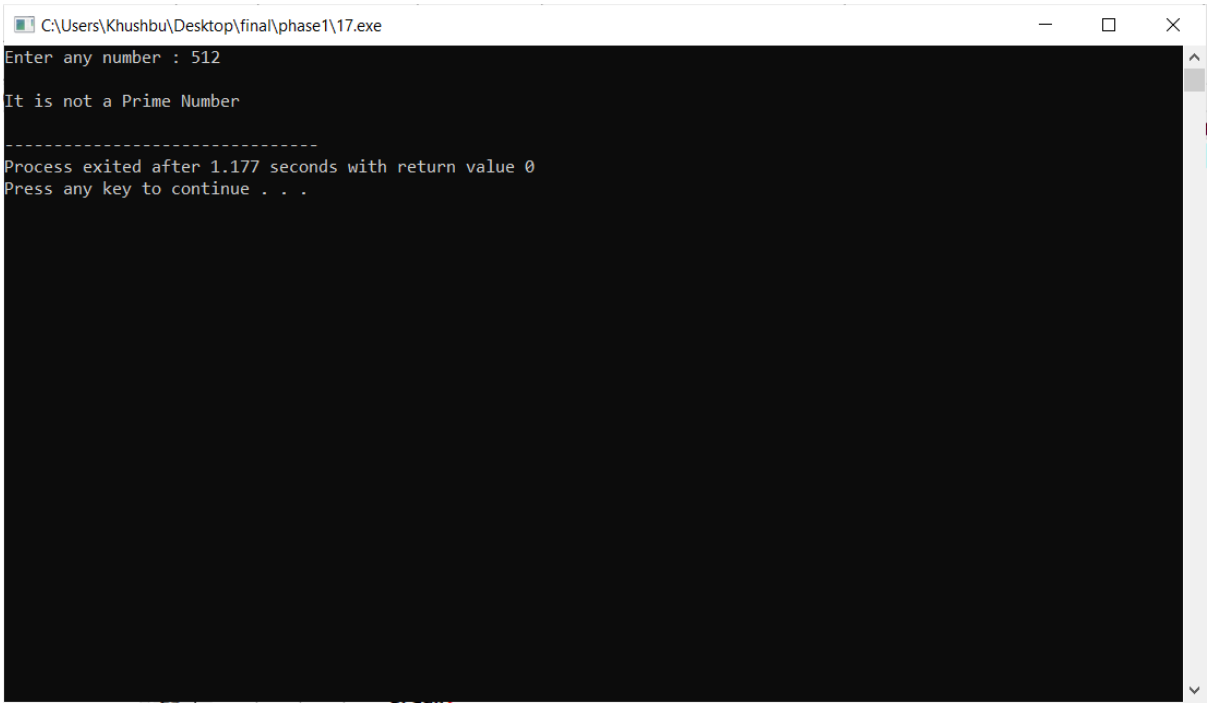
Process exited after 1.917 seconds with return value 0
Press any key to continue . . .

Aim : Sameer needs to master a technique to find if a given number is Prime number or not for his best presentation at the Teachers Day to impress his Math teacher. Help sameer to Write a C++ Program with best technique.

Program :17

```
#include<iostream>
using namespace std;

class Prime
{
        private :
           int num,a=0,i;

        public :
           void setData()
                {
              cout << "Enter any number : ";
              cin >> num;
           }

           void display()
                {
                for(i=2; i<num; i++)
                {
              if(num%i==0)
              {
                 a++;
                 break;
              }
   }
   if(a==0)
      cout<<"\nIt is a Prime Number";
   else
      cout<<"\nIt is not a Prime Number";
   cout<<endl;
 }
};
int main()
{
   Prime p;

p.setData();
p.display();

  return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\17.exe
Enter any number : 512
It is not a Prime Number

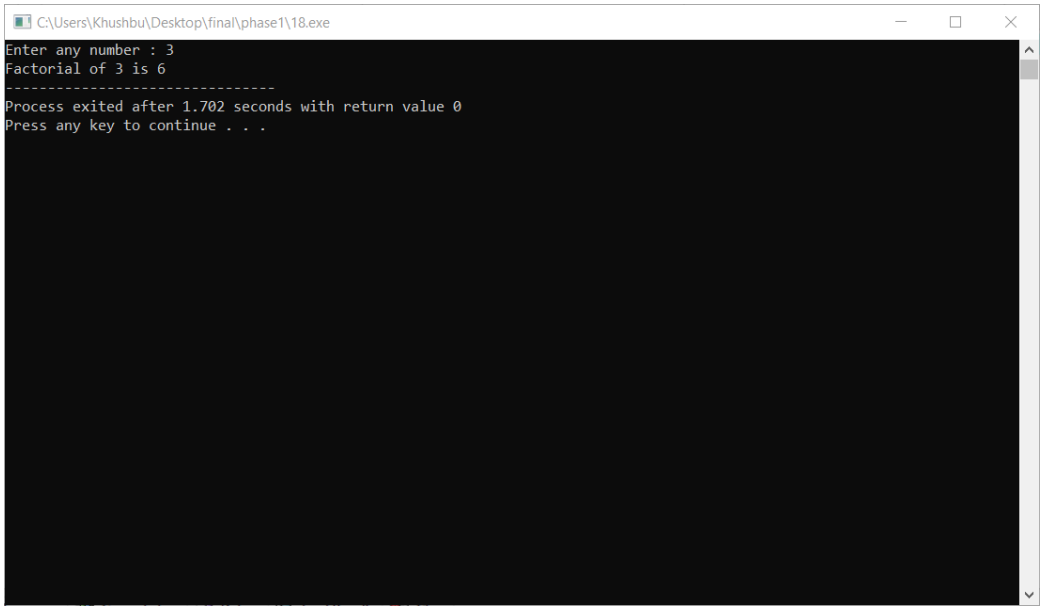
Process exited after 1.177 seconds with return value 0
Press any key to continue . . .

Aim : Tushar is trying very hard to teach his classmateHarsh that how to find Factorial of a Number. Write a C++Program for Tushar with best possibe technique**.**

Program :18

```
#include<iostream>
using namespace std;

class Factorial
{
        private :
           int num,fact=1,i;

        public :
           void setData()
                {
              cout << "Enter any number : ";
              cin >> num;
           }
           void display()
                {
                for(i=1; i<=num; i++)
                {
                        fact = fact * i;

                    }
                    cout<<"Factorial of "<<num<<" is "<<fact;
                }
};
int main()
{
   Factorial f;

f.setData();
f.display();

  return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\18.exe
Enter any number : 3
Factorial of 3 is 6

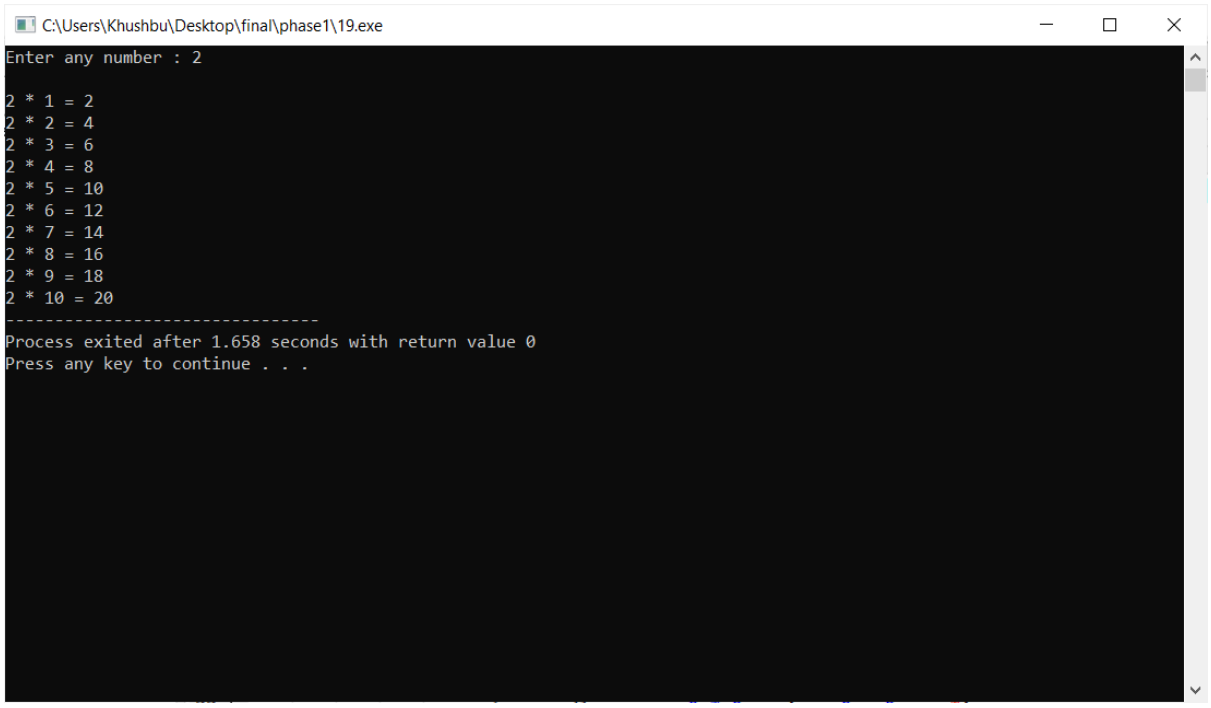
Process exited after 1.702 seconds with return value 0
Press any key to continue . . .

Aim : Write a C++ program to Print Table of any Number lessthan 10. A group of needy newbie math students willappriciate your help for your help.

Program :19

```
#include<iostream>
using namespace std;

class Table
{
        private :
           int n, i;

        public :
           void setData()
                {
              cout << "Enter any number : ";
              cin >> n;
           }

           void display()
                {
                if(n <= 10)
                {
                                for(i = 1 ; i <= 10 ; i++)
                        {
                                  cout  << endl << n << " * " << i << " = " << n*i;
                                }
                        }
                        else
                                cout << endl << "Please enter number between 1 to 10";
                }
};

int main()
{
   Table t;

t.setData();
t.display();

  return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\19.exe
Enter any number : 2
2 * 1 = 2
2 * 2 = 4
2 * 3 = 6
2 * 4 = 8
2 * 5 = 10
2 * 6 = 12
2 * 7 = 14
2 * 8 = 16
2 * 9 = 18
2 * 10 = 20

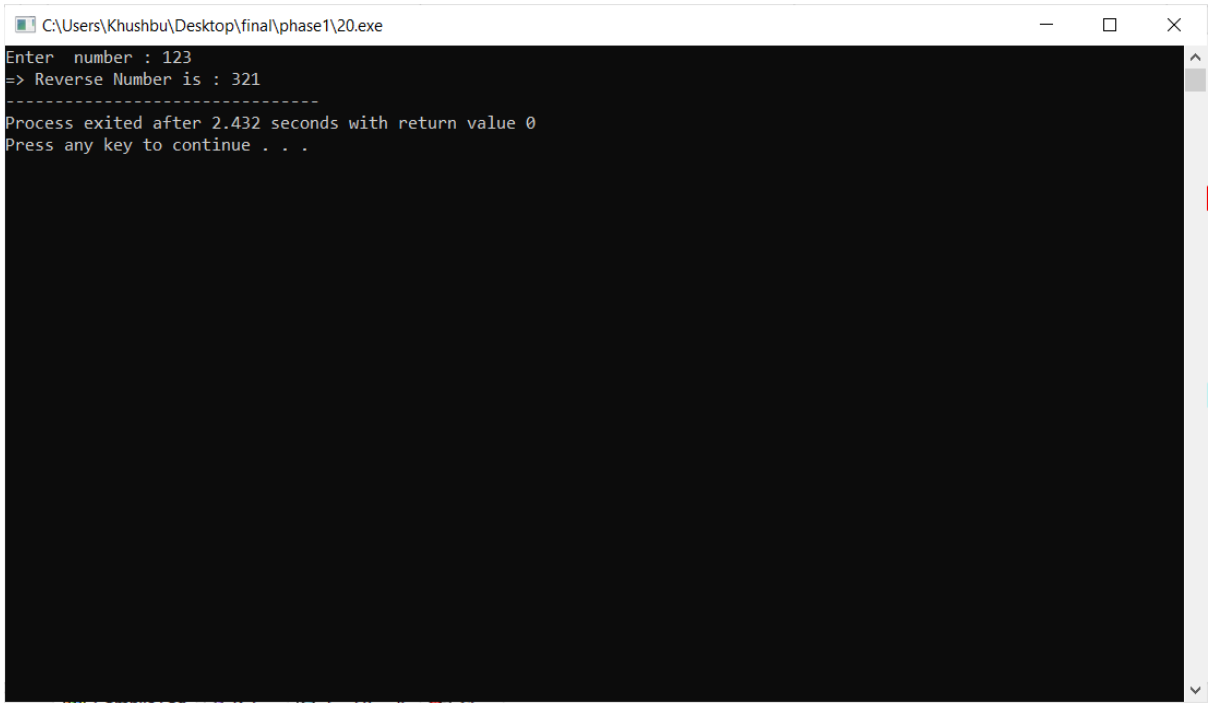
Process exited after 1.658 seconds with return value 0
Press any key to continue . . .

Aim : A Teacher give a punishment to all students to findreverse numbers of given 3 random numbers by logicallyunder 15 minutes. Write a C++ Program to provide asolution for this problem**.**

Program :20

```
#include <iostream>
using namespace std;

class Reverse
{
	private :
		int n,re,a,r;
	public :
		void setData()
		{
			cout << "Enter  number : ";
			cin >> this -> n;

		}

		void display()
		{
			a=n;
			while(a>0)
			{
				r=a%10;
				re=(re*10)+r;
				a=a/10;
			}
			cout << "=> Reverse Number is : " << re;
			}


};

int main()
{
	Reverse r;

	r.setData();
	r.display();
  return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\20.exe
Enter number : 123
=> Reverse Number is : 321

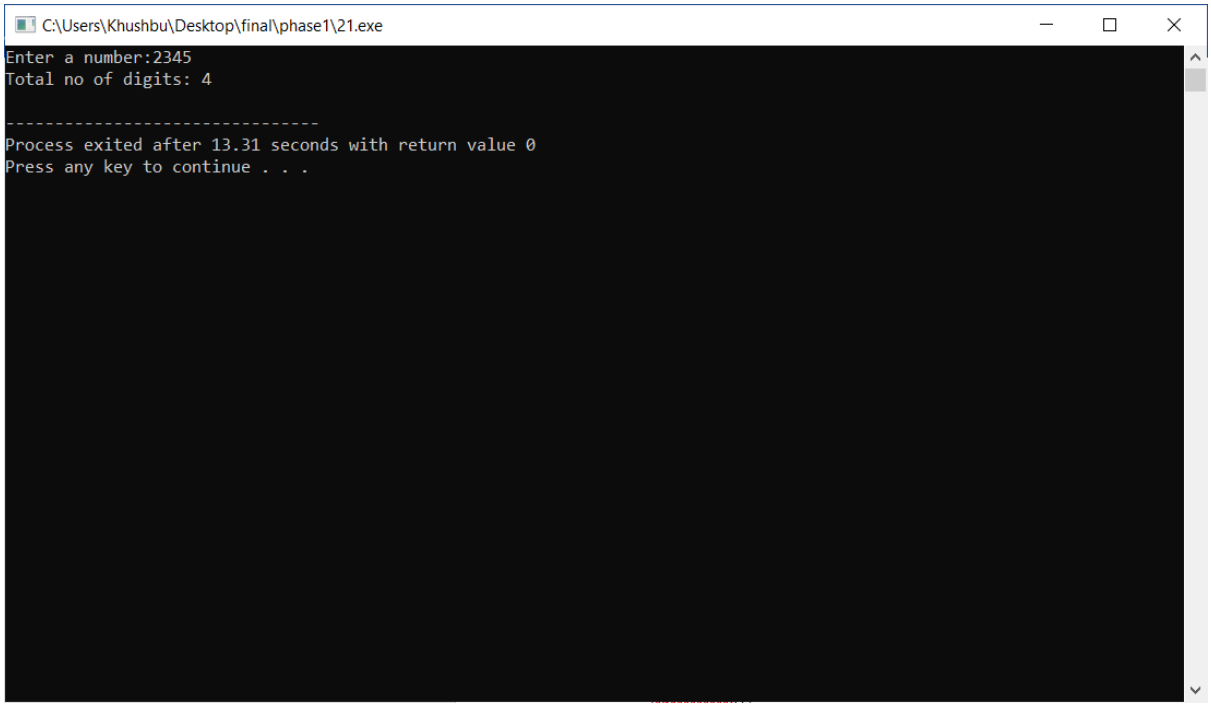
Process exited after 2.432 seconds with return value 0
Press any key to continue . . .

Aim : Priya wants to teach his newly enrolled boy that howto find number ofDigits in any number. Write a C++Program to provide a solution for this problem.

Program :21

```
#include<iostream>
using namespace std;

class Digit_Count {
        private :
                int num, i;
        public:


            void setData() {
               cout << "Enter a number:";
               cin >> num;
            }

            void getData()
                  {
               for (i = 0; num > 0; i++)
                           {
               num = num / 10;
               }
            }

            void display() {

              cout << "Total no of digits: " << i << endl;

            }
};

int main() {

   Digit_Count c;
         c.setData();
   c.getData();
   c.display();

   return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\21.exe
Enter a number:2345
Total no of digits: 4

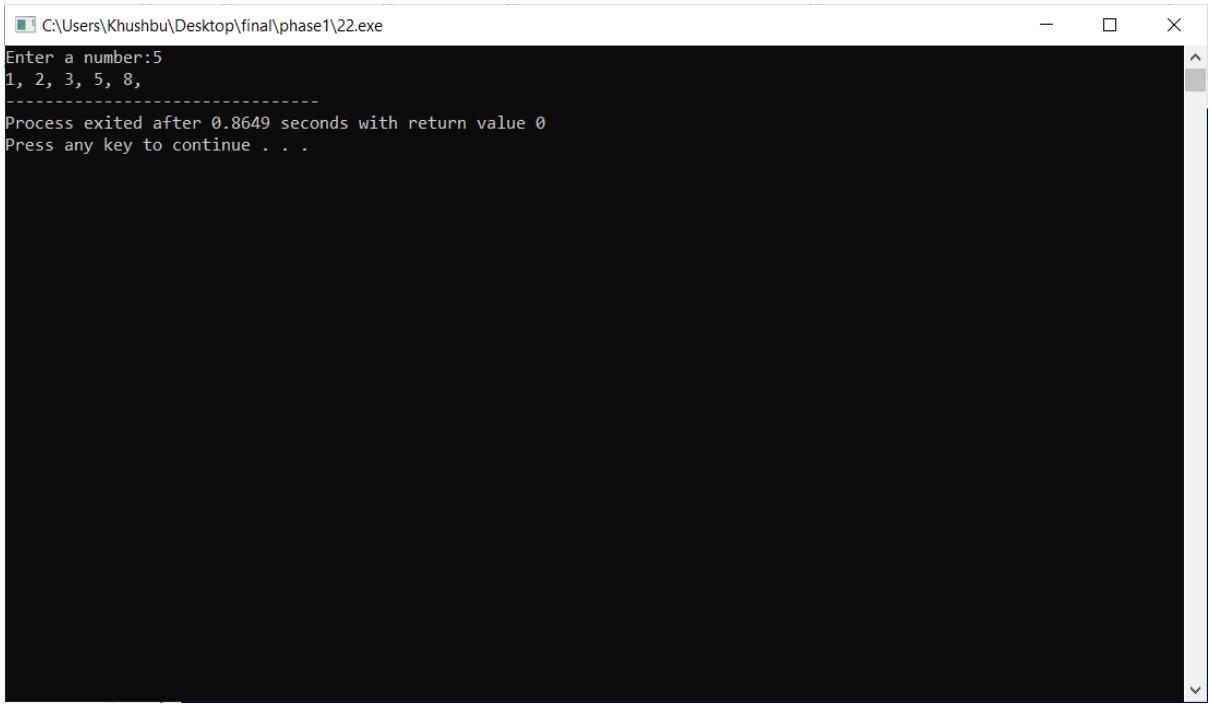
Process exited after 13.31 seconds with return value 0
Press any key to continue . . .

Aim : Write a C++ Program to find Fibonacci Series upto Nnumbers to help Darshan by passing fastest-finger firstround for entering Coding Quiz competition.

Program :22

```
#include<iostream>
using namespace std;

class Fibonacci {
        private :
                int num,a=0,b=1,c;
        public:


           void setData() {
              cout << "Enter a number:";
              cin >> num;
           }

           void getData()
                {
        for(int i = 1; i <= num; i++)
                        {
                                c=a+b;
                                cout<<c;
                                a=b;
                                b=c;
                 cout <<  ", ";
        }
           }

};

int main() {

   Fibonacci f;
f.setData();
f.getData();
   return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\22.exe
Enter a number:5
1, 2, 3, 5, 8,

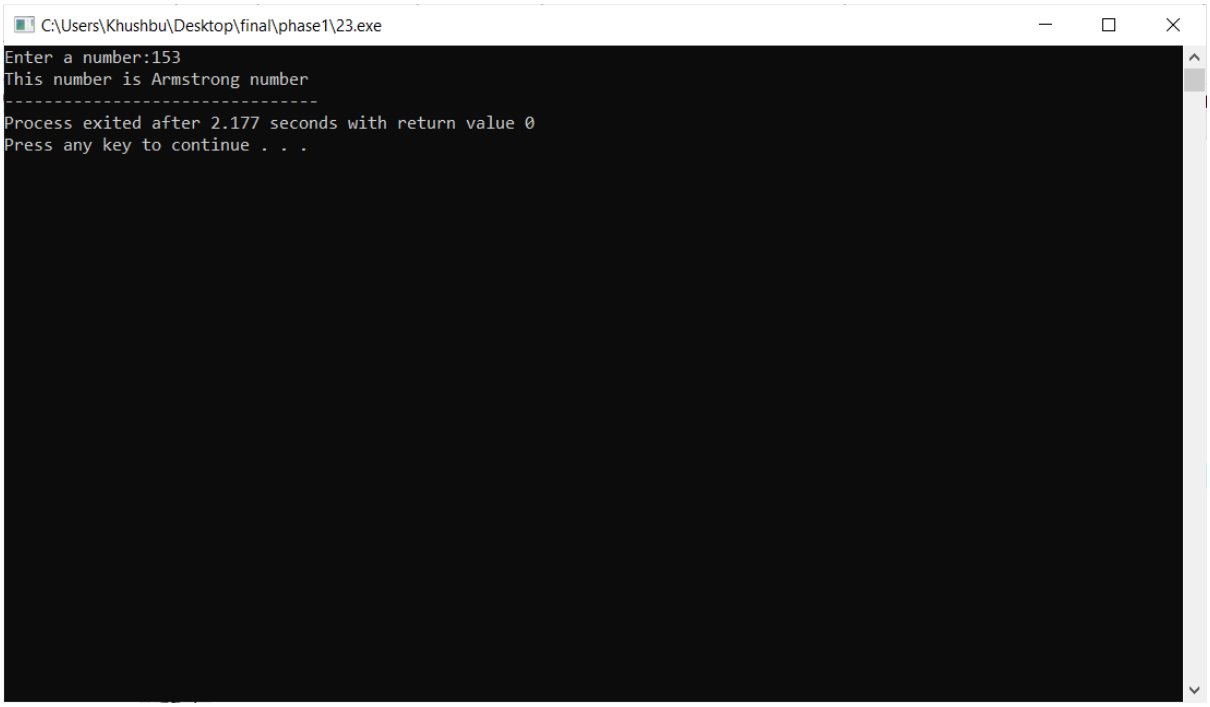
Process exited after 0.8649 seconds with return value 0
Press any key to continue . . .

Aim : By writing a logic for checking if a given number isArmstrong or Not, Mayur will be qualified for an entranceexam. Write a C++ Program for Mayur to qualify.

Program :23

```
#include<iostream>
using namespace std;

class Armstrong {
        private :
                int n,r,total=0,temp;
        public:


           void setData() {
              cout << "Enter a number:";
              cin >> n;
           }

           void getData()
                 {
              temp=n;

                          while(temp>0)
                          {
                              r=temp%10;
                              total=total+(r*r*r);
                              temp=temp/10;
                     }
                     temp=n;
                             if(temp==total)
                           printf("This number is Armstrong number");
                             else
                           printf("This number is not Armstrong number");

           }

};

int main() {

   Armstrong a;
a.setData();
a.getData();
   return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\23.exe
Enter a number:153
This number is Armstrong number

Process exited after 2.177 seconds with return value 0
Press any key to continue . . .

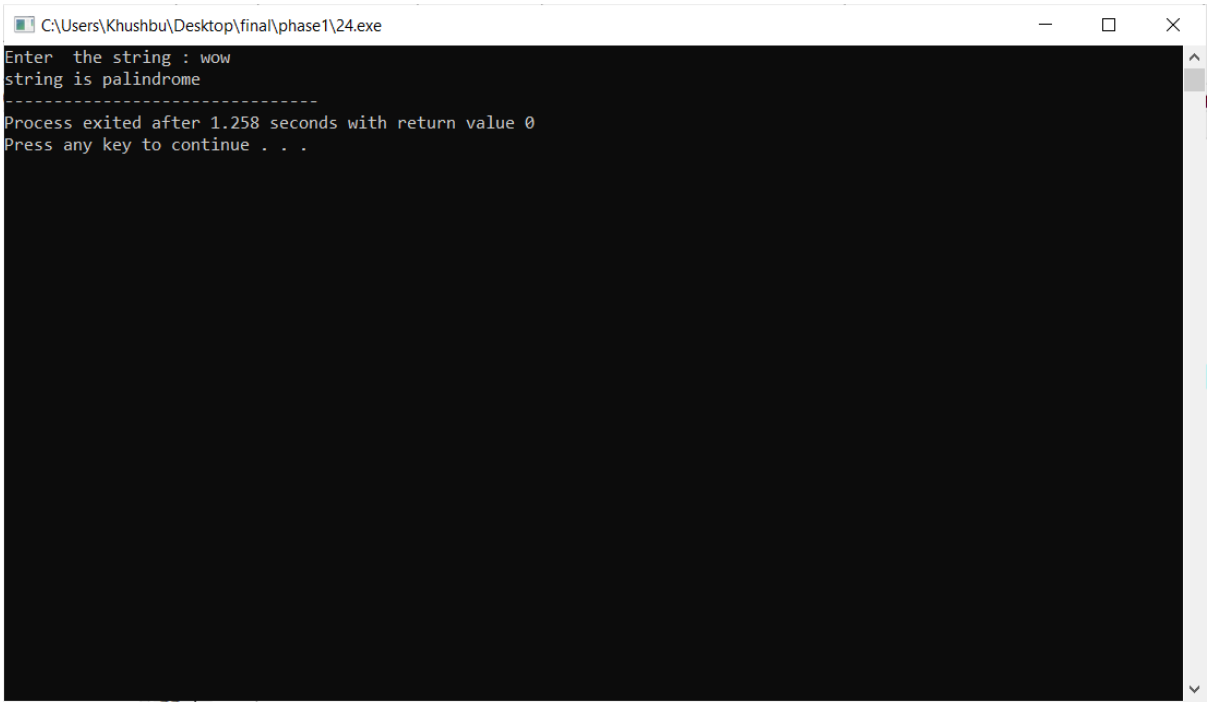
Aim : By writing a logic for checking if a given string isPalindrom or Not, Apexa will be qualified for an entranceexam. Write a C++ Program for Apexa to qualify.

Program :24

```
#include<iostream>
#include<conio.h>
#include<string.h>
using namespace std;

class String_palindrome {
        private :
                char s[100];
                int i,n,c=0;
        public:


           void setData() {

              cout<<"Enter  the string : ";
                 gets(s);
           }

           void getData()
                 {
               n=strlen(s);

                    for(i=0;i<n/2;i++)
                    {
                          if(s[i]==s[n-i-1])
                          c++;

                          }
                          if(c==i)
                             cout<<"string is palindrome";
                    else
                       cout<<"string is not palindrome";

                    }

};

int main() {

   String_palindrome s;
s.setData();
```

```
s.getData();
    return 0;
}
```

Output :



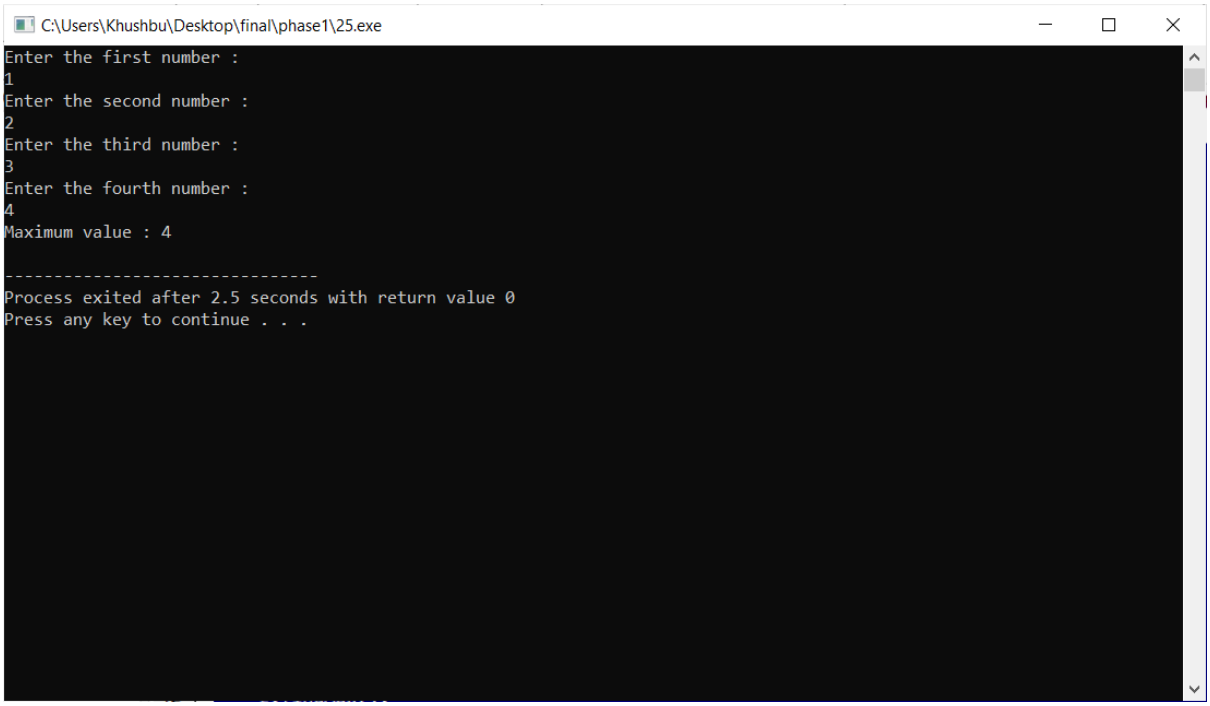
Aim : By using an easy technique, Write a C++ program toFind Largest Number among four numbers to help Prishaboost-up her confidence in logical building process.

Program :25

```
#include <iostream>
using namespace std;

class Max
{
private:
   int a, b, c, d, max;

public:
   void findMax()
   {

    cout << "Enter the first number : " << endl;
   cin >> a;

   cout << "Enter the second number : " << endl;
   cin >> b;

   cout << "Enter the third number : " << endl;
   cin >> c;

   cout << "Enter the fourth number : " << endl;
   cin >> d;
}
   void showMax()
   {
         int maxFirst = a >b ? a : b;
         int maxSecond =  c> d ? c : d;

                  max = maxFirst >maxSecond ? maxFirst : maxSecond;
         }
          void Displymax()
   {
                  cout << "Maximum value : " << max << endl;
         }
};


int main()
{
   Max c;
   c.findMax();
   c.showMax();
```

```
    c.Displymax();
}
```

Output :

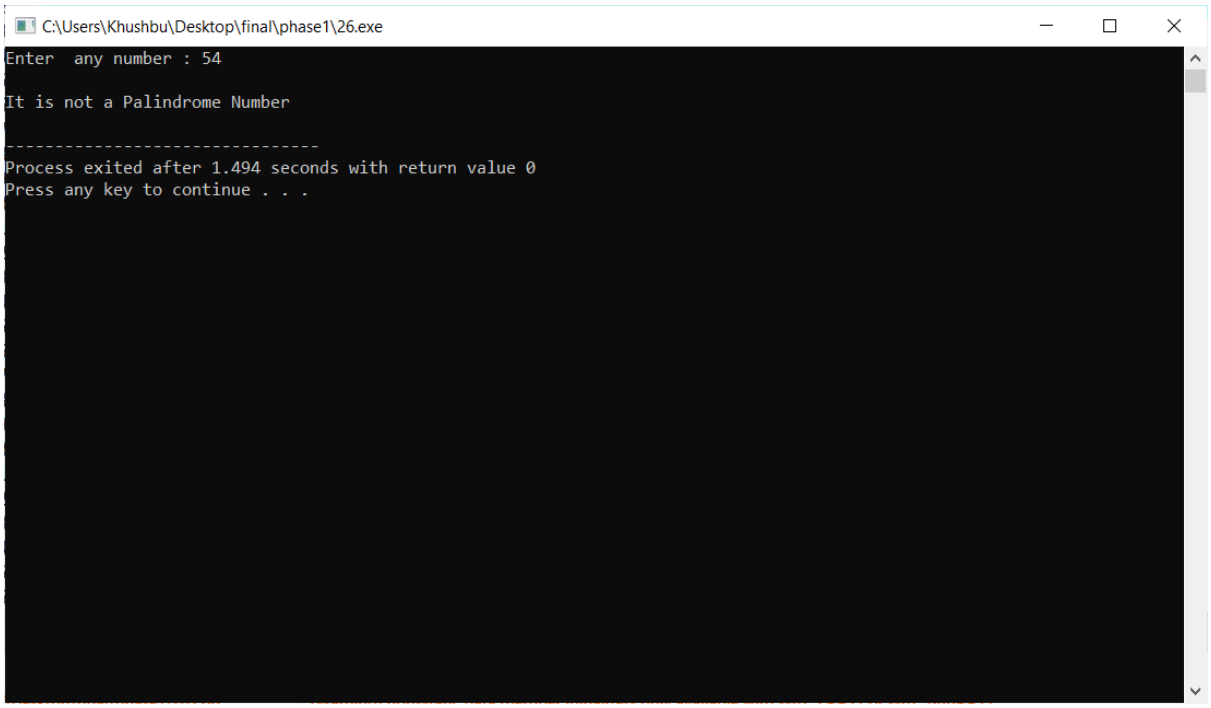


Aim : Develop a simple comparision system which identify ifgiven number is Palindrome or not. By this system, a bankemployee will appriciate your help. Write a C++ programfor developing this system.

Program :26

```
#include<iostream>
using namespace std;

class palindrome {
        private :
                int num,rev=0,rem,temp;
        public:


            void setData() {

               cout<<"Enter  any number : ";
                cin>>num;
            }

            void getData()
                {
                temp = num;
                    while(temp>0)
                    {
                        rem = temp%10;
                        rev = (rev*10)+rem;
                        temp = temp/10;
                    }
                    if(rev==num)
                        cout<<"\nIt is a Palindrome Number";
                    else
                        cout<<"\nIt is not a Palindrome Number";
                    cout<<endl;

                }

};

int main() {

   palindrome p;
p.setData();
p.getData();
   return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\26.exe
Enter any number : 54
It is not a Palindrome Number

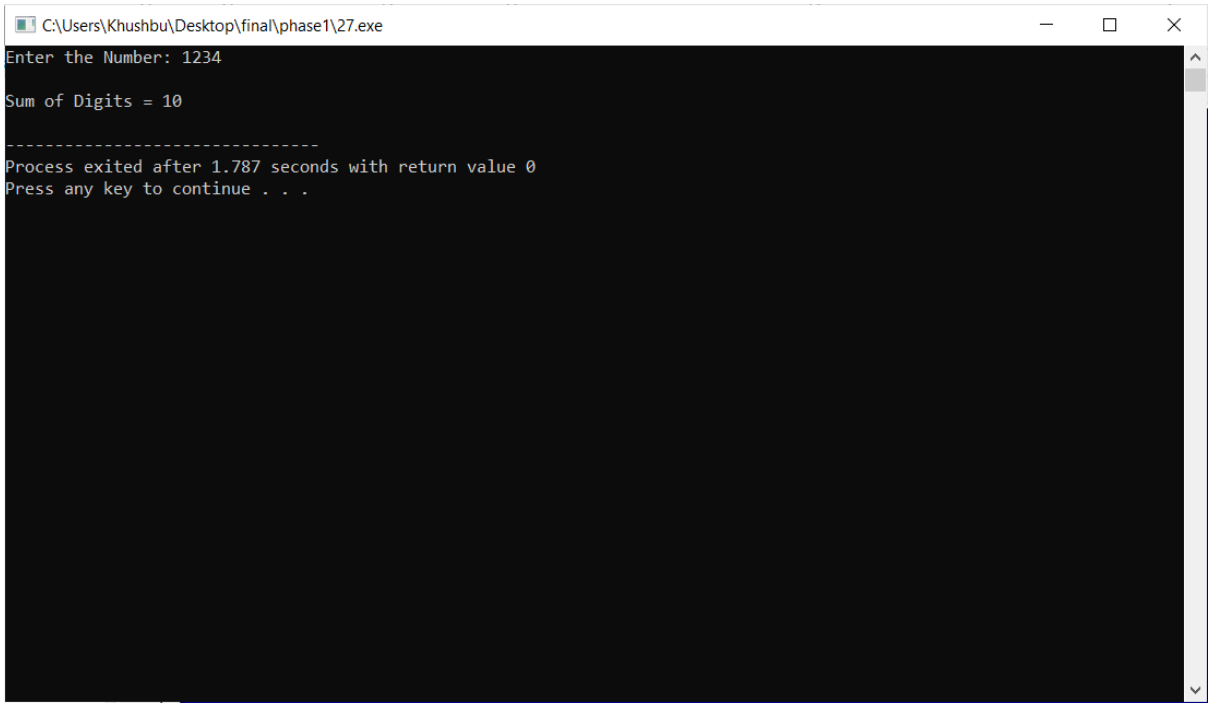
Process exited after 1.494 seconds with return value 0
Press any key to continue . . .

Aim : Create a addition logic to find sum of all digits ofa given number to surpass a very challenging dream ofTanmay. Write a C++ program to develop this system forTanmay.

