/*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.*/

```
#include<stdio.h>
#include<stdlib.h>
int set_union(int setA[], int m, int setB[], int n, int UNION[])
{
int i,j,k=0;
for(i=0;i<m;i++)
{
        UNION[k]=setA[i];
        k++;
}
for(i=0;i<n;i++)
{
        int flag=1;
        for(j=0;j<m;j++)
        {
                if(setA[j]== setB[i])
                {
                        flag = 0;
                        break;
                }
        }
        if(flag ==1)
        {
                UNION[k] = setB[i];
                k++;
        }
```

```
}
return (k);
}
int Intersection(int setA[],int m,int setB[],int n,int INTER[])
{
        int i,j,k=0,l;
        for(i=0;i<m;i++)
        {
        for(j=0;j<n;j++)
                {
                if(setA[i]==setB[j])
                        {
                        INTER[k]=setA[i];
                        k++;
                        }
                }
        }
        return k;
}
int Difference(int setA[],int m, int setB[],int n,int DIFF[])
{
        int i,j,k=0;
        for(i=0;i<m;i++)
        {
        int flag=0;
        for(j=0;j<n;j++)
                {
        if(setA[i]==setB[j])
                        {
```

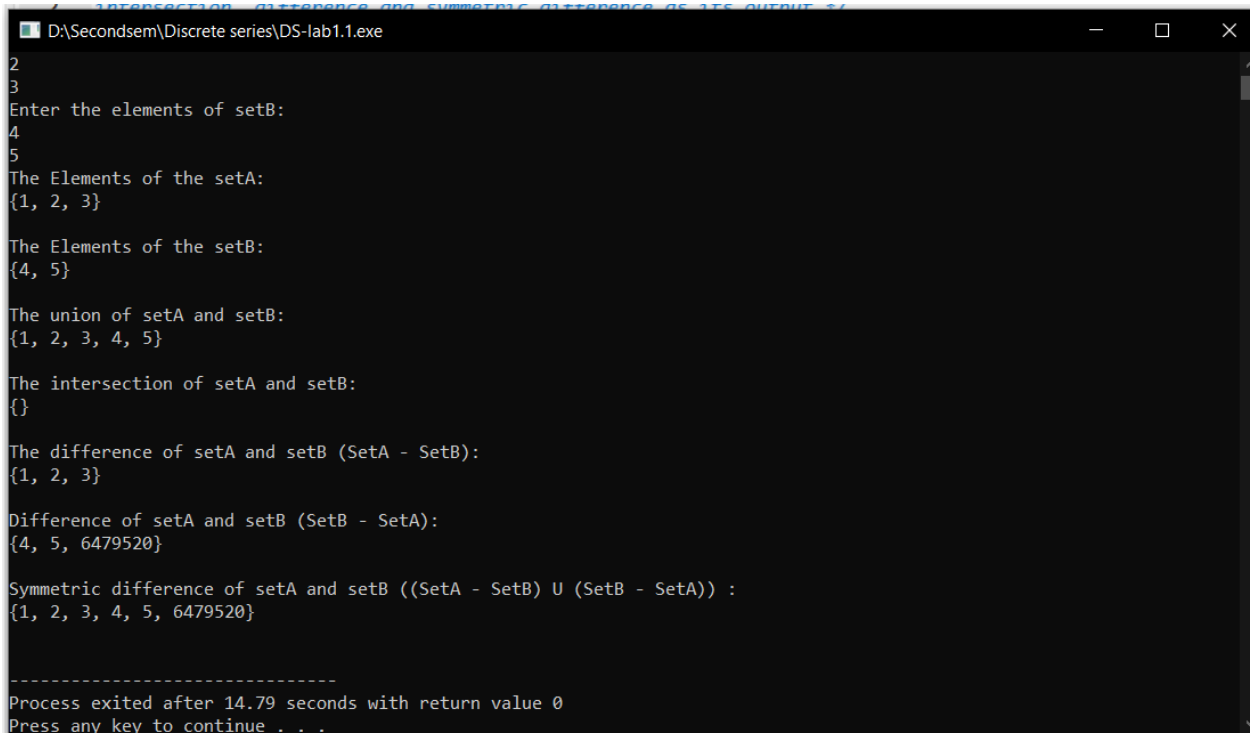
```
		flag =1;
		break;
		}
		}
		if (flag == 0)
			{
		DIFF[k++]=setA[i];
		}
		}
		return k;
}
int Symmetric(int setA[],int m,int setB[],int n,int SYMM[])
{
		int k = set_union(setA,m,setB,n,SYMM);
}
int element(int set[],int size)
{
		int i;
		for(i=0;i<size;i++)
		{
			scanf("%d",&set[i]);
		}
}
void display(int set[],int size)
{
		int i,j,k;
		printf("{");
		for(i=0;i<size;i++)
		{
```

```
                if(i<size-1)
                {
                        printf("%d, ",set[i]);
                }
                else if (i==size-1)
                {
                        printf("%d",set[i]);
                }
        }
        printf("}\n\n");
}
void bubblesort(int set[], int size)
{
        int i, j,temp;
