1. Write a program that takes two or more sets as input and produces set operations like union, intersection, difference and symmetric difference as its output.

Program:

```
# include <iostream>
# include <stdlib.h>
  using namespace std;
  void union(int all[10]) {
      cout << "{ "
      for(int i=0; i<10; i++) {
      int flag =0
      for(int j= i+1; j<10; j++) {
          if(all[i] = all[j])
          { flag = 1;
            break;
          }
       if(flag ==0)
       cout << "<<all[i];
      }
      cout << "}" << endl;
    }
void intersection(int all[10]) {
     cout << "{ "
     for(int i=0; i<10; i++) {
     for(int j = i+1 ;) < 10 : j++ )
      { if(all[i] = all[j] && i!=j)
       { cout << " " << all[i];
       }
      }
      }
   cout << " }" << endl;
     }
```

```
cout<<"enter for elements of B: "<<endl;
for(int j=0; j<r; j++){
cout<<"for element "<<j+1<<": ";
cin>>b[j];
}
system("cls");
Cout<<"set A is: <<endl<<"{";
for(int i=0; i<5; i++){
cout<<" "<<a[i];
}
Cout<<"}"<<endl;
Cout<<"set B is: "<<endl<<"{";
for(int j=0; j<5; j++){
cout<<" "<<b[j];
}
cout<<"}"<<endl;
for(int i=0; i<5; i++){
all[i]=a[i];
}
for(int j=0; j<5; j++){
all[j+5]=b[j];
}
cout<<"AUB is:"<<endl;
union(all);
cout<<"AnB is:"<<endl;
intersection(all);
cout<<"A-B is:"<<endl;
difference(a,b);
cout<<"A"<<char(30)<<"B is:"<<endl;
sy difference(all);
return 0;
}
```

2. Write a program that takes two or more sets as input and produces their cartesian product as output.

Program:

```
#include<iostream>
using namespace std;
  int main() {
  int a[5], b[5], n, m;
Cout<<" enter no of elements of set A : ");
   cin>>;
 Cout-<<" enter for set A : " <<endl;
 for(int i=0 ; i<n ; i++) {
 Cout-<<" for element" <<i+1<<"; ";
     cin >>a[i];
    }
 Cout<< "enter no of elements for set B : " ;
   cin>>m;
  Cout<<" enter for set B : "<<endl;
  for(int j=0;j<m ;j++) {
    Cout<<" for element"<< j+1 <<" :";
       cin>>b[j];
   }
  Cout<< " cartesian product is : ";
   Cout<<" { "
   for(int i=0 ; i<n ; i++) {
      for(int j=0 ; j<m ;j++) {
       Cout<<"("<<a[i]<<" << b[j]<<"j"<<"; ";
        }
     }
  Cout<<"}";
   return 0;
    }
```

8. Write a program that takes a real number and produces its ceiling and floor integers as output.

Program:

```
#include <iostream>
using namespace std;
    float a;
    int b;
  cout << " enter integer value: " ;
     cin >> a ;
     b = a ;
      if (a < 0) {
    cout << " floor value of " << a << " is : " << b-1 << endl;
cout << " ceiling value of " << a << " is : " << b << endl;
      }
    if (a != b && a > 0) {
cout << " floor value of integer " << a << " is : " << b << endl;
cout << ceiling value of " << a << " is : " << b+1 << endl;

    if (a == b) {
    cout << " floor value of " << a << " is : " << b << endl;
    cout << " ceiling value of " << a << " is : " << b << endl;
      }
    return 0;
    }
```

4. Write a program that takes name and age of a 5 persons as an input and gives the degree of membership of the person as its output according to following membership functions.