Program :27

```
#include<iostream>
using namespace std;
class Sum
{
   private:
      int num, sum, rem;
   public:
      void getNumber()
      {
         cout<<"Enter the Number: ";
                        cin>>num;
                }
      int findSumOfDigit()
      {
         sum=0;
                    while(num>0)
                    {
                       rem = num%10;
                       sum = sum+rem;
                       num = num/10;
                    }
                cout<<"\nSum of Digits = "<<sum;
                        cout<<endl;
         }
};

int main()
{
   Sum s;

s.getNumber();
s.findSumOfDigit();

   return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase1\27.exe
Enter the Number: 1234
Sum of Digits = 10

Process exited after 1.787 seconds with return value 0
Press any key to continue . . .

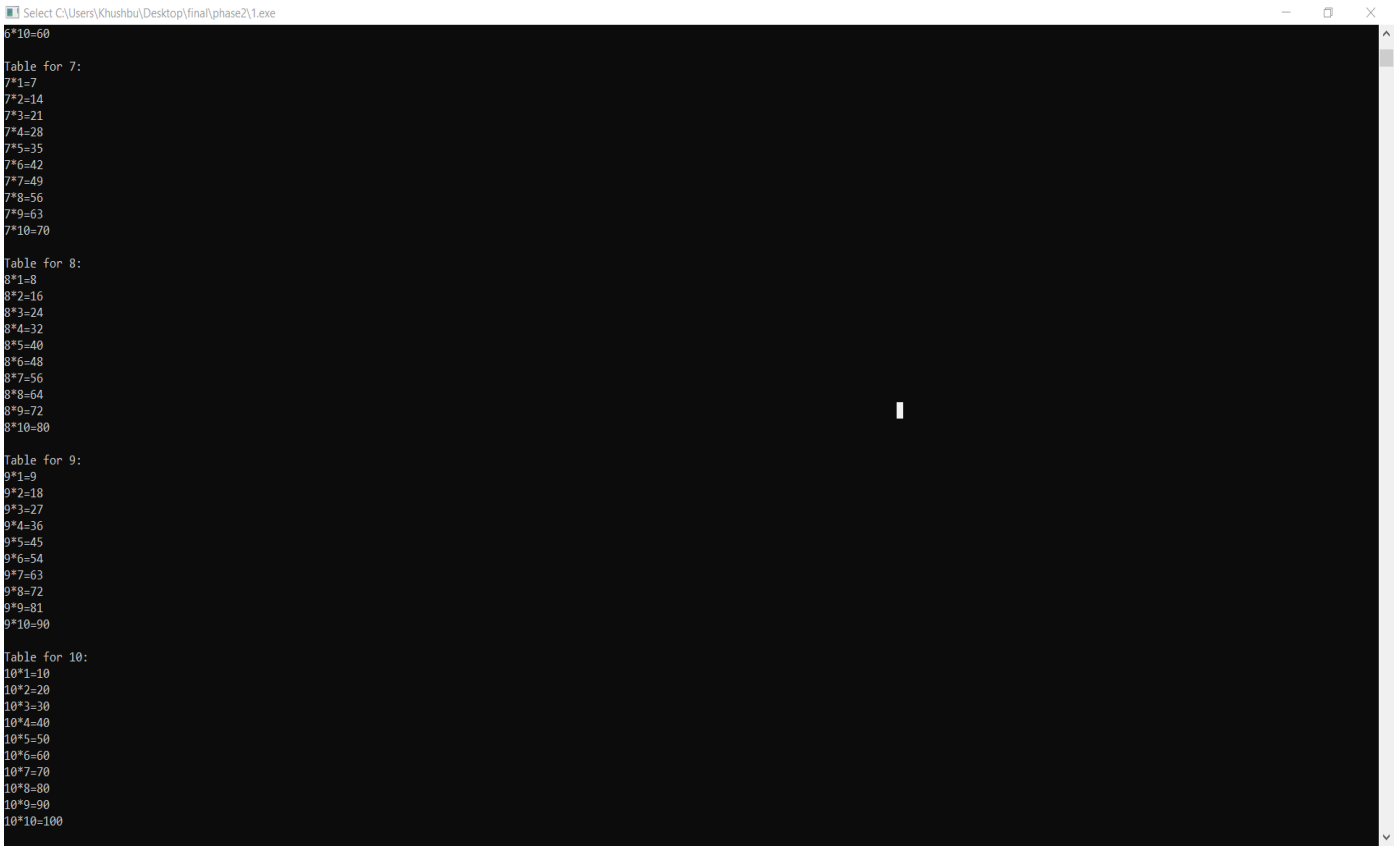
Phase :2

Aim : Kashyap has difficulty to remember multiplication tables. Write a C++ Program which generatesmultiplication tables between n1 and n2 provided values.

Program :1

```
#include<bits/stdc++.h>
using namespace std;

class mul
{
        public :

           int i,j;


  public:
                        void getdata()
                         {
                           do
                        {
                                 cout<<"Table for "<<i<<":\n";

                                for(j=1;j<=10;j++)
                                        cout<<i<<"*"<<j<<"="<<(i*j)<<"\n";

                                cout<<"\n";
                                        i++;

                        }while(i<=10);
                        }

} ;
int main()
{
        mul m;
        m.getdata();
}
```

Output :

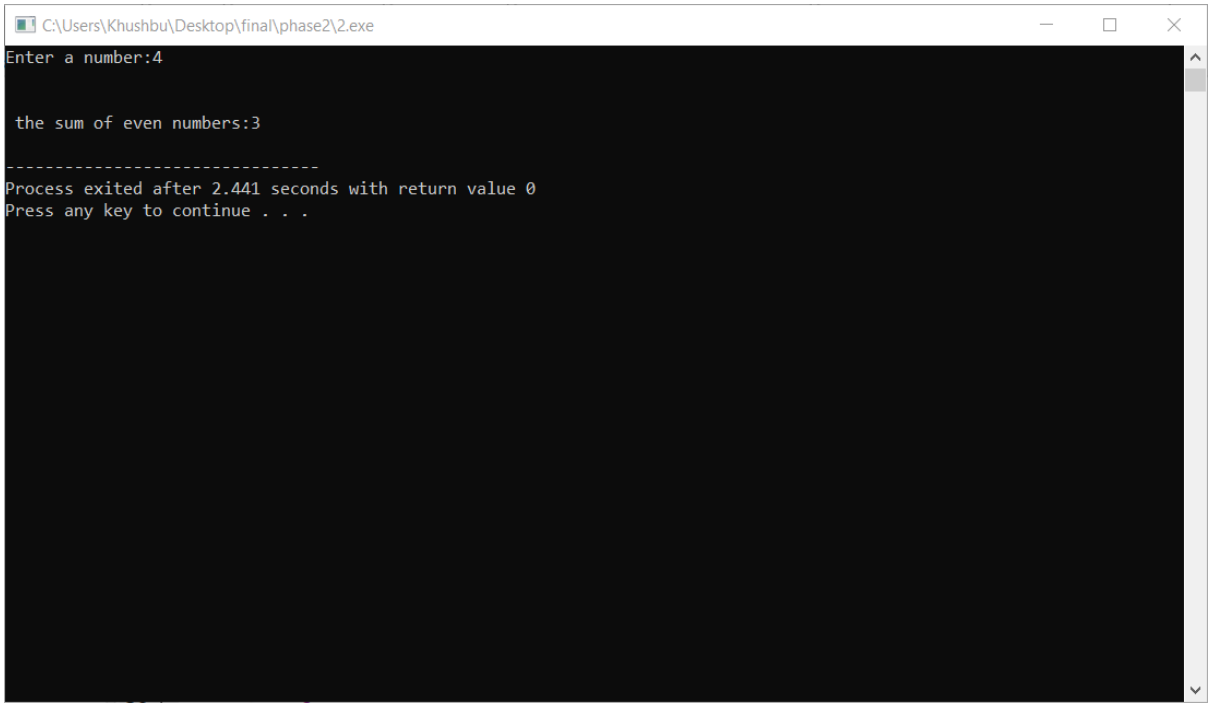

Select C:\Users\Khushbu\Desktop\final\phase2\1.exe
6*10=60
Table for 7:
7*1=7
7*2=14
7*3=21
7*4=28
7*5=35
7*6=42
7*7=49
7*8=56
7*9=63
7*10=70
Table for 8:
8*1=8
8*2=16
8*3=24
8*4=32
8*5=40
8*6=48
8*7=56
8*8=64
8*9=72
8*10=80
Table for 9:
9*1=9
9*2=18
9*3=27
9*4=36
9*5=45
9*6=54
9*7=63
9*8=72
9*9=81
9*10=90
Table for 10:
10*1=10
10*2=20
10*3=30
10*4=40
10*5=50
10*6=60
10*7=70
10*8=80
10*9=90
10*10=100

Aim : A Math problem to find average of all even numbersfrom n Natural numbers raise difficulty to all 5th standard students. Write a C++ Program to help them.

Program :2

```
#include<iostream>
using namespace std;

class Multiplication_table
{
        private :
                int n, count=0,sum =0,average=0;
        public:
           void getData()
                {
              cout << "Enter a number:";
              cin >> n;
           }
           void even()
                {
        for( int i=1; i<=n; i++)
                        {
                                if(i%2==0)
                                {
                                        count= count+1;
                                        sum = sum+i;
                                }
                        }
                        average = sum/count;
                        cout << "\n\n the sum of even numbers:"<<average <<endl;
                }

};

int main() {

        Multiplication_table m;
        m.getData();
        m.even();

   return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase2\2.exe
Enter a number:4
the sum of even numbers:3

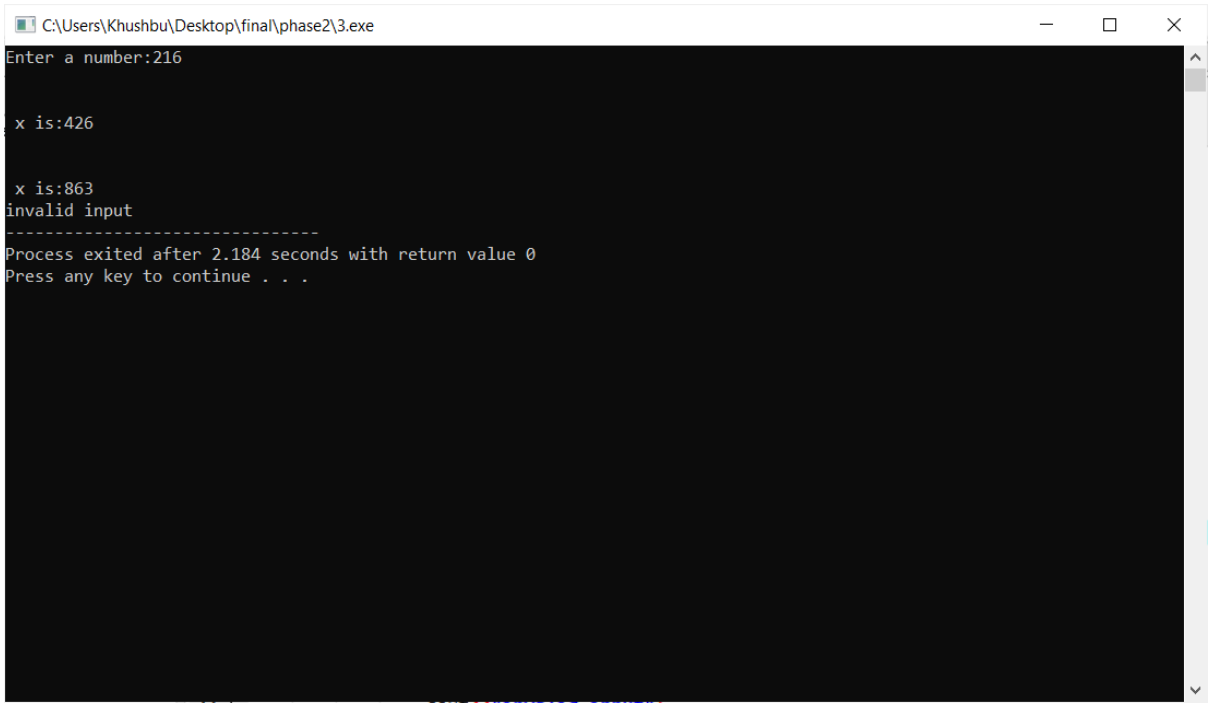
Process exited after 2.441 seconds with return value 0
Press any key to continue . . .

Aim : Write a C++ Program to solve this mathematicalequation to find outwrite answer for passing math'sexam: 2(x-3)=4x-1

Program :3

```
#include<iostream>
#include<math.h>
using namespace std;

class Equation
{

                float x,lhs,rhs;
        public:
           void getData()
                {
              cout << "Enter a number:";
              cin >> x;
           }
        equation()
                {
              lhs = 2*(x-3);
              rhs = (4*x)-1;
                        cout << "\n\n x is:"<<lhs <<endl;
                        cout << "\n\n x is:"<<rhs <<endl;
                        if(lhs==rhs)
                        {
                                cout<<"valid input";
                        }
                        else
                        {
                                cout<<"invalid input";
                        }
                }
};

int main() {

        Equation e;
        e.getData();
        e.equation();

   return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase2\3.exe
Enter a number:216
x is:426
x is:863
invalid input

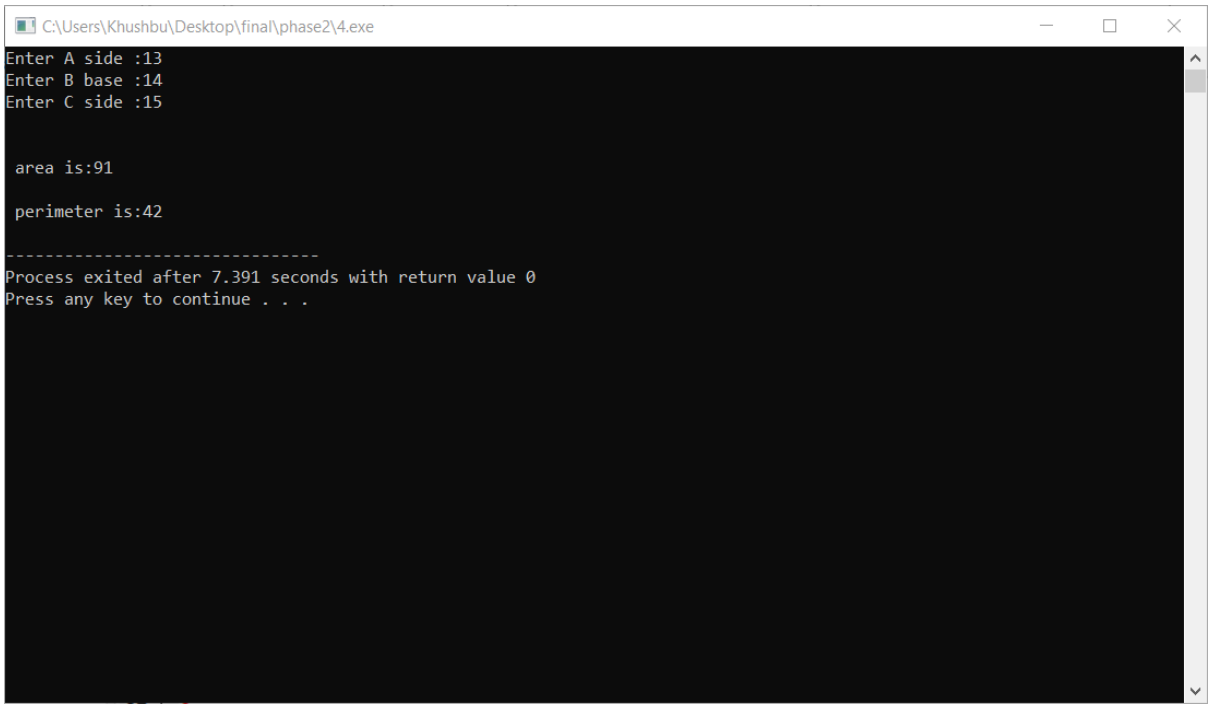
Process exited after 2.184 seconds with return value 0
Press any key to continue . . .

Aim : Write a C++ Program which finds the area of trianglewhose base is 56 units and height is 21 units. Also printsum of all digits of that area of triangle.

Program :4

```
#include<iostream>
#include<math.h>
using namespace std;

class Triangle
{
        private :
                float x,y,z,ans,res;
        public:
           void getData()
                {
              cout << "Enter A side :";
              cin >> x;
              cout << "Enter B base :";
              cin >> y;
              cout << "Enter C side :";
              cin >> z;

           }
           void peri_area()
                {
              ans = (x * y)/2.0;
              res = (x+y+z);
                        cout << "\n\n area is:"<<ans <<endl;
                        cout << "\n perimeter is:"<<res <<endl;
                }
};

int main() {

        Triangle t;
        t.getData();
        t.peri_area();

   return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase2\4.exe
Enter A side :13
Enter B base :14
Enter C side :15
area is:91
perimeter is:42

Process exited after 7.391 seconds with return value 0
Press any key to continue . . .

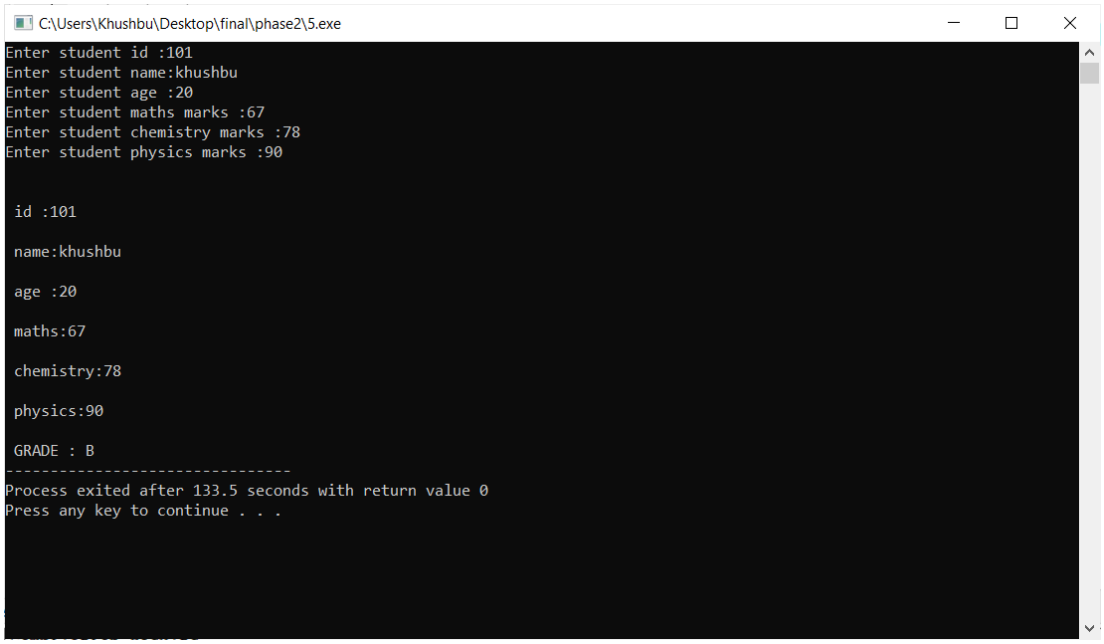
Aim : A Prime School wants an automate system for generating students grades.
If marks in Maths>80, Phy>75 and Chem>72 then generate Grade A.
If marks in 60<=Maths<=80, 55<=Phy<=75 and 50<=Chem<=72 then generate Grade B.
If marks in 40<=Maths<60, 35<=Phy<55 and 35<=Chem<50 then generate Grade C.
Apply Grade D (Fail) if minimum criteria of marks doesn't satisfy bt any student.
Write a C++ Program for generating total N number of students grades for this Prime School.

Program :5

```
#include<iostream>
#include<math.h>
using namespace std;

class Student
{
        private :
                int id,age,maths,che,phy;
                char name[100];
        public:
           void setData()
                {
              cout<<"Enter student id :";
              cin >> this->id;
              cout <<"Enter student name:";
              cin >> this->name;
              cout<< "Enter student age :";
              cin >> this->age;
              cout<<"Enter student maths marks :";
              cin >> this->maths;
              cout<<"Enter student chemistry marks :";
              cin >> this->che;
              cout<< "Enter student physics marks :";
              cin >> this->phy;
           }
           void getData()
                {
                                cout << "\n\n id :"<<id <<endl;
                                cout << "\n name:"<<name <<endl;
                                cout << "\n age :"<<age <<endl;
                        cout << "\n maths:"<<maths <<endl;
                                cout << "\n chemistry:"<<che <<endl;
                                cout << "\n physics:"<<phy <<endl;
```

```
                        if(maths>80 && che>72 && phy>75)
                        {
                                cout<<"\n GRADE : A";
                        }
                        else if((maths>=60&& maths<=80) ||(che>=50&&
che<=72)||(phy>=55&& phy<=75))
                        {
                                cout<<"\n GRADE : B";
                        }
                        else if((maths>=40&& maths<=60) ||(che>=35&&
che<=50)||(phy>=35&& phy<=55))
                        {
                                cout<<"\n GRADE : C";
                        }
                        else
                        {
                                cout<<"\n GARDE : D";
                        }
        }
};
int main() {

        Student s;
        s.setData();
        s.getData();

   return 0;
}
```

Output :



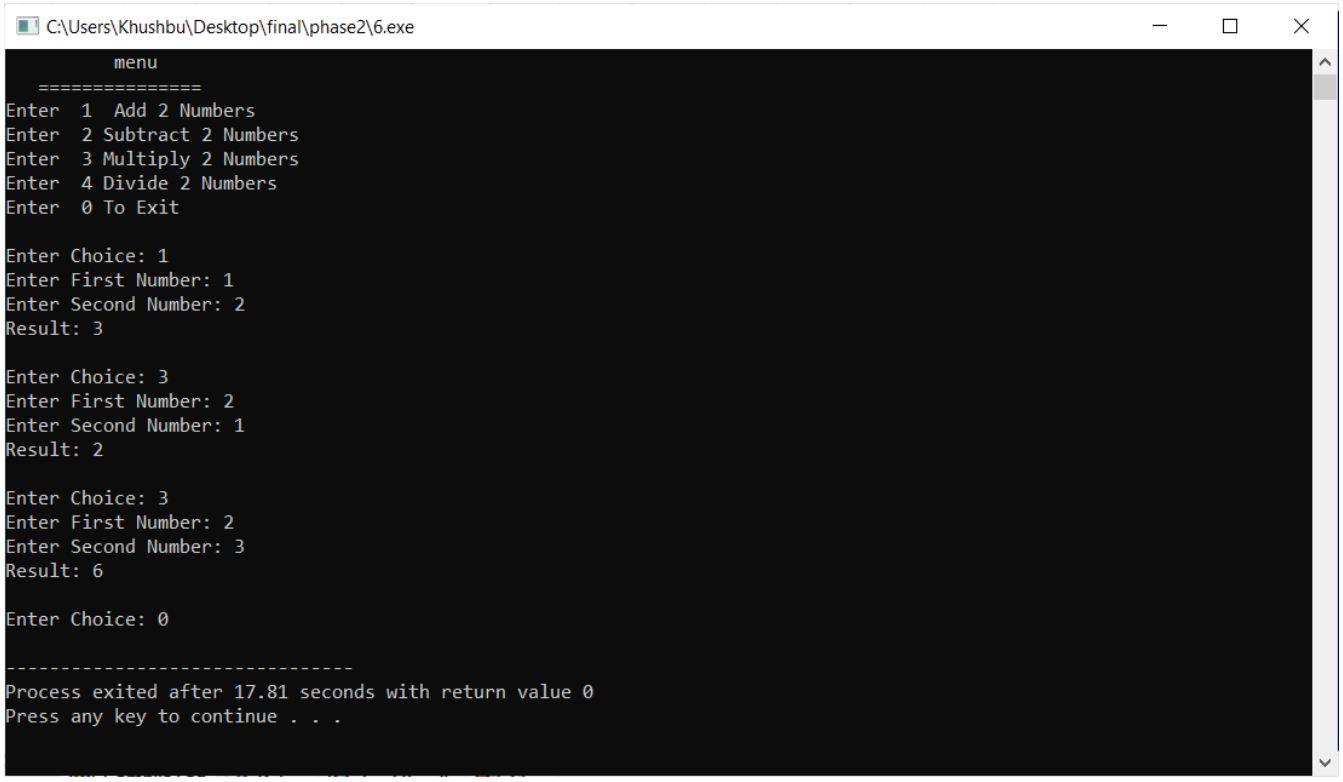
Aim : Design a Calculator for an arithmetic operations inwhich user can do all basic operations as many times he/she wants until he/she exit from that. Use C++ as aprimary language to accomplish this challenge.

Program :6

```
#include <iostream>
#include <math.h>
using namespace std;
class Calculator
{
        double A, B;
        public:
           void get()
                {
              cout << "Enter First Number: ";
              cin >> A;
              cout << "Enter Second Number: ";
              cin >> B;
        }
           double add()
                {
              return A + B;
           }
           double sub()
                {
              return A - B;
           }
           double mul()
                {
              return A * B;
           }
                double div()
                {
        if (B == 0)
                        {
        cout << "Divison By Zero" << endl;
        return INFINITY;
        }
        else
                        {
        return A / B;
        }
        }
};
int main()
{
   int choice;
   Calculator cal;
```

```
   cout<< "          menu             "
          << "\n   ===============       "
<< "\nEnter  1  Add 2 Numbers"
<< "\nEnter  2 Subtract 2 Numbers"
<< "\nEnter  3 Multiply 2 Numbers"
<< "\nEnter  4 Divide 2 Numbers"
<< "\nEnter  0 To Exit"
<< "\n";
   do {
      cout << "\nEnter Choice: ";
      cin >> choice;
      switch (choice) {
      case 1:
cal.get();
         cout << "Result: " <<cal.add() << endl;
         break;
      case 2:
cal.get();
         cout << "Result: " <<cal.sub() << endl;
         break;
      case 3:
cal.get();
         cout << "Result: " <<cal.mul() << endl;
         break;
      case 4:
cal.get();
         cout << "Result: " <<cal.div() << endl;
         break;
      }
   } while (choice >= 1 && choice <= 4);
   return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase2\6.exe
menu
==========
Enter 1 Add 2 Numbers
Enter 2 Subtract 2 Numbers
Enter 3 Multiply 2 Numbers
Enter 4 Divide 2 Numbers
Enter 0 To Exit
Enter Choice: 1
Enter First Number: 1
Enter Second Number: 2
Result: 3
Enter Choice: 3
Enter First Number: 2
Enter Second Number: 1
Result: 2
Enter Choice: 3
Enter First Number: 2
Enter Second Number: 3
Result: 6
Enter Choice: 0
Process exited after 17.81 seconds with return value 0
Press any key to continue . . .

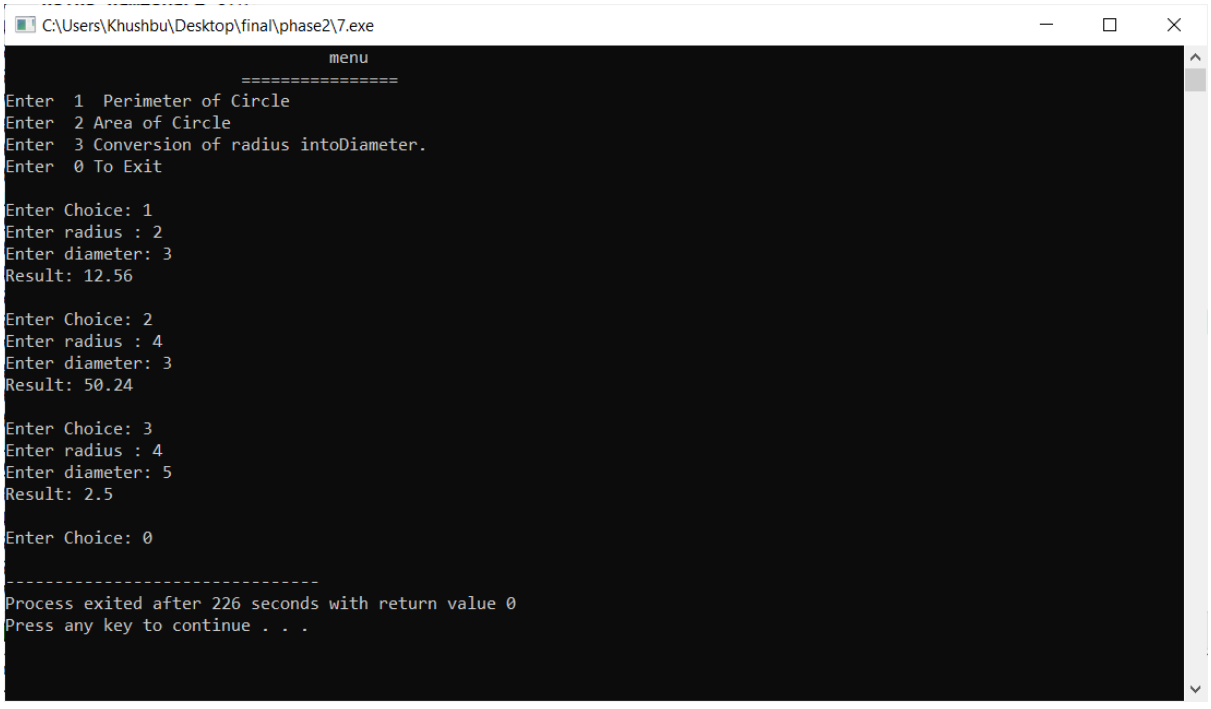
Aim : Prepare a Calculator which only performs Circlerelated mathematical operations like finding Area ofCircle, Perimeter of Circle and Conversion of radius intoDiameter. All operations are continuous until user wish to exit. By using C++, create this calculator for a batchof bacholers.

Program :7

```
#include <iostream>
#include <math.h>
using namespace std;
class Calculator
{
        double r, b;
        public:
          void get()
                {
            cout << "Enter radius : ";
            cin >> r;
            cout << "Enter diameter: ";
            cin >> b;
        }
        double perimeter()
                {
            return 2 * 3.14 * r ;
          }
          double area()
                {
            return 3.14 * r * r;
          }

          double diameter()
                {
            return b/2;
          }

};
int main()
{
   int choice;
   Calculator cal;
   cout<< "                                menu            "
        << "\n                               ===============      "
<< "\nEnter  1  Perimeter of Circle"
<< "\nEnter  2 Area of Circle"
<< "\nEnter  3 Conversion of radius intoDiameter."
<< "\nEnter  0 To Exit"
<< "\n";
   do {
      cout << "\nEnter Choice: ";
```

```
        cin >> choice;
        switch (choice) {
        case 1:
cal.get();
            cout << "Result: " <<cal.perimeter() << endl;
            break;
        case 2:
cal.get();
            cout << "Result: " <<cal.area() << endl;
            break;
        case 3:
cal.get();
            cout << "Result: " <<cal.diameter() << endl;
            break;
        }
    } while (choice >= 1 && choice <= 3);
    return 0;
}
```

Output :

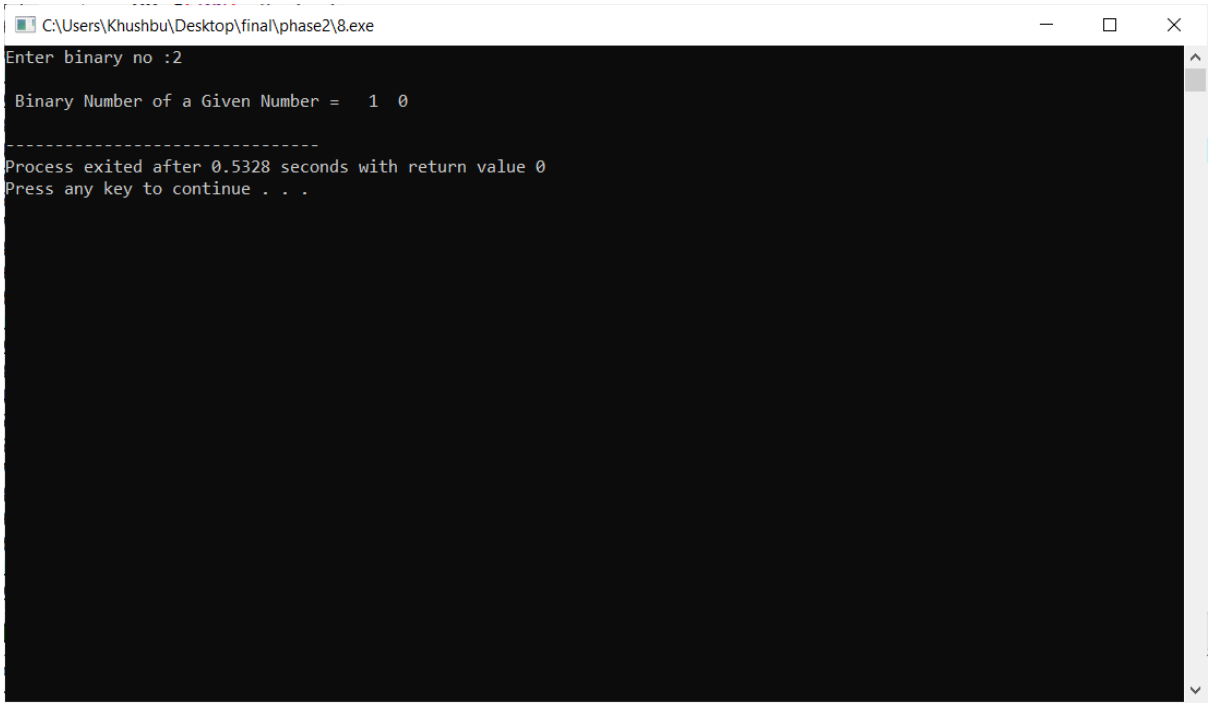


Aim : A Computer Teacher wants to teach a 10th standardclass taht how a computer converts any decimal value intobinary value. Help that teacher by developing C++ programfor this urpose.

Program :8

```
#include<iostream>
#include<math.h>
using namespace std;

class Binary
{
        private :
                int a[100], n, i, j;
        public:
           void setData()
                {
              cout << "Enter binary no :";
              cin >> n;


           }
           void decimal()
                {
        for(i = 0; n > 0; i++)
                        {
                    a[i] = n % 2;
                    n = n / 2;
                }
                cout<<"\n Binary Number of a Given Number =  ";
                for(j = i - 1; j >= 0; j--)
                        {
                         cout<<" "<<a[j]<<" ";
                }
                cout<<"\n";
                }
};

int main() {

        Binary b ;
        b.setData();
        b.decimal();

   return 0;
}
```

Output :

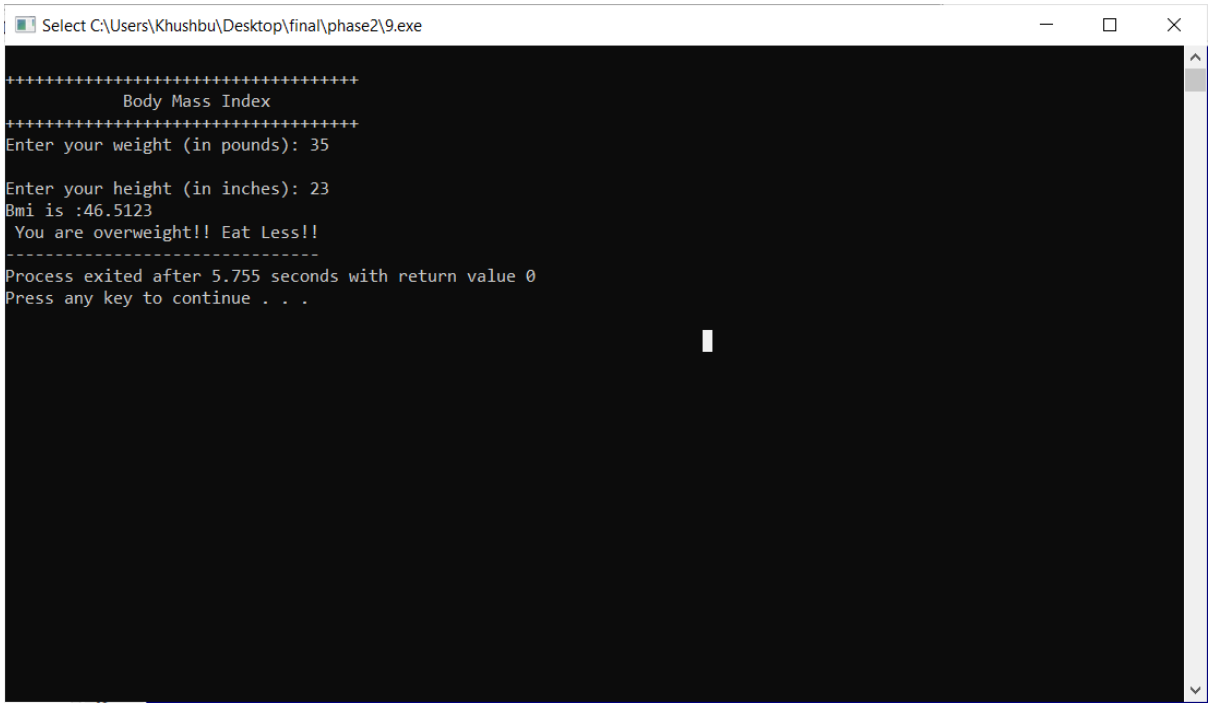

C:\Users\Khushbu\Desktop\final\phase2\8.exe
Enter binary no :2
Binary Number of a Given Number = 1 0
Process exited after 0.5328 seconds with return value 0
Press any key to continue . . .

Aim : A Hospital Staff needs a BMI Calculator for rapidlycheck BMI values of any patient. Design a BMI Calculatorby using C++ to provide this facility to all Hospitalstaff members.

Program :9

```
#include<iostream>
using namespace std;

class Bmi
{
        private :
                double weight, height, BMI;
        public:
           void setData()
                {
              cout << "\n++++++++++++++++++++++++++++++++++++\n"
                                << "          Body Mass Index"
                                << "\n++++++++++++++++++++++++++++++++++++\n";

                                cout << "Enter your weight (in pounds): ";
                                cin >> weight;
                                cout << "\nEnter your height (in inches): ";
                                cin >> height;
                }
           void calculate()
                {
              BMI = (weight * 703) / (height * height);
                        cout<<"Bmi is :"<<BMI;
                        if(BMI < 18.5)
                                cout << "\n You are underweight!! Eat More!! ";
                        if(BMI >= 18.5 && BMI <= 25)
                                cout << "\n You are in optimal shape!! Good Work!";
                        if(BMI > 25)
                                cout << "\n You are overweight!! Eat Less!!";
           }
};

int main() {

        Bmi b;
        b.setData();
        b.calculate();

   return 0;
}
```

Output :


Select C:\Users\Khushbu\Desktop\final\phase2\9.exe
++++++++++++++++++++++++++++++++++++
Body Mass Index
++++++++++++++++++++++++++++++++++++
Enter your weight (in pounds): 35
Enter your height (in inches): 23
Bmi is :46.5123
You are overweight!! Eat Less!!

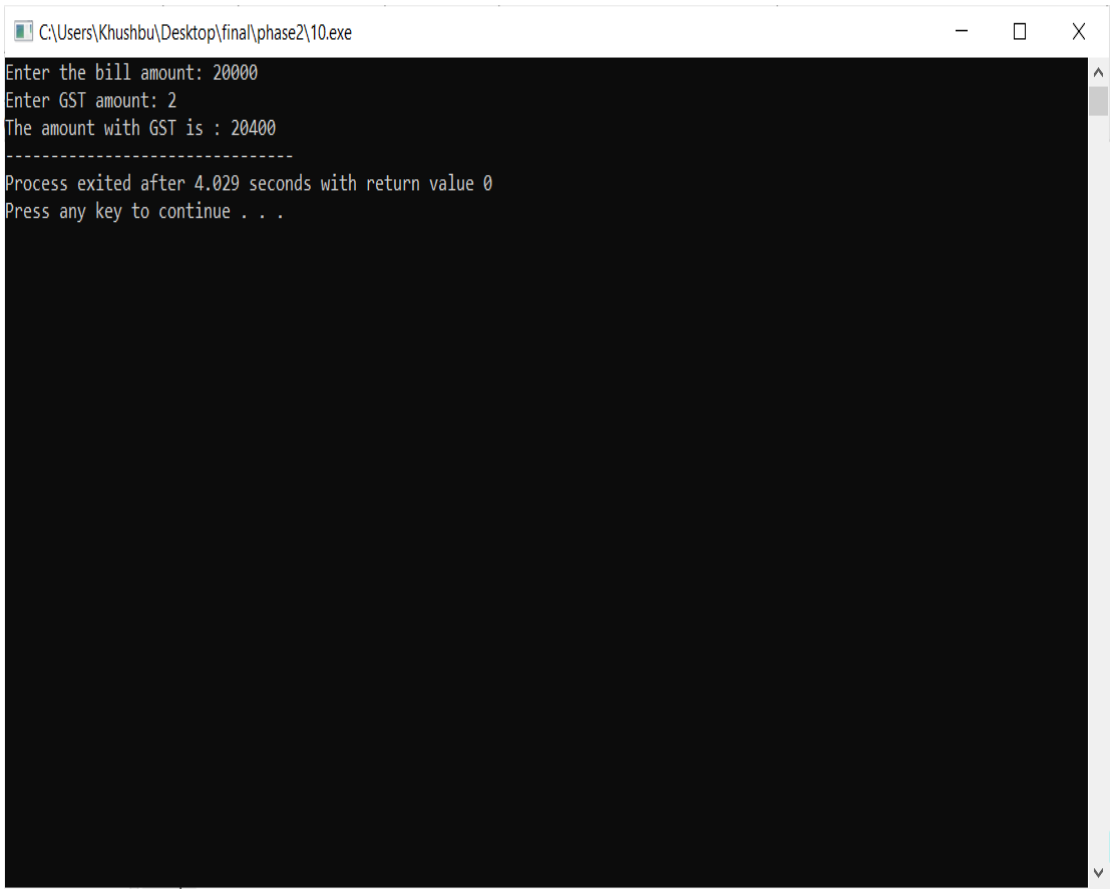
Process exited after 5.755 seconds with return value 0
Press any key to continue . . .

Aim : An average consumer established his own businessshop. He went to C.A for maintain all his accountsrelated queries. Now, help that C.A to build GST calculator for ease of calculation.

Program :10

```
#include<iostream>
using namespace std;
class Gst
{
        private :
                float price, gst, amount;
        public:
           void setData()
                {
              cout<<"Enter the bill amount: ";
                        cin>>price;
                        cout<<"Enter GST amount: ";
                        cin>>gst;
                }
           void calculate()
                {
              amount = price + ((gst/100)*price);
                        cout<<"The amount with GST is : "<<amount;
           }
};
int main() {

        Gst g;
        g.setData();
        g.calculate();

   return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase2\10.exe
Enter the bill amount: 20000
Enter GST amount: 2
The amount with GST is : 20400

Process exited after 4.029 seconds with return value 0
Press any key to continue . . .

Aim : A Mountain Tracker needs a Temperature Converter formaintaining his tracking at Mount Everest. Buildtemperature converter for that tracker using C++ as yourprimary language.

Program :11

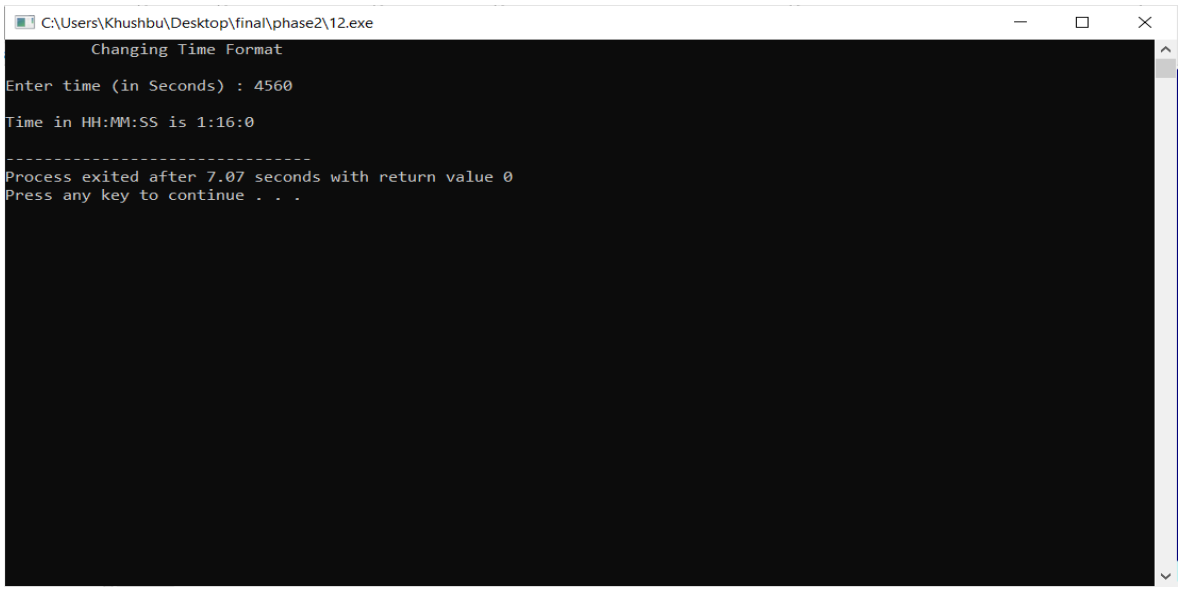
Output :

Aim : Nishant trapped in a cyber game, in which he onlygets some random amount of seconds for determining atwhich exact time he has to leave that game. Wite a C++program which converts that seconds into HH:MM:SS format.