        for(i=0;i<size-1;i++)
        {
                for(j=0;j<size-i-1;j++)
                {
                        if ( set[j]>set[j+1])
                        {
                                temp = set[j+1];
                                set[j+1] = set[j];
                                set[j] = temp;
                        }
                }
        }
}
int main(){
int m,n,i,j,UNION[40],INTERSECTION[40], DIFFA[40],DIFFB[40], SYM[40], INTER[40],SYMM[40];
```

```
int union_num,inter_num,diff_numA,diff_numB,symm_num;
printf("Enter size of set A: ");
scanf("%d",&m);
printf("Enter size of set B: ");
scanf("%d",&n);
int setA[m], setB[n];
printf("Enter the elements of setA: \n");
element(setA, m);
bubblesort(setA,m);
printf("Enter the elements of setB: \n");
element(setB, n);
bubblesort(setB,n);
//displaying the elemensts of set A and set B
printf("The Elements of the setA: \n");
display(setA,m);
printf("The Elements of the setB: \n");
display(setB,n);
//union set operation
printf("The union of setA and setB: \n");
union_num = set_union(setA,m,setB,n,UNION);
bubblesort(UNION,union_num);
display(UNION,union_num);
//intersection set operation
printf("The intersection of setA and setB: \n");
inter_num = Intersection(setA,m,setB,n,INTER);
bubblesort(INTER,inter_num);
display(INTER,inter_num);
//difference set operation
printf("The difference of setA and setB (SetA - SetB): \n");
```

```
diff_numA = Difference(setA,m,setB,n,DIFFA);
bubblesort(DIFFA,diff_numA);
display(DIFFA, diff_numA);
//difference set operation
printf("Difference of setA and setB (SetB - SetA): \n");
diff_numB = Difference(setB,m,setA,n,DIFFB);
bubblesort(DIFFB,diff_numB);
display(DIFFB,diff_numB);
//symmetric difference set opration
printf("Symmetric difference of setA and setB ((SetA - SetB) U (SetB - SetA)) : \n");
symm_num = Symmetric(DIFFA,diff_numA,DIFFB,diff_numB, SYMM);
bubblesort(SYMM,symm_num);
display(SYMM, symm_num);
}
```

Output:



