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.

Code:

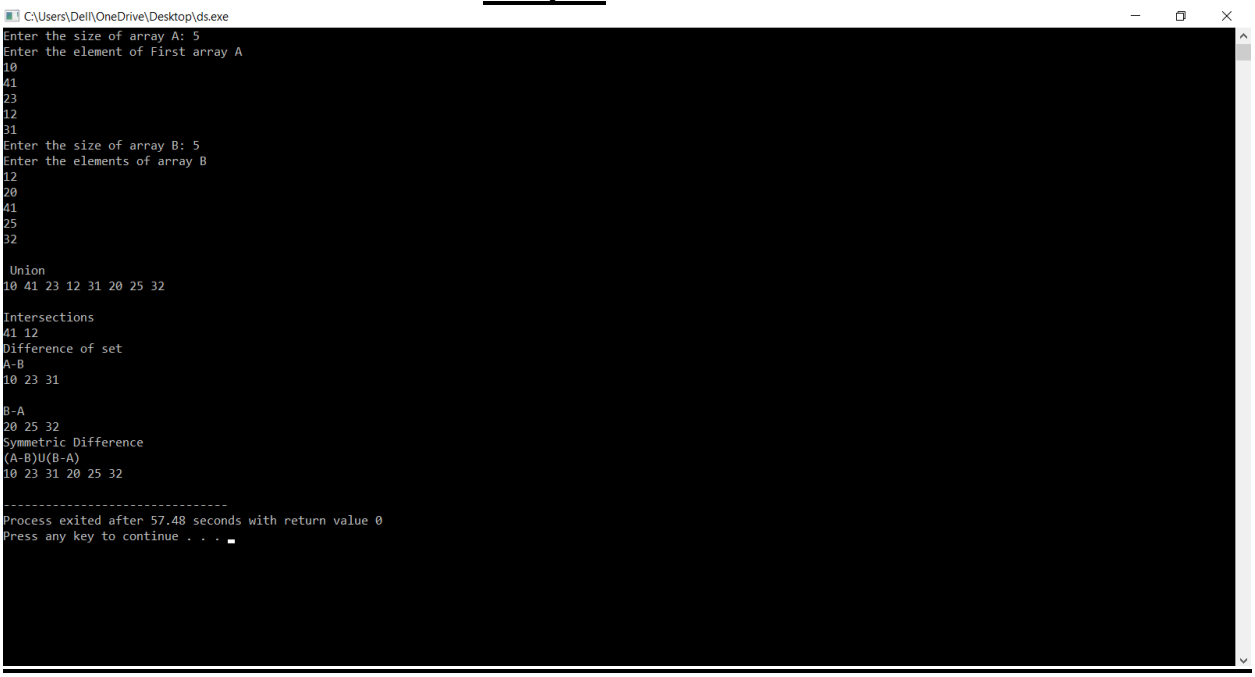
```
#include<stdio.h>
int a[10],b[10],c[10],d[10],i,j,k=0,n,m,flag=0;
void unio(){
for(i=0;i<n;i++){
c[k]=a[i];
k++; }
for(i=0;i<m;i++){
flag=0;
for(j=0;j<n;j++){
if(b[i]==a[j]){
flag=1;
break;
}
}
if(flag==0){
c[k]=b[i];
k++;
}
}
printf("\n Union \n");
for(i=0;i<k;i++){
printf("%d ",c[i]);
}
}
void intersection(){
printf("\nIntersections\n");
for(i=0;i<n;i++){
for(j=0;j<m;j++){
if(a[i]==b[j])
printf("%d ",a[i]);
}
}
}
void difference(){
```

```
printf("\nA-B\n");
for(i=0;i<n;i++){
flag=0;
for(j=0;j<m;j++){
if(a[i]==b[j]){
flag=1;
break;
}
}
if(flag==0)
printf("%d ",a[i]);
}
printf("\n\nB-A\n");
for(i=0;i<m;i++){
flag=0;
for(j=0;j<n;j++){
if(b[i]==a[j]){
flag=1;
break;
}
}
if(flag==0)
printf("%d ",b[i]);
}
}
void symmetric_diff(){
k=0;
for(i=0;i<n;i++){
flag=0;
for(j=0;j<m;j++){
if(a[i]==b[j]){
flag=1;
break;
}
}
if(flag==0){
d[k]=a[i];
k++;
}
}
```

```
for(i=0;i<m;i++){
flag=0;
for(j=0;j<n;j++){
if(b[i]==a[j]){
flag=1;
break;
}
}
if(flag==0){
d[k]=b[i];
k++;
}
}
printf("\n(A-B)U(B-A)\n");
for(i=0;i<k;i++){
printf("%d ",d[i]);
}
}
int main(){
printf("Enter the size of array A\n");
scanf("%d",&n);
printf("Enter the element of First array A\n");
for(i=0;i<n;i++){
scanf("%d",&a[i]);
}
printf("Enter the size of array B\n");
scanf("%d",&m);
printf("Enter the elements of array B\n");
for(j=0;j<m;j++){
scanf("%d",&b[j]);
}
unio();
printf("\n");
intersection();
printf("\n");
printf("Difference of set");
difference();
printf("\n");
printf("Symmetric Difference");
symmetric_diff();
```

```
printf("\n");
return 0;
}
```

Output



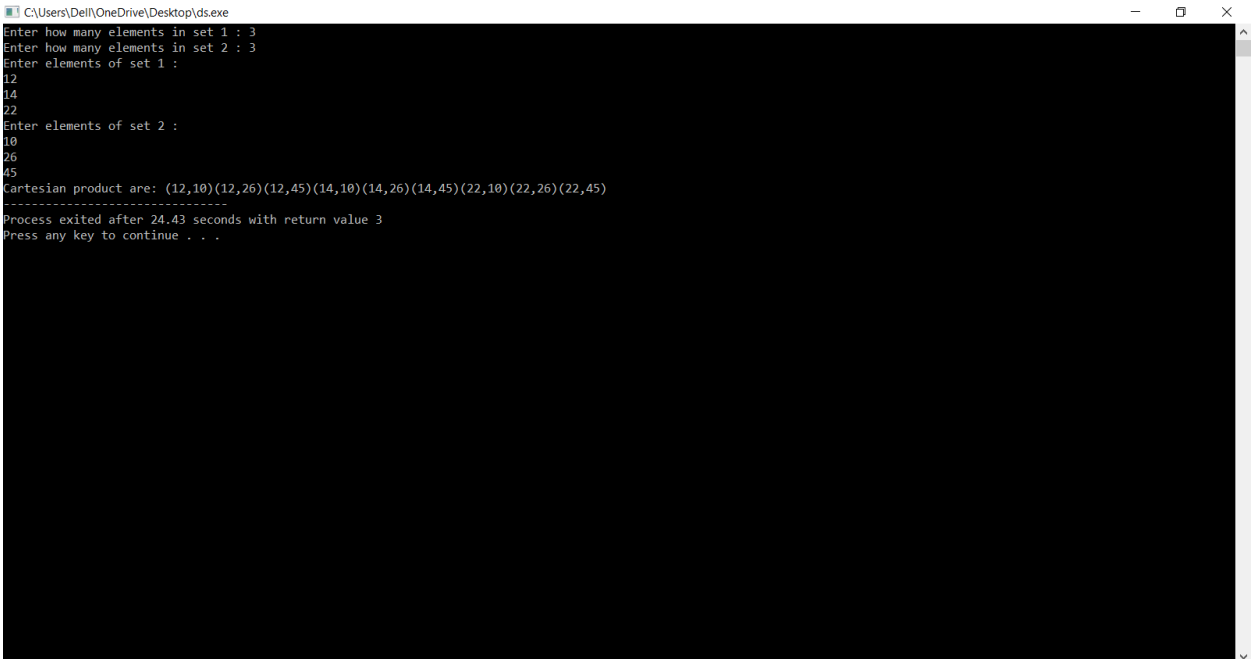
2. Write a program that takes two or more sets as input and produces their Cartesian product as output.

Code:

```
#include<stdio.h>
int main(){
int a[50],b[50],c[50],i,s1,s2,j,k;
printf("Enter how many elements in set 1 :\n");
scanf("%d",&s1);
printf("Enter how many elements in set 2 :\n");
scanf("%d",&s2);
printf("Enter elements of set 1 :\n");
for(i=0;i<s1;i++) {
scanf("%d",&a[i]);
}
printf("Enter elements of set 2 :\n");
for(i=0;i<s2;i++){
scanf("%d",&b[i]);
```

```
}
printf("\tCartesian product are: ");
for(i=0;i<s1;i++){
for(j=0;j<s2;j++){
printf("(%d,%d)",a[i],b[j]);
}
}
}
```

Output



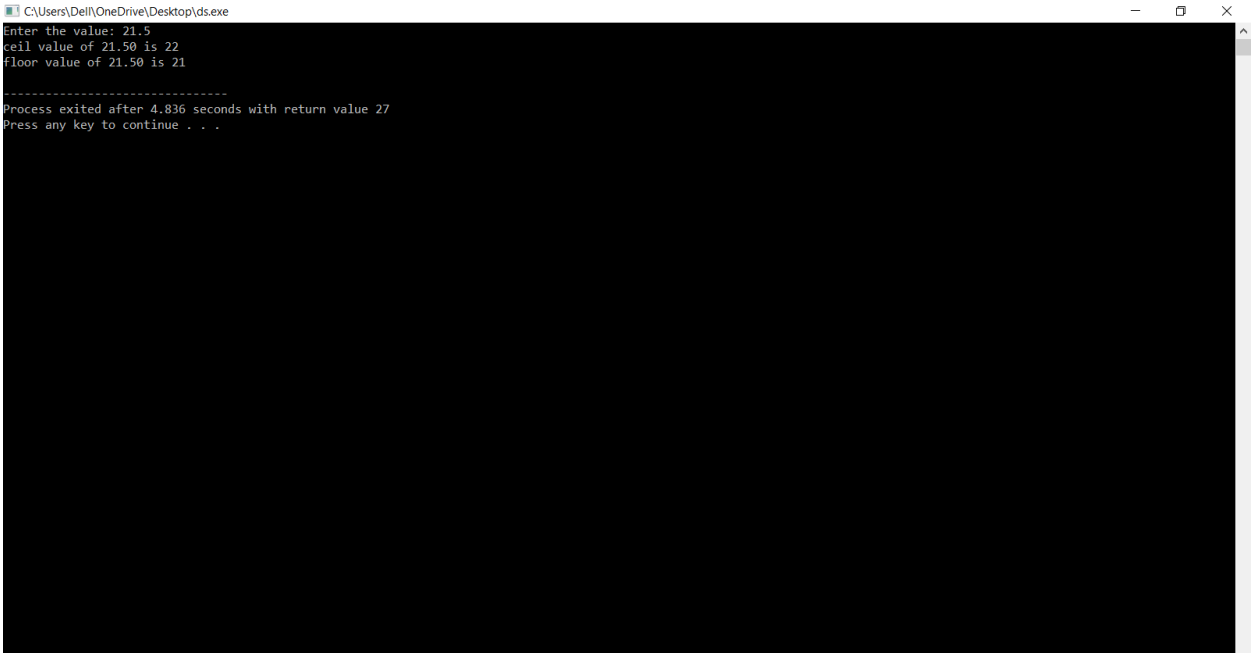
3. Write a program that takes a real number and produces its ceiling and floor integers as output.

Code:

```
#include <stdio.h>
int floor(float x){
if (x == (int)(x)){
return x;
}
else if(x < 0){
return (int)(x)-1;
}
else{
return (int)(x);
```

```
}
}
int ceil(float x)
{
if(x == (int)(x))
{
return x;
}
else if(x >= 0)
{
return (int)(x)+1;
}
else{
return (int)(x);
}
}
int main(){
float num;
printf("Enter the value: ");
scanf("%f", &num);
printf("ceil value of %.2f is %d\n",num,ceil(num));
printf("floor value of %.2f is %d\n",num,floor(num));
}
```

Output



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 of membership = 1
if age<=20
Degree of membership = (30-age)/10
Degree of membership = 0
b. Degree of membership = 1
Degree of membership = (35-age)/20
Degree of membership = 0
two sets.
if age>20 and age<=30
if age>30
if age<=15
if age>15 and age<=35
if age>35
Perform set operations according to rules of fuzzy sets, on these
Code:

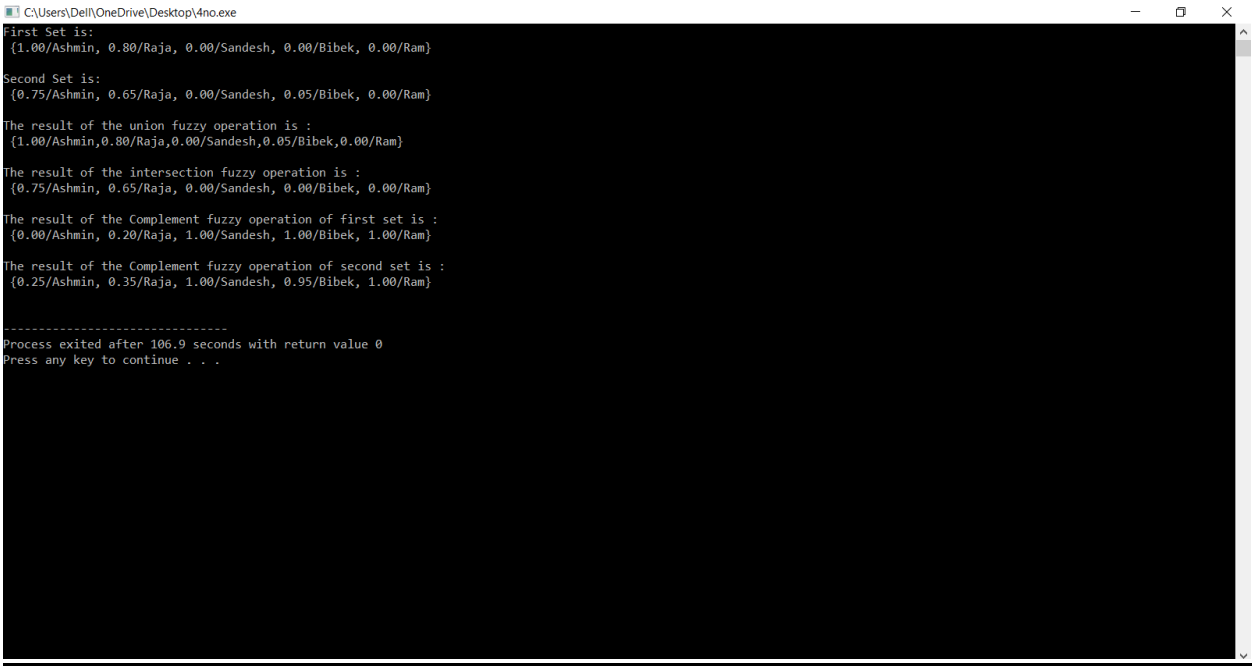
```
#include<stdio.h>
#include<stdlib.h>
float degree_of_membershipA(int age){
if (age <=20)       return 1;
else if(age<=30)    return  (float)(30-age)/10;
else                return 0;
}
float degree_of_membershipB(int age){
if (age <=15)       return 1;
else if(age<=35)    return  (float)(35-age)/20;
else                return 0;
}
//Fuzzy Union
void fuzzy_union(char Name[40][40],float MembershipA[40], float MembershipB[40]){
float union_Set[20];
int i,j;
for(i=0;i<5;i++){
if(MembershipA[i]>MembershipB[i]){
union_Set[i]=MembershipA[i];
}
```

```
else if(MembershipA[i]< MembershipB[i]) {
union_Set[i]= MembershipB[i];
}
else{
union_Set[i]=MembershipA[i];
}
}
printf("The result of the union fuzzy operation is : \n {");
for(i=0;i<5;i++){
if(i<4){
printf("%.2f/%s,",union_Set[i],Name[i]);
}
else if(i == 4){
printf("%.2f/%s",union_Set[i],Name[i]);

}
}
printf("}\n\n");
}
        //Fuzzy intersection
void fuzzy_intersection(char Name[40][40],float MembershipA[40], float
MembershipB[40]){
float intersection_set[20];
int i,j;
for(i=0;i<5;i++){
if(MembershipA[i]>MembershipB[i]){
intersection_set[i]=MembershipB[i];
}
else if(MembershipA[i]< MembershipB[i]){
intersection_set[i]= MembershipA[i];
}
else{
intersection_set[i]=MembershipA[i];
}
}
printf("The result of the intersection fuzzy operation is : \n {");
for(i=0;i<5;i++){
if(i<4){
printf("%.2f/%s, ",intersection_set[i],Name[i]);
}
```

```
else if(i==4){
printf("%.2f/%s",intersection_set[i],Name[i]);
}
}
printf("}\n\n");
}

        //Fuzzy Complement
void fuzzy_complement(char Name[40][40],float MembershipA[40], float MembershipB[40]){
float complement_SetA[20],complement_SetB[20];
int i,j;
for(i=0;i<5;i++){
complement_SetA[i]=1-MembershipA[i];
complement_SetB[i]=1-MembershipB[i];
}
printf("The result of the Complement fuzzy operation of first set is : \n {");
for(i=0;i<5;i++){
if(i<4){
printf("%.2f/%s, ",complement_SetA[i],Name[i]);
}
else if(i==4){
printf("%.2f/%s",complement_SetA[i],Name[i]);
}
}
printf("}\n\n");
printf("The result of the Complement fuzzy operation of second set is : \n {");
for(i=0;i<5;i++){
if(i<4){
printf("%.2f/%s, ",complement_SetB[i],Name[i]);
}
else if(i==4){
printf("%.2f/%s",complement_SetB[i],Name[i]);
}       }
printf("}\n\n");
}
int main(){
int age[40],i=0;
char name[40][40];
```

```
float membershipA[20],membershipB[20];
for(i=0;i<5;i++){
printf("Enter the name: ");     scanf("%s",name[i]);
printf("Enter age: ");          scanf("%d",&age[i]);
}
for(i=0;i<5;i++){
membershipA[i]= degree_of_membershipA(age[i]);
membershipB[i]= degree_of_membershipB(age[i]);
}
system("clear");
printf("First Set is: \n {");
for(i=0;i<5;i++){
if(i<4){
printf("%.2f/%s, ",membershipA[i],name[i]);
}
else if(i==4){
printf("%.2f/%s",membershipA[i],name[i]);
}    }
printf("}\n\n");
printf("Second Set is: \n {");
for(i=0;i<5;i++){
if(i<4){
printf("%.2f/%s, ",membershipB[i],name[i]);
}
else if(i==4){
printf("%.2f/%s",membershipB[i],name[i]);
}
}
printf("}\n\n");
fuzzy_union(name, membershipA, membershipB);
fuzzy_intersection(name,membershipA,membershipB);
fuzzy_complement(name,membershipA,membershipB);
}
```

Output



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