Program :12

```
#include<iostream>
using namespace std;
class Second
{
        public :
        int time,hour,minutes,second;
};
int main()
{
         Second t,h,m,s;
         cout<<"\t Changing Time Format "<<endl;
         cout<<"\n";
         cout<<"Enter time (in Seconds) : ";
         cin>>t.time;
        h.hour =t.time/3600;
        t.time=t.time%3600;
         m.minutes=t.time/60;
        t.time=t.time%60;
        s.second=t.time;
         cout<<"\n";
         cout<<"Time in HH:MM:SS is "<<h.hour<<":"<<m.minutes<<":"<<s.second<<endl;
 return 0;
}
```

Output :



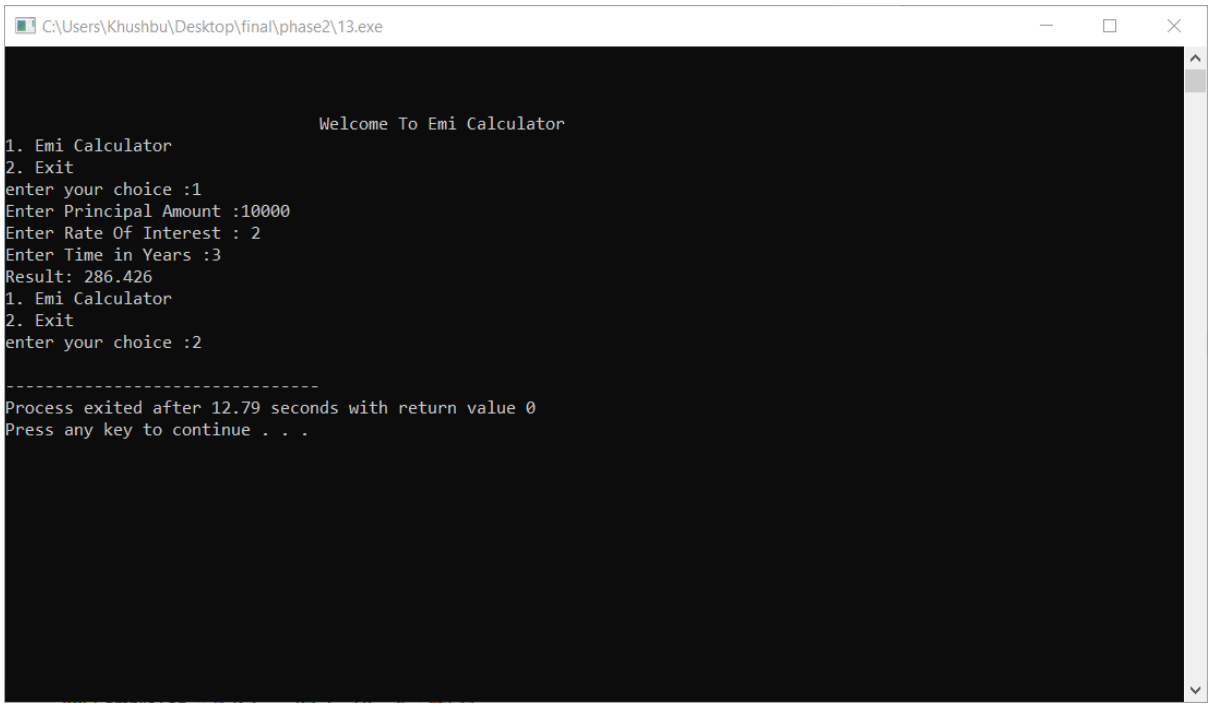
Aim : Design an EMI Calculator for deciding accurate EMIprice of ex-showroom car models to help an executive toeasily guide his consumers. Use C++ to build this type ofsystem.

Program :13

```
#include<iostream>
#include<math.h>
using namespace std;
class Emi
{
		float p, r, t,emi;
	public  :
		void setData()
		{

			cout << "Enter Principal Amount :";
			cin >> p;
			cout << "Enter Rate Of Interest : ";
			cin >> r;
			cout << "Enter Time in Years :";
			cin >> t;
		}
		float emi_calculate()
		{
			r = r / (12 * 100); /*one month interest*/
		   t = t * 12; /*one month period*/

		   return (p * r * pow(1 + r, t)) / (pow(1 + r, t) - 1);

		}

};


int main()
{
	int n;
	Emi e;
	cout << "\n\n\n\t\t\t\tWelcome To Emi Calculator" << endl;
	do
	{

		cout << "1. Emi Calculator" << endl;
		cout << "2. Exit" << endl;
		cout<<"enter your choice :";
		cin >> n;
		switch (n) {
		case 1:
```

```
                                e.setData();
        cout << "Result: " << e.emi_calculate() << endl;
                                break;
                }
        }while(n<=1);
        return 0;
}
```

Output :

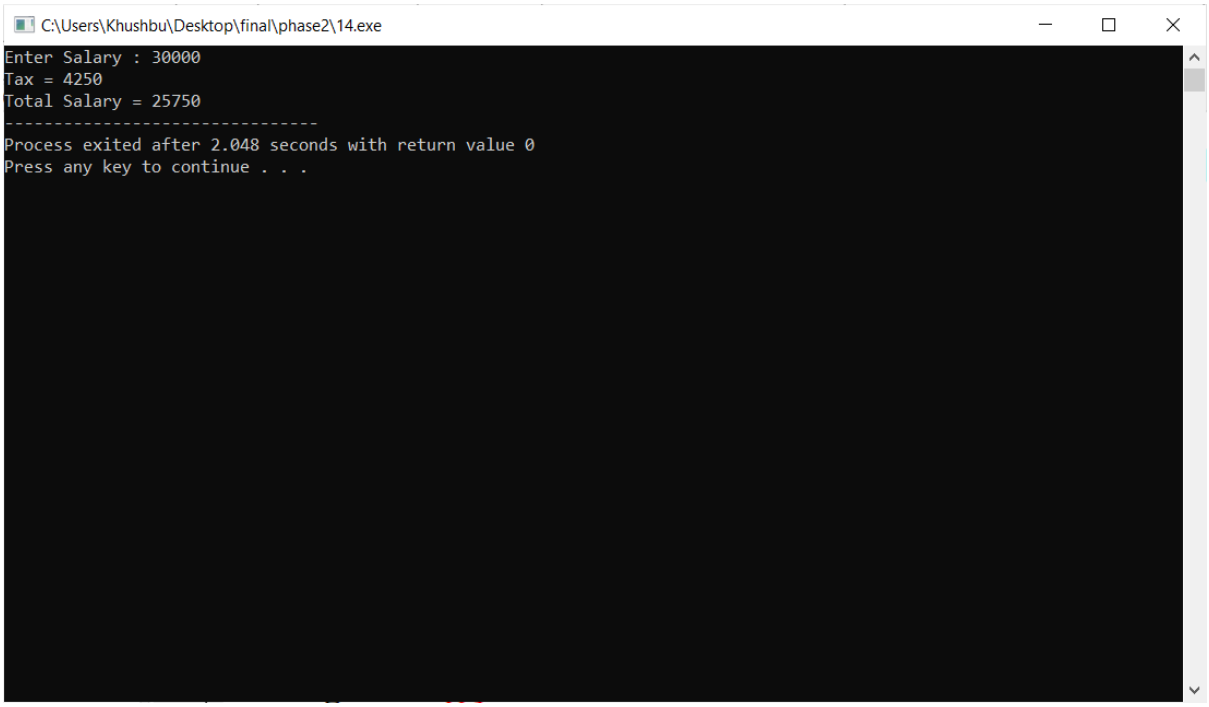


Aim: Develop a solution for Income Tax Department foridentify which personhave to pay how much tax basis onhis/her income using C++ and pre-defined percentagecriteria for tax calculation.

Program :14

```
#include<iostream>
using namespace std;
class Tax
{
	private:
		float salary,tax,total_salary;
	public:
		void setData()
		{
			cout << "Enter Salary : ";
			cin >> salary;
		}
		void getData()
		{
			if(salary<2000)
			{
				tax=150;
			}
			else if(salary<=3000)
			{
				tax=150+0.01*(salary-2000);
			}
			else
			{
				tax=200+0.15*(salary-3000);
			}
			total_salary=salary-tax;
			cout << "Tax = " << tax << endl;
			cout << "Total Salary = " << total_salary;
		}
};
int main()
{
	Tax t;
	t.setData();
	t.getData();
	return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase2\14.exe
Enter Salary : 30000
Tax = 4250
Total Salary = 25750

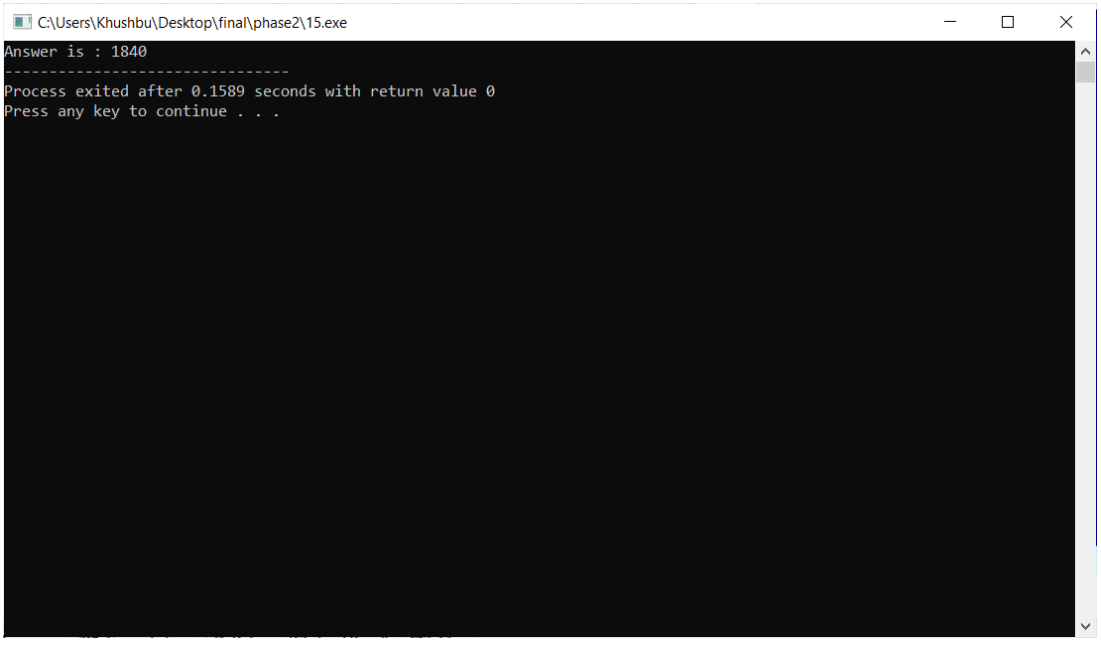
Process exited after 2.048 seconds with return value 0
Press any key to continue . . .

Aim : A new OLED Smart TV as a gift from a businssman with emmersive 32*52 inch size iz arrived at occasion of Dashera in tha house of Mayer. Now Mayer has to decide that how much of minimum wall area (width*hight) will be required to fit that new TV so that even afatr applying that TV , 10inch of margin still available around TV. Help Mayer to identify the solution by using C++.

Program :15

```
#include<iostream>
using namespace std;
class A
{
	private:
		int still=10,ans;
	public:
		A()
		{
			ans=35*52+(still*2);
			cout << "Answer is : " << ans;
		}
};
int main()
{
	A o1;
	return 0;
}
```

Output :



Phase :3

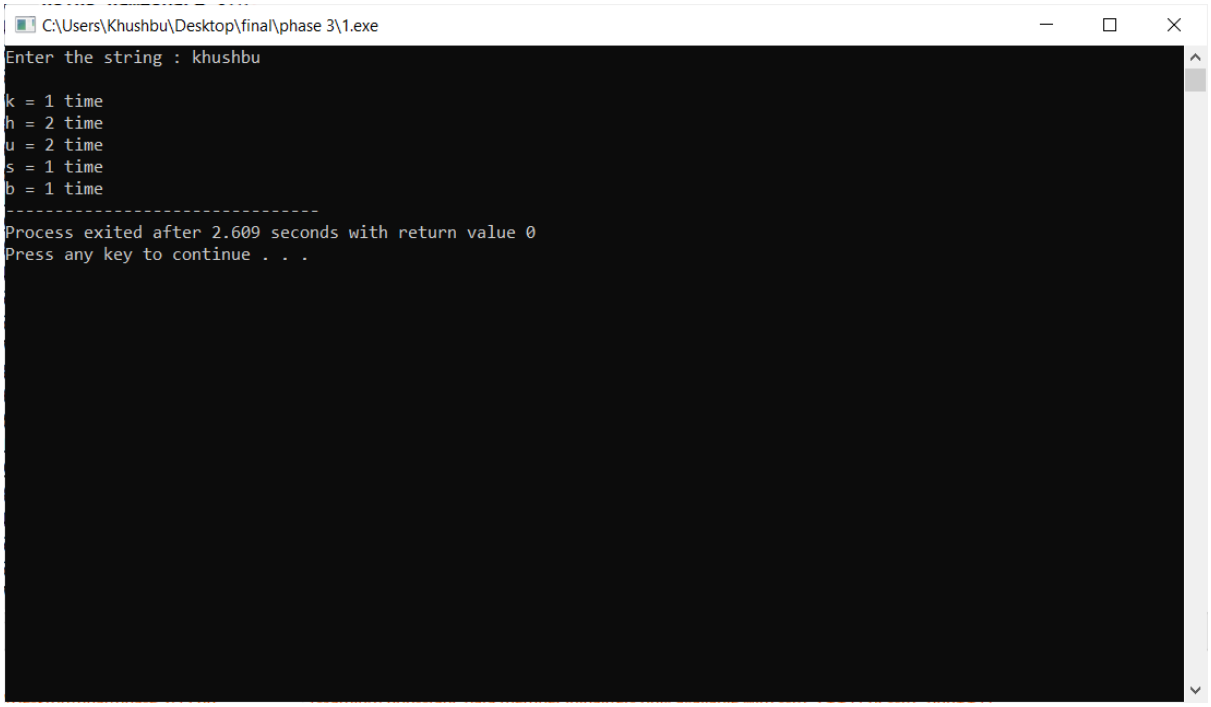
Aim : Nayan bet ₹.1200 to his friend Kartik if he findfrequency of each characters in given String. WhereasDhruv bet ₹.1500 to his friend Piyush if he finds itfirst. Provide a C++ program to help this fellows so thatthey can play this interesting game.

Program :1

```
#include <iostream>
#include <string.h>
using namespace std;

class Frequency
{
        private :
                char a[100];
        int i, j, k, count = 0, n;
public :
        void frequecy()
        {
                cout << "Enter the string : ";
                   gets(a);

                   n = strlen(a);

                for(i = 0 ; i < n ; i++)
                   {
                        count = 1;
                        if(a[i])
                        {
                                        for(j = i+1 ; j < n ; j++)
                                {
                                        if(a[i] == a[j])
                                {
                        count++;
                        a[j] = '\0';
                                        }
                                {
                                        cout << endl << a[i] << " = " << count << " time";

                        }
                        }
                }
};

int main()
{
```

```
    Frequency f;

f.frequecy();

  return 0;
}
```

Output :



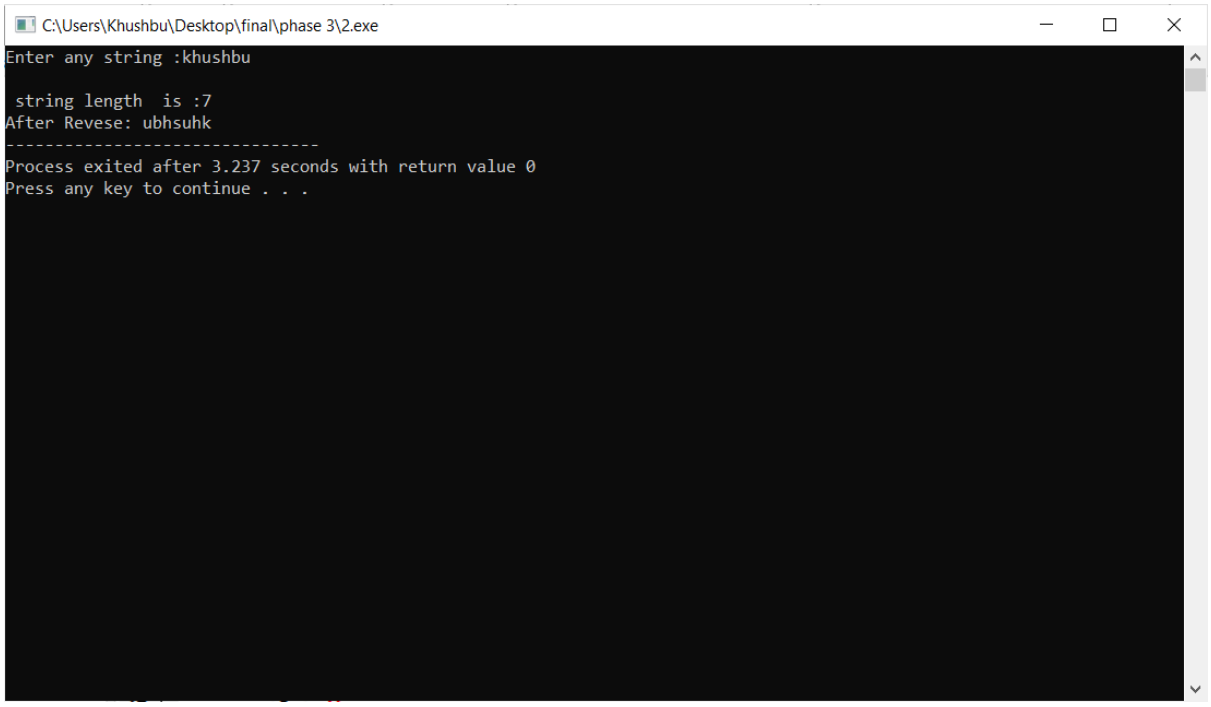
Aim : Design a system in which if a length of a String isgreater than 3 and less than 9, then it returns reverseof that string. Otherwise, it returns sum of each letters' ASCII value. Use C++ for building this type ofsystem.

Program :2

```
#include<iostream>
#include<string.h>
#include<conio.h>
using namespace std;

class String
{


        public:
                        char s[100];
                        int i,sum=0,n;
           void setData()
                {
              cout << "Enter any string :";
              gets(s);

           }
           void getlength()
                {

                        n=strlen(s) ;
                        cout << "\n string length  is :"<<n;

                        if(n >= 3 && n<=9)
                        {
                                strrev(s);

                                 cout << "\nAfter Revese: "<< s;
                        }
                        else
                        {
                                for (i = 0; s[i] != '\0'; i++)
                                {

                                 sum = sum + s[i];

                        }
                         cout << endl<<"Sum of all characters : " << sum;
                        }
                }
};
```

```
int main() {

        String s;
        s.setData();
        s.getlength();

   return 0;
}
```

Output :



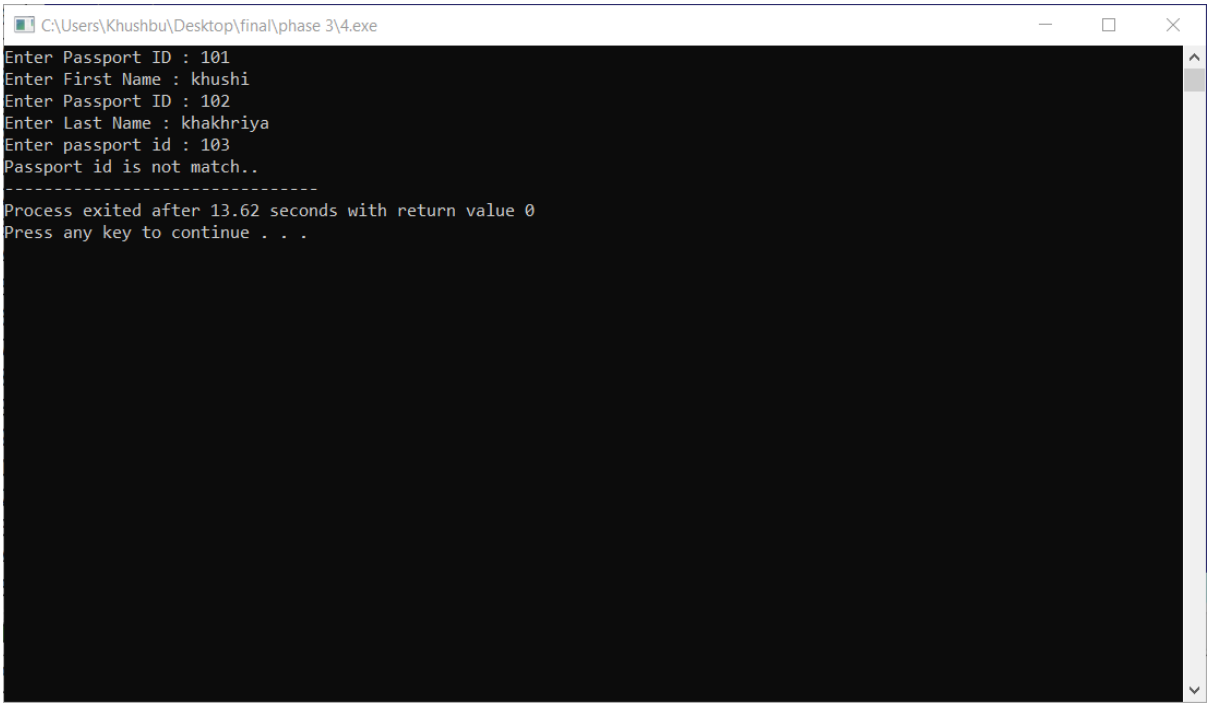
Aim : A Refugee camp have shortage of registering refugeeswhich are coming from Afghanistan. So registration teamsplit up their register documents in two teams: One notedown first name along with passport id, another one note down last name along with that passport id. Now whileentering that all data as a final stage, a Computeroperator needs a system which automatically merge firstname and last name togather as per reference of passportid. So design this type of system in C++ to help thatRefugee camp.

Program :4

```
#include<iostream>
#include<string.h>
using namespace std;
class A
{
	public:
		int f_id;
		char f_name[100];
	void put_f_name()
	{
		cout << "Enter Passport ID : ";
		cin >> f_id;
		cout << "Enter First Name : ";
		cin >> f_name;
	}
};
class B : public A
{
	private:
		int l_id,p_id;
		char l_name[100];
		char full_name[100];
	public:
		void put_l_name()
		{
			cout << "Enter Passport ID : ";
			cin >> l_id;
			cout << "Enter Last Name : ";
			cin >> l_name;
		}
		void getData()
		{
			cout << "Enter passport id : ";
			cin >> p_id;
			if(p_id==f_id==l_id)
			{
				strcpy (f_name,(strcat(f_name," ")));
				strcpy(full_name,strcat(f_name,l_name));
				cout << endl << "Full Name : " << full_name << endl
```

```
                        << "Passport Id : " << p_id << endl;
                }
                else
                {
                        cout << "Passport id is not match..";
                }
        }
};
int main()
{
        B b;
        b.put_f_name();
        b.put_l_name();
        b.getData();
        return 0;
}
```

Output :



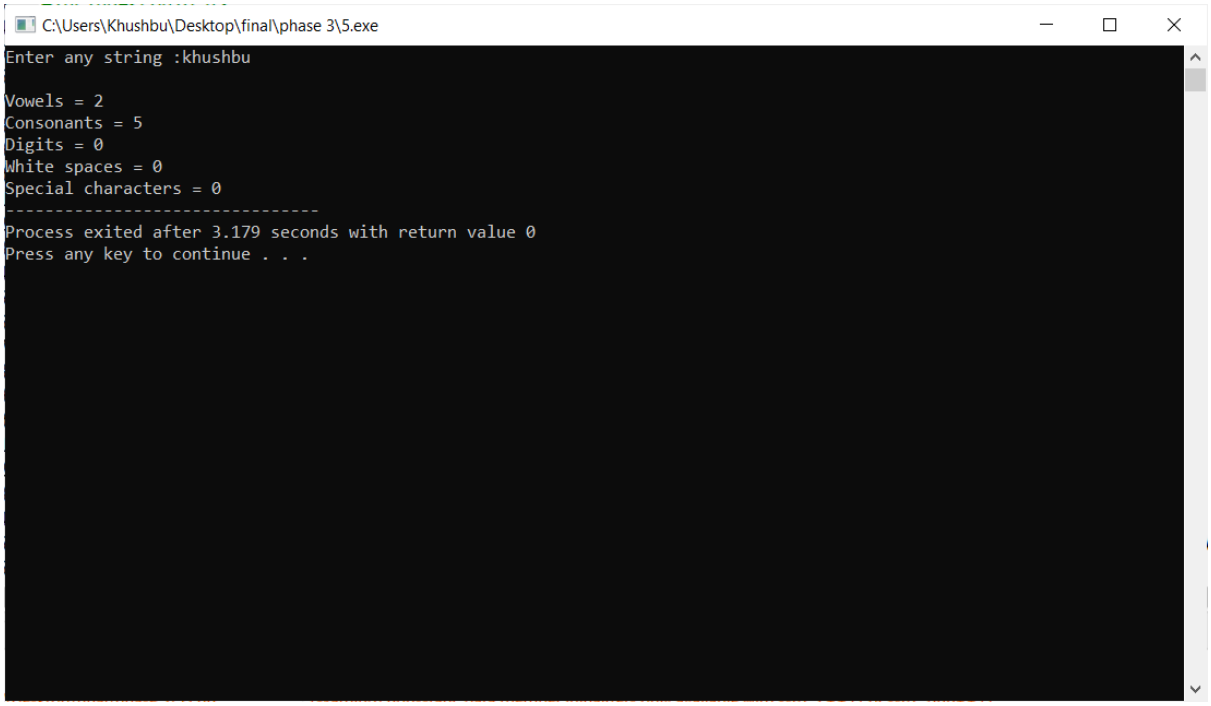
Aim : An Indian Airport needs an identification system toeasily extract all types of vowels, consonants, digitsand spacial symbols from Highjackers' communicativemessages to identify their next move. Help Indian Airlines by building a C++ program which prime purpose isto identify all string literals.

Program :5

```
#include<iostream>
#include<string.h>
#include<conio.h>
using namespace std;

class String
{


        public:
                        char str[100];
                        int i,vowels=0,consonants=0,digits=0,spaces=0,specialCharacters=0;

                        void setData()
                        {
                    cout << "Enter any string :";
                    gets(str);

                }
                void getlength()
                        {

                                for(i=0;str[i]!='\0';i++)
                        {
                        if(str[i]=='a' || str[i]=='e' || str[i]=='i' ||str[i]=='o' || str[i]=='u' ||
str[i]=='A' ||str[i]=='E' || str[i]=='I' || str[i]=='O' ||str[i]=='U')
                        {
                                 vowels++;
                                }
                            else if((str[i]>='a'&& str[i]<='z') || (str[i]>='A'&& str[i]<='Z'))
                            {
                               consonants++;
                            }
                            else if(str[i]>='0' && str[i]<='9')
                            {
                               digits++;
                            }
                            else if (str[i]==' ')
                            {
                               spaces++;
                            }
```

```
                    else
                    {
                        specialCharacters++;
                    }
                }
                cout<<"\nVowels = "<<vowels;
                cout<<"\nConsonants = "<<consonants;
                cout<<"\nDigits = "<<digits;
                cout<<"\nWhite spaces = "<<spaces;
                cout<<"\nSpecial characters = "<<specialCharacters;
    }



};

int main() {

        String s;
        s.setData();
        s.getlength();

    return 0;
}
```

Output :



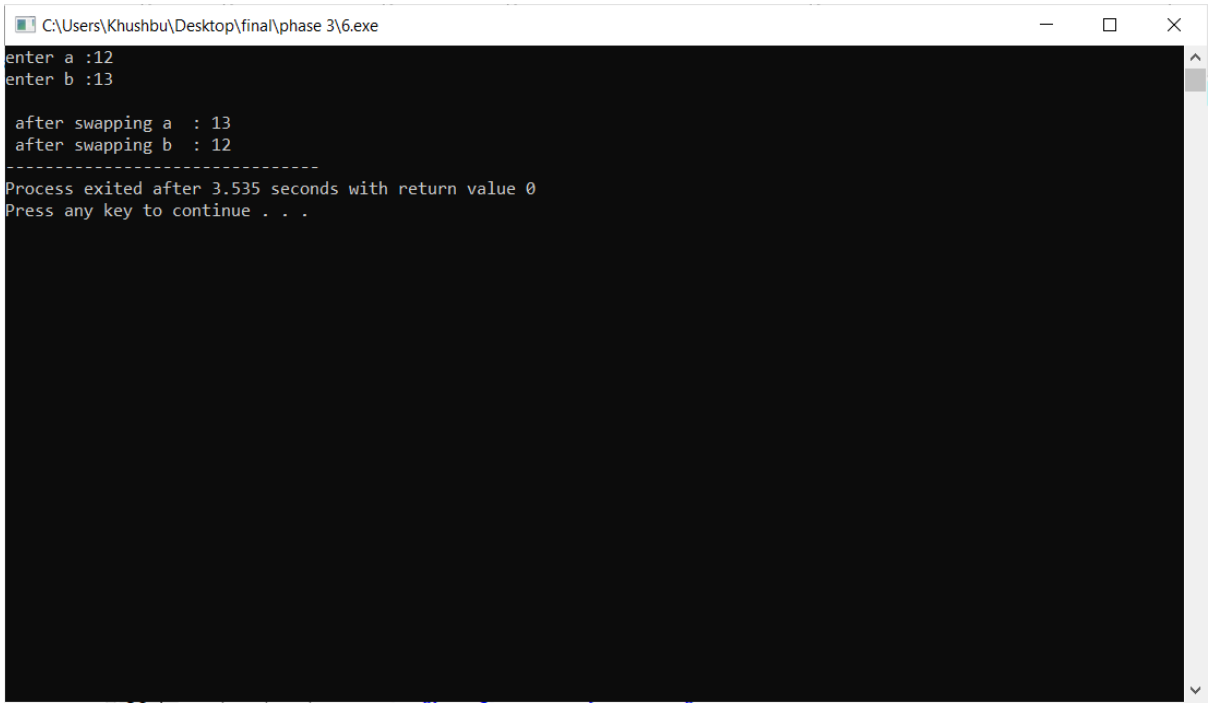
Aim : Design a system for “Dare to Win” game scenario. Inthis game, two participants have to guess any situationor work which he/she wants to be done by oppositionplayer. So both player write their itended dare works and now a system will swap that both dare works and providethat to other opposite players. Write a C++ program tohelp swapping that dare works.

Program :6

```
#include<iostream>
#include<string.h>
#include<conio.h>
using namespace std;

class Swap
{


        public:
                        int a ,b,c;

                        void setData()
                        {
                    cout<<"enter a :";
                    cin>>a;
                        cout<<"enter b :";
                    cin>>b;

                }
                void getData()
                        {
                         c = a;
                                  a = b;
                                  b = c;
                                 cout<<"\n after swapping a  : "<< a;
                                 cout<<"\n after swapping b  : "<<b;
                        }




};

int main() {

        Swap s;
        s.setData();
        s.getData();

   return 0;
```

}

Output :


C:\Users\Khushbu\Desktop\final\phase 3\6.exe
enter a :12
enter b :13
after swapping a : 13
after swapping b : 12
Process exited after 3.535 seconds with return value 0
Press any key to continue . . .

Aim : Build a C++ program which helps students that how toconvert a given string in lowwercase, uppercase, titlecase and togglecase whenever they wants by passing theirchoice.

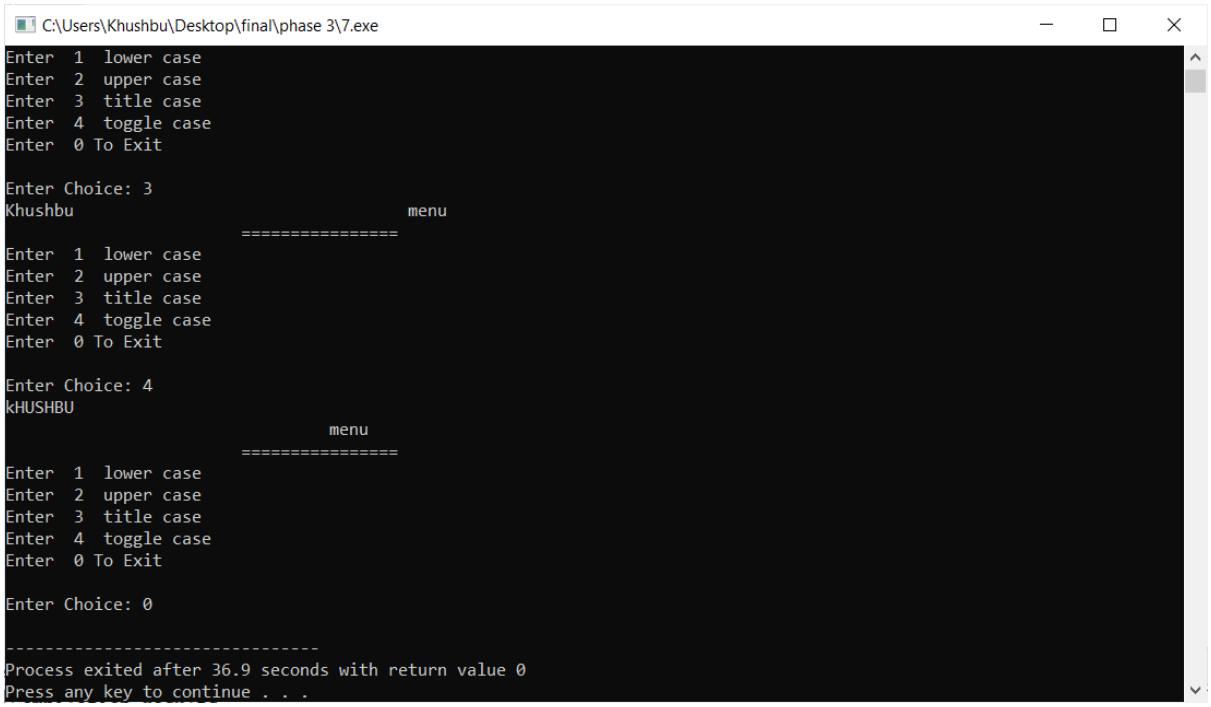
Program :7

```
#include <iostream>
#include<string.h>
using namespace std;
class Student
{
        private :
        char s[100];
        int i,temp;
        public:
           void get()
                {
              cout << "Enter any string : ";
              gets(s);

        }
        void lowercase()
                {
        for(i=0; s[i]!='\0'; i++)
                {
                        if(s[i]>= 'A' && s[i]<='Z')
                        {
                           s[i] = s[i] + 32;
                        }
                    }
                    cout<<"\n"<<s;

                 }


            void uppercase()
                {
                for(int i=0; s[i]!='\0'; i++)
                {
                        if(s[i]>='a' && s[i]<='z')
                        {
                           s[i] = s[i] - 32;
                        }
                    }
                         cout<<"\n"<<s;
           }

           void titlecase()
                {
```

```
            s[0]=s[0]-32;
        for(i=0;s[i]!='\0';i++)
        {
                if(s[i]==' ')
                {
                    s[i+1] = s[i+1]-32;
                }
           }
                  cout<<s;
            }
            void togglecase()
                  {
                 int n=strlen(s);
                        for(int i=0;i<n;i++)
                          {
                             if(s[i]>='A' && s[i]<='Z')
                             {
                                s[i]='a'+(s[i]-'A');
                             }
                             else if(s[i]>='a' && s[i]<='z')
                             {
                                s[i]='A'+(s[i]-'a');
                             }
                          }
                          cout<<s<<endl;
                  }

};
int main()
{
   int choice;
   Student s;
         s.get();
         do
         {
                    cout<< "                                    menu            "
                         << "\n                                 ================      "
                  << "\nEnter  1  lower case "
                  << "\nEnter  2  upper case "
                  << "\nEnter  3  title case "
                  << "\nEnter  4  toggle case "
                  << "\nEnter  0 To Exit"
                  << "\n";


                              cout << "\nEnter Choice: ";
                         cin >> choice;

                       switch (choice)
                                 {
```

```
                    case 1:

                s.lowercase() ;
                    break;
                case 2:

                s.uppercase() ;
                    break;
                case 3:

                s.titlecase() ;
                    break;
                case 4:

                    s.togglecase();
                        break;
                    }
            }while(choice>=1 && choice<=4);


   return 0;
}
```

Output :



Aim : Build a C++ program which detects if a given wordcontains any vowels or not. And if it contains, thencount how many total vowels are present and which theyare. Also returns average value of total vowels' ASCIIvalues'. Based on that average value, decide word'slevel! If 10<=average<=1 , then a word is "SMOO"HERIf 1 <average<=30, then a word is "SOBER Ifaverage>=30, then a word is "HARER If average==0, then a word is "GORGEOUS"

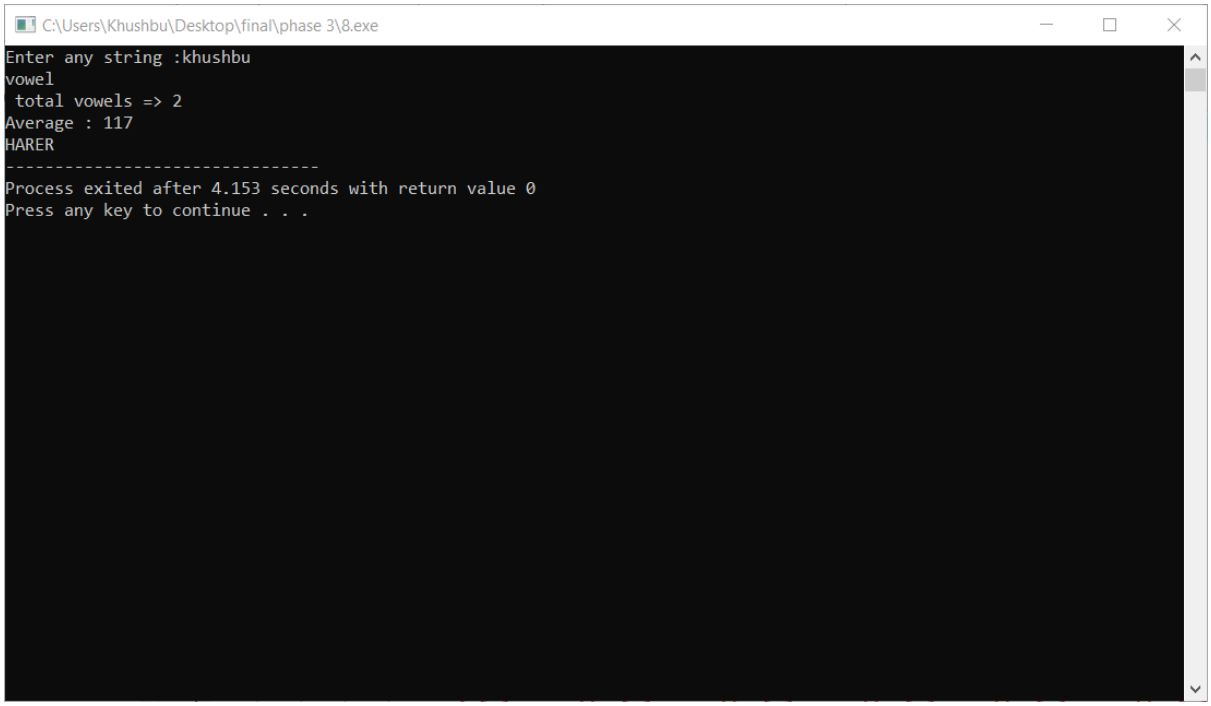
Program :8

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

using namespace std;

class String
{

        public:
                        char c[100];
                        int count=0,i,sum=0;
                int flag=0,vowel=0,var,avg;
                        void setData()
                        {
                      cout << "Enter any string :";
                      gets(c);

                   }
                   void getvowel()
                        {
                                for(i = 0; c[i]; i++)
                        {

                        if(c[i]=='a' || c[i]=='e' || c[i]=='i' || c[i]=='o'|| c[i]=='u' || c[i]=='A'  ||
c[i]=='E' || c[i]=='I' || c[i]=='O' || c[i]=='U')
                        {
                                flag++;
                                vowel++;
                                }
                           }
                             if(flag!=0)
                             {
                                        cout<<"vowel"<<endl;
                                  }
                                  else
                                  {
                                                cout << "not vowel"<<endl;
                                  }

                        }
```

```
		void getData()
			{
				for(i = 0; c[i]; i++)
			{
				if (c [i]== 'a' || c[i]== 'e' || c[i] == 'i' || c[i] == 'o' || c[i]== 'u' ||
c[i]=='A'|| c[i]=='E'||c[i]=='I'||c[i]=='O' ||c[i]=='U')
				{
					count++;
					var+=c[i];

				}


				}
				avg = var/count;
				cout<< " total vowels => " <<count << endl;
				cout<<"Average : " <<avg;
		}
		void average()
		{

				if(avg>=10 && avg<=15)
				{
					cout<<"\n"<<"SMOOTHER";
				}
				else if(avg>=15 && avg<=30)
				{
					cout<<"\n"<<"SOBER";
				}
				else if(avg>=30)
				{
					cout<<"\n"<<"HARER";
				}
				else if(avg==30)
				{
					cout<<"\n"<<"GORGEOUS";
				}
			}



};

int main()
{

	String s;
	s.setData();
	s.getvowel();
```

```
        s.getData();
        s.average();
    return 0;
}
```

Output :

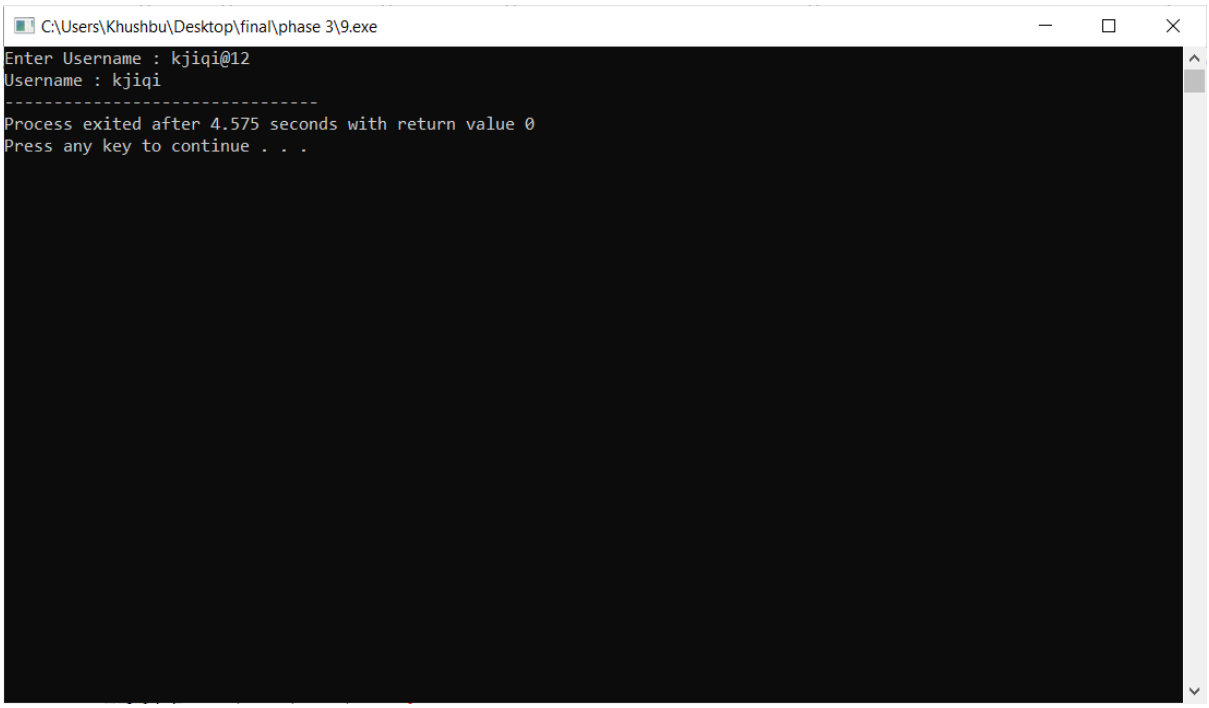


Aim : Create an Instagram filter by which we can easilyextract all digits and special symbols fron any username.By doing so, we can retrieve a pure username with onlyalphabets within it. Use C++ as a prime language to do so.

Program :9

```
#include<iostream>
#include<string.h>
using namespace std;
class A
{
	private:
		char a[100];
		int i;
	public:
		void setData()
		{
			cout << "Enter Username : ";
			gets(a);
		}
		void getData()
		{
			cout << "Username : ";
			for(i=0;a[i]!=NULL;i++)
			{
				if(a[i]>='A'&&a[i]<='Z')
				{
					cout << a[i];
				}
				if(a[i]>='a'&&a[i]<='z')
				{
					cout << a[i];
				}
			}
		}
};
int main()
{
	A a;
	a.setData();
	a.getData();
	return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase 3\9.exe
Enter Username : kjiqi@12
Username : kjiqi

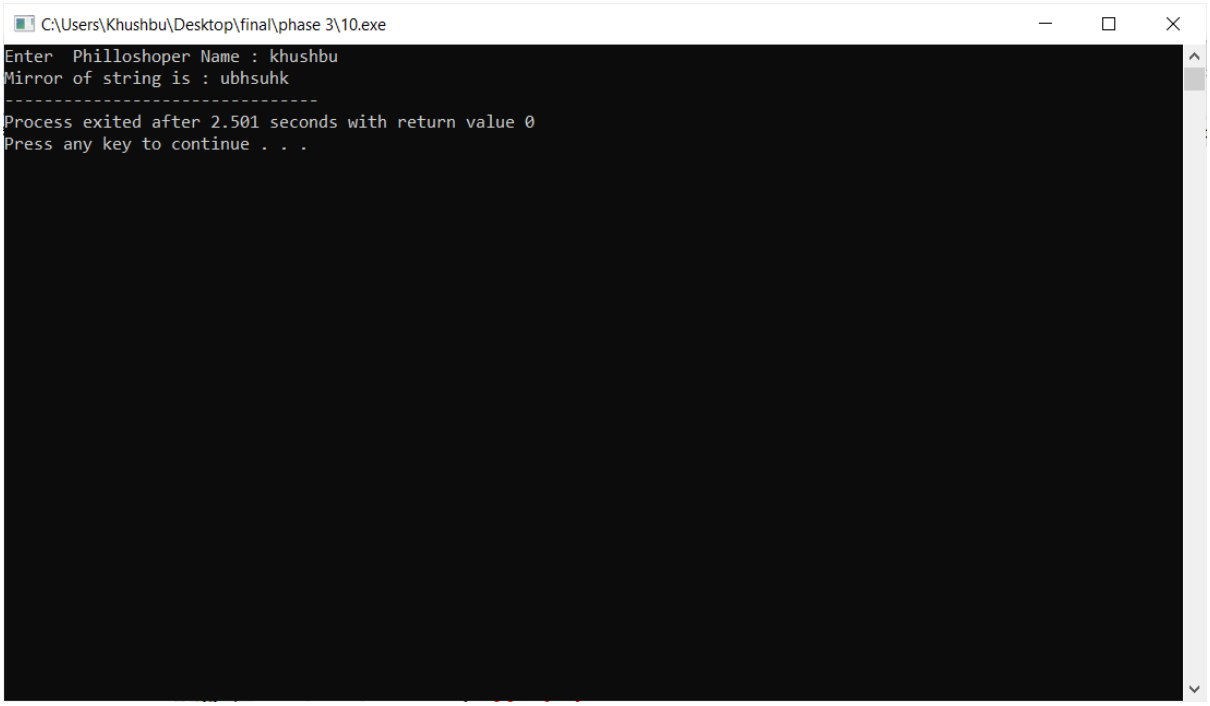
Process exited after 4.575 seconds with return value 0
Press any key to continue . . .

Aim : List of some historical words by some famousPhilosopher has been written in his diary. But all thatwords are only can be read if we put that word in frontof mirror. So write a C++ program to design it.

Program :10

```
#include<iostream>
#include<string.h>
using namespace std;
class A
{
	private:
		char a[100];
		int l=0,i;
	public:
	void setData()
	{
		cout << "Enter  Philloshoper Name : ";
		gets(a);
	}
	void getData()
	{
		l=strlen(a);
		cout << "Mirror of string is : ";
		for(i=l-1;i>=0;i--)
		{
			cout << a[i];
		}
	}
};
int main()
{
	A a;
	a.setData();
	a.getData();
	return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase 3\10.exe
Enter Philloshoper Name : khushbu
Mirror of string is : ubhsuhk

Process exited after 2.501 seconds with return value 0
Press any key to continue . . .

Aim : Build a system which converts given message intoCyphertext by adding custom letter or ASCII value. Alsoprovide decoding for that encoded text to understandIndian Army to secure internal communication betweensoldiers. Help them by creating a C++ program.

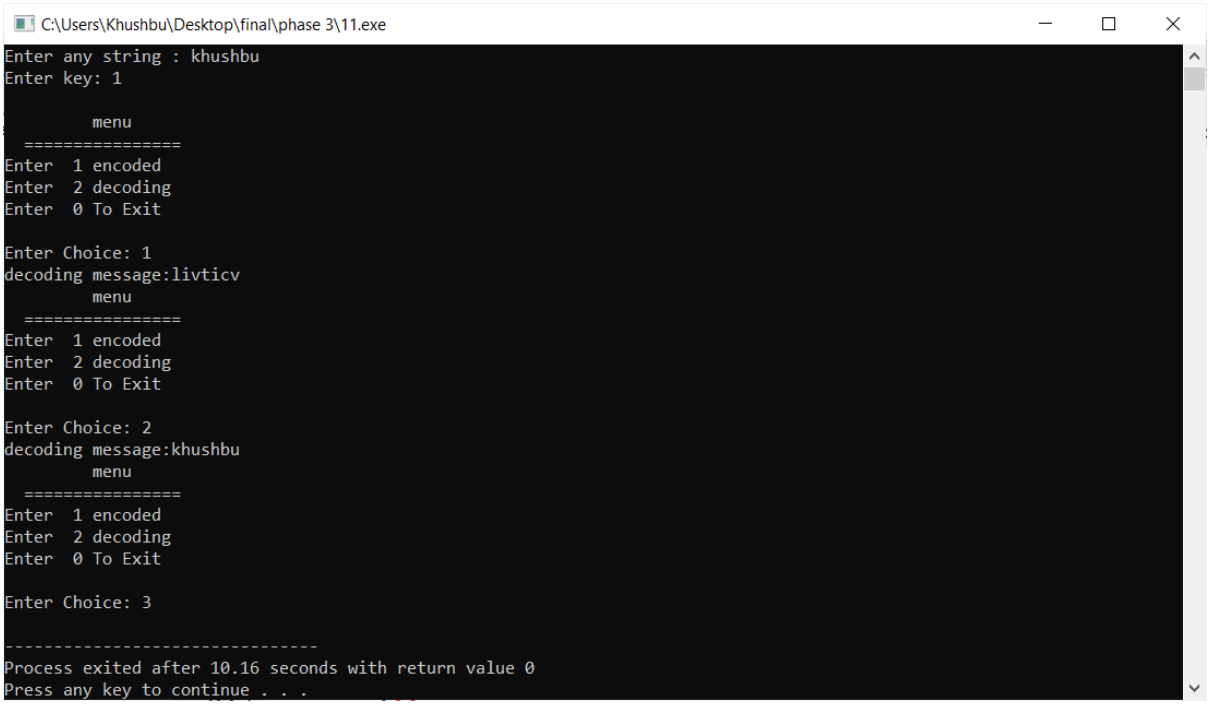
Program :11

```
#include <iostream>
#include<stdio.h>
#include<string.h>
using namespace std;
class Cyphertext
{
        private :
        char s[100];
        int i,key,ch;
        public:
           void get()
                {
              cout << "Enter any string : ";
              gets(s);
              printf("Enter key: ");
                        cin>>key;

        }
        void encoded()
                {

                   for(i = 0; s[i] != '\0'; ++i)
                        {
            ch = s[i];
                                if(ch >= 'a' && ch <= 'z')
                                {
                                        ch = ch + key;
                                        if(ch > 'z')
                                        {
                                                ch = ch - 'z' + 'a' - 1;
                                        }
                                        s[i] = ch;
                                }
                                else if(ch >= 'A' && ch <= 'Z')
                                {
                                        ch = ch + key;
                                        if(ch > 'Z')
                                        {
                                                ch = ch - 'Z' + 'A' - 1;
                                        }
                                        s[i] = ch;
                                }
```

```
                }
                cout<<"decoding message:"<< s;
        }


    void decoding()
        {
                for(i = 0; s[i] != '\0'; ++i)
                {
                    ch = s[i];
                    if(ch >= 'a' && ch <= 'z')
                    {
                            ch = ch - key;
                            if(ch < 'a')
                            {
                                ch = ch + 'z' - 'a' + 1;
                            }
                            s[i] = ch;
                    }
                    else if(ch >= 'A' && ch <= 'Z')
                    {
                        ch = ch - key;
                        if(ch < 'A')
                        {
                            ch = ch + 'Z' - 'A' + 1;
                    }
                    s[i] = ch;
                    }
                }
                cout<<"decoding message:"<< s;
    }



};
int main()
{
   int choice;
   Cyphertext c;
        c.get();
        do
        {
            cout<< "\n              menu           "
                << "\n  ================      "
              << "\nEnter  1 encoded "
              << "\nEnter  2 decoding"
              << "\nEnter  0 To Exit"
              << "\n";
```

```
                cout << "\nEnter Choice: ";
            cin >> choice;

        switch (choice)
                {
            case 1:

                c.encoded() ;
                break;
            case 2:

                c.decoding() ;
                break;

                }
    }while(choice>=1 && choice<=2);


   return 0;
}
```

Output :



Phase :4

Aim : A Train going to Busan have 2 containers which contains Zombies. Container A has 6 zombies, and Container B has 4 zombies. Passengers have to reach in engine container by passing through them. Help them by transferring zombies from both that containers to a new Container C. Build a C++ program for it.

Program :1

Output :

Aim : Hitler ordered a 10 soldiers pared to align in a row. He wants to know that which soldier have the highest killing score. Help him by design a C++ Program.

Program :2

Output :

Aim : Design a C++ system which automatically identifies if a given word contains any letter or symbol between both SHIFT keys from our regular PC Keyboard.

Program :3

Output :

Aim : Ronak gives an examination in which he gains internal viva marks in all subjects like this: 23, 19, 22, 28 & 23 (all marks are out of 30). And gains final written examination marks like this: 65, 58, 49, 52 & 64 (all marks are out of 70). Evaluate final total examination marks by adding both exam marks and reveal marks out of 100 in each subject by using C++. Also, final total average value for that.

Program :4

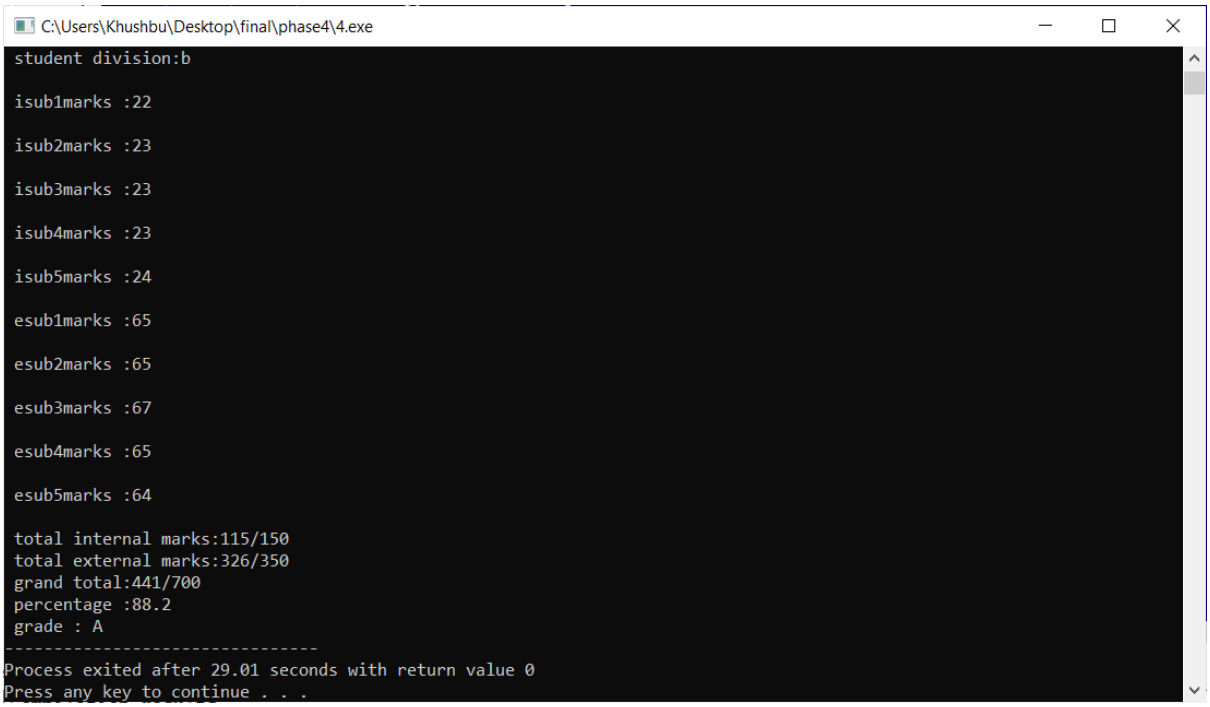
```
#include <iostream>
#include<string.h>
using namespace std;

class Student
```

```
{
        private :

        char name[50],division[5],semester[10];
                int
isub1marks,isub2marks,isub3marks,isub4marks,isub5marks,internaloutof,esub1marks,esub2
marks,esub3marks,esub4marks,esub5marks,externaloutof;
                int rollno;
        int grandtotal;
                float per;
                char grade[5];
        public:
           void set()
                {
                                        cout<<"enter student rollno :";
                                        cin>>rollno;
                        cout<<"enter student name :";
                                        cin>>name;
                                        cout<<"enter student semester:";
                                        cin>>semester;
                                        cout<<"enter student division:";
                                        cin>>division;
                                        cout<<"\n inernal marks ";
                                        cout<<"\n================= ";
                                        cout<<"\nenter isub1marks :";
                                        cin>>isub1marks;
                                        cout<<"enter isub2marks :";
                                        cin>>isub2marks;
                                        cout<<"enter isub3marks :";
                                        cin>>isub3marks;
                                        cout<<"enter isub4marks :";
                                        cin>>isub4marks;
                                        cout<<"enter isub5marks :";
                                        cin>>isub5marks;
                                        cout<<"\n external marks ";
                                        cout<<"\n ================== ";
                                        cout<<"\n enter esub1marks :";
                                        cin>>esub1marks;
                                        cout<<" enter esub2marks :";
                                        cin>>esub2marks;
                                        cout<<" enter esub3marks :";
                                        cin>>esub3marks;
                                        cout<<"enter esub4marks :";
                                        cin>>esub4marks;
                                        cout<<"enter esub5marks :";
                                        cin>>esub5marks;

                }
                void display_student()
                {
```

```
                cout<<"\n student rollno :"<<rollno<<endl;
                cout<<"\n student name :"<<name<<endl;
                cout<<"\n student semester:"<<semester<<endl;
                cout<<"\n student division:"<<division<<endl;
                cout<<"\n isub1marks :"<<isub1marks<<endl;
                cout<<"\n isub2marks :"<<isub2marks<<endl;
                cout<<"\n isub3marks :"<<isub3marks<<endl;
                cout<<"\n isub4marks :"<<isub4marks<<endl;
                cout<<"\n isub5marks :"<<isub5marks<<endl;
                cout<<"\n esub1marks :"<<esub1marks<<endl;
                cout<<"\n esub2marks :"<<esub2marks<<endl;
                cout<<"\n esub3marks :"<<esub3marks<<endl;
                cout<<"\n esub4marks :"<<esub4marks<<endl;
                cout<<"\n esub5marks :"<<esub5marks<<endl;

        }
    void getmarks()
        {
                internaloutof = 0,externaloutof = 0;
                internaloutof =
isub1marks+isub2marks+isub3marks+isub4marks   +isub5marks;
                externaloutof =
esub1marks+esub2marks+esub3marks+esub4marks+esub5marks;

                cout<<"\n total internal marks:"<<internaloutof<<"/150";
                cout<<"\n total external marks:"<<externaloutof<<"/350";
        }
        void getresult()
        {
            grandtotal = (internaloutof+externaloutof);
            per = (grandtotal * 100.00) / 500.0;
        }
        void display_result()
        {
                cout<<"\n grand total:"<<grandtotal<<"/700";
                cout<<"\n percentage :"<<per;
                if(per >= 90)
                    cout<<"\n grade : o";
                else if(per >= 80 && per < 90)
                    cout<<"\n grade : A";
                else if(per >= 70 && per < 80)
                    cout<<"\n grade : B";
                else if(per >= 60 && per < 70)
                    cout<<"\n grade : C";
                else if(per >= 50 && per < 60)
                    cout<<"\n grade : D";
                else if(per >= 36 && per < 50)
                    cout<<"\n grade : E";
                else
                    cout<<"\n grade : F";
```

```
                }
};
int main()
{
   Student  s;
         s.set();
         s.display_student();
         s.getmarks();
         s.getresult();
         s.display_result();
   return 0;
}
```

Output :



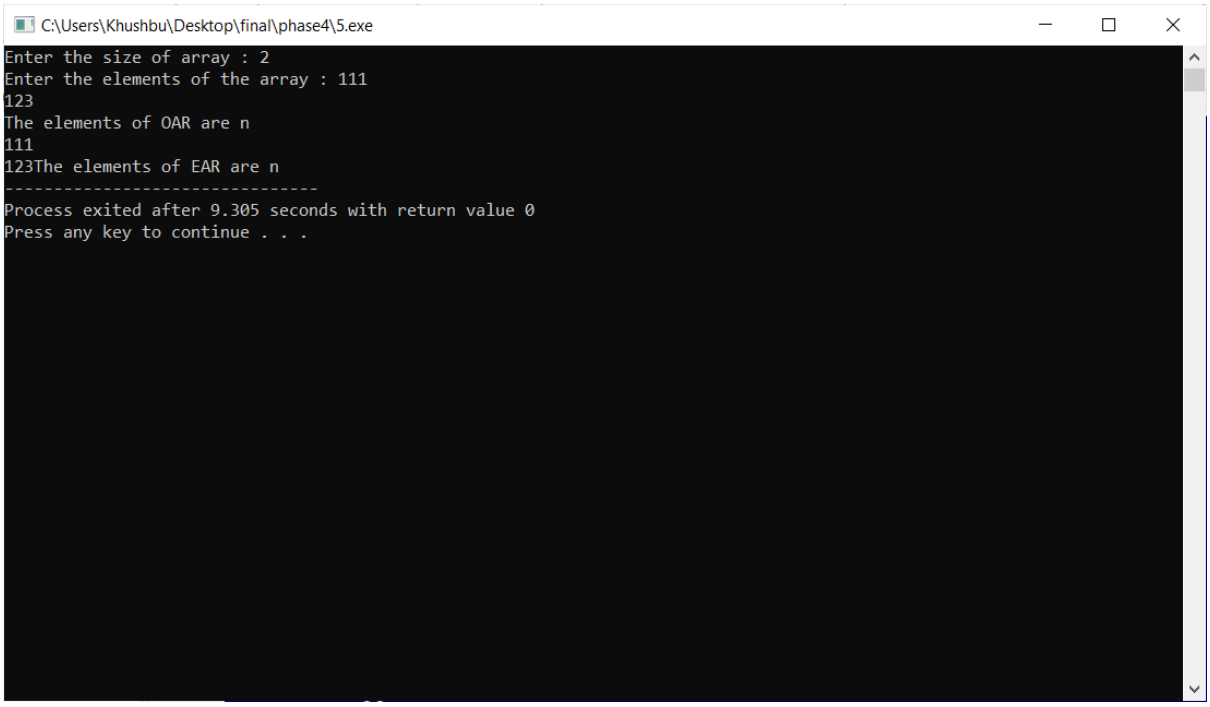
Aim : Devansh gives a list of random numbers to his colleague Rohan to distinguish all odd and even numbers, and store them in different lists. Help Rohan by building such a solution with help of C++.

Program :5

```
#include <iostream>
#include<string.h>
using namespace std;
class odd_even
{
        private :

        int ARR[10], OAR[10], EAR[10];
      int i, j = 0, k = 0, n;

        public:
           void set()
                {
                  cout<<"Enter the size of array : ";
                  cin>>n;

        }
        void get()
                {
                        printf("Enter the elements of the array : ");
                    for (i = 0; i < n; i++)
                    {
                       cin>> ARR[i];
                    }

                    for (i = 0; i < n; i++)
                    {
                       if (ARR[i] % 2 == 0)
                       {
                          EAR[j] = ARR[i];
                          j++;
                       }
                       else
                       {
                          OAR[k] = ARR[i];
                          k++;
                       }
                    }

                    cout<<"The elements of OAR are n ";
                    for (i = 0; i < k; i++)
                    {
                       cout<<"\n"<< OAR[i];
```

```
                    }

                    cout<<"The elements of EAR are n ";
                    for (i = 0; i < j; i++)
                    {
                        cout<<"\n"<< EAR[i];
                    }

                }
        };
int main()
{

        odd_even oe;
        oe.set();
        oe.get();
   return 0;
}
```

Output :



Aim : A Teacher gives a list to students in which a list contains many years in numeric format i.e 1994, 1947, 2002, 1996, etc. All students supposed to find all duplicate years which occurs more than once and store them into another list. Design such type of system with help of C++.

Program :6
Output :

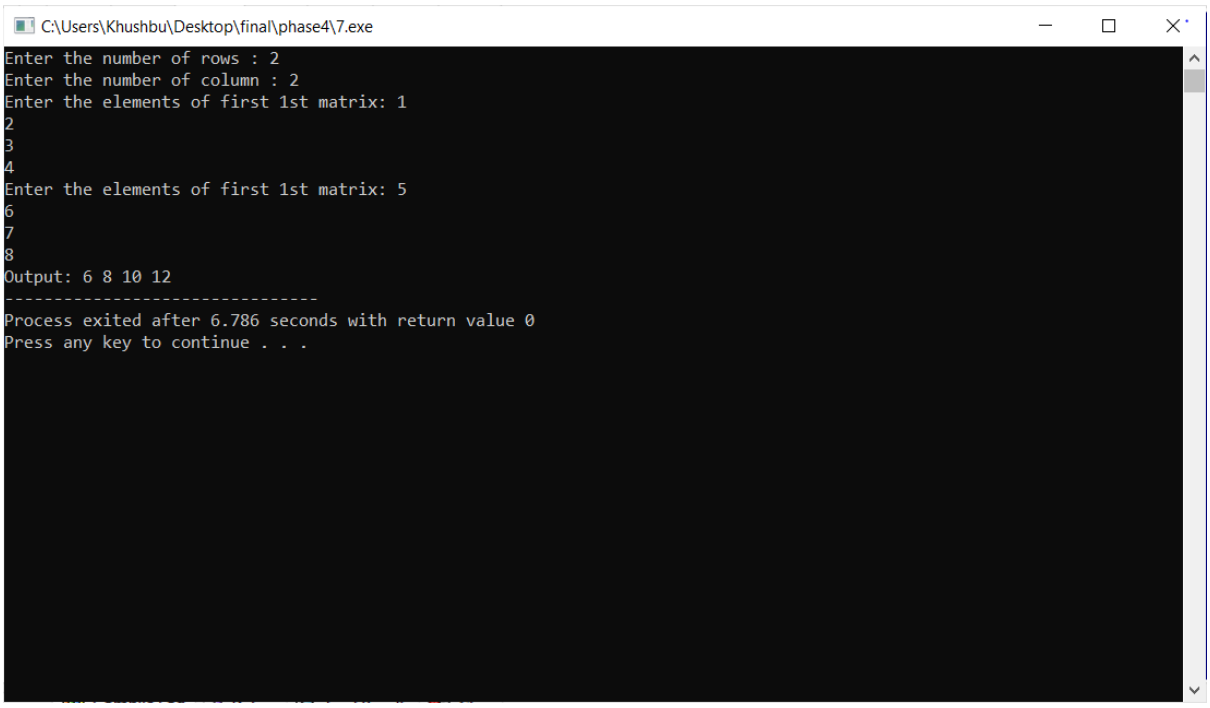
Aim : A Frontman can randomly assign two 3x3 matrices to all participants in Squid Games. All participants have to add that matrices and store final answer as a separate matrix to win this type of round in the game. Build a C++ system to help them all.

Program :7

```
#include <iostream>
#include<string.h>
using namespace std;
class Traspose
{
        private :

        int row, col, m1[10][10], m2[10][10], sum[10][10];

        public:
           void set()
                {
                  cout<<"Enter the number of rows : ";
                                cin>>row;
                                cout<<"Enter the number of column : ";
                                cin>>col;
        }
        void get()
                {
                        cout << "Enter the elements of first 1st matrix: ";
                         for (int i = 0;i<row;i++ ) {
                           for (int j = 0;j < col;j++ ) {
                             cin>>m1[i][j];
                           }
                         }

                         cout << "Enter the elements of first 1st matrix: ";
                         for (int i = 0;i<row;i++ ) {
                           for (int j = 0;j<col;j++ ) {
                             cin>>m2[i][j];
                           }
```

```
                        }

                        cout<<"Output: ";
                        for (int i = 0;i<row;i++ ) {
                          for (int j = 0;j<col;j++ ) {
                            sum[i][j]=m1[i][j]+m2[i][j];
                            cout<<sum[i][j]<<" ";
                          }
                        }
                }
        };
int main()
{

        Traspose t;
        t.set();
        t.get();
   return 0;
}
```

Output :



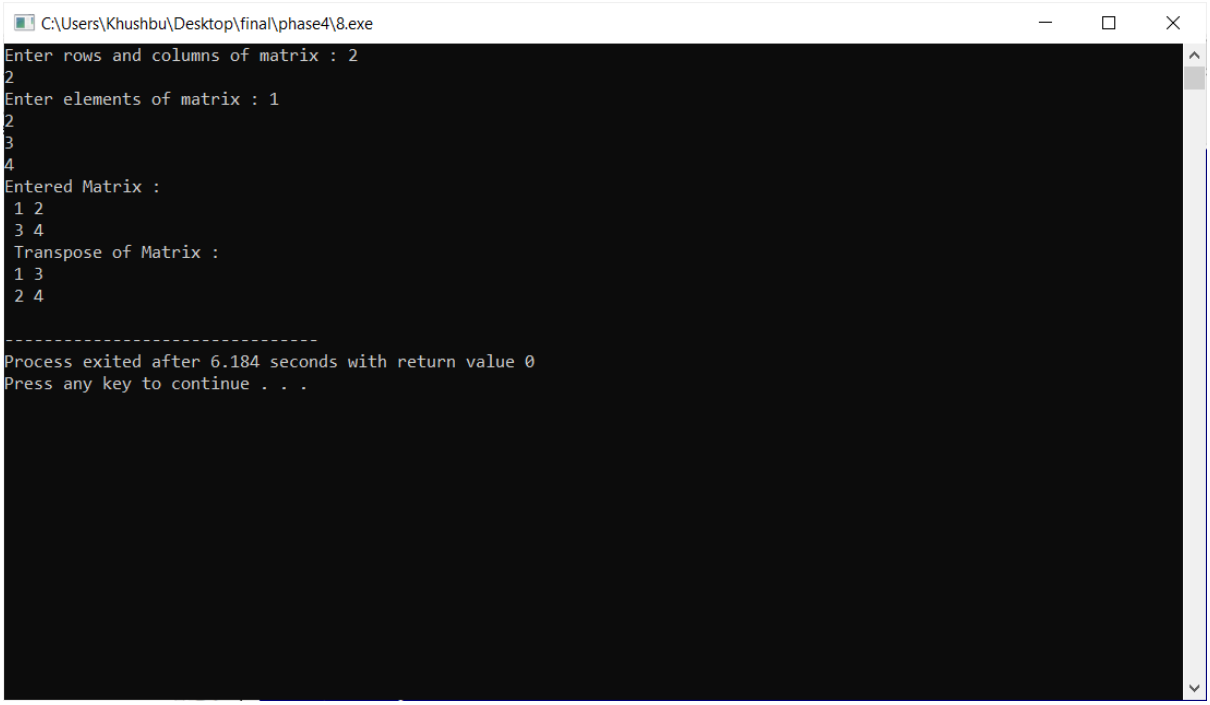
Aim : Design a system in C++ which automatically transpose any given Matrix of RxC dimension. Where R is number of Rows and C is number of Columns. Help three musketeers for passing an interview round by solving this last question.

Program :8

```
#include <iostream>
#include<string.h>
using namespace std;
class Traspose
{
        private :
          int A[10][10], m, n, i, j;

        public:
           void set()
                {
               cout << "Enter rows and columns of matrix : ";
                        cin >> m >> n;
        }
        void get()
                {
                        cout << "Enter elements of matrix : ";
                        for (i = 0; i < m; i++)
                           for (j = 0; j < n; j++)
                              cin >> A[i][j];

                        cout << "Entered Matrix : \n ";
                        for (i = 0; i < m; i++)
                        {
                           for (j = 0; j < n; j++)
                              cout << A[i][j] << " ";
                           cout << "\n ";
                        }

                        cout << "Transpose of Matrix : \n ";
                        for (i = 0; i < n; i++)
                        {
                           for (j = 0; j < m; j++)
                              cout << A[j][i] << " ";
                           cout << "\n ";
                        }
                }
        };
int main()
{

        Traspose t;
```

```
        t.set();
        t.get();
    return 0;
}
```

Output :

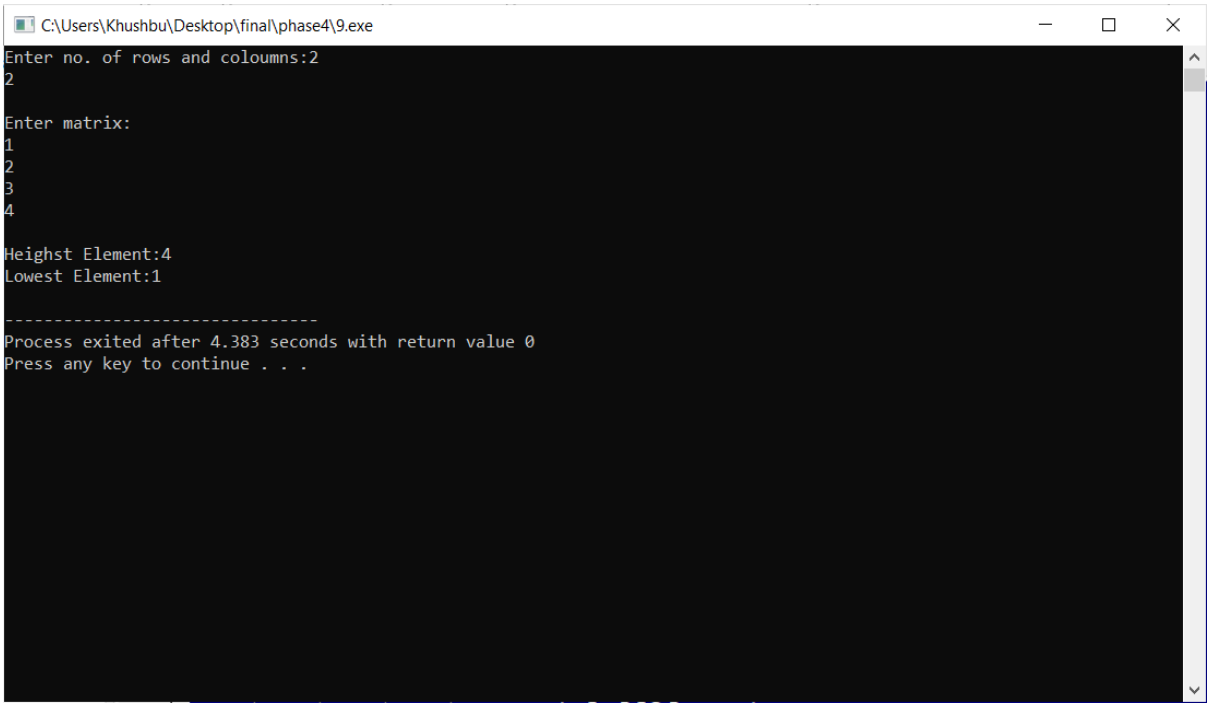


Aim : Columbian army arranged all 9 forbidden refugees in a 3x3 matrix formation. An army cadets have to find that which one of the refugees stats the highest weight and which one weighs the lowest weight. Help army cadets by preparing C++ solution for their undercover mission.

Program :9

```
#include<iostream>

using namespace std;

int main()
{
		int m,n,a[10][10],i,j,high,low;

		cout<<"Enter no. of rows and coloumns:";
		cin>>m>>n;
		cout<<"\nEnter matrix:\n";
		for(i=0;i<m;++i)
		{
			for(j=0;j<n;++j)
			cin>>a[i][j];
		}

		high=a[0][0];
		low=a[0][0];
		for(i=0;i<m;++i)
		{
			for(j=0;j<n;++j)
			{
				if(a[i][j]>high)
					high=a[i][j];
				else
					if(a[i][j]<low)
					low=a[i][j];
			}
		}
		cout<<"\nHeighst Element:"<<high<<"\nLowest Element:"<<low<<"\n";

return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase4\9.exe
Enter no. of rows and coloumns:2
2
Enter matrix:
1
2
3
4
Heighst Element:4
Lowest Element:1

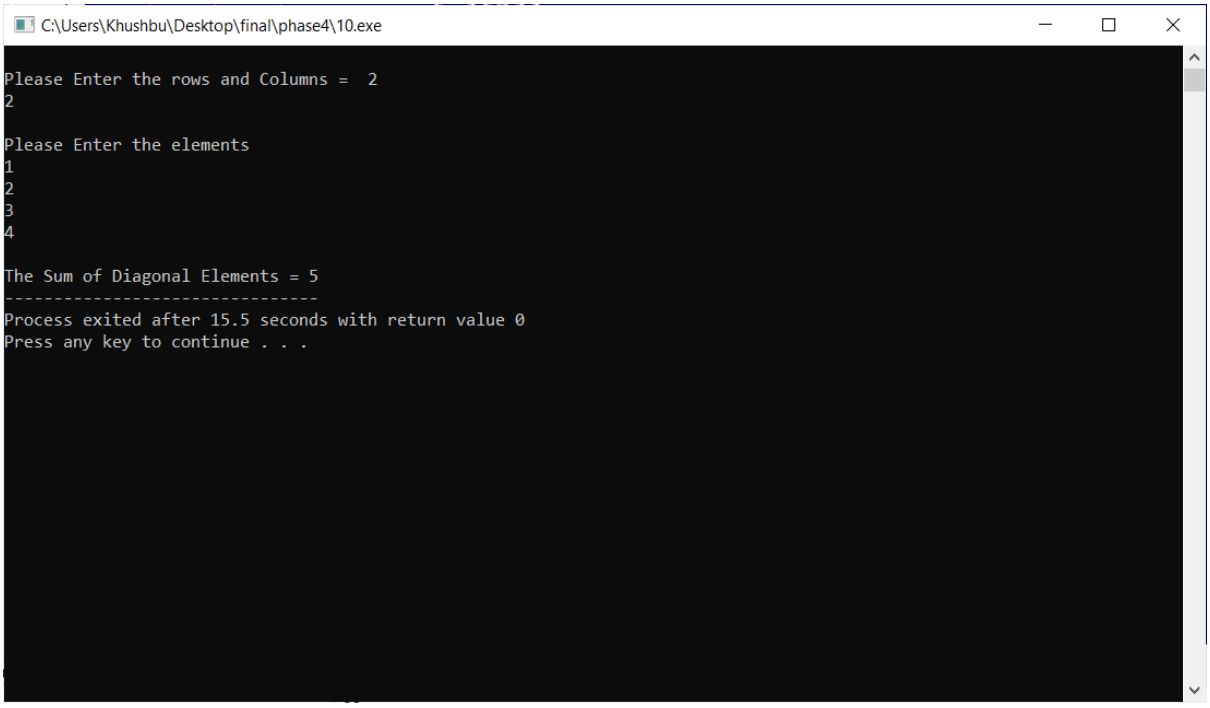
Process exited after 4.383 seconds with return value 0
Press any key to continue . . .

Aim : Help Martin to solve a special kind of puzzle by designing a C++ system. Total 25 random numbers arranged in a form of Square Matrix. To solve that puzzle, he has to find addition of all diagonally aligned numbers on puzzle cardboard.

Program :10

```
#include <iostream>
#include<string.h>
using namespace std;
class Diagonal
{
        private :
         int i, j, r, c, sum = 0;
        public:
           void set()
                {
               cout << "\nPlease Enter the rows and Columns =  ";
                        cin >> i >> j;
        }
        void get()
                {
                        int a[i][j];

                                cout << "\nPlease Enter the elements \n";
                                for(r = 0; r < i; r++)    {
                                        for(c = 0; c < i; c++) {
                                                cin >> a[r][c];
                                        }
                                }

                                for(r = 0; r < i; r++)
                                {
                                        sum = sum + a[r][r];
                                }

                                cout << "\nThe Sum of Diagonal Elements = " << sum;

                }
        };
int main()
{

        Diagonal d;
        d.set();
        d.get();
   return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase4\10.exe
Please Enter the rows and Columns = 2
2
Please Enter the elements
1
2
3
4
The Sum of Diagonal Elements = 5

Process exited after 15.5 seconds with return value 0
Press any key to continue . . .

Aim : A one-sided open Tennis ball jar has capacity of storing total 5 different balls. Each ball has unique number attached as a label itself. Arrange all that balls in a jar in such a way that their order is stats as a reverse by referring attached numbers as a label. Create a C++ system for doing such type of task.

Program :11

```
#include <iostream>
#include<string.h>
using namespace std;
class DotMtrix
{
        private :
          int i, j, m, n, p, q;
                   int A[10][10], B[10][10], C[10];

        public:
           void set()
                  {
                  cout << "Enter number of rows and columns of matrix A : ";
                              cin >> m >> n;
                              cout << "Enter number of rows and columns of matrix B : ";
                              cin >> p >> q;
        }
        void get()
                  {
                              if ((m != p) && (n != q))
                              {
                                 cout << "Dot product cannot be found as matrices are not of same
size!";

                                 exit(0);
                              }
                              cout << "Enter elements of matrix A : ";
                              for (i = 0; i < m; i++)
                                 for (j = 0; j < n; j++)
                                    cin >> A[i][j];

                              cout << "Enter elements of matrix B : ";
                              for (i = 0; i < m; i++)
                                 for (j = 0; j < n; j++)
                                    cin >> B[i][j];
                              for (i = 0; i < m; i++)
                              {
                                 C[i] = 0;
                                 for (j = 0; j < n; j++)
                                    C[i] +=  A[i][j] * B[i][j];

                              }
```

```
                        cout<<"Printing matrix A " <<endl;
                        for (i = 0; i < m; i++)
                        {
                           for (j = 0; j < n; j++)
                              cout << A[i][j] << " ";
                           cout << "\n ";
                        }

                              cout<<"Printing matrix B "<<endl ;
                        for (i = 0; i < m; i++)
                        {
                           for (j = 0; j < n; j++)
                              cout << B[i][j] << " ";
                           cout << "\n ";
                        }
                        cout << "\n Dot product : ";
                        for (i = 0; i < m; i++)
                          cout << C[i] << " ";
                  }
        };
int main()
{

        DotMtrix d;
        d.set();
        d.get();
   return 0;
}
```

Output :

Aim : A College wants to celebrate all degree holder students to throwing their hats in a predefined way: First all 25 students have to arranged in a Square Matrix. First, an upper half of triangle matrix will throwing hats and then a lower half of triangle matrix will. Help them to achieve this unique idea by using C++.

Program :12
Output :

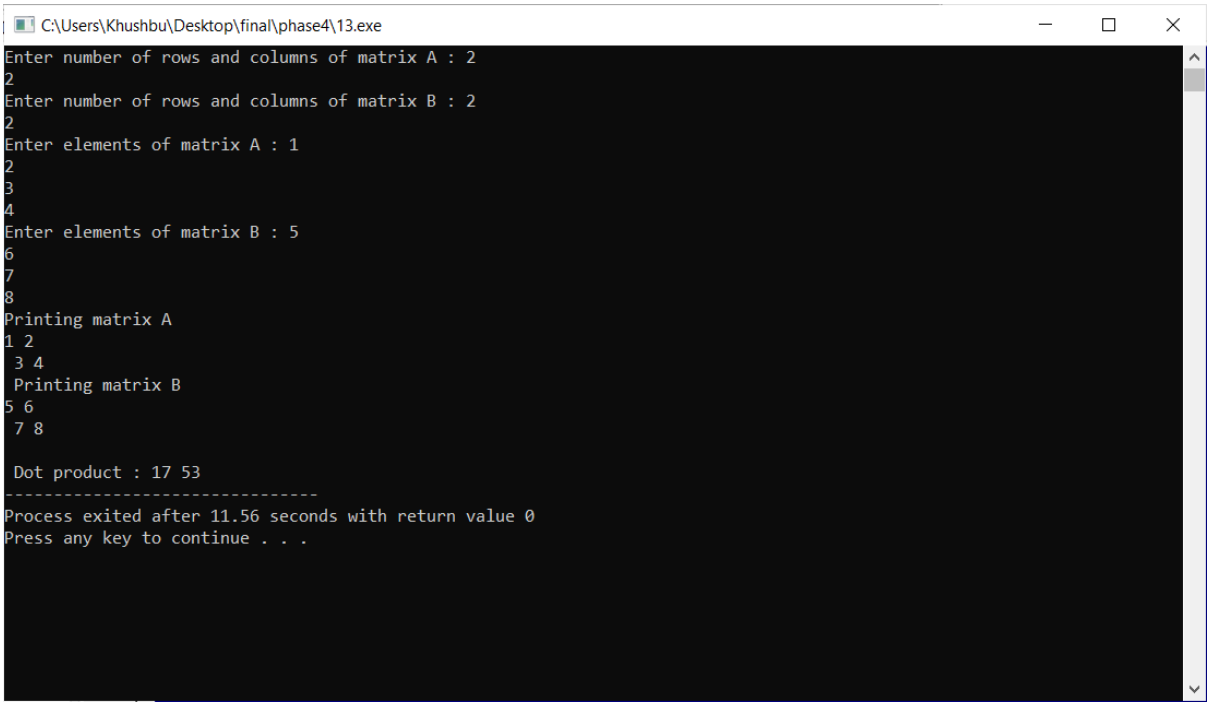
Aim : A Math teacher wants to teach how to perform a dot product of two matrices. Design a better approach in C++ to help this math teacher.

Program :13

```
#include <iostream>
#include<string.h>
using namespace std;
class DotMtrix
{
        private :
          int i, j, m, n, p, q;
                   int A[10][10], B[10][10], C[10];

        public:
           void set()
                {
                cout << "Enter number of rows and columns of matrix A : ";
                        cin >> m >> n;
                        cout << "Enter number of rows and columns of matrix B : ";
                        cin >> p >> q;
        }
        void get()
                {
                        if ((m != p) && (n != q))
                        {
                           cout << "Dot product cannot be found as matrices are not of same
size!";
                           exit(0);
                        }
                        cout << "Enter elements of matrix A : ";
                        for (i = 0; i < m; i++)
                           for (j = 0; j < n; j++)
                              cin >> A[i][j];

                        cout << "Enter elements of matrix B : ";
                        for (i = 0; i < m; i++)
                           for (j = 0; j < n; j++)
                              cin >> B[i][j];
                        for (i = 0; i < m; i++)
                        {
                           C[i] = 0;
                           for (j = 0; j < n; j++)
                              C[i] +=  A[i][j] * B[i][j];

                        }

                        cout<<"Printing matrix A " <<endl;
                        for (i = 0; i < m; i++)
                        {
                           for (j = 0; j < n; j++)
                              cout << A[i][j] << " ";
                           cout << "\n ";
```

```
                    }

                        cout<<"Printing matrix B "<<endl ;
                    for (i = 0; i < m; i++)
                    {
                       for (j = 0; j < n; j++)
                          cout << B[i][j] << " ";
                       cout << "\n ";
                    }
                    cout << "\n Dot product : ";
                    for (i = 0; i < m; i++)
                      cout << C[i] << " ";
                }
        };
int main()
{

        DotMtrix d;
        d.set();
        d.get();
   return 0;
}
```

Output :



Phase :5

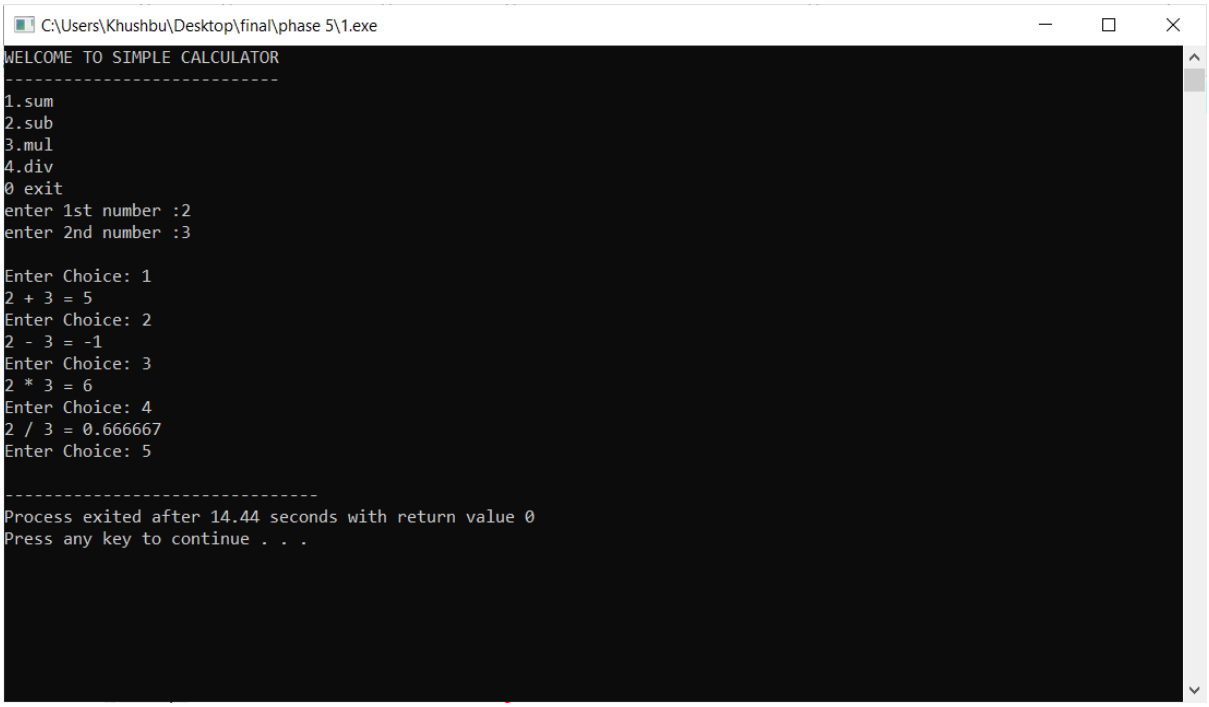
Aim : Create a Calculator in C++ by using all types of user defined functions. User can perform all types of basic arithmetic operations until he/she wants.

Program :1

```
#include <iostream>
using namespace std;

float add(float num1, float num2);
float sub(float num1, float num2);
float mult(float num1, float num2);
float div(float num1, float num2);

int main()
{
   int op;
   float num1, num2, result=0.0f;
   cout<<"WELCOME TO SIMPLE CALCULATOR\n";
   cout<<"----------------------------\n";
   cout<<"1.sum\n";
   cout<<"2.sub\n";
   cout<<"3.mul\n";
         cout<<"4.div\n";
         cout<<"0 exit\n";
         cout<<"enter 1st number :";
         cin>>num1;
         cout<<"enter 2nd number :";
   cin>>num2;

   do
   {
                  cout << "\nEnter Choice: ";
      cin >> op;
            switch(op)
            {
               case 1:
                  result = add(num1, num2);
                  cout<<num1<<" " <<"+"<<" "<< num2 <<" = "<<result;
                  break;

               case 2:
                  result = sub(num1, num2);
                  cout<<num1<<" " <<"-"<<" "<< num2 <<" = "<<result;
                  break;
```

```
                case 3:
                    result = mult(num1, num2);
                    cout<<num1<<" " <<"*"<<" "<< num2 <<" = "<<result;
                    break;

                case 4:
                    result = div(num1, num2);
                    cout<<num1<<" " <<"/"<<" "<< num2 <<" = "<<result;
                    break;

            }
    }while (op >= 1 && op <= 4);
        return 0;
}

float add(float num1, float num2)
{
    return num1 + num2;
}

float sub(float num1, float num2)
{
    return num1 - num2;
}

float mult(float num1, float num2)
{
    return num1 * num2;
}

float div(float num1, float num2)
{
    return num1 / num2;
}
```

Output :

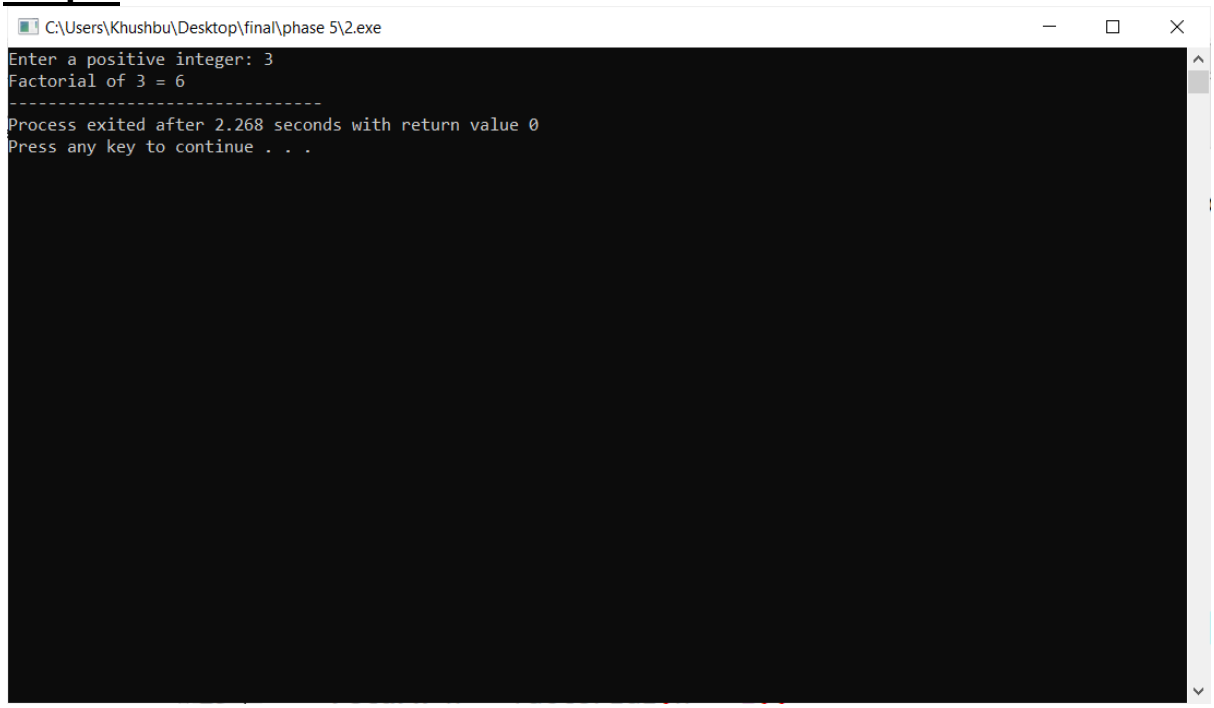

C:\Users\Khushbu\Desktop\final\phase 5\1.exe
WELCOME TO SIMPLE CALCULATOR
1.sum
2.sub
3.mul
4.div
0 exit
enter 1st number :2
enter 2nd number :3
Enter Choice: 1
2 + 3 = 5
Enter Choice: 2
2 - 3 = -1
Enter Choice: 3
2 * 3 = 6
Enter Choice: 4
2 / 3 = 0.666667
Enter Choice: 5
Process exited after 14.44 seconds with return value 0
Press any key to continue . . .

Aim : Develop a solution for Akshay by which he can retrieve factorial of all numbers between given range of two numbers using a C++ user defined function (UDF).

Program :2

```
#include<iostream>
using namespace std;

int factorial(int n);
        class Fatorial
        {
                public :
                 int n;
                setData()
                {
                        cout << "Enter a positive integer: ";
                        cin >> n;

                        cout << "Factorial of " << n << " = " << factorial(n);

                        return 0;
                }
        };
int main() {

 Fatorial f;
 f.setData();


}

int factorial(int n) {
  if(n > 1)
    return n * factorial(n - 1);
  else
    return 1;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase 5\2.exe
Enter a positive integer: 3
Factorial of 3 = 6

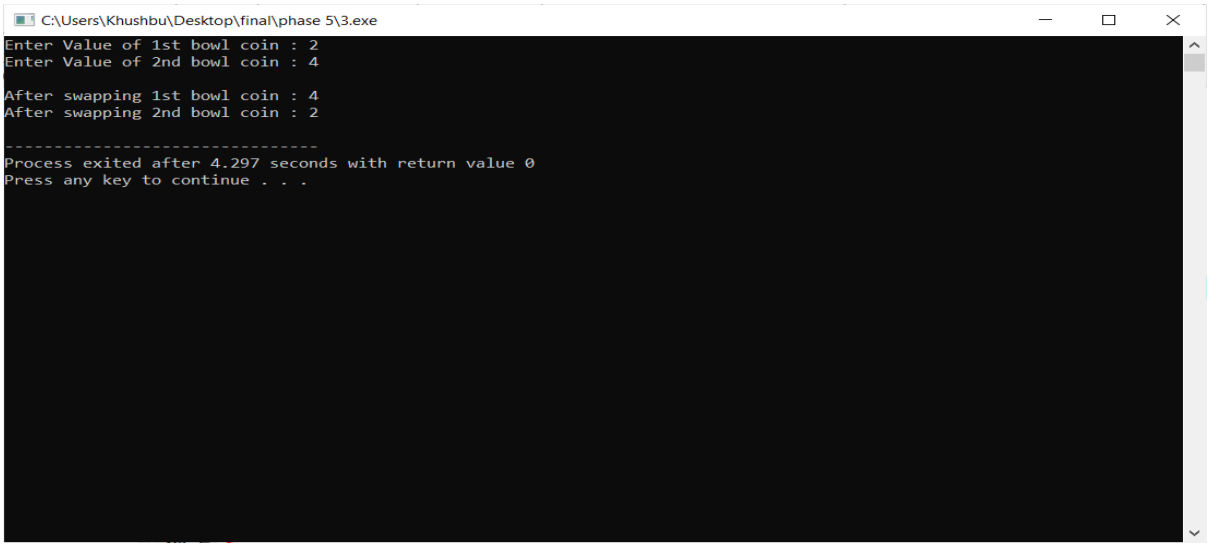
Process exited after 2.268 seconds with return value 0
Press any key to continue . . .

Aim : Kevin has two plain floors within different bowls containig one coin in each bowl. He bet his friend to transfer that coins in either bowls within 5 minutes. Help him by providing a C++ solution using UDF.

Program :3

```
#include<iostream>
using namespace std;
void swap()
{
	int a,b,c=0;
	cout << "Enter Value of 1st bowl coin : ";
	cin >> a;
	cout << "Enter Value of 2nd bowl coin : ";
	cin >> b;
	c=a;
	a=b;
	b=c;
	cout << endl << "After swapping 1st bowl coin : " << a;
	cout << endl << "After swapping 2nd bowl coin : " << b << endl;
}
int main()
{
swap();
return 0;
}
```

Output :



Aim : Design a C++ UDF which producing cubes of all elements of provided array in form of another array. ¶hen, find average value of that new array. Based on that average value decide that array's kindμ

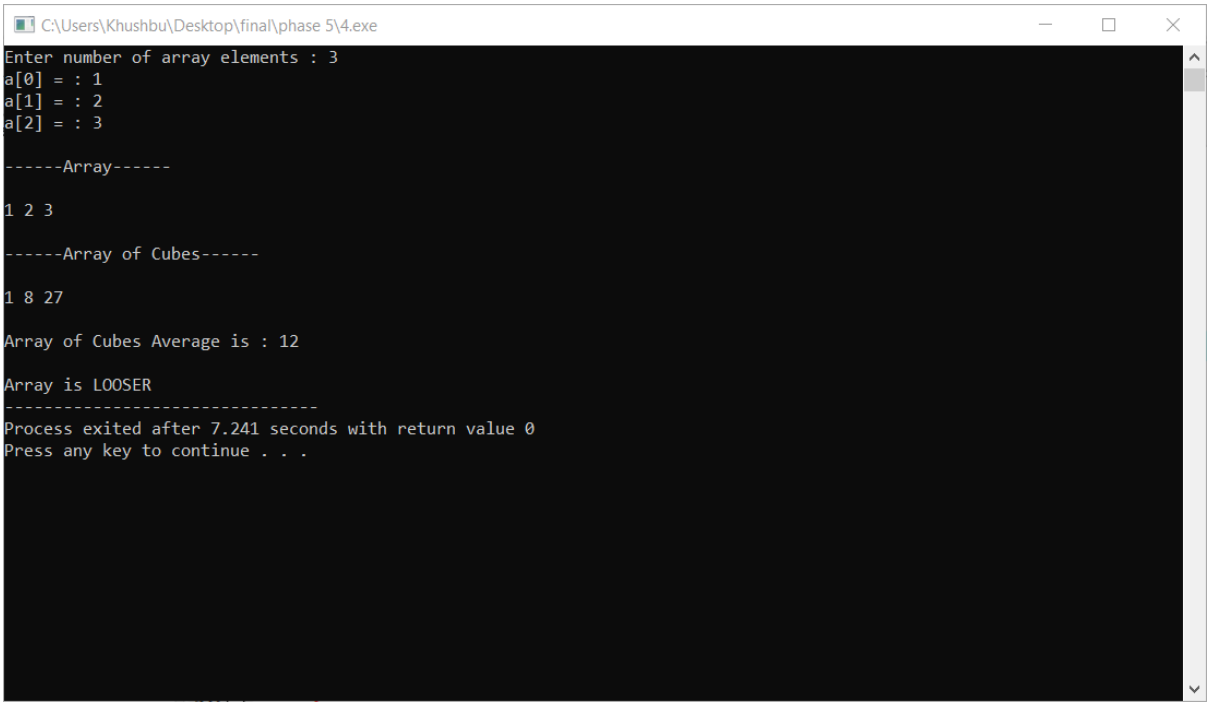
If 22<=average<=35, then an array is "TIGHTER"
If 35<average<=50, then an array is "BALANCED©
If average>50, then an array is "TOXIC"
If average<22, then an array is "LOOSEa"

Program :4

```
#include<iostream>
using namespace std;
void ave()
{
	int a[100],b[100],i,n,sum=0,ave;
	cout << "Enter number of array elements : ";
	cin >> n;
	for(i=0;i<n;i++)
	{
		cout << "a[" << i << "] = : ";
		cin >> a[i];
	}
	cout << endl << "------Array------" << endl << endl;
	for(i=0;i<n;i++)
	{
		cout << a[i] << " ";
	}
	for(i=0;i<n;i++)
	{
		b[i]=a[i]*a[i]*a[i];
		sum=sum+b[i];
		ave=sum/n;
	}
	cout << endl << endl;
	cout << "------Array of Cubes------" << endl << endl;
	for(i=0;i<n;i++)
	{
		cout << b[i] << " ";
	}
	cout << endl << endl << "Array of Cubes Average is : " << ave << endl;
	if(ave>=22 && ave<=35)
	{
		cout << endl << "Array is TIGHTER";
	}
	else if(ave>=35 && ave<=50)
	{
		cout << endl << "Array is BALANCED";
	}
	else if(ave>50)
```

```
        {
                cout << endl << "Array is TOXIC";
        }
        else if(ave<20)
        {
                cout << endl << "Array is LOOSER";
        }
}
int main()
{
        ave();
        return 0;
}
```

Output :



Aim : A scientist wants to create a sientific calculator which only contains functionalities like: maximum number from 3 number square of a given numbe square root of a given numbe components of a given number
Design a C++ system to help this scientist by using UDFs.

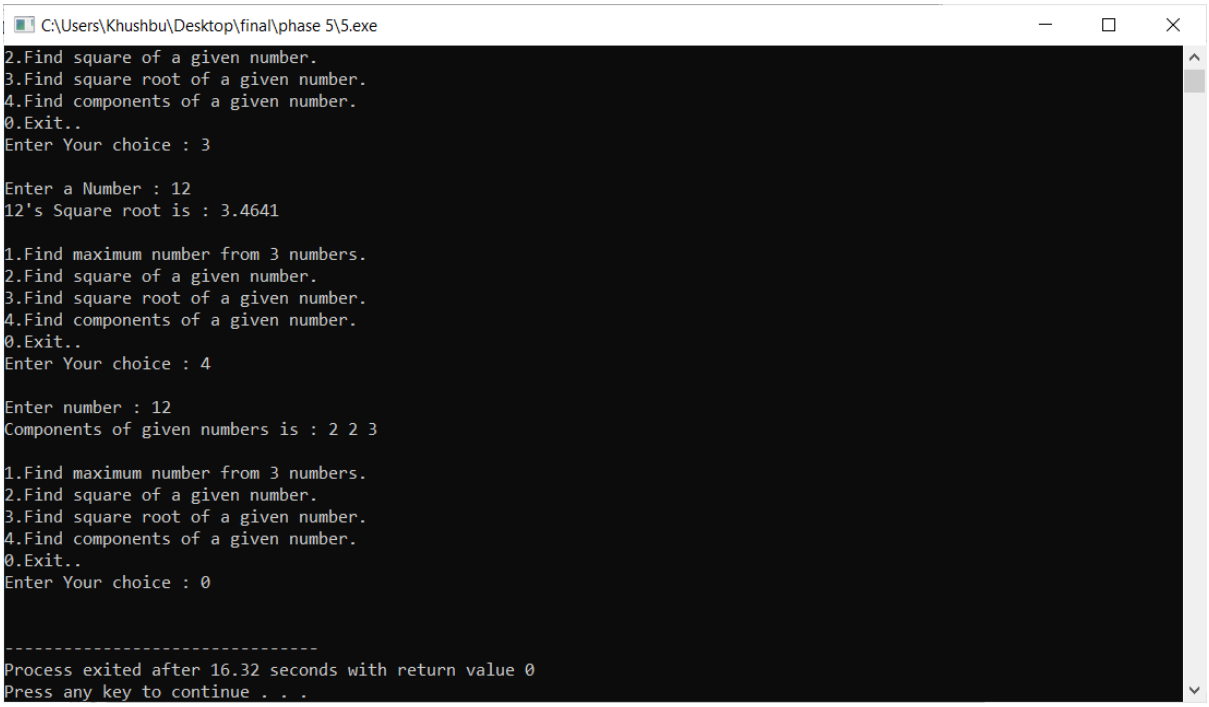
Program :5

```
#include<iostream>
using namespace std;
void max()
{
	int a,b,c;
	cout << "Enter value of A : ";
	cin >> a;
	cout << "Enter value of B : ";
	cin >> b;
	cout << "Enter value of C : ";
	cin >> c;
	if(a==b&&b==c)
	{
	cout << "=> All values are same!" << endl;
	}
	else if(a==b)
	{
	cout << "=> A and B values are same!" << endl;
	}
	else if(b==c)
	{
	cout << "=> B and C values are same!" << endl;
	}
	else if(a==c)
	{
	cout << "=> A and C values are same!" << endl;
	}
	else
	{
		if(a>b&&a>c)
		{
		cout << "=> A is Max." << endl;
		}
		else if(b>a&&b>c)
		{
		cout << "=> B is Max." << endl;
		}
		else if(c>a&&c>b)
		{
		cout << "=> C is Max." << endl;
		}
	}
```

```
}
void Square()
{
	int n;
	cout << "Enter Number : ";
	cin >> n;
	cout << n << "'s square is : " << n*n << endl;
}
void Square_root()
{
	int n;
	float r=1;
	int i=0;
	cout << "Enter a Number : ";
	cin >> n;
	while(1)
	{
		i=i+1;
		r=(n/r+r)/2;
		if (i==n+1)
		{
			break;
		}
	}
	cout << n << "'s Square root is : " << r << endl;
}
void comp()
{
	int n,i;
	cout << "Enter number : ";
	cin >> n;
	cout << "Components of given numbers is : ";
	while(n!=1)
	{
		for(i=2;i<=n;i++)
		{
			if(n%i==0)
			{
				cout << i << " ";
				n=n/i;
				break;
			}
		}
	}
	cout << endl;
}
class A
{
	private:
		int c;
```

```
	public:
		void getData()
		{
	do
	{
		cout << endl << "1.Find maximum number from 3 numbers."<< endl<<
"2.Find square of a given number." << endl<< "3.Find square root of a given number." <<
endl<< "4.Find components of a given number." << endl<< "0.Exit.." << endl<< "Enter Your
choice : ";

		cin >> c;
		cout << endl;
		switch(c)
		{
			case 1:
				max();
			break;
			case 2:
				Square();
			break;
			case 3:
				Square_root();
			break;
			case 4:
				comp();
			break;
			case 0:
			break;
			default:
			cout << "Invalid choice!! Please Try again." << endl;
			void getData();
		}
	}while(c!=0);
}
};
int main()
{
	A a;
	a.getData();
	return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase 5\5.exe
2.Find square of a given number.
3.Find square root of a given number.
4.Find components of a given number.
0.Exit..
Enter Your choice : 3
Enter a Number : 12
12's Square root is : 3.4641
1.Find maximum number from 3 numbers.
2.Find square of a given number.
3.Find square root of a given number.
4.Find components of a given number.
0.Exit..
Enter Your choice : 4
Enter number : 12
Components of given numbers is : 2 2 3
1.Find maximum number from 3 numbers.
2.Find square of a given number.
3.Find square root of a given number.
4.Find components of a given number.
0.Exit..
Enter Your choice : 0

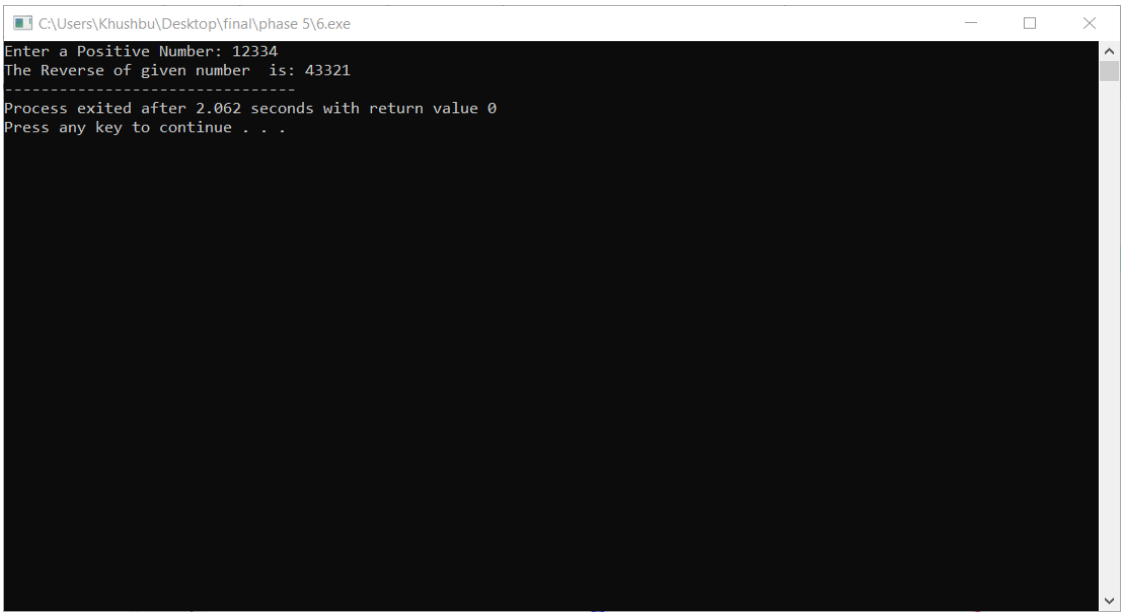
Process exited after 16.32 seconds with return value 0
Press any key to continue . . .

Aim : A Reality show on TV organizes “Fastest-fingers Fast” round for entering in a Game. In this round participant has to find reverse of a given number as soon as possible to win this round. Design a C++ UDF for that.

Program :6

```
#include <iostream>
#include <math.h>
using namespace std;

Reverse(int n)
{
  int sum=0;
  while (n!=0)
  {
    sum = sum*10 + n%10;
    n /= 10;
  }
  return sum;
}
int main()
{
  int rev, num;

  cout<<"Enter a Positive Number: ";
  cin>>num;
  rev = Reverse(num);
  cout<<"The Reverse of given number %d is: " <<rev;
}
```

Output :

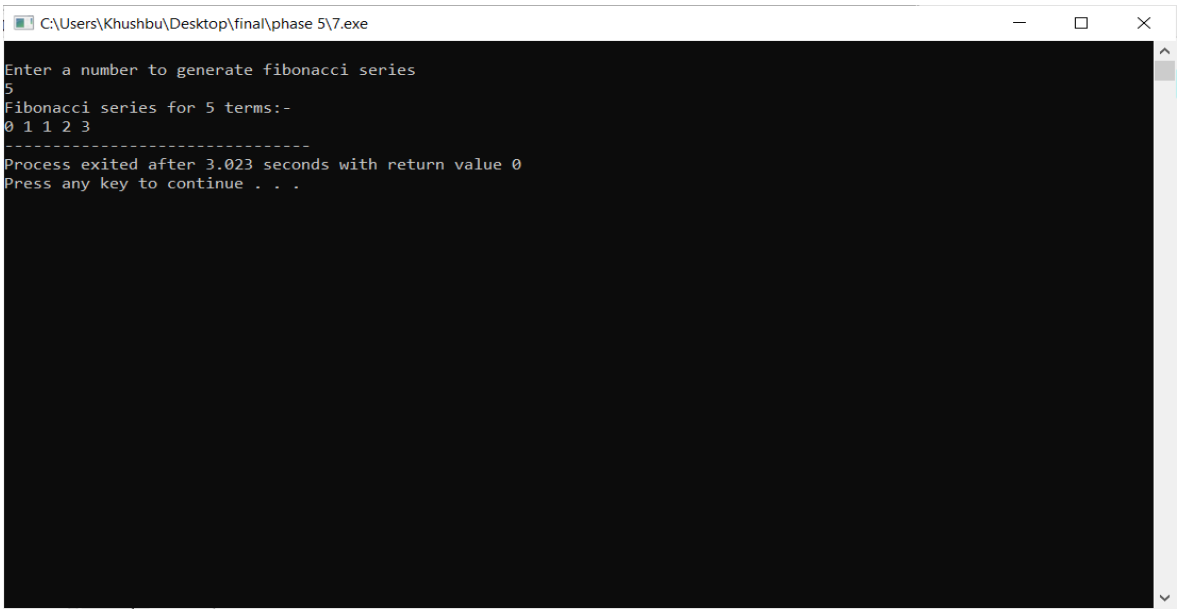


Aim : Ajay has to find Fibonacci Series upto given number to successfully pass in Math's examination. Help him by designing a UDF in C++.

Program :7

```
#include<iostream>
using namespace std;
void fibo(int);
int main()
{
  int n;
  printf("\nEnter a number to generate fibonacci series \n",n);
  scanf("%d",&n);
  fibo(n);
}
void fibo(int n)
{
  int i,c=0;
  int a=0;
  int b=1;
  printf("Fibonacci series for %d terms:-\n",n);
  for(i=0;i<n;i++)
  {
     printf("%d ",c);
     a=b;
     b=c;
     c=a+b;
  }
}
```

Output :



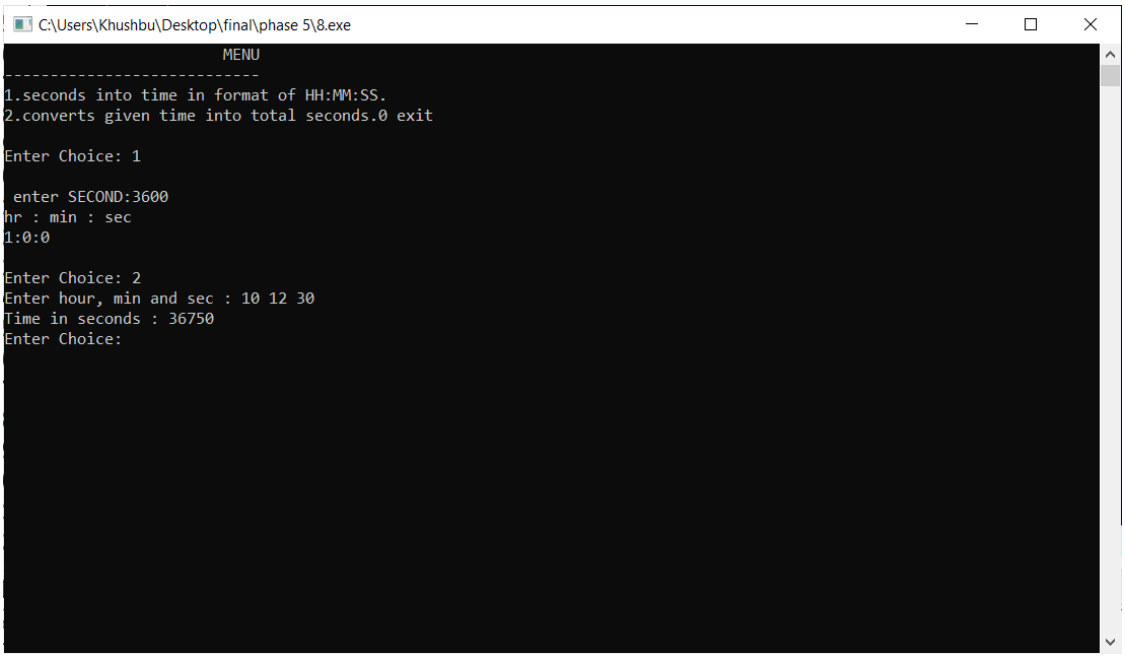
Aim : Design a C++ UDF which converts given seconds into time in format of HH:MM:SS. Also create another UDF which converts given time into total seconds. End user have choice to perform either operations whenever he/she wants.

Program :8

```
#include <iostream>
#include <math.h>
using namespace std;

int hour(int h)
   {
      int second;

     second= h / 3600;
      return (second);
   }

   int minute(int m)
   {
      int second2;
       second2= (m % 3600) / 60;
      return(second2);
   }

   int second(int s)
   {
      int second3;
      second3=s % 60;
      return (second3);
   }
   int givesec()
   {
         int timeinsec,ho,mi,se ;
         cout << "Enter hour, min and sec : ";
                  cin >> ho >> mi >> se;
         //cm = frm.hours.value * (60 * 60) + frm.minutes.value * 60 + frm.seconds.value * 1
                  timeinsec =  se + (mi * 60) + (ho * 60 * 60);
                  cout << "Time in seconds : " << timeinsec;
         }


int main()
{
   int op,s,h,m,timeinsec;

   cout<<"                         MENU\n";
   cout<<"----------------------------\n";
```

```
   cout<<"1.seconds into time in format of HH:MM:SS.\n";
   cout<<"2.converts given time into total seconds.";
         cout<<"0 exit\n";

   do
   {
                  cout << "\nEnter Choice: ";
      cin >> op;
            switch(op)
            {
               case 1:
               cout<<"\n enter SECOND:";
                  cin>>s;
                 cout<<"hr : min : sec \n";
                  cout<<hour(s)<<":"<<minute(s)<<":"<<second(s)<<endl;
                  break;

               case 2:

                   givesec();
                  break;


            }
   }while (op >= 1 && op <= 2);

   return 0;
}
```

Output :

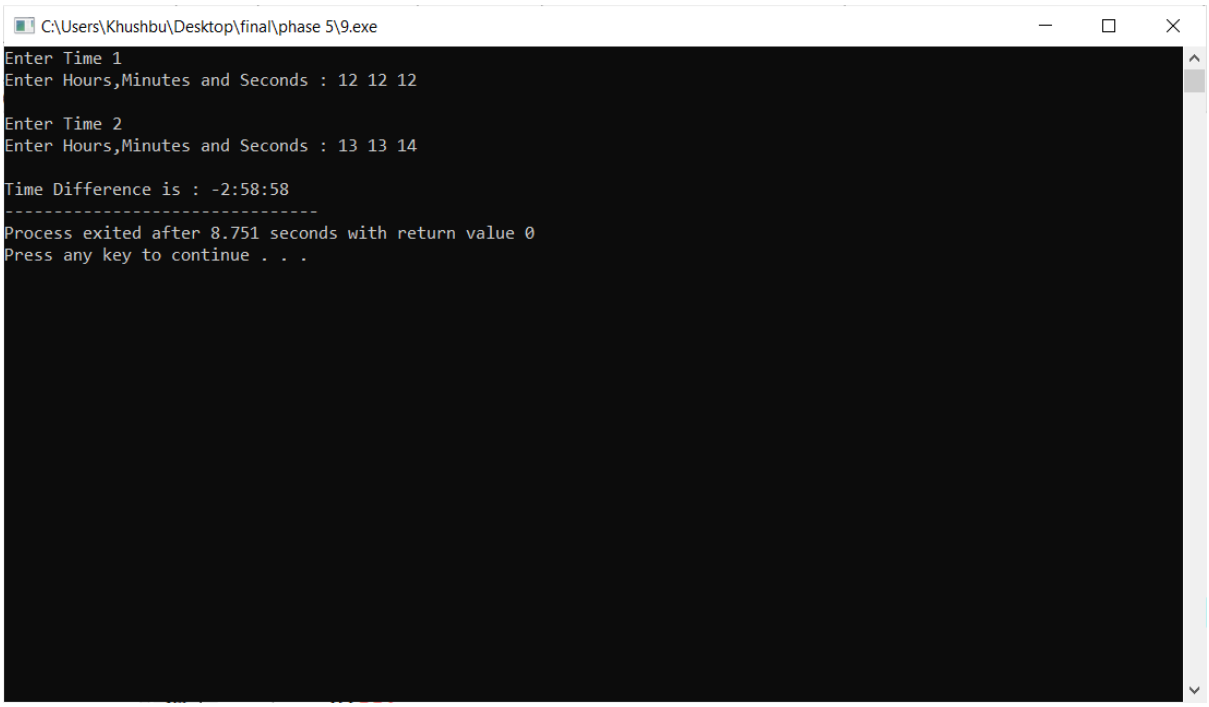


Aim : A Supreme Court wants a system which automatically figure out difference of two given time whether it is in seconds or any other format. Develop a solution in C++ using UDF**.**

Program :9

```
#include<iostream>
using namespace std;
void Dif()
{
	int h1,m1,s1,h2,s2,m2,hour,min,sec;
	cout << "Enter Time 1" << endl;
	cout << "Enter Hours,Minutes and Seconds : ";
	cin >> h1 >> m1 >> s1;
	cout << endl << "Enter Time 2" << endl;
	cout << "Enter Hours,Minutes and Seconds : ";
	cin >> h2 >> m2 >> s2;
	if(s2>s1)
	{
		m1--;
		s1+=60;
	}
	sec=s1-s2;
	if(m2>m1)
	{
		h1--;
		m1+=60;
	}
	min=m1-m2;
	hour=h1-h2;
	cout << endl << "Time Difference is : " << hour << ":" << min << ":" <<sec;
}
int main()
{
	Dif();
return 0;
}
```

Output :

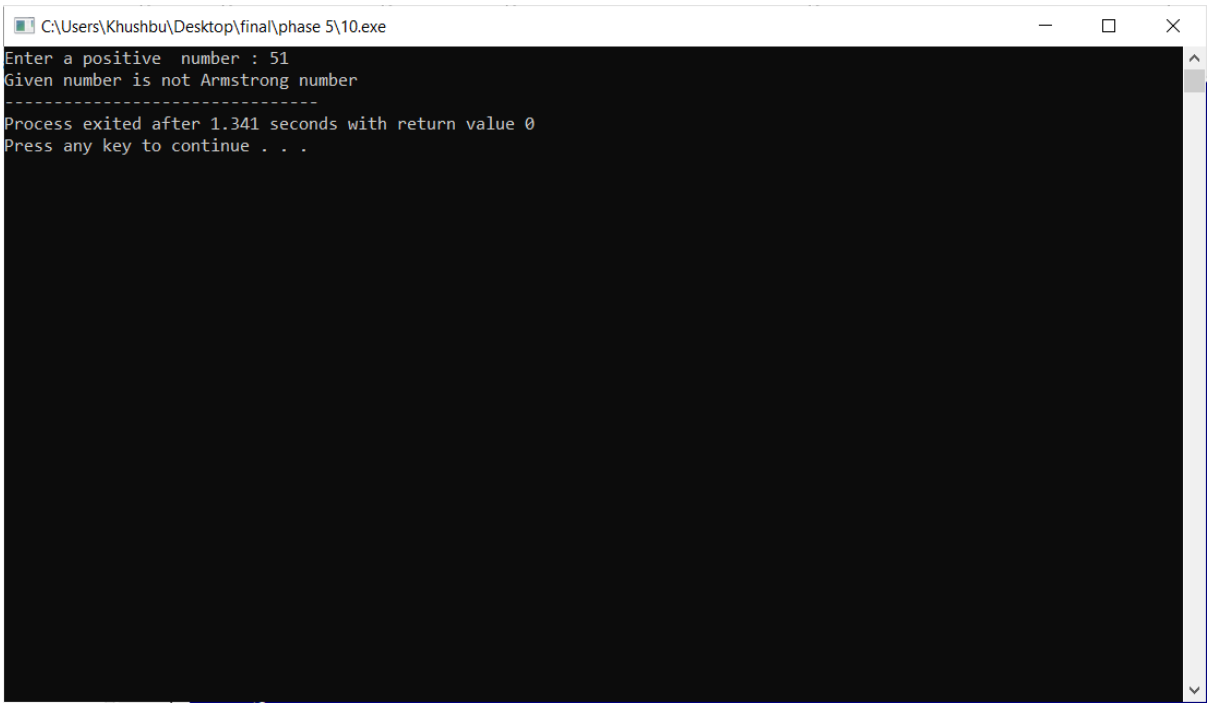

C:\Users\Khushbu\Desktop\final\phase 5\9.exe
Enter Time 1
Enter Hours,Minutes and Seconds : 12 12 12
Enter Time 2
Enter Hours,Minutes and Seconds : 13 13 14
Time Difference is : -2:58:58
Process exited after 8.751 seconds with return value 0
Press any key to continue . . .

Aim : A bomb is planted at Suratgarh Railway Station. It can be defused by entering any number which is itself an Armstrong number. Design a C++ UDF which figures out if a given number is Armstrong or not.

Program :10

```
#include <iostream>
using namespace std;

bool ArmstrongNumber(int num);

int main()
{
        int num;
        bool flag;
        cout<<"Enter a positive  number : ";
        cin>>num;

        flag = ArmstrongNumber(num);
        if(flag == true)
           cout<<"Given number is Armstrong number";
        else
           cout<<"Given number is not Armstrong number";

        return 0;
}

bool ArmstrongNumber(int num)
{
   int temp, sum=0, digit;
   bool isArmstrong;

        temp = num;
        while(temp != 0)
        {
        digit = temp % 10;
        sum = sum +(digit * digit * digit);
        temp = temp/10;
        }
        if(sum==num)
        isArmstrong = true;
        else
        isArmstrong = false;

  return isArmstrong;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase 5\10.exe
Enter a positive number : 51
Given number is not Armstrong number

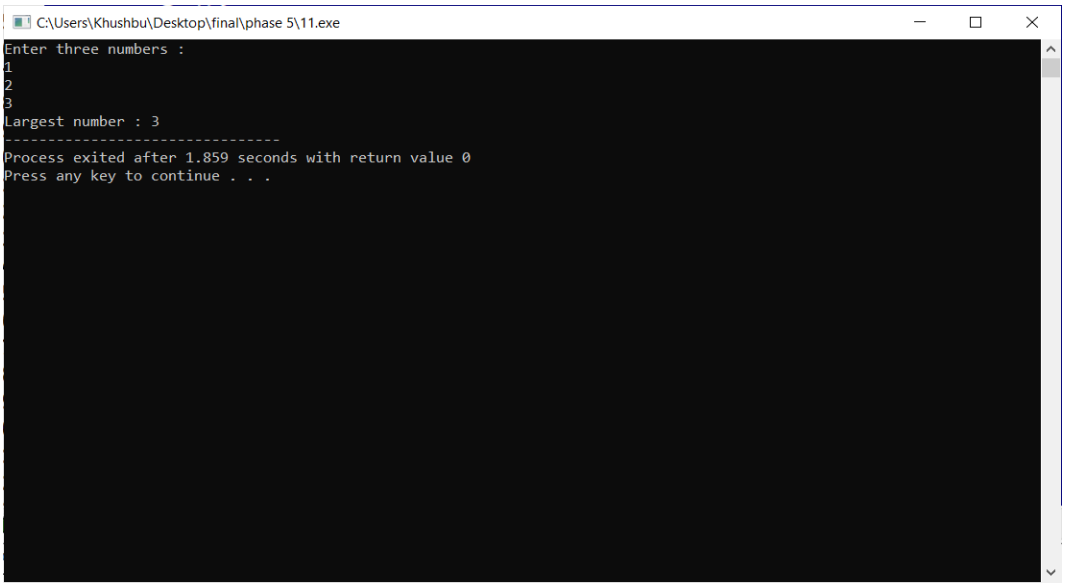
Process exited after 1.341 seconds with return value 0
Press any key to continue . . .

Aim : Declare a result of the survey that tells us which country have largest Army strength, US, China or India. Design a C++ UDF to announce the result of this survey to the public.

Program :11

```
#include <iostream>
using namespace std;
void Large();
int main()
{
   Large();
  return 0;
}
void Large()
{
   float n1, n2, n3;
    cout << "Enter three numbers : " << endl;
    cin >> n1 >> n2 >> n3;

    if(n1 >= n2 && n1 >= n3)
        cout << "Largest number : " << n1;

    if(n2 >= n1 && n2 >= n3)
        cout << "Largest number : " << n2;

    if(n3 >= n1 && n3 >= n2)
        cout << "Largest number : " << n3;
}
```

Output :

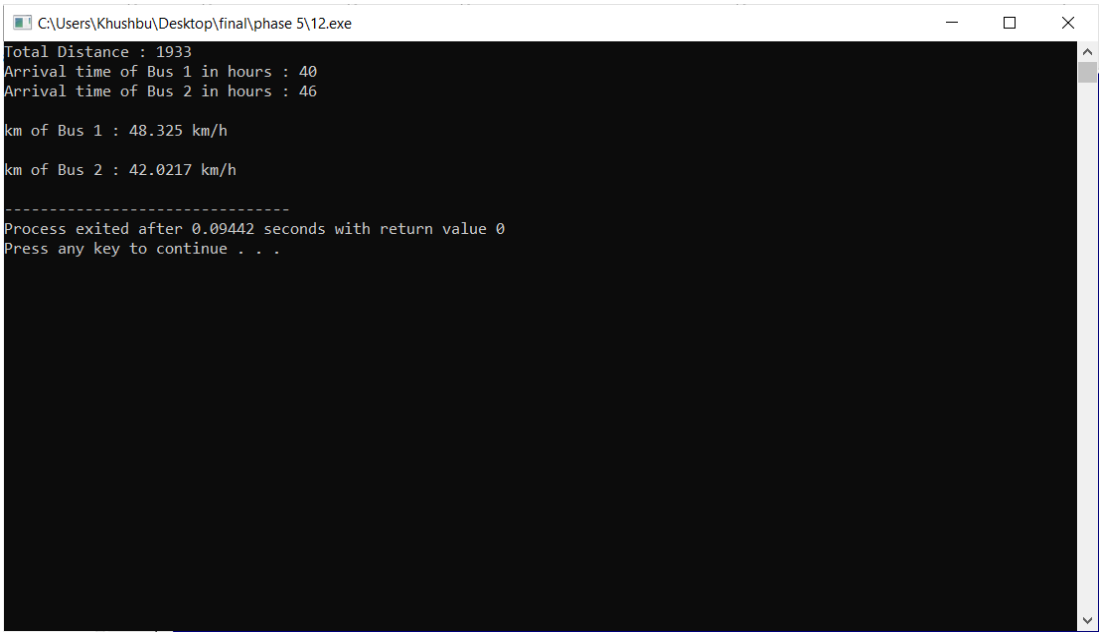


Aim : Two buses(Bus B1 & Bus B2) head forwards from Mumbai to Kolkata. Both of them have to cover total distance of 1933 KM. Bus B1 reached on destination with total time of 40 Hr & Bus B2 takes total time of 46 Hr. Find out velocity of both buses using a C++ UDF.

Program :12

```
#include<iostream>
using namespace std;
void km();
int main()
{
        km();
  return 0;
}
void km()
{
        float distance = 1933, bus1 = 40, bus2 = 46, a, b;
        cout << "Total Distance : " << distance << endl;
        cout << "Arrival time of Bus 1 in hours : " << bus1 << endl;
        cout << "Arrival time of Bus 2 in hours : " << bus2 << endl;

        a = distance/bus1;
        b = distance/bus2;

        cout << endl << "km of Bus 1 : " << a << " km/h" << endl;
        cout << endl << "km of Bus 2 : " << b << " km/h" << endl;
}
```

Output :



Aim :

Develop a C++ solution for Maths students to solve all types Geometry problems such likeI

- Area of Circlg
- Perimeter of Circlg
- Area of Squarg
- Area of Rectanglg
- Area of Trianglg
- Area of Sphere
-

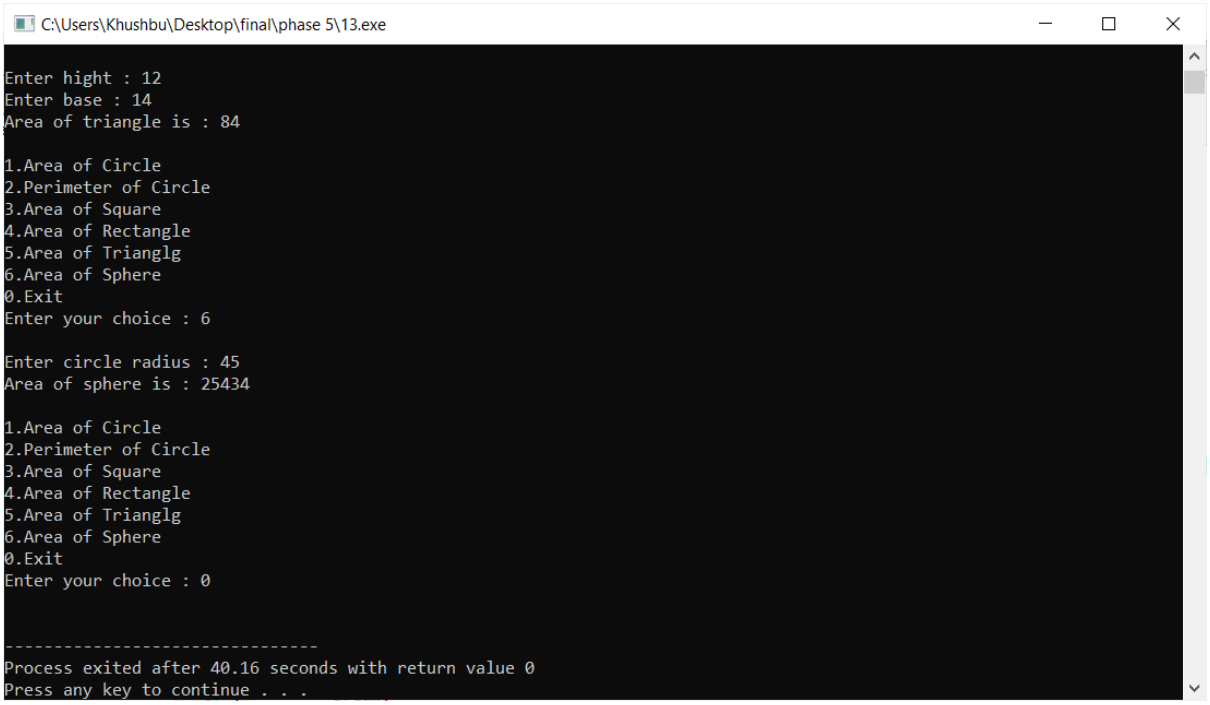
Program :13

```
#include<iostream>
using namespace std;
void area_circle()
{
	int r;
	float ans;
	cout << "Enter circle radius : ";
	cin >> r;
	ans=3.14*r*r;
	cout << "Area of circle is : " << ans << endl;
}
void peri_circle()
{
	int r;
	float p;
	cout << "Enter circle radius : ";
	cin >> r;
	p=2*3.14*r;
	cout << "Perimeter of circle is : " << p << endl;
}
void area_sqare()
{
	int s;
	float ans;
	cout << "Enter value of sqare side : ";
	cin >> s;
	ans=4*s;
	cout << "Area of square is : " << ans << endl;
}
void area_rect()
{
	int l,b;
	float ans;
	cout << "Enter length : ";
	cin >> l;
	cout << "Enter breadth : ";
	cin >> b;
```

```
	ans=l*b;
	cout << "Area of rectangle is : " << ans << endl;
}
void area_tri()
{
	int h,b;
	float ans;
	cout << "Enter hight : ";
	cin >> h;
	cout << "Enter base : ";
	cin >> b;
	ans=0.5*h*b;
	cout << "Area of triangle is : " << ans << endl;
}
void area_sphere()
{
	int r;
	float ans;
	cout << "Enter circle radius : ";
	cin >> r;
	ans=4*3.14*r*r;
	cout << "Area of sphere is : " << ans << endl;
}
int main()
{
	int ch;
	do
	{
		cout << endl;
		cout << "1.Area of Circle" << endl
		<< "2.Perimeter of Circle" << endl
		<< "3.Area of Square" << endl
		<< "4.Area of Rectangle" << endl
		<< "5.Area of Trianglg" << endl
		<< "6.Area of Sphere" << endl
		<< "0.Exit" << endl
		<< "Enter your choice : ";
		cin >> ch;
		cout << endl;
		switch(ch)
		{
		case 1:
				area_circle();
		break;
		case 2:
			peri_circle();
		break;
		case 3:
			area_sqare();
		break;
```

```
                case 4:
                        area_rect();
                break;
                case 5:
                        area_tri();
                break;
                case 6:
                        area_sphere();
                break;
                case 0:
                        break;
                default:
                        cout << "Invalid choice!!" << endl << "Please try again!!" <<
                        endl;
main();
}
}while(ch!=0);
return 0;
}
```

Output :

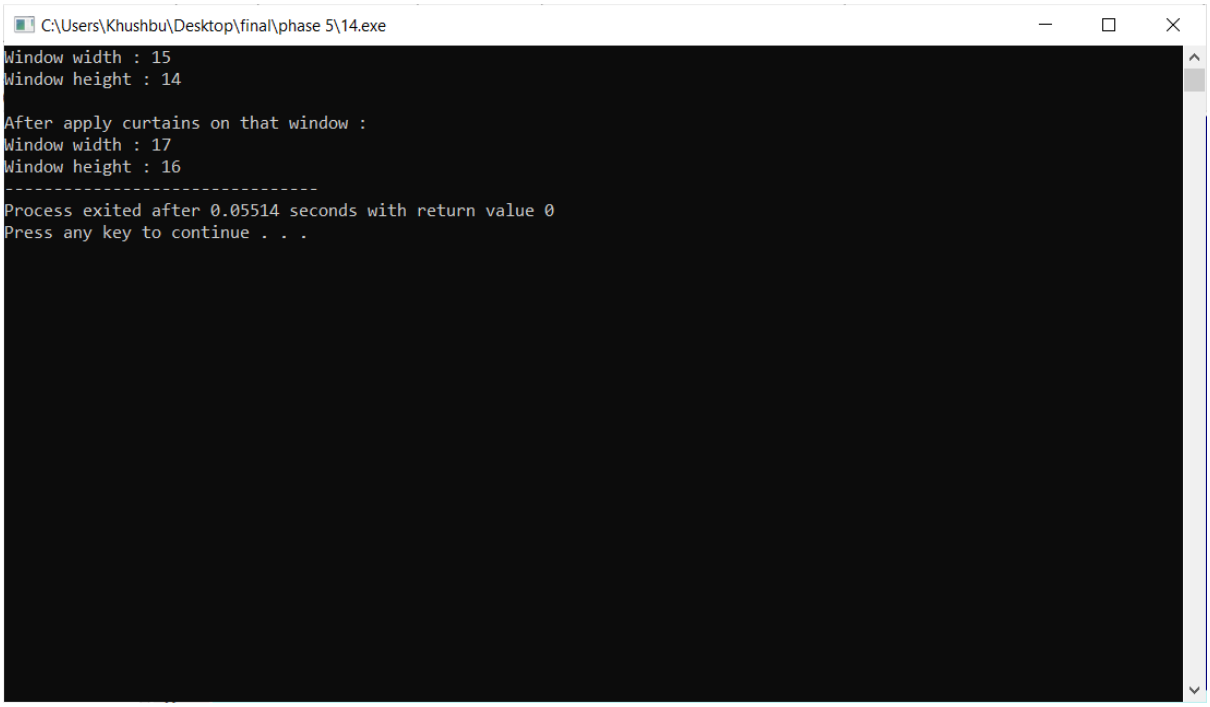


Aim : A window on a side wall have a dimension of 10x4 feet. Kaveri wants to apply curtains on that window such that a window will perfectly coverd from all sides with extra 2 feet. Design a C++ UDF with figures out if a given dimensions of curtains satisfies mentioned criteria or not.

Program :14

```
#include<iostream>
using namespace std;
void c(int n, int m)
{
	cout << endl << "After apply curtains on that window : " << endl;
	cout << "Window width : " << n << endl;
	cout << "Window height : " << m;
}
class Window
{
	public:
		int w1=15,h1=14,w2,h2;
		Window()
		{
			cout << "Window width : " << w1 << endl;
			cout << "Window height : " << h1 << endl;
		}
		void getData()
		{
			w2=w1+2;
			h2=h1+2;
			c(w2,h2);
		}
};
int main()
{
	Window o1;
	o1.getData();
	return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase 5\14.exe
Window width : 15
Window height : 14
After apply curtains on that window :
Window width : 17
Window height : 16

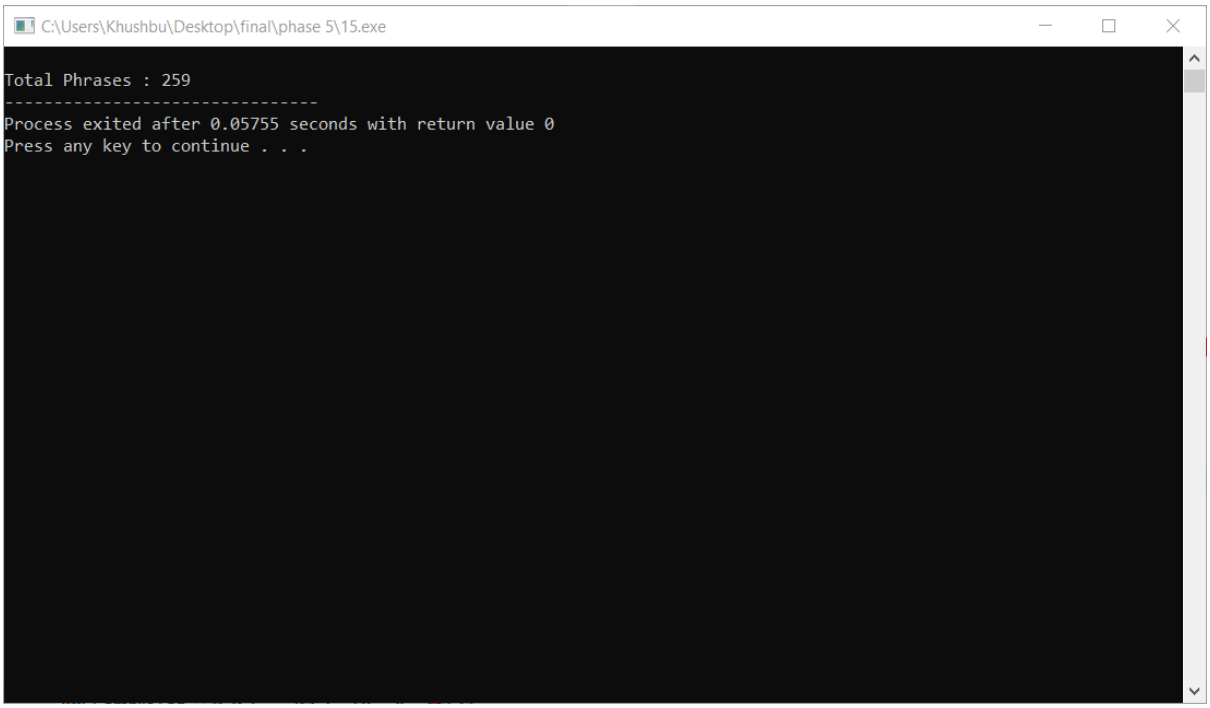
Process exited after 0.05514 seconds with return value 0
Press any key to continue . . .

Aim : Determine how many phrases(of 350x90 px dimensions) are perfectly arranged in an A4 size Canvas with distance of 8 px between all phrases. Develop a C++ UDF to count total number of phrases arranged in an A4 size Canvas.

Program :15

```
#include<iostream>
using namespace std;
void a()
{
	int a,b,c;
	a=2480/354;
	b=3508/94;
	c=a*b;
	cout << endl << "Total Phrases : " << c;
}
class B
{
	public:
	Phras()
	{
		cout << "A4 paper Size : 2480 x 3508 px" << endl;
		cout << "Phrases Size : 350 x 90 px" << endl;
	}
	void getData()
	{
		a();
	}
};
int main()
{
	B b;
	b.getData();
	return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase 5\15.exe
Total Phrases : 259

Process exited after 0.05755 seconds with return value 0
Press any key to continue . . .

Phase :6

Aim : Create>an Add to Cart system for only Grocery Items Such as:

- Breads, Wheat,Milk,Soup,FrozenFoods,Cheese.

Customer can buy these items in any quantity he/she wants. A customer can add/update/delete any item in any quantity whenever he/she wants.
Givecustomer a final bill including all types of TAX on Total price. Identify if a customer can pay bill or not With his/her available wallet amount.

Program :1
Output :

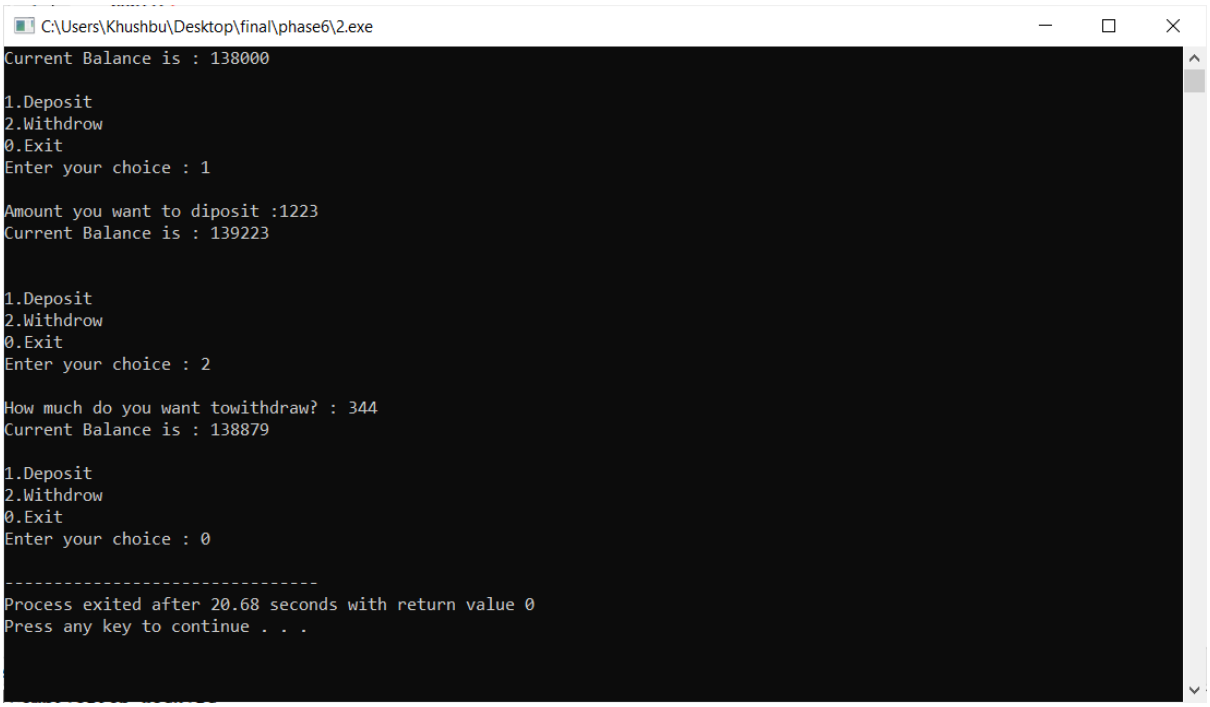
Aim : A Businessman was bankrupted in a Scam with a minimal amount left in a bank of ₹. 18,000. After some months of Hard Work, he earned an external amount of ₹. 1,20,000. Now He might be goes to the bank and do a deposit or withdraw some money as he wants. Prepare a C++ solution for this Scenario with all required validations and criterias

Program :2

```
#include<iostream>
using namespace std;
class A
{
	private:
	int balance,b,with,c;
	public:
	A()
	{
		balance=18000+120000;
		cout << "Current Balance is : " << balance << endl;
		do
		{
		cout << endl << "1.Deposit" << endl
		<< "2.Withdrow" << endl
		<< "0.Exit" << endl
		<< "Enter your choice : " ;
		cin >> c;
		switch(c)
		{
			case 1:
				cout << endl << "Amount you want to diposit :";
```

```
                cin >> b;
                balance+=b;
                cout << "Current Balance is : " << balance <<endl << endl;
            break;
            case 2:
                cout << endl << "How much do you want towithdraw? : ";
                cin >> with;
                if(balance<with)
                {
                cout << "You do not have enough money      in your account to
withdraw." << endl;
                }
                else
                {
                balance-=with;
                cout << "Current Balance is : " <<     balance << endl;
            }
            break;
            case 0:
            break;
            }
        }while(c!=0);
        }
};
int main()
{
    A a;
    return 0;
}
```

Output :



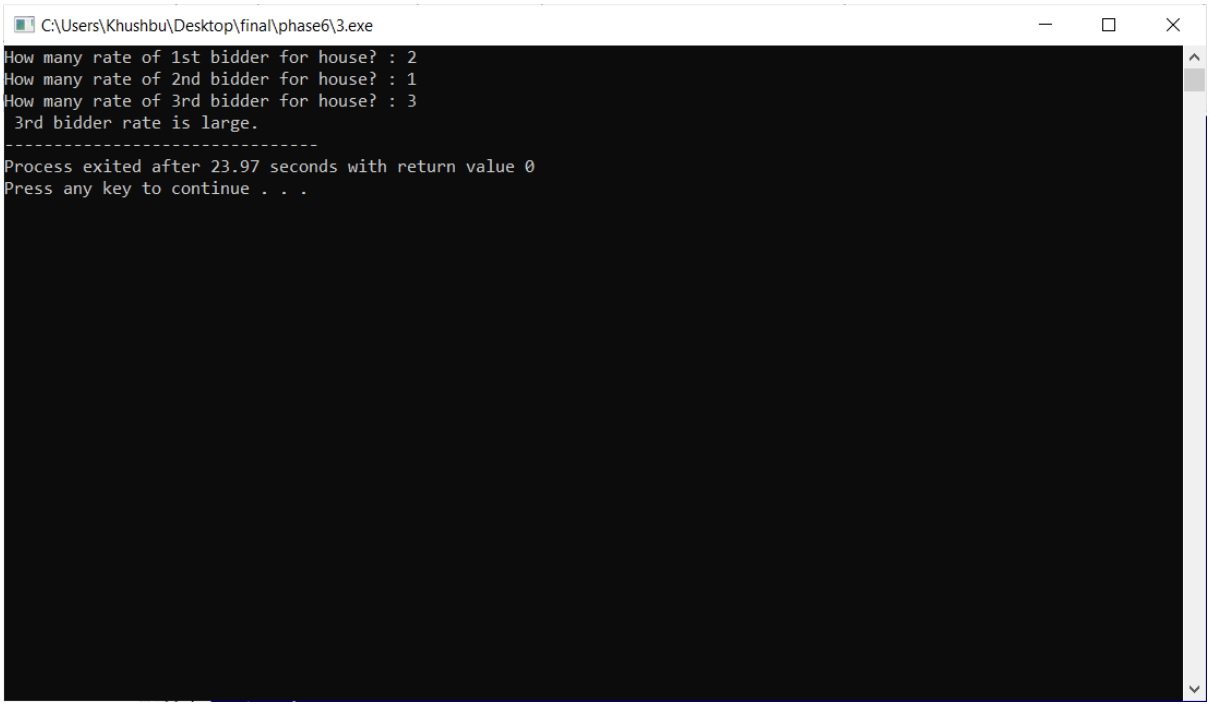
Aim : An Auction is helding at Arizona for selling an old Haunted house For the reason this is a haunted house, Only three gigantic companies took a part in this Auction Sell this haunted house to the highest bidder With count of three Use C++ with all required criteria To build this type of Auction System

Program :3

```
#include<iostream>
using namespace std;
void A()
{
	int a,b,c;
	cout << "How many rate of 1st bidder for house? : ";
	cin >> a;
	cout << "How many rate of 2nd bidder for house? : ";
	cin >> b;
	cout << "How many rate of 3rd bidder for house? : ";
	cin >> c;
	if(b==a&&b==c)
	{
		cout << "All bidders rate are same!";
	}
	else if(a==b)
	{
		cout << " 1st and 2nd bidder rate are same!";
	}
	else if(a==c)
	{
		cout << " 1st and 3rd bidder rate are same!";
	}
	else if(b==c)
	{
		cout << " 2nd and 3rd bidder rate are same!";
	}
	else
	{
		if(a>b&&a>c)
		{
		cout << " 1st bidder rate is large.";
		}
		else if(b>a&&b>c)
		{
		cout << " 2nd bidder rate is large.";
		}
		else if(c>a&&c>b)
		{
		cout << " 3rd bidder rate is large.";
```

```
                }
        }
}
int main()
{
        A();
return 0;
}
```

Output :

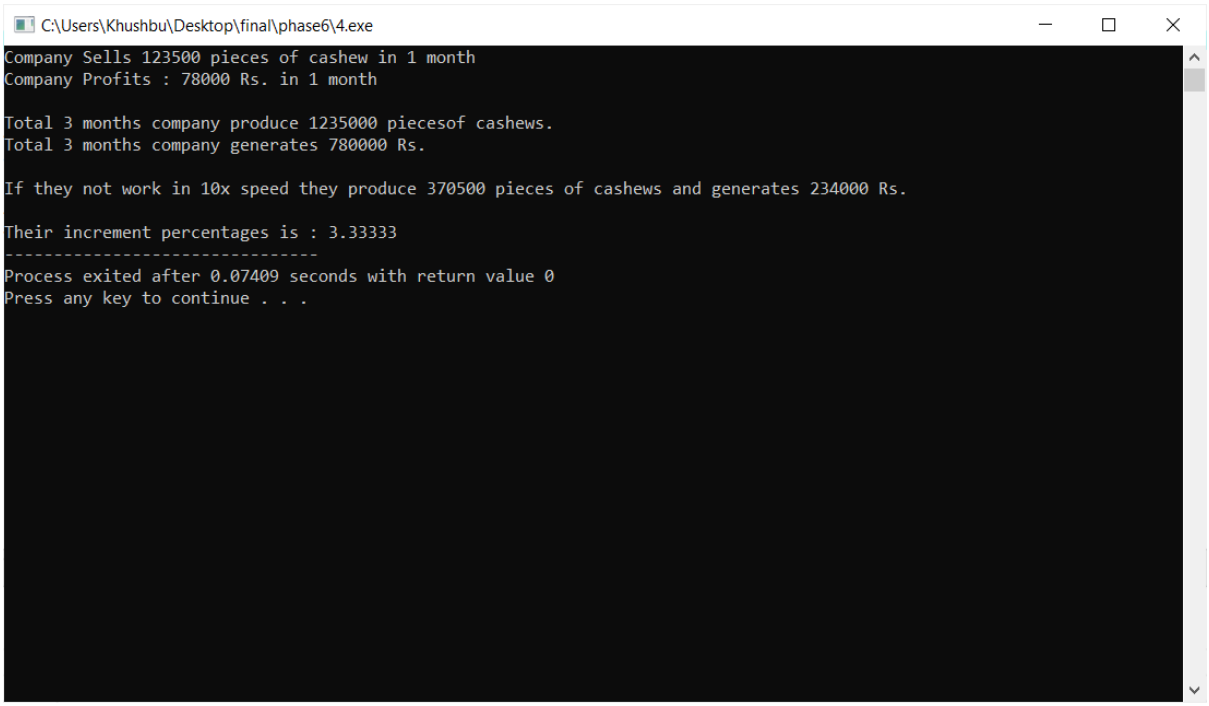


Aim : Build a C++ system which predicts a total profit of a Cashew Company in Goa. If this company sells 1,23,500 pieces of cashews in 1 month, then it generates a total of ₹. 78,000 in a month. Help this company by producing 10X more cashews in 3 months and display total revenue with increment percentage.

Program :4

```
#include<iostream>
using namespace std;
class A
{
	private:
		int a=123500,b=78000,c,d;
		float e,f;
	public:
	A()
	{
		cout << "Company Sells " << a << " pieces of cashew in 1 month" <<endl<<
"Company Profits : " << b << " Rs. in 1 month" << endl;
		c=10*a;
		d=10*b;
		cout << endl << "Total 3 months company produce " << c << " piecesof
cashews." << endl;
		cout << "Total 3 months company generates " << d << " Rs." << endl;
		e=3*a;
		f=3*b;
		cout << endl << "If they not work in 10x speed they produce " << e<< " pieces
of cashews and generates " << f << " Rs." << endl;
		cout << endl << "Their increment percentages is : " << c/e;
	}
};
int main()
{
	A a;
	return 0;
}
```

Output :

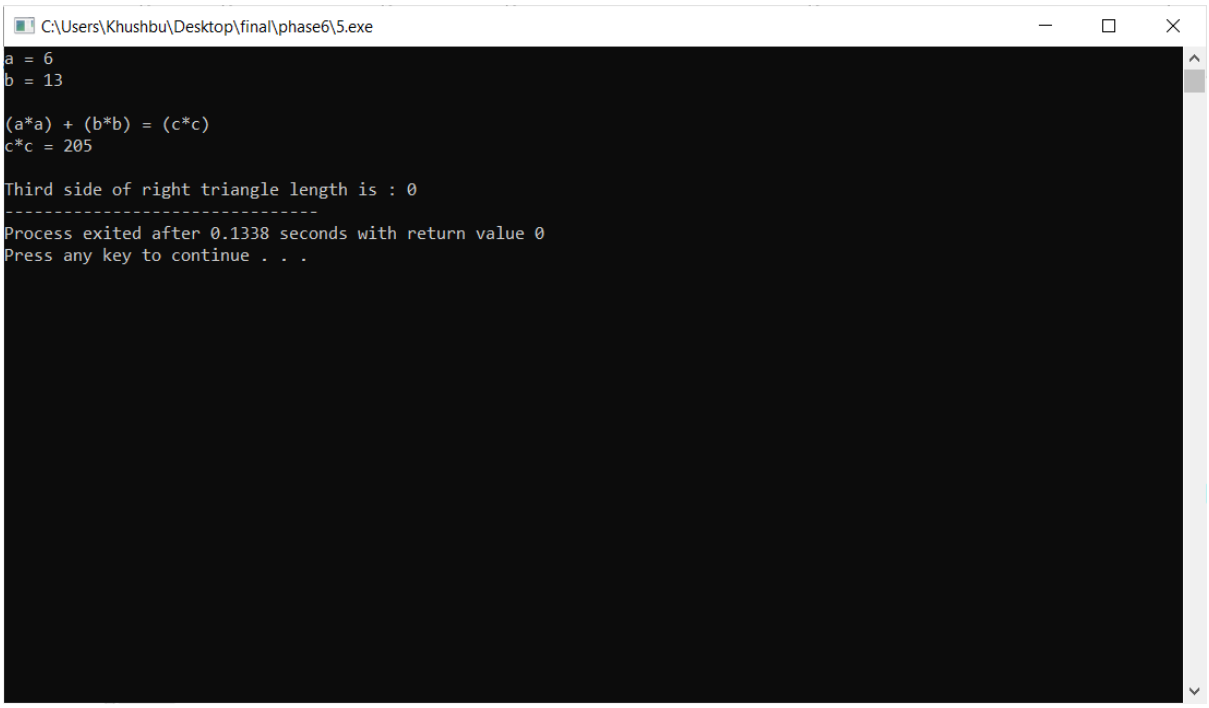

C:\Users\Khushbu\Desktop\final\phase6\4.exe
Company Sells 123500 pieces of cashew in 1 month
Company Profits : 78000 Rs. in 1 month
Total 3 months company produce 1235000 piecesof cashews.
Total 3 months company generates 780000 Rs.
If they not work in 10x speed they produce 370500 pieces of cashews and generates 234000 Rs.
Their increment percentages is : 3.33333
Process exited after 0.07409 seconds with return value 0
Press any key to continue . . .

Aim : The two short sides of a right triangle are 6 cm and 13 cm. Find the length of the third side using Pythagoras Theorem with help of C++.

Program :5

```
#include<iostream>
using namespace std;
class T
{
	private:
		float a=6,b=13,c,x,y,z=0;
	public:
		T()
		{
		y = (a*a)+(b*b);
		cout << "a = " << a << endl;
		cout << "b = " << b << endl << endl;
		cout << "(a*a) + (b*b) = (c*c) "<< endl;
		cout << "c*c = " << y << endl << endl;
	}
	void getData()
	{
		y=x/2;
		while(z!=z)
		{
		z = y;
		y = (x/z+z)/2;
		}
		cout << "Third side of right triangle length is : " << y;
	}
};
int main()
{
	T t;
	t.getData();
	return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase6\5.exe
a = 6
b = 13
(a*a) + (b*b) = (c*c)
c*c = 205
Third side of right triangle length is : 0
Process exited after 0.1338 seconds with return value 0
Press any key to continue . . .

Aim : A 26 m long rope is stretched from the top of a 13 m tree to the ground. Find the distance between the tree and the end of the rope on the ground.

Program :6

```
#include<iostream>
using namespace std;
class A
{
	private:
	int a=26,b=13,ans;
	public:
	A()
	{
		cout << "a = " << a << "m" << endl;
		cout << "b = " << b << "m" << endl;
	}
	void getData()
	{
		ans=a/b;
		cout << endl << "Distance between the tree and the end of the rope on the
ground is : "<< ans << "m";
	}
};
int main()
{
	A a;
	a.getData();
	return 0;
}
```

Output :

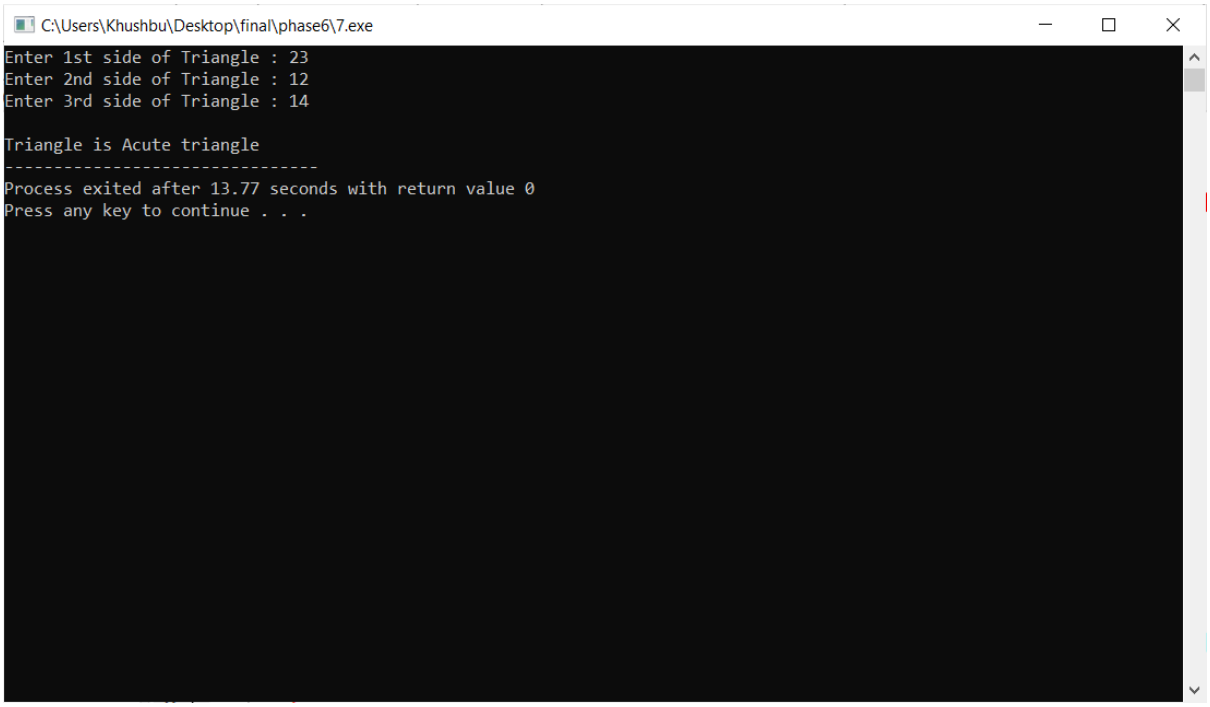

C:\Users\Khushbu\Desktop\final\phase6\6.exe
a = 26m
b = 13m
Distance between the tree and the end of the rope on the ground is : 2m
Process exited after 0.07257 seconds with return value 0
Press any key to continue . . .

Aim : Build a C++ system which helps a Mathematician to figure out the type of a Triangle. Bases on Pythagoras' theorem, find out if a triangle is: obtuse, right or acute.

Program :7

```
#include<iostream>
using namespace std;
class A
{
	private:
		int a,b,c,d=0;
	public:
	A()
	{
		cout<<"Enter 1st side of Triangle : ";
		cin>>a;
		cout<<"Enter 2nd side of Triangle : ";
		cin>>b;
		cout<<"Enter 3rd side of Triangle : ";
		cin>>c;
	}
	void getData()
	{
		d=a+b+c;
		if(d==180)
		{
			cout<<endl<<"Triangle is Right side triangle";
		}
		else if(d<180)
		{
			cout<<endl<<"Triangle is Acute triangle";
		}
		else if(d>180)
		{
			cout<<endl<<"Triangle is Obtuse triangle";
		}
	}
};
int main()
{
	A a;
	a.getData();
	return 0;
}
```

Output :

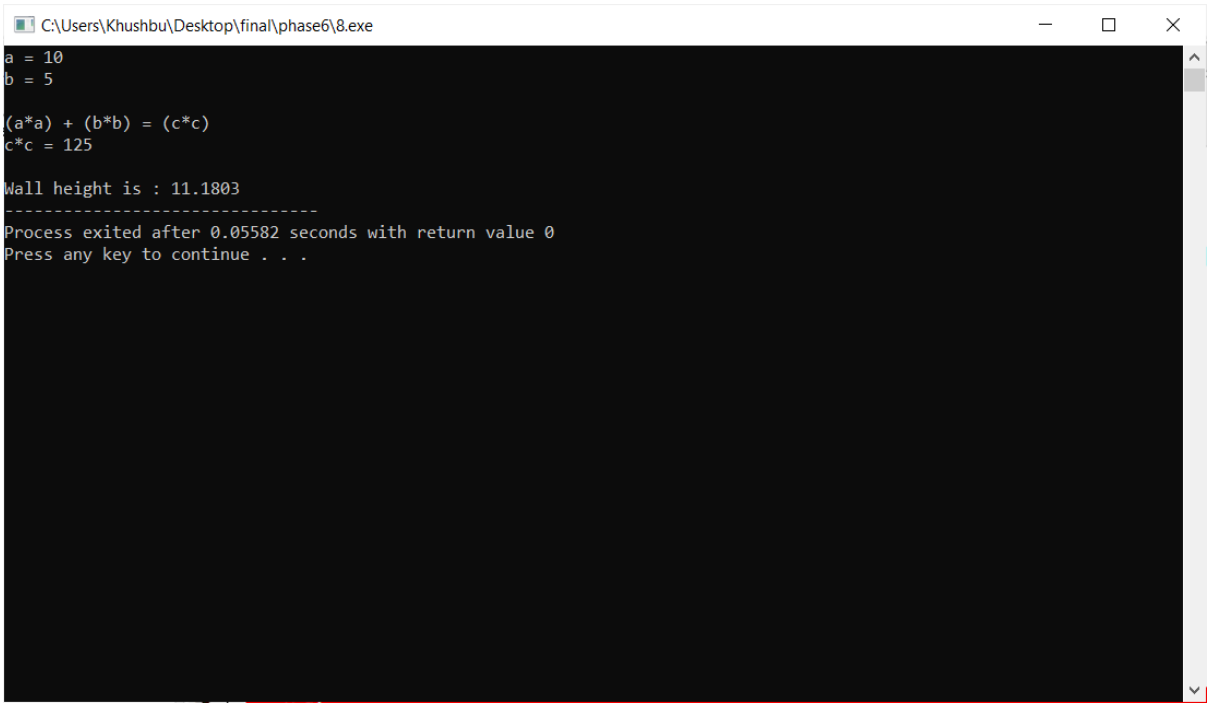

C:\Users\Khushbu\Desktop\final\phase6\7.exe
Enter 1st side of Triangle : 23
Enter 2nd side of Triangle : 12
Enter 3rd side of Triangle : 14
Triangle is Acute triangle
Process exited after 13.77 seconds with return value 0
Press any key to continue . . .

Aim : Build a C++ system which helps a Mathematician to figure out the type of a Triangle. Bases on Pythagoras' theorem, find out if a triangle is: obtuse, right or acute.

Program :8

```
#include<iostream>
using namespace std;
class A
{
	private:
		float a=10,b=5,c,d,e,z=0;
	public:
	A()
	{
		d = (a*a)+(b*b);
		cout << "a = " << a << endl;
		cout << "b = " << b << endl << endl;
		cout << "(a*a) + (b*b) = (c*c) "<< endl;
		cout << "c*c = " << d << endl << endl;
	}
	void getData()
	{
		e=d/2;
		while(e!=z)
		{
			z = e;
			e = (d/z+z)/2;
		}
		cout << "Wall height is : " << e;
	}
};
int main()
{
	A a;
	a.getData();
	return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase6\8.exe
a = 10
b = 5
(a*a) + (b*b) = (c*c)
c*c = 125
Wall height is : 11.1803
Process exited after 0.05582 seconds with return value 0
Press any key to continue . . .

Aim : Design a GST Calculator in C++ to find total TAX on various types of categorized items. Apply proper types of Indian GST TAX varients based on different types of Goods. GST have been divided into four GST rates – 5%, 12%, 18%, and 28% by the GST Council.

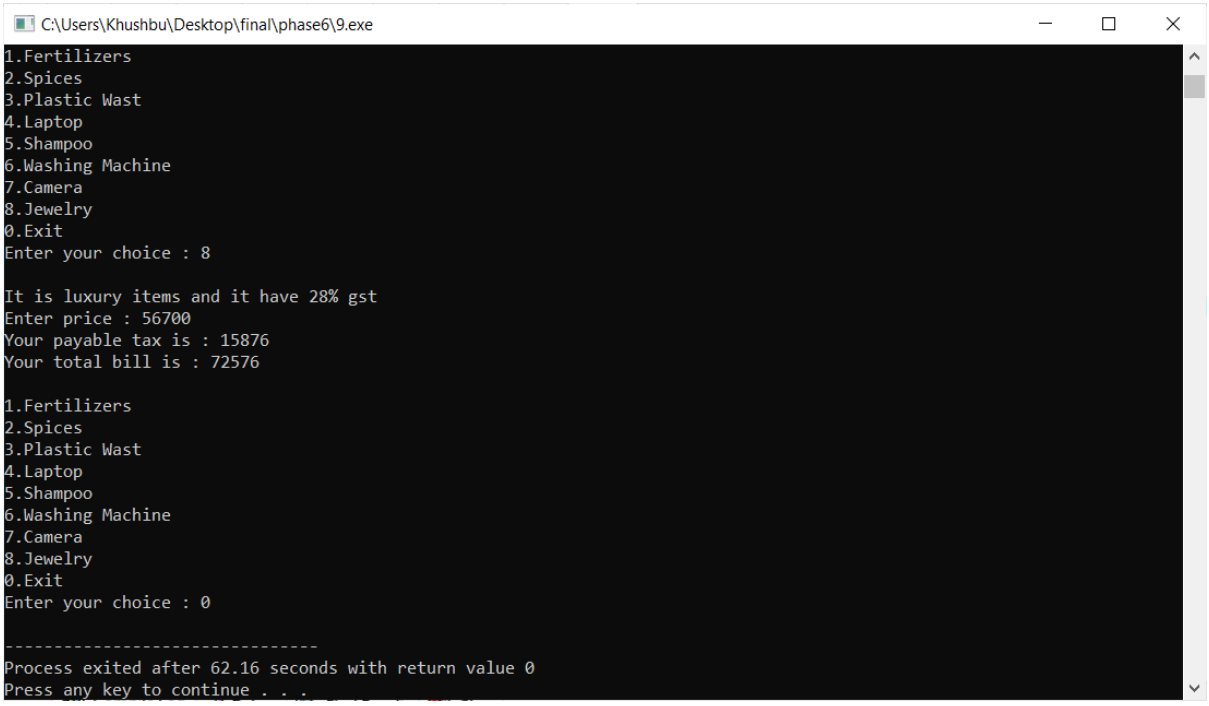
Program :9

```
#include<iostream>
using namespace std;
class		A
{
	private:
		float a;
		int b,c;
	public:
	A()
	{
	do
	{
		cout << endl << "1.Fertilizers" << endl
		<< "2.Spices" << endl
		<< "3.Plastic Wast" << endl
		<< "4.Laptop" << endl
		<< "5.Shampoo" << endl
		<< "6.Washing Machine" << endl
		<< "7.Camera" << endl
		<< "8.Jewelry" << endl
		<< "0.Exit" << endl
		<< "Enter your choice : ";
		cin >> c;
	switch(c)
	{
		case 1:
			cout << endl << "It is household items and it have 5% gst" << endl;
			cout << "Enter price : ";
			cin >> b;
			a=b*5/100;
			cout << "Your payable tax is : " << a << endl;
			cout << "Your total bill is : " << b+a << endl;
		break;
		case 2:
			cout << endl << "It is household items and it have 5% gst" << endl;
			cout << "Enter price : ";
			cin >> b;
			a=b*5/100;
			cout << "Your payable tax is : " << a << endl;
			cout << "Your total bill is : " << b+a << endl;
		break;
		case 3:
```

```
                cout << endl << "It is an industrial intermediaries items and it have
12% gst" << endl;
                cout << "Enter price : ";
                cin >> b;
                a=b*12/100;
                cout << "Your payable tax is : " << a << endl;
                cout << "Your total bill is : " << b+a << endl;
        break;
        case 4:
                cout << endl << "It is an industrial intermediaries items and it have
18% gst" << endl;
                cout << "Enter price : ";
                cin >> b;
                a=b*18/100;
                cout << "Your payable tax is : " << a << endl;
                cout << "Your total bill is : " << b+a << endl;
        break;
        case 5:
                cout << endl << "It is an industrial intermediaries items and it have
18% gst" << endl;
                cout << "Enter price : ";
                cin >> b;
                a=b*18/100;
                cout << "Your payable tax is : " << a << endl;
                cout << "Your total bill is : " << b+a << endl;
        break;
        case 6:
                cout << endl << "It is an industrial intermediaries items and it have
18% gst" << endl;
                cout << "Enter price : ";
                cin >> b;
                a=b*18/100;
                cout << "Your payable tax is : " << a << endl;
                cout << "Your total bill is : " << b+a << endl;
        break;
        case 7:
                cout << endl << "It is an industrial intermediaries items and it have
18% gst" << endl;
                cout << "Enter price : ";
                cin >> b;
                a=b*18/100;
                cout << "Your payable tax is : " << a << endl;
                cout << "Your total bill is : " << b+a << endl;
        break;
        case 8:
        cout << endl << "It is luxury items and it have 28% gst" << endl;
                cout << "Enter price : ";
                cin >> b;
                a=b*28/100;
                cout << "Your payable tax is : " << a << endl;
```

```
                cout << "Your total bill is : " << b+a << endl;
            break;
            case 0:
            break;
            default:
                cout << "Invalid choice!";
            break;
            }
        }while(c!=0);
        }
};
int main()
{
        A a;
        return 0;
}
```

Output :



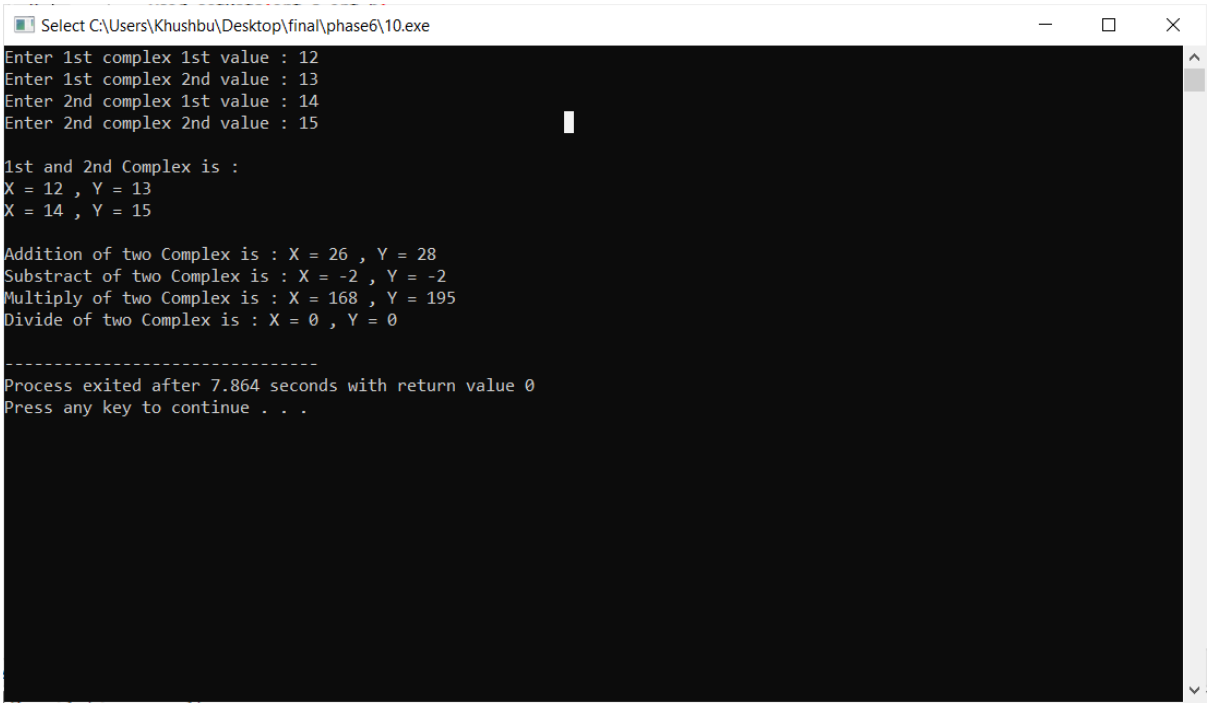
Aim : Develop a C++ solution by which a user can add/subtract/multiply/divide two Complex numbers with help of Operator Overloading concept. In the context of math, a complex number contains two parts: a real part and an imaginary part.

Program :10

```
#include<iostream>
using namespace std;
class Complex
{
	private:
		int real,img;
	public:
		void setData(int a,int b)
		{
			this->real=a;
			this->img=b;
		}
		void getData()
		{
			cout << "X = " << this->real << " , "<< "Y = " << this->img << endl;
		}
		Complex operator+(Complex n)
		{
			Complex temp;
			temp.real=this->real+n.real;
			temp.img=this->img+n.img;
			return temp;
		}
		Complex operator-(Complex n)
		{
			Complex temp;
			temp.real=this->real-n.real;
			temp.img=this->img-n.img;
			return temp;
		}
		Complex operator*(Complex n)
		{
			Complex temp;
			temp.real=this->real*n.real;
			temp.img=this->img*n.img;
			return temp;
		}
		Complex operator/(Complex n)
		{
			Complex temp;
			temp.real=this->real/n.real;
			temp.img=this->img/n.img;
```

```
                return temp;
            }
};
int main()
{
    Complex c1,c2,c3;
    int a,b,c,d;
    cout << "Enter 1st complex 1st value : ";
    cin >> a;
    cout << "Enter 1st complex 2nd value : ";
    cin >> b;
    cout << "Enter 2nd complex 1st value : ";
    cin >> c;
    cout << "Enter 2nd complex 2nd value : ";
    cin >> d;
    cout << endl << "1st and 2nd Complex is : " << endl;
    c1.setData(a,b);
    c2.setData(c,d);
    c1.getData();
    c2.getData();
    c3=c1+c2;
    cout << endl << "Addition of two Complex is : ";
    c3.getData();
    c3=c1-c2;
    cout << "Substract of two Complex is : ";
    c3.getData();
    c3=c1*c2;
    cout << "Multiply of two Complex is : ";
    c3.getData();
    c3=c1/c2;
    cout << "Divide of two Complex is : ";
    c3.getData();
return 0;
}
```

Output :


Select C:\Users\Khushbu\Desktop\final\phase6\10.exe
Enter 1st complex 1st value : 12
Enter 1st complex 2nd value : 13
Enter 2nd complex 1st value : 14
Enter 2nd complex 2nd value : 15
1st and 2nd Complex is :
X = 12 , Y = 13
X = 14 , Y = 15
Addition of two Complex is : X = 26 , Y = 28
Substract of two Complex is : X = -2 , Y = -2
Multiply of two Complex is : X = 168 , Y = 195
Divide of two Complex is : X = 0 , Y = 0

Process exited after 7.864 seconds with return value 0
Press any key to continue . . .

Aim : Build an Indian Regional Festival system in C++. User can enter any date of current running year, and bases on that date display which festival will be coming on that date

Program :11

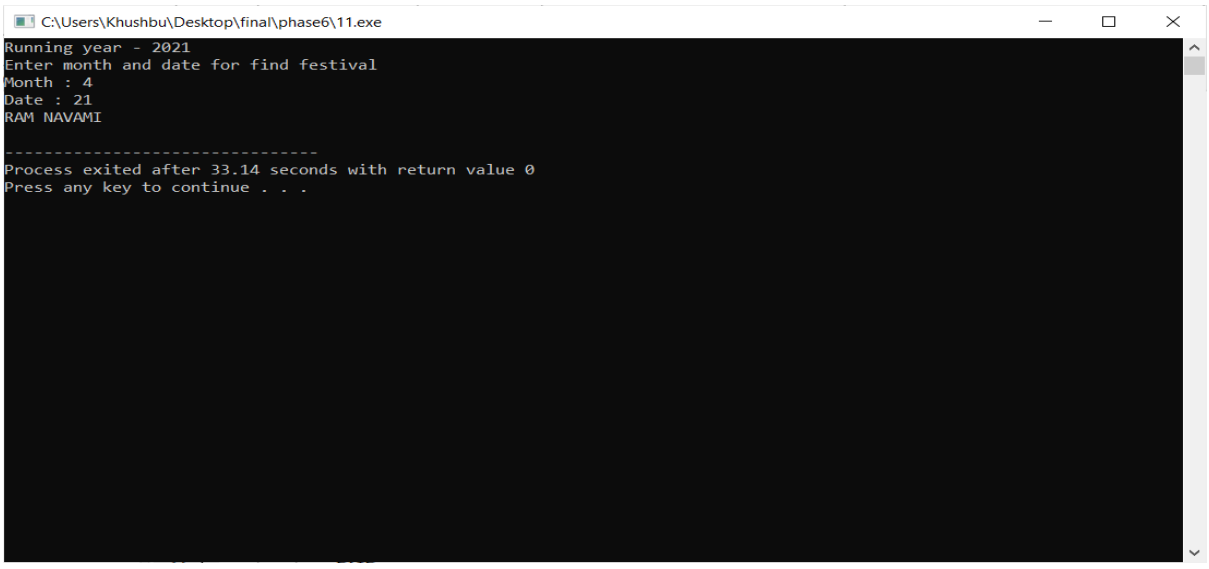
```
#include<iostream>
using namespace std;
class	A
{
	private:
		int d, m;
	public:
		A()
		{
			cout << "Running year - 2021" << endl;
			cout << "Enter month and date for find festival" << endl;
			cout << "Month : ";
			cin >> m;
			if(m==2||m==5||m==6)
			{
				cout << "No festival on this month in 2021!!" << endl;
			}
			else
			{
				cout << "Date : ";
				cin >> d;
			}
		}
		void getData()
		{
			if(m==1)
			{
				if(d==14)
					cout << "UTTARAYAN" << endl;
				else if(d==1)
					cout << "NEW YEAR" << endl;
				else if(d==13)
					cout << "LOHRI" << endl;
				else if(d==23)
					cout << "SUBHAS CHANDRA BOSE JAYANTI"
<<endl;
				else if(d==26)
					cout << "REPUBLIC DAY" << endl;
				else
					cout << "No festival on this date in 2021!!" << endl;
			}
			else
			{
```

```
                if(m==3)
                {
                        if(d==11)
                                cout << "MAHASHIVRATRI" << endl;
                        else if(d==28)
                                cout << "HOLI" << endl;
                        else if(d==29)
                                cout << "DHULETI" << endl;
                        else
                                cout << "No festival on this date in 2021!!" <<
                                endl;
                }
                else
                {
        if(m==4)
        {
                if(d==13)
                        cout << "GUDI PADWA" <<
                        endl;
                else if(d==14)
                        cout << "AMBEDKAR
                        JAYANTI" << endl;
                else if(d==21)
                        cout << "RAM NAVAMI" <<
                        endl;
                else if(d==27)
                        cout << "HANUMAN
                        JAYANTI" << endl;
                else
                        cout << "No festival on this date in 2021!!" <<endl;
        }
        else
        {
                if(m==7)
                {
                        if(d==12)
                                cout << "RATH YATRA"<< endl;
                        else if(d==24)
                                cout << "GURUPURNIMA" << endl;
                        else
                                cout << "No festival on this date in 2021!!"<<
endl;
                }
                else
                {
                        if(m==8)
                        {
                                if(d==15)
                                        cout <<"INDEPENDENCE DAY" <<
endl;
```

```
                                        else if(d==22)
                                                cout <<"RAKSHA BANDHAN" <<
endl;
                                        else if(d==30)
                                                cout <<"JANMASHTAMI" << endl;
                                        else
                                                cout << "No festival on this date in
2021!!"<< endl;
                                }
                                else
                                {
                                        if(m==9)
                                        {
                                                if(d==10)
                                                        cout <<"GANESH CHATURTHI" <<
endl;
                                                else
                                                        cout << "No festival on this date
in 2021!!" << endl;
                                        }
                                        else
                                        {
                                                if(m==10)
                                                {
                                                if(d==2)
                                                        cout << "GANDHI JAYANTI" << endl;
                                                else
                                                if(d==7)
                                                        cout << "NAVARATRI" << endl;
                                                else
                                                if(d==15)
                                                        cout << "DASHERA" << endl;
                                                else
                                                cout << "No festival on this date in 2021!!" <<
endl;
                                        }
                                        else
                                        {
                                                if(m==11)
                                                {
                                                if(d==2)
                                                cout << "DHANTERASH" << endl;
                                                else
                                                if(d==4)
                                                cout << "DIWALI" << endl;
                                                else
                                                if(d==6)
                                                cout << "BHAI DOOJ" << endl;
                                                else
                                                cout << "No festival on this date in
```

```
                                        2021!!" << endl;
                                        }
                                else
                                {
                                        if(m==12)
                                        {
                                                if(d==25)
                                                        cout << "CHRISTMAS" << endl;
                                                else
                                                        cout << "No festival on this date
in 2021!!" << endl;
                                        }
                                }
                        }
                }
        }
        }
        }
        }
        }
};
int main()
{
        A a;
        a.getData();
        return 0;
}
```

Output :



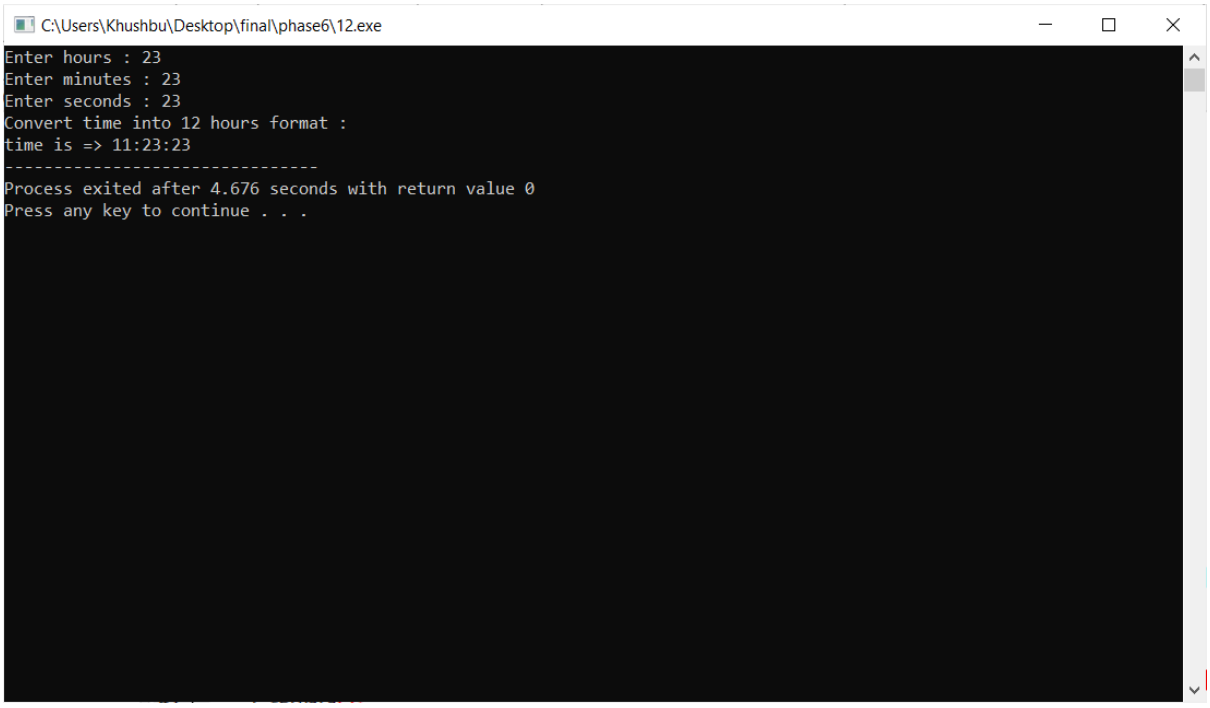
Aim : Prince wants to create a 24 Hr time convertor app in C++. In this app, a user can provide any 24 Hr time he/she wants but output must be produced in 12 Hr format. For example, i/p: 15 Hr, 32 Minutes o/p: 3:32 PM

Program :12

```
#include<iostream>
using namespace std;
class Time
{
	private:
		int h,m,s,s1=1;
	public:
	void setData()
		{
			cout << "Enter hours : ";
			cin >> h;
			cout << "Enter minutes : ";
			cin >> m;
			cout << "Enter seconds : ";
			cin >> s;
		}
		void getData()
		{
			if(h>24||h<0)
			{
				s1=0;
				cout << "Invalid hours!";
			}
			if(m>60||m<0)
			{
				s1=0;
				cout << "Invalid minutes!";
			}
			if(s>60||s<0)
			{
				s1=0;
				cout << "Invalid seconds!";
			}
			if(h>12)
			{
				h=h-12;
				cout << "Convert time into 12 hours format :" << endl;
				cout << "time is => " << h << ":" << m << ":" << s;
			}
		}
};
int main()
{
```

```
        Time t;
        t.setData();
        t.getData();
        return 0;
}
```

Output :



Aim : Build a Counter App in C++ using OOP concept. Initially the counter meant to be set as a value 0 using constructor. By pressing UPArrow from keyboard, counter will be increment and by pressing DOWN Arrow, counter will be decrement. You can use ASCII value concept by achieving this type of functionality at the execution time of a Program.

Program :13

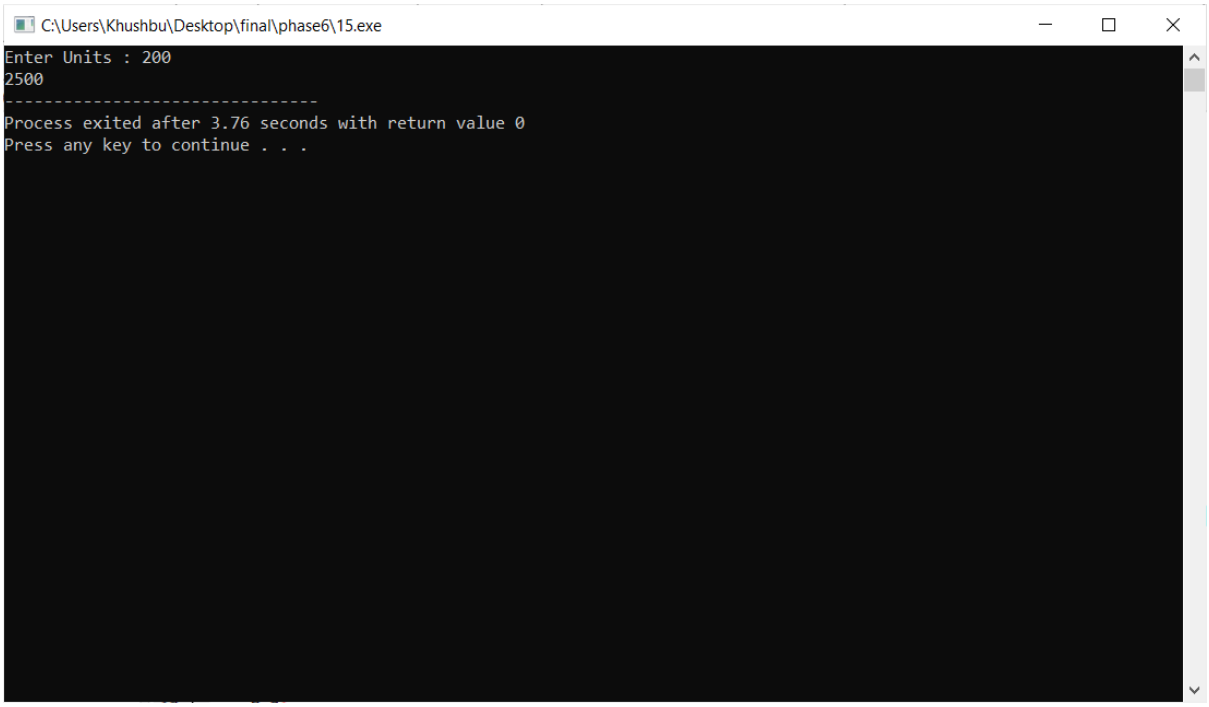
```
#include <conio.h>
#include <iostream>
using namespace std;
#define KEY_UP 72
#define KEY_DOWN 80
class A
{
	public:
	A()
	{
		int count=0;
		while(32)
		{
			count=0;
			switch(count=getch())
			{
				case KEY_UP:
					count++;
					cout << endl << "Up" << endl << "increment is : "
<<count << endl;
				break;
				case KEY_DOWN:
					count--;
					cout << endl << "Down" << endl << "decrement is :
"<< count << endl;
				break;
				default:
					cout << endl << "null" << endl;
				break;
			}
		}
	}
};
int main()
{
	A a;
	return 0;
}
```

Aim : Calculate an Electricity Bill of a House of one month based on total units burned. Develop a C++ solution for this calculation.

Program :14

```
#include<iostream>
using namespace std;
class A
{
	public:
		int get(int b)
		{
			if(b<=100)
			{
				return b*10;
			}
			else if(b<=200)
			{
				return(100*10)+(b-100)*15;
			}
			else if (b<=300)
			{
				return (100*10)+(100*15)+(b-200)*20;
			}
			else if (b>300)
			{
				return (100*10)+(100*15)+(100*20)+(b-300)*25;
			}
			return 0;
		}
};
int main()
{
	A a;
	int b;
	cout << "Enter Units : ";
	cin >> b;
	cout << a.get(b);
	return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase6\15.exe
Enter Units : 200
2500

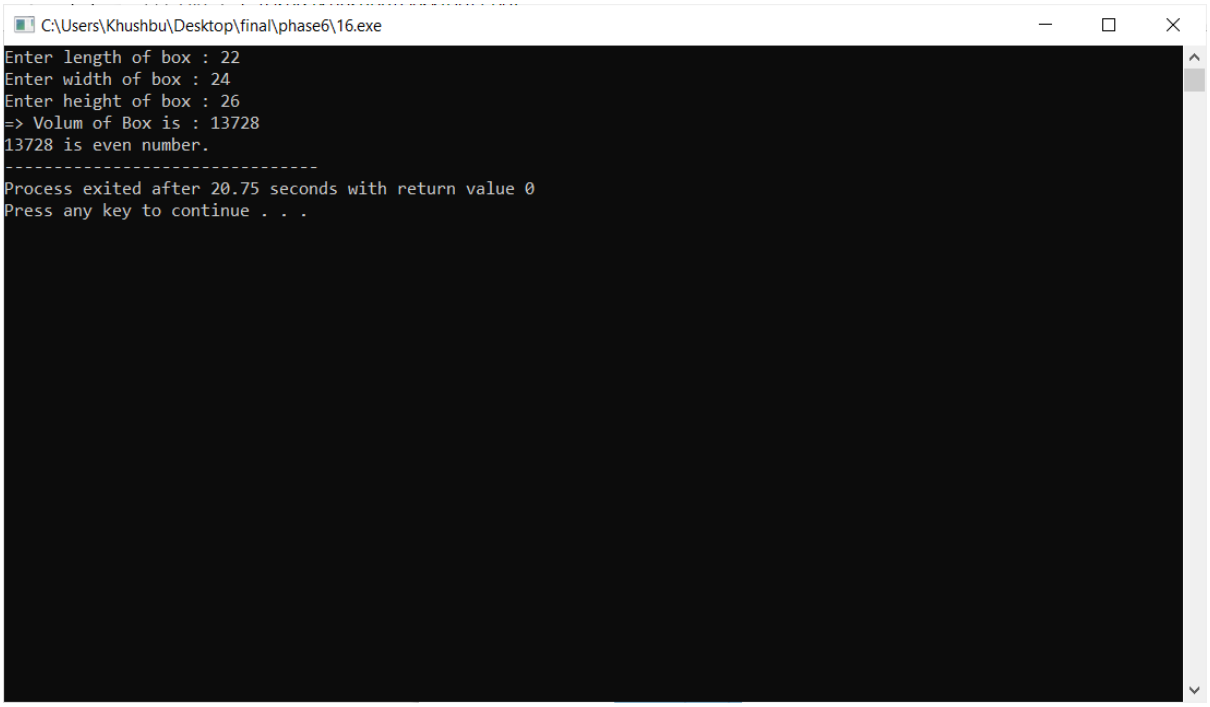
Process exited after 3.76 seconds with return value 0
Press any key to continue . . .

Aim : Find Volume of a Box using Parameterized Constructor and figure out if that is odd or even number.

Program :16

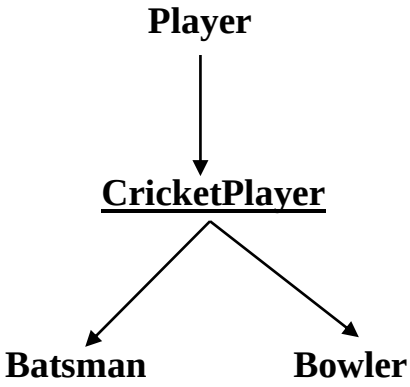
```
#include<iostream>
using namespace std;
class Box
{
	public:
	Box(int l,int w,int h)
	{
		int ans=l*w*h;
		cout << "=> Volum of Box is : " << ans << endl;
		if(ans%2==0)
		{
			cout << ans << " is even number.";
		}
		else
		{
			cout << ans << " is odd number.";
		}
	}
};
int main()
{
	int l,w,h;
	cout << "Enter length of box : ";
	cin >> l;
	cout << "Enter width of box : ";
	cin >> w;
	cout << "Enter height of box : ";
	cin >> h;
	Box b(l,w,h);
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase6\16.exe
Enter length of box : 22
Enter width of box : 24
Enter height of box : 26
=> Volum of Box is : 13728
13728 is even number.

Process exited after 20.75 seconds with return value 0
Press any key to continue . . .

Aim :

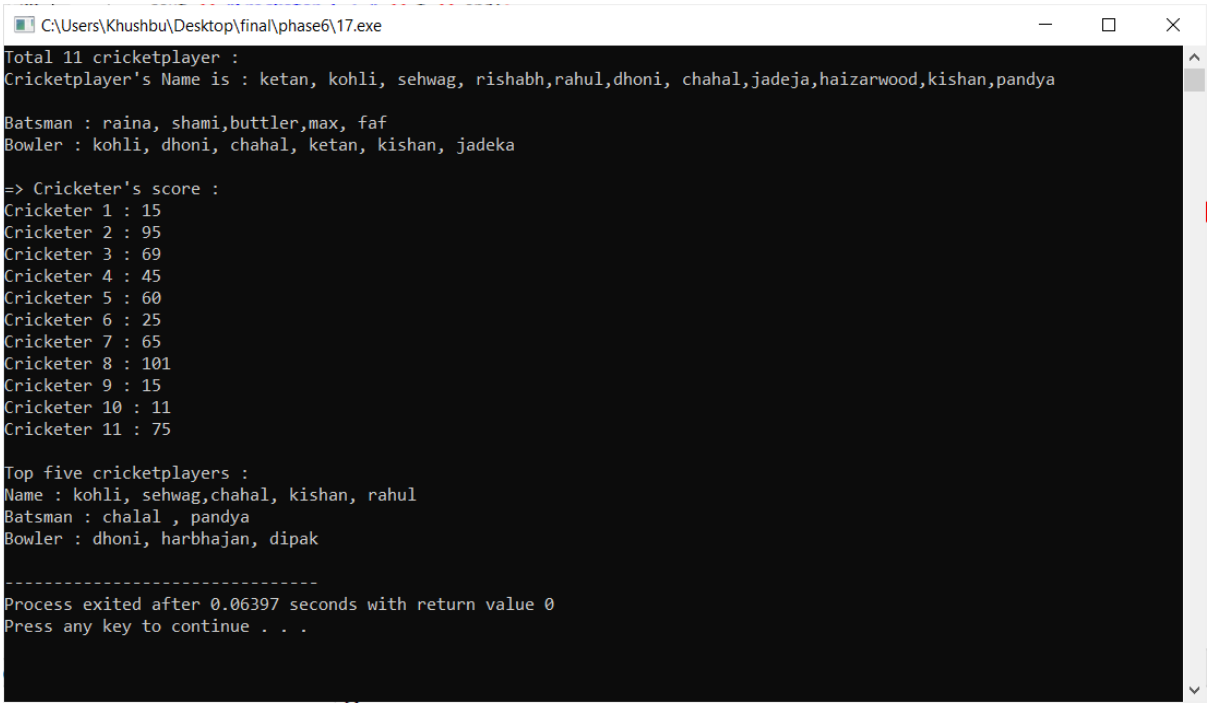


Program :17

```
#include<iostream>
using namespace std;
class Player
{
	private:
		int a=15, b=95, c=69, d=45, e=60, f=25, g=65, h=101, i=15, j=11, k=75;
	public:
	void set()
	{
		cout<<"Total 11 cricketplayer : "<<endl;
		cout<<"Cricketplayer's Name is : ketan, kohli, sehwag, rishabh,rahul,dhoni,
chahal,jadeja,haizarwood,kishan,pandya"<<endl<<endl;
		cout<<"Batsman : raina, shami,buttler,max, faf"<<endl;
		cout<<"Bowler : kohli, dhoni, chahal, ketan, kishan, jadeka"<<endl;
		cout << endl << "=> Cricketer's score :" << endl;
		cout << "Cricketer 1 : " << a << endl;
		cout << "Cricketer 2 : " << b << endl;
		cout << "Cricketer 3 : " << c << endl;
		cout << "Cricketer 4 : " << d << endl;
		cout << "Cricketer 5 : " << e << endl;
		cout << "Cricketer 6 : " << f << endl;
		cout << "Cricketer 7 : " << g << endl;
		cout << "Cricketer 8 : " << h << endl;
		cout << "Cricketer 9 : " << i << endl;
		cout << "Cricketer 10 : " << j << endl;
		cout << "Cricketer 11 : " << k << endl;
	}
};
class CricketPlayer : public Player
{
	public:
```

```
		void put()
		{
			cout << endl << "Top five cricketplayers : " << endl;
			cout << "Name : kohli, sehwag,chahal, kishan, rahul" << endl;
		}
};
class Batsman : public CricketPlayer
{
	public:
		void get()
		{
			cout << "Batsman : ";
			cout << "chalal , pandya" << endl;
		}
};
class Bowler : public CricketPlayer
{
	public:
		void push()
		{
			cout << "Bowler : ";
			cout << "dhoni, harbhajan, dipak" << endl;
		}
};
int main()
{
	Batsman b;
	Bowler l;
	b.set();
	b.put();
	b.get();
	l.push();
	return 0;
}
```

Output :

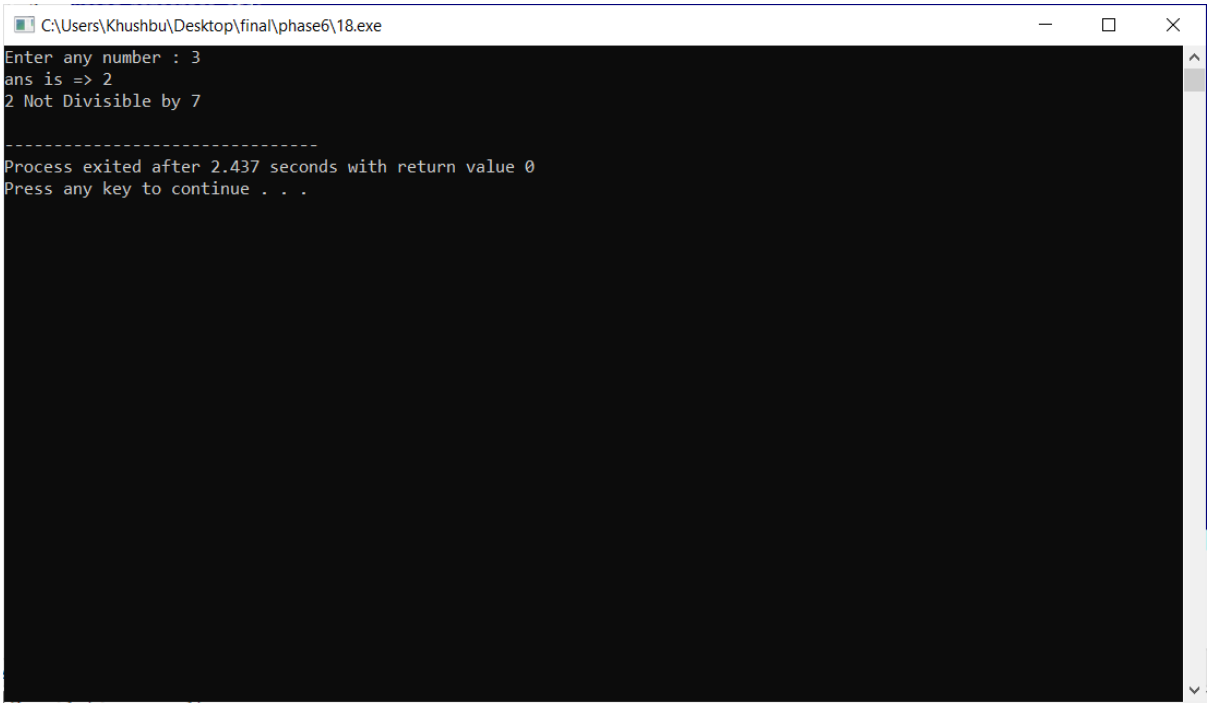

C:\Users\Khushbu\Desktop\final\phase6\17.exe
Total 11 cricketplayer :
Cricketplayer's Name is : ketan, kohli, sehwag, rishabh,rahul,dhoni, chahal,jadeja,haizarwood,kishan,pandya
Batsman : raina, shami,buttler,max, faf
Bowler : kohli, dhoni, chahal, ketan, kishan, jadeka
=> Cricketer's score :
Cricketer 1 : 15
Cricketer 2 : 95
Cricketer 3 : 69
Cricketer 4 : 45
Cricketer 5 : 60
Cricketer 6 : 25
Cricketer 7 : 65
Cricketer 8 : 101
Cricketer 9 : 15
Cricketer 10 : 11
Cricketer 11 : 75
Top five cricketplayers :
Name : kohli, sehwag,chahal, kishan, rahul
Batsman : chalal , pandya
Bowler : dhoni, harbhajan, dipak
Process exited after 0.06397 seconds with return value 0
Press any key to continue . . .

Aim : Help Ayush to perform given operation:
a. Assume any number
b. Add 8 in that number
c. Multiply it with 3
d. Subtract 12 from it
e. Add another 5 into that
f. Add your birth year in it
g. Subtract current year from that Finally display which number he get after performing all above mentioned operations and find is it divisible by 7 or not.

Program :18

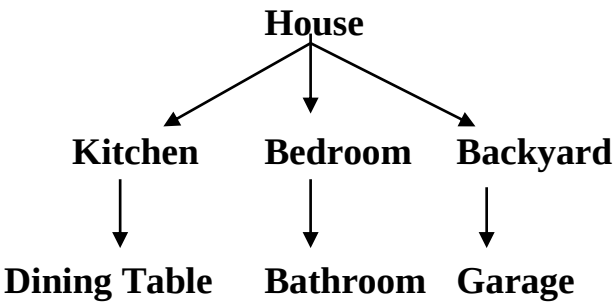
```
#include<iostream>
using namespace std;
class A
{
	private:
		int n,ans;
	public:
	A()
	{
		cout << "Enter any number : ";
		cin >> n;
		ans=n+8*3-12+5+2003-2021;
		cout << "ans is => " << ans << endl;
		if(ans%7==0)
		{
			cout << ans << " Divisible by 7" << endl;
		}
		else
		{
			cout << ans << " Not Divisible by 7" << endl;
		}
	}
};
int main()
{
	A a;
	return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase6\18.exe
Enter any number : 3
ans is => 2
2 Not Divisible by 7

Process exited after 2.437 seconds with return value 0
Press any key to continue . . .

Aim :

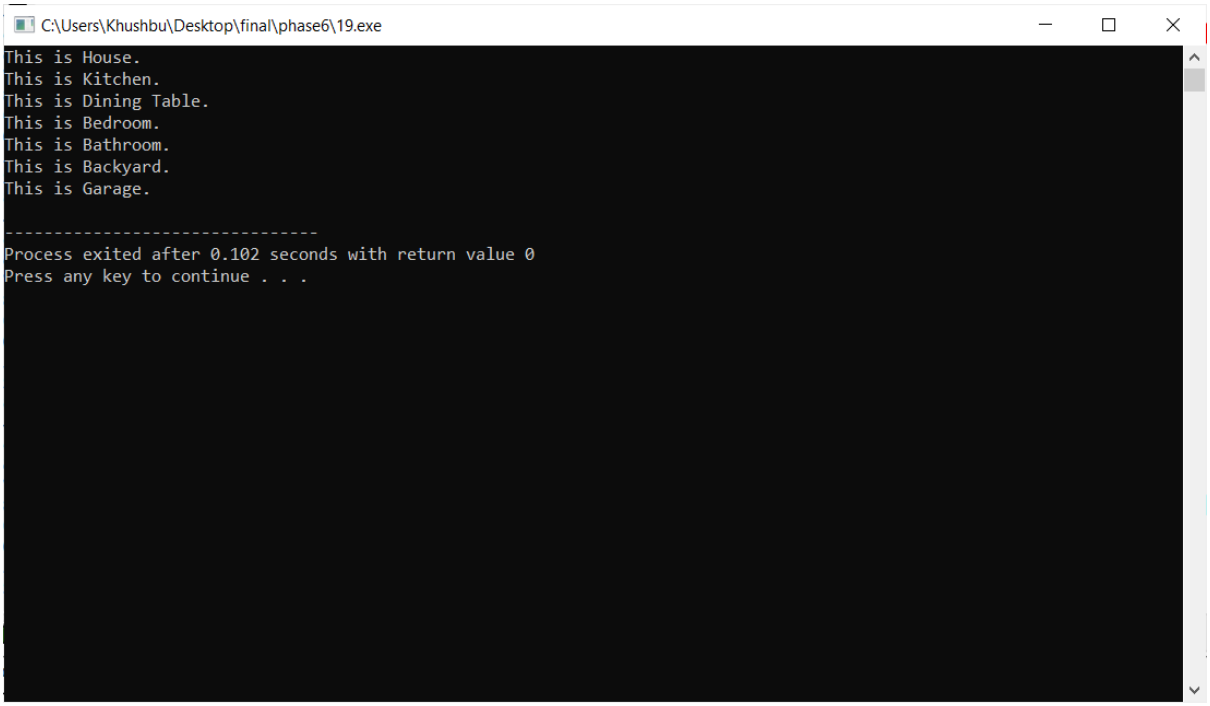


Program :19

```
#include<iostream>
using namespace std;
class House
{
	public:
		void getHouse()
		{
			cout << "This is House." << endl;
		}
};
class Kitchen : public House
{
	public:
		void getKitchen()
		{
			cout << "This is Kitchen." << endl;
		}
};
class Bedroom : public House
{
	public:
		void getBedroom()
		{
			cout << "This is Bedroom." << endl;
		}
};
class Backyard : public House
{
	public:
		void getBackyard()
		{
			cout << "This is Backyard." << endl;
		}
};
class DiningTable : public Kitchen
{
	public:
```

```
		void getDiningTable()
		{
			cout << "This is Dining Table." << endl;
		}
};
class Bathroom : public Bedroom
{
	public:
		void getBathroom()
		{
			cout << "This is Bathroom." << endl;
		}
};
class Garage : public Backyard
{
	public:
		void getGarage()
		{
			cout << "This is Garage." << endl;
		}
};
int main()
{
	DiningTable d;
	Bathroom b;
	Garage g;
	d.getHouse();
	d.getKitchen();
	d.getDiningTable();
	b.getBedroom();
	b.getBathroom();
	g.getBackyard();
	g.getGarage();
	return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase6\19.exe
This is House.
This is Kitchen.
This is Dining Table.
This is Bedroom.
This is Bathroom.
This is Backyard.
This is Garage.

Process exited after 0.102 seconds with return value 0
Press any key to continue . . .

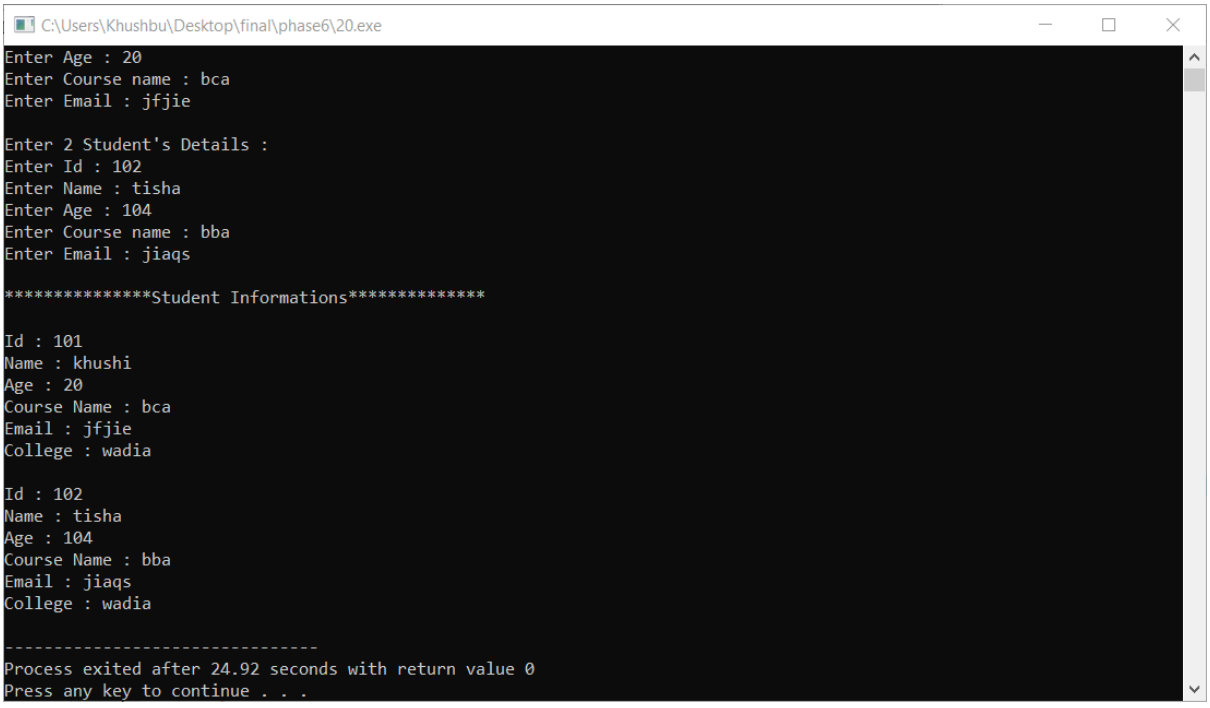
Aim : A Higher Secondary School opens after COVID-19 crisis and admission process will be starting for registration of students. Help administration department for registering student information such liker stu_id,stu_name,stu_age ,stu_course ,stu_email, stu_college

Program :20

```
#include<iostream>
using namespace std;
class Student
{
	public:
		int id;
		char name[100];
		int age;
		char course[100];
		char email[100];
	public:
		static char college[100];
		void setData(int i)
		{
			cout << endl << "Enter " << i+1 << " Student's Details : " << endl;
			cout << "Enter Id : ";
			cin >> this->id;
			cout << "Enter Name : ";
			cin >> this->name;
			cout << "Enter Age : ";
			cin >> this->age;
			cout << "Enter Course name : ";
			cin >> this->course;
			cout << "Enter Email : ";
			cin >> this->email;
		}
		void getdata()
		{
			cout << endl << "Id : " << id << endl
			<< "Name : " << name << endl
			<< "Age : " << age << endl
			<< "Course Name : " << course << endl
			<< "Email : " << email << endl
			<< "College : " << college << endl;
		}
};
char Student::college[100]="wadia";
int main()
{
	Student s[100];
	int n,i;
	cout << "How many Student? : ";
```

```
        cin >> n;
        for(i=0;i<n;i++)
        {
                s[i].setData(i);
        }
        cout << endl << "****************Student Informations**************" << endl;
        for(i=0;i<n;i++)
        {
                s[i].getdata();
        }
        return 0;
}
```

Output :

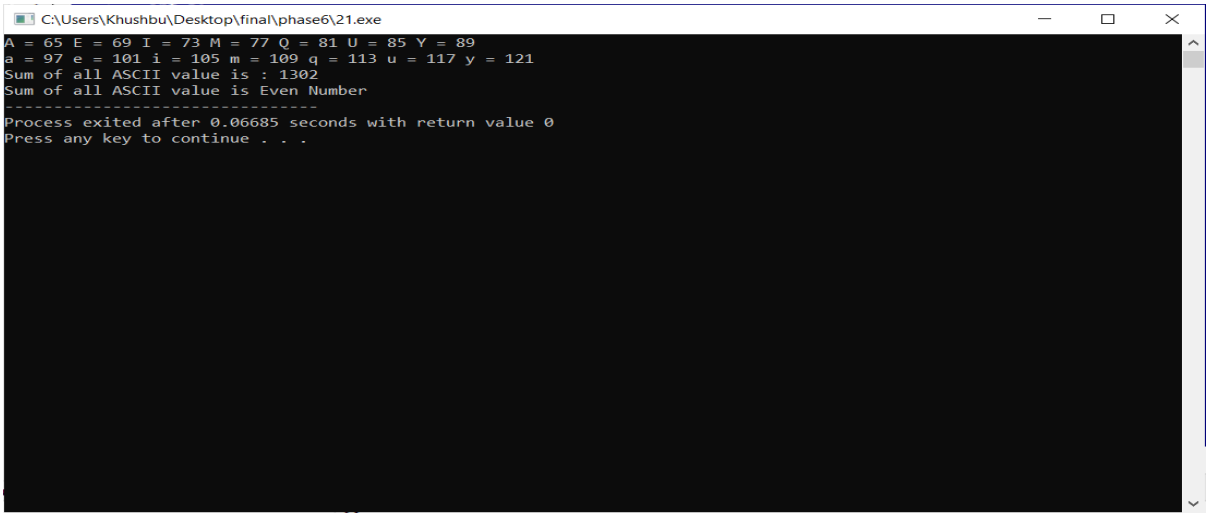


Aim : Build a C++ solution which returns array of all ASCII values of alphabets skipping 3 characters. Use concept of Constructors. After returning that array, find addition of that values and decide whether it is a odd or even number.

Program :21

```
#include<iostream>
using namespace std;
class EvenOdd
{
	private:
		int i,sum=0;
		int a;
	public:
		EvenOdd()
		{
			for(i=65;i<=90;i+=4)
			{
				cout << (char)i << " = " << i << " ";
				sum=sum+i;
			}
			cout << endl;
			for(i=97;i<=122;i+=4)
			{
				cout << (char)i << " = " << i << " ";
				sum=sum+i;
			}
			cout << endl << "Sum of all ASCII value is : " << sum;
			if(sum%2==0)
			{
				cout << endl << "Sum of all ASCII value is Even Number";
			}
			else
			{
				cout << endl << "Sum of all ASCII value is Odd Number";
			}
		}
};
int main()
{
	EvenOdd o1;
	return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase6\21.exe
A = 65 E = 69 I = 73 M = 77 Q = 81 U = 85 Y = 89
a = 97 e = 101 i = 105 m = 109 q = 113 u = 117 y = 121
Sum of all ASCII value is : 1302
Sum of all ASCII value is Even Number

Process exited after 0.06685 seconds with return value 0
Press any key to continue . . .

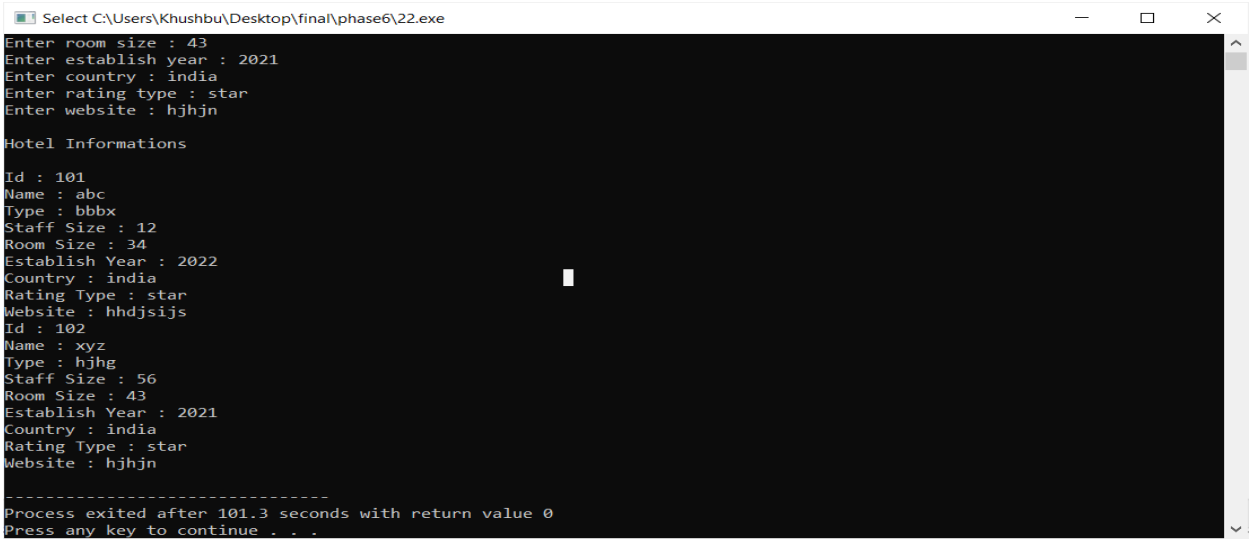
Aim : A Global survey held to collect information about hotels all around the world. Provide a C++ solution to create a class Hotel with fields like
- hotel_id
–hotel_name
- hotel_type
- hotel_staff_size
- hotel_room_size
- hotel_establish_year
- hotel_countre
- hotel_rating_type
- hotel_website Illustrate the use of strict encapsulation with this keyword

Program :22

```
#include<iostream>
using namespace std;
class Hotel
{
	private:
		int hotel_id;
		char hotel_name[50];
		char hotel_type[50];
		int hotel_staff_size;
		int hotel_room_size;
		int hotel_establish_year;
		char hotel_country[50];
		char hotel_rating_type[50];
		char hotel_website[50];
	public:
		void setData()
		{
			cout << "Enter id : ";
			cin >> this->hotel_id;
			cout << "Enter name : ";
			cin >> this->hotel_name;
			cout << "Enter type : ";
			cin >> this->hotel_type;
			cout << "Enter staff size : ";
			cin >> this->hotel_staff_size;
			cout << "Enter room size : ";
			cin >> this->hotel_room_size;
			cout << "Enter establish year : ";
			cin >> this->hotel_establish_year;
			cout << "Enter country : ";
			cin >> this->hotel_country;
			cout << "Enter rating type : ";
			cin >> this->hotel_rating_type;
			cout << "Enter website : ";
```

```
                cin >> this->hotel_website;
        }
        void getData()
        {
                cout<< "Id : " << this->hotel_id << endl
                << "Name : " << this->hotel_name << endl
                << "Type : " << this->hotel_type << endl
                << "Staff Size : " << this->hotel_staff_size << endl
                << "Room Size : " << this->hotel_room_size << endl
                << "Establish Year : " << this->hotel_establish_year << endl
                << "Country : " << this->hotel_country << endl
                << "Rating Type : " << this->hotel_rating_type << endl
                << "Website : " << this->hotel_website << endl;
        }
};
int main()
{
        Hotel h[100];
        int n,i;
        cout << "How many Hotels : ";
        cin >> n;
        for(i=0; i<n; i++)
        {
                h[i].setData();
        }
        cout << endl << "Hotel Informations" << endl << endl;
        for(i=0; i<n; i++)
        {
                h[i].getData();
        }
}
```

Output :

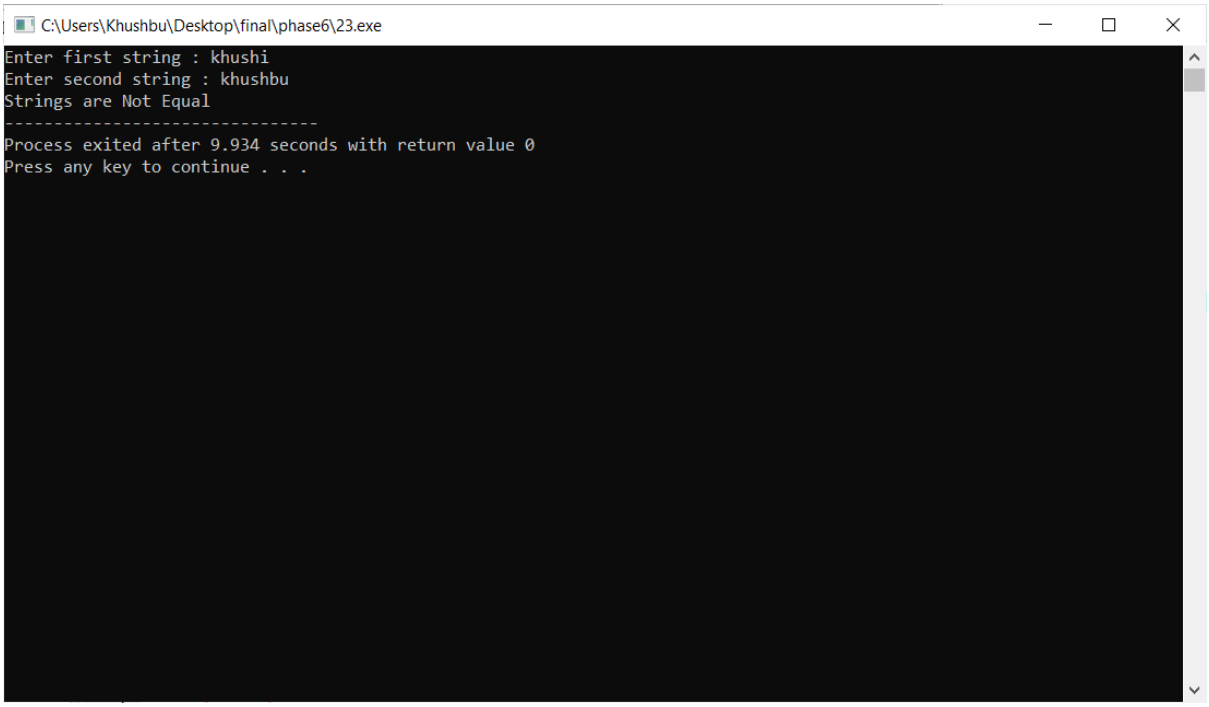


Aim : Jemin wants to create an automate system which compare two given strings and it returns 1 if both strings are same and 0 otherwise. Create a C++ system for helping Jemin using overloading concept.

Program :23

```
#include<iostream>
#include<string.h>
using namespace std;
class A
{
	private:
		char a[100];
	public:
		void getStr()
		{
			gets(a);
		}
		int operator==(A s)
		{
			if(!strcmp(this->a,s.a))
			{
				return 1;
			}
			else
			{
				return 0;
			}
		}
};
int main()
{
	A o1,o2;
	cout << "Enter first string : ";
	o1.getStr();
	cout << "Enter second string : ";
	o2.getStr();
	if(o1==o2)
	{
		cout << "Strigs are Equal";
	}
	else
	{
		cout << "Strings are Not Equal";
	}
	return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase6\23.exe
Enter first string : khushi
Enter second string : khushbu
Strings are Not Equal

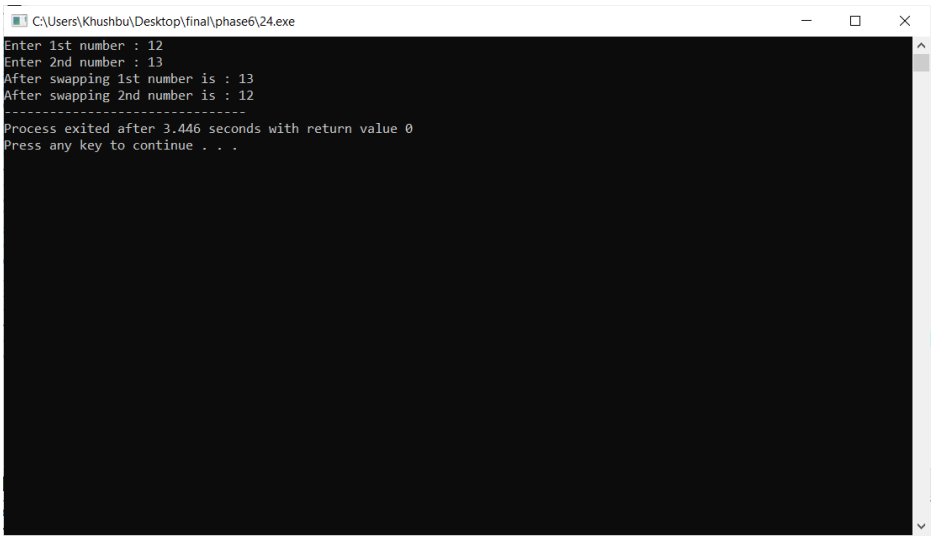
Process exited after 9.934 seconds with return value 0
Press any key to continue . . .

Aim : Design a swapping program using only constructors for helping Devansh to gain passing marks in examination.

Program :24

```
#include<iostream>
using namespace std;
class Swap
{
	private:
		int c;
	public:
		Swap(int a,int b)
		{
			c=a;
			a=b;
			b=c;
			cout << "After swapping 1st number is : " << a << endl;
			cout << "After swapping 2nd number is : " << b;
		}
};
int main()
{
	int a,b;
	cout << "Enter 1st number : ";
	cin >> a;
	cout << "Enter 2nd number : ";
	cin >> b;
	Swap s(a,b);
	return 0;
}
```

Output :

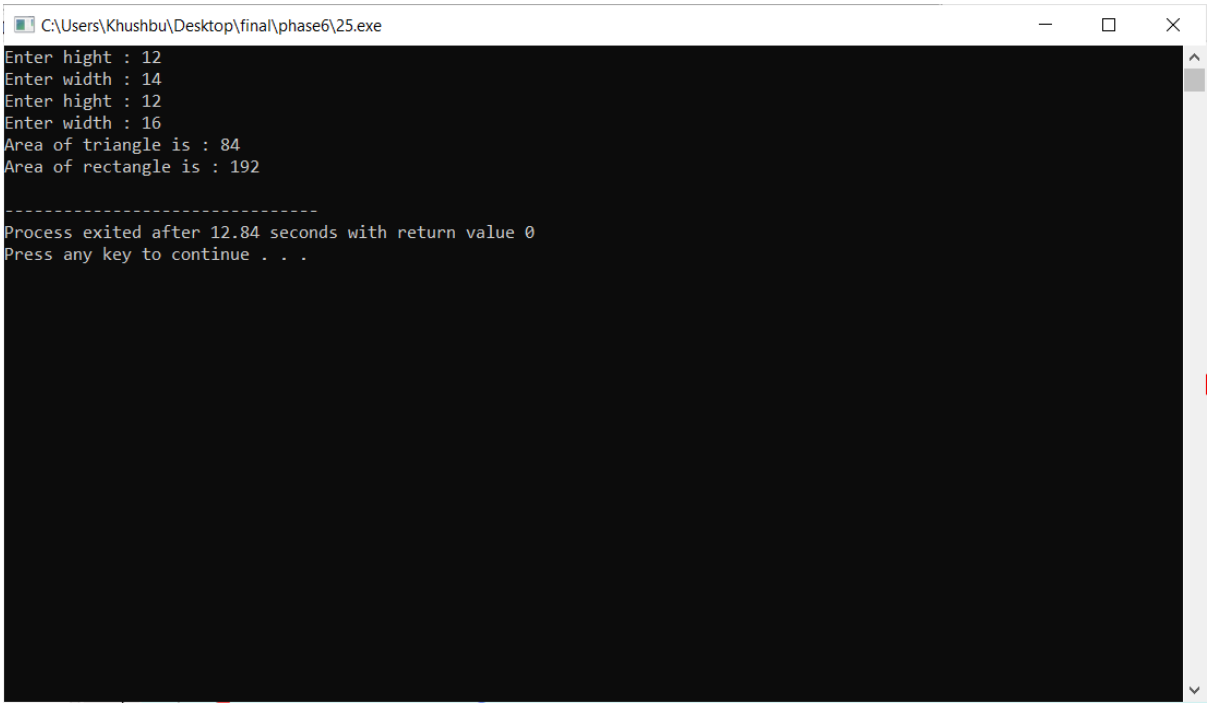


Aim : Create a C++ Base class Shape with a constructor for providing values for width and height. Then define two derived classes Triangle and Rectangle, that calculate the area of the shape area(). In the main, define two objects: a triangle and a rectangle and then call the area() function by this two objects.

Program :25

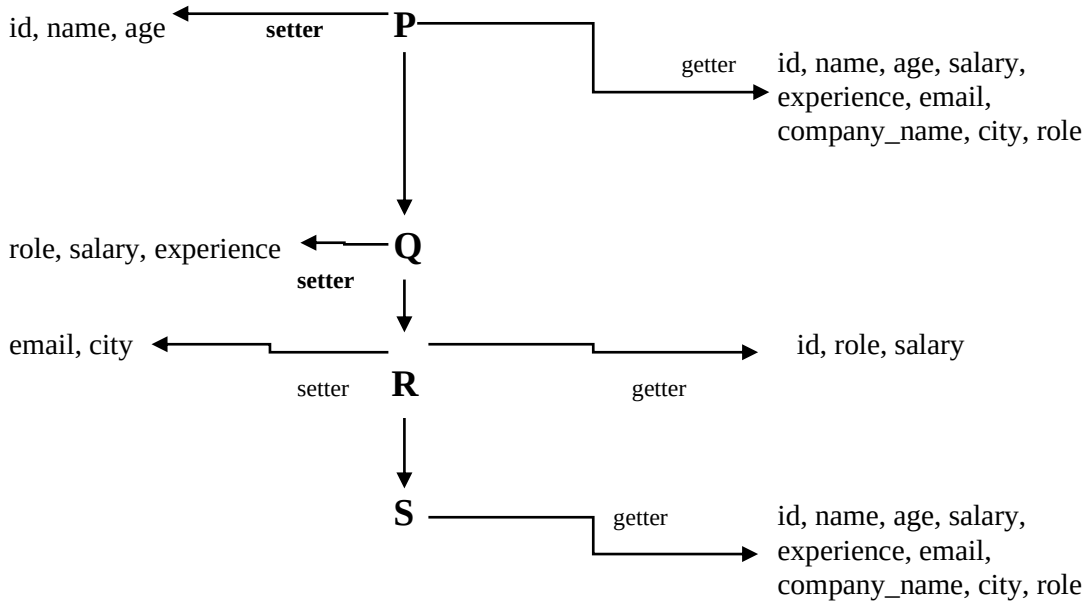
```
#include<iostream>
using namespace std;
class Shape
{
	public:
		int h,w;
		Shape()
		{
			cout << "Enter hight : ";
			cin >> h;
			cout << "Enter width : ";
			cin >> w;
		}
};
class Triangle : public Shape
{
	public:
		float area;
		void putArea()
		{
			area=0.5*h*w;
			cout << "Area of triangle is : " << area << endl;
		}
};
class Rectangle : public Shape
{
	public:
		float area;
		void getArea()
		{
			area=h*w;
			cout << "Area of rectangle is : " << area << endl;
		}
};
int main()
{
	Triangle t;
	Rectangle r;
	t.putArea();
	r.getArea();
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase6\25.exe
Enter hight : 12
Enter width : 14
Enter hight : 12
Enter width : 16
Area of triangle is : 84
Area of rectangle is : 192

Process exited after 12.84 seconds with return value 0
Press any key to continue . . .

Aim :



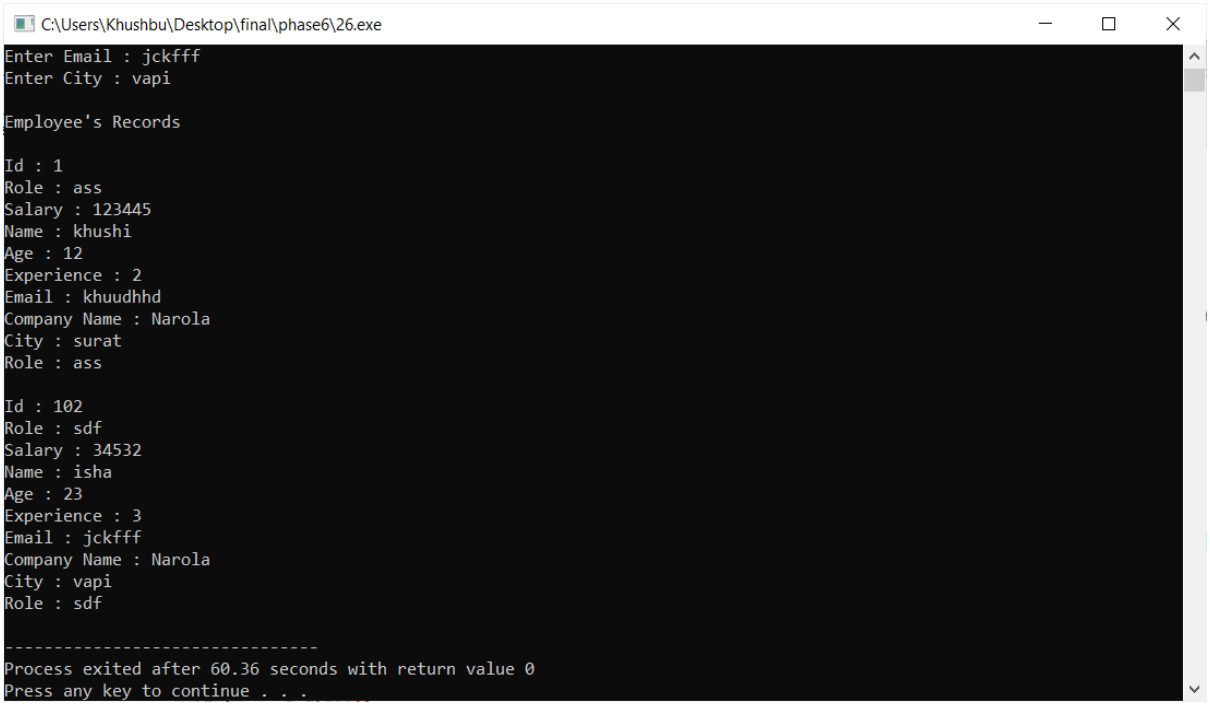
Program :26

```
#include<iostream>
using namespace std;
class A
{
	public:
		int id;
		char name[100];
		int age;
		int salary;
		int experience;
		char email[100];
		char city[100];
		char role[100];
	public:
		static char cmp_name[100];
		void setData(int i)
		{
			cout << endl << "Enter " << i+1 << " Employee's Details : " << endl;
			cout << "Enter Id : ";
			cin >> this->id;
			cout << "Enter Name : ";
			cin >> this->name;
			cout << "Enter Age : ";
			cin >> this->age;
		}
};
class B : public A
{
	public:
```

```
		void putData()
		{
			cout << "Enter Role : ";
			cin >> this->role;
			cout << "Enter Salary : ";
			cin >> this->salary;
			cout << "Enter Experience : ";
			cin >> this->experience;
		}
};
class C : public B
{
	public:
		void showData()
		{
			cout << "Enter Email : ";
			cin >> this->email;
			cout << "Enter City : ";
			cin >> this->city;
		}
		void getC()
		{
			cout << endl << "Id : " << id << endl<< "Role : " << role << endl<<
"Salary : " << salary << endl;
		}
};
class D : public C
{
	public:
		void getD()
		{
			cout << "Name : " << name << endl
			<< "Age : " << age << endl
			<< "Experience : " << experience << endl
			<< "Email : " << email << endl
			<< "Company Name : " << cmp_name << endl
			<< "City : " << city << endl
			<< "Role : " << role << endl;
		}
};
char A::cmp_name[100]="Narola";
int main()
{
	D d[100];
	int n,i;
	cout << "How many Employees? : ";
	cin >> n;
	for(i=0;i<n;i++)
	{
		d[i].setData(i);
```

```
                d[i].putData();
                d[i].showData();
        }
        cout << endl << "Employee's Records" << endl;
        for(i=0;i<n;i++)
        {
                d[i].getC();
                d[i].getD();
        }
return 0;
}
```

Output :

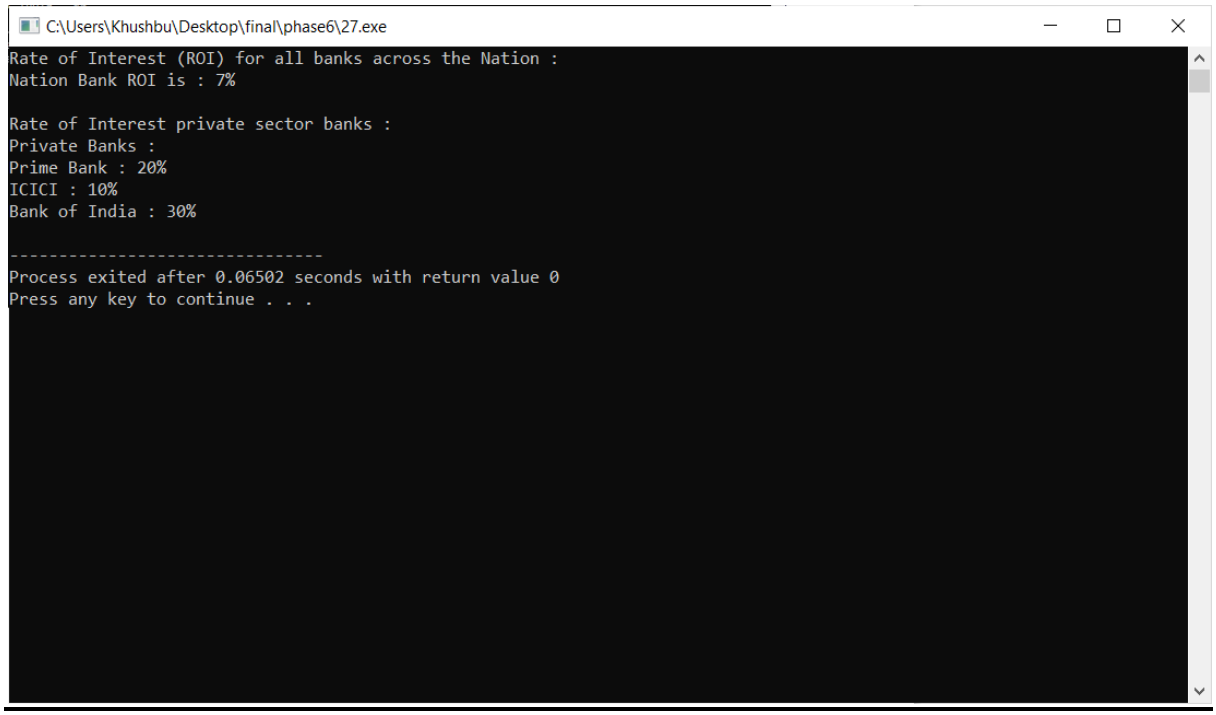


Aim : Reserve Bank of India pre-defines a Rate of Interest (ROI) for all banks across the Nation. But some private sector banks can apply different ROI. Use inheritance and polymorphism concept to illustrate this scenario.

Program :27

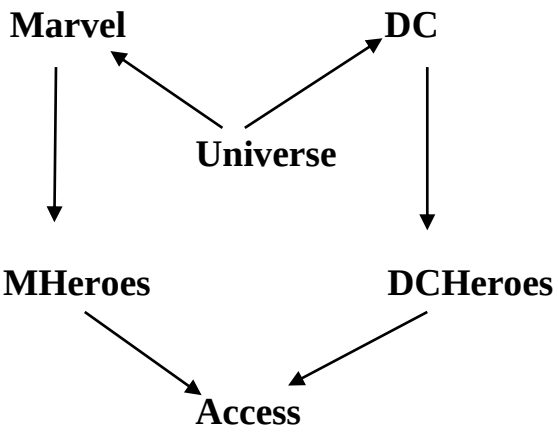
```
#include<iostream>
using namespace std;
class Bank
{
	public:
	int a,b,c;
};
class ICICI : public Bank
{
	public:
		void get()
		{
			cout << "Rate of Interest (ROI) for all banks across the Nation : " <<
			endl;
			cout << "Nation Bank ROI is : 7%" << endl << endl;
		}
};
class Bank_of_India : public ICICI
{
	public:
		void get()
		{
			ICICI o1;
			o1.get();
			a = 20;
			b = 10;
			c = 30;
			cout << "Rate of Interest private sector banks : " << endl;
			cout << "Private Banks : " << endl;
			cout << "Prime Bank : " << a << "%" << endl;
			cout << "ICICI : " << b << "%" << endl;
			cout << "Bank of India : " << c << "%" << endl;
		}
};
int main()
{
	Bank_of_India b;
	b.get();
	return 0;
}
```

Output :


C:\Users\Khushbu\Desktop\final\phase6\27.exe
Rate of Interest (ROI) for all banks across the Nation :
Nation Bank ROI is : 7%
Rate of Interest private sector banks :
Private Banks :
Prime Bank : 20%
ICICI : 10%
Bank of India : 30%

Process exited after 0.06502 seconds with return value 0
Press any key to continue . . .

Aim :



Program :28

```
#include<iostream>
using namespace std;
class Marvel
{
	public:
		void getData()
		{
			cout << " class Marvel" << endl;
		}
};
class DC
{
	public:
		void setData()
		{
			cout << "lass DC" << endl;
		}
};
class Universe : public Marvel,public DC
{
	public:
	void putData()
		{
			cout << "class Universe" << endl;
		}
};
class MHeroes : public Marvel
{
	public:
		void showData()
		{
			cout << "class MHeroes" << endl;
		}
```

```
};
class DCHeroes : public DC
{
	public:
		void get()
		{
			cout << "class DCHeroes" << endl;
		}
};
class Access : public MHeroes,public DCHeroes
{
	public:
		void set()
		{
			cout << "class Access" << endl;
		}
};
int main()
{
	Access a;
	Universe u;
	u.getData();
	u.setData();
	u.putData();
	a.showData();
	a.get();
	a.set();
	return 0;
}
```

Output :