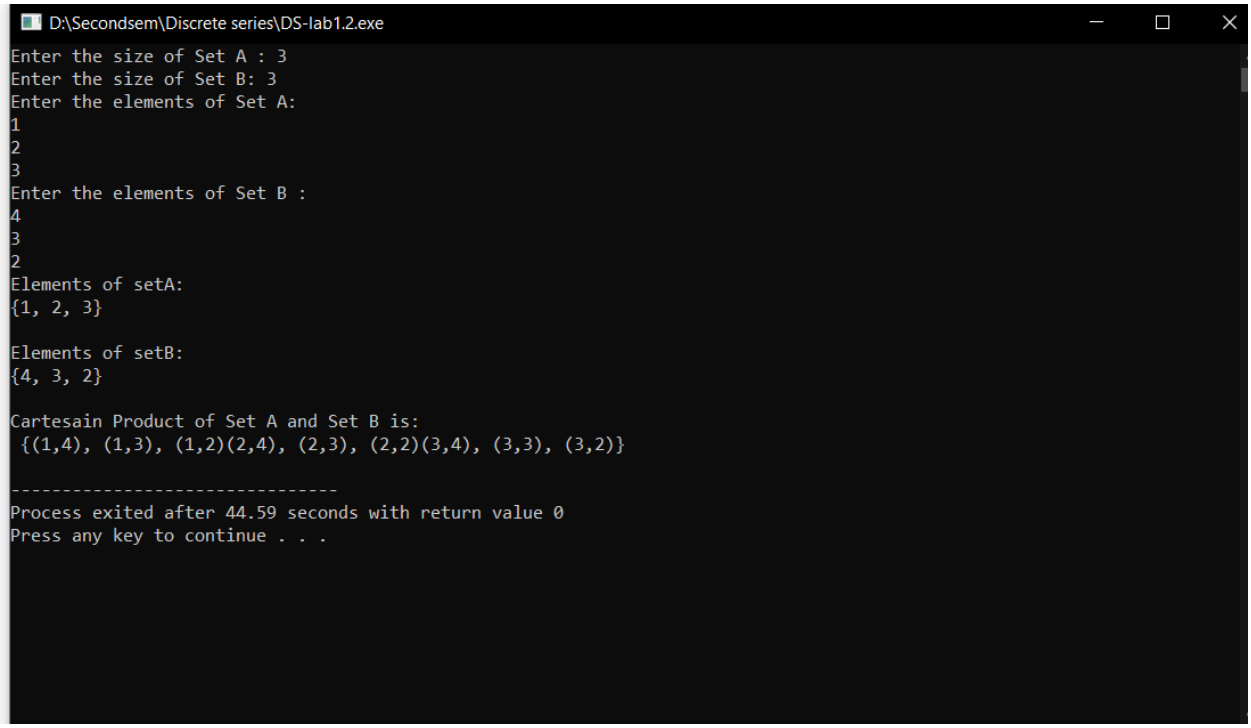
```
//Write a program that takes two or more sets as input and produces their Cartesian product as output.
#include<stdio.h>
#include<string.h>
#include<stdlib.h>
void CartProduct(int arr1[],int arr2[],int n1, int n2){
int i,j;
printf("{");
for(i=0; i < n1; i++){
for(j=0; j < n2; j++){
        if (j<n2-1){
         printf("(%d,%d), ",arr1[i],arr2[j]);
        }
        else if (j== n2-1){
         printf("(%d,%d)",arr1[i],arr2[j]);
        }
}
}
printf("}\n");
}
void display(int set[],int size){
int i,j,k;
printf("{");
for(i=0;i<size;i++)
{
        if(i<size-1)
        {
                printf("%d, ",set[i]);
        }
        else if (i==size-1)
```

```
        {
                printf("%d",set[i]);
        }
}
printf("}\n\n");
}
int main(){
int n1,n2,i,j;
printf("Enter the size of Set A : ");
scanf("%d",&n1);
printf("Enter the size of Set B: ");
scanf("%d",&n2);
int setA[n1],setB[n2];
printf("Enter the elements of Set A:\n");
for(i=0; i<n1; i++)
{
        scanf("%d",&setA[i]);
}
printf("Enter the elements of Set B :\n");
for(j=0;j<n2;j++)
{
        scanf("%d",&setB[j]);
}
printf("Elements of setA: \n");
display(setA,n1);
printf("Elements of setB: \n");
display(setB,n2);
printf("Cartesain Product of Set A and Set B is: \n ");
CartProduct(setA,setB,n1,n2);
```

return 0;

}

Output:



//Program to take a real number and produce ceiling and floor integers as output.