a. Degree membership = 1 if age <= 20

Degree of membership = (30 - age)/10 if age > 20 and age <= 30

Degree of membership = 0 if age > 30

b. Degree of membership = 1 if age <= 15

Degree of membership = (35 - age)/20 if age > 15 and age <= 35

Degree of membership = 0 if age > 35

Perform set operations according to rules of fuzzy sets, on the two sets

program:

```
#include <iostream>
Using namespace std;
   int main() {
   string name[5];
 double age[5], membership[5], age1[5], membership1[5];
cout<<"Enter names: "<<endl;
 for(int i=0; i<5; i++) {
 cout<<"Name of "<<i+1<<"person:";
   cin>>name[i];
  }
cout<<endl<<"enter age: "<<endl;
 for(int i=0; i<5; i++) {
 if(age[i]=20) {
 cout<<"Degree of membership of "<<name[i]<<"="<<
                                              <<endl
     membership[i]=1;
     }
```

```
if (age[i] >20 && age[i] <=30) {
Cout<<" Degree of membership of " <<name[i] << "= " <<
                                    (30 - age[i]) /10 <<endl;
membership [i] = (80 -age[i])/10;
}
if(age[i]>30) {
Cout<<" Degree of membership of "<<name[i]<<"= "<<0<<endl;
membership [i]=0;
}
}
Cout-<<" Enter age for another set" <<endl;
for (int i=0; i<5; i++) {
Cout << "Age of " <<name[i] <<": ";
Cin >> age1[i];
}for(int i=0; i<5; i++) {
if(age1[i] <=15 ) {
Cout-<<" Degree of membership of " <<name[i]<<":"<<
                                    1 <<endl;
membership1[i] = 1;
}
if(age1[i]>15 && age1[i] <=35) {
Cout<<" Degree of membership of " <<name[i] <<" = "<<
                                    (35-age1[i])/20 <<endl;
membership1[i] = (35 - age1[i])/20;
}
if(age1[i] >35) {
Cout-<<" Degree of membership of " <<name[i]<<"="<<0;
membership1[i]=0;
}
}
```

```
void difference(int a[5], int b[5]) {
  cout << "{ ";
  for(int i=0; i<5; i++) {
     int flag=0;
   for(int j=0; j<5; j++) {
     if(a[i] == b[j]) {
        flag=1;
        break;
       }
     }
    if(flag==0) {
       cout<<" "<<a[i];
       }
      }
    cout<<" }"<<endl;
    }
   void symdifference(int all[10]) {
        cout << "{ ";
    for(int i=0; i<10; i++) {
       int flag=0;
    for(int j=0; j<10; j++) {
    if(all[i] == all[j] && i!=j) {
         flag=1;
         break;
        }
     if(flag==0) {
         cout<<" "<<all[i];
         }
       }
     cout<<" }";
   }
   int main() {
   int a[5], b[10], all[10];
  cout<<"Enter for set A: "<<endl;
  for(int i=0; i<5; i++) {
      cout<<"for element "<<i+1<<": ";
        cin>>a[i];
        }
```

```
cout << "union of two fuzzy set is:" << endl << "{";
for (int i=0 ; i<5, i++) {
if(membership[i] > mebership [i] ) {
cout<< membership[i] << "/" << name[i] << ",";
  }
  else {
   cout << membership1[i] << "/" << name[i] << ",";
    }
    }
  cout << "}" << endl;
 cout << " Intersection of two fuzzy set is " << endl << "{";
   for(int i=0; i<5 ; i++) {
   if (membership[i] == membership1[i]) {
    cout << membership[i] << "/" << name[i] << ",";
    }
   }
    cout << "}" << endl;
cout << " Compliment of 1st fuzzy set is " << endl << "{";
    for (int i= 0 ; i<5 ; i++) {
      cout << (1-membership[i] ) << "/" << name[i] << ",";
      }
   cout << "}" << endl;
  cout << "complement of 2nd fuzzy set is " << endl << "{";
    for (int i= 0 ; i<5 ; i++) {
      cout << (1-membership1[i] << "/" << name[i] << ",";
       }
       cout << "}";
       return 0;
        }
```