

Birla Institute of Technology & Science, Pilani,
K. K. BIRLA Goa Campus
Computer Programming (CS F111)
Second Semester 2013-2014
Lab-11 (C Programming - ADTs)

Write a C program that performs the following set operations:
Files you need