#include<stdio.h>

int floorValue(float num){

if (num == (int)(num)){

return num;

}

else if (num>=0){

return (int)(num/1);

}

else{

return (int)(num-1);

}

}

```
int CeilValue(float num){
if(num == (int)(num)){
return num;
}
else if(num>=0){
    return (int)((num/1)+1);
}
else{
    return (int)(num);
}
}
int main(){
float x;
int ceil,floor;
printf("Enter the number: ");
scanf("%f",&x);
ceil = CeilValue(x);
floor = floorValue(x);
printf("The Ceiling value of %.2f: %d\n",x,ceil);
printf("The Floor value of   %.2f: %d\n", x ,floor);
if ( (int)(x) != x)
{
printf("\n|-(%d)\n|\n|-(%.2f)\n|\n|-(%d)\n\n",ceil,x,floor);
}
}
```

Output:


```
//program to take 5 names and their age as inputs and give degree of membership as output
#include<stdio.h>
#include<stdlib.h>
float degree_of_memshiA(int age){
        if (age <=20)
        {
                return 1;
        }
        else if(age<=30)
        {
                return  (float)(30-age)/10;
        }
        else
        {
           return 0;
        }
```

```
}

float degree_of_memshiB(int age){
	if (age <=15)
	{
		return 1;
	}
	else if(age<=35)
	{
		return  (float)(35-age)/20;
	}
	else
	{
		return 0;
	}
}

// For Fuzzy Union
void fuzzy_union(char Name[40][40],float MemshiA[40], float MemshiB[40]){
	float union_Set[20];
	int i,j;
	for(i=0;i<5;i++)
	{
	if(MemshiA[i]>MemshiB[i])
	{
	 union_Set[i]=MemshiA[i];
	}
	else if(MemshiA[i]< MemshiB[i])
	{
```

```
            union_Set[i]= MemshiB[i];
            }
            else
            {
           union_Set[i]=MemshiA[i];
            }
            }

      printf("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");
}


//For Fuzzy intersection
void fuzzy_intersection(char Name[40][40],float MemshiA[40], float MemshiB[40]){
            float intersection_set[20];
            int i,j;
            for(i=0;i<5;i++)
            {
            if(MemshiA[i]>MemshiB[i])
```

```
            {
             intersection_set[i]=MemshiB[i];
            }
            else if(MemshiA[i]< MemshiB[i])
            {
             intersection_set[i]= MemshiA[i];
            }
            else
            {
             intersection_set[i]=MemshiA[i];
            }
            }

        printf("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 MemshiA[40], float MemshiB[40]){
            float complement_SetA[20],complement_SetB[20];
            int i,j;
```

```
            for(i=0;i<5;i++)
            {
          complement_SetA[i]=1-MemshiA[i];
          complement_SetB[i]=1-MemshiB[i];
            }

printf("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("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 memshiA[20],memshiB[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++){
     memshiA[i]= degree_of_memshiA(age[i]);
     memshiB[i]= degree_of_memshiB(age[i]);
        }

        printf("First Set is: \n {");
        for(i=0;i<5;i++)
        {
        if(i<4){
       printf("%.2f/%s, ",memshiA[i],name[i]);
        }
        else if(i==4){
       printf("%.2f/%s",memshiA[i],name[i]);
                }
        }
   printf("}\n\n");
   printf("Second Set is: \n {");
        for(i=0;i<5;i++)
```

```
        {
        if(i<4){
      printf("%.2f/%s, ",memshiB[i],name[i]);
        }
        else if(i==4){
      printf("%.2f/%s",memshiB[i],name[i]);
        }
        }
        printf("}\n\n");
        fuzzy_union(name, memshiA, memshiB);
        fuzzy_intersection(name,memshiA,memshiB);
fuzzy_complement(name,memshiA,memshiB);
}
```

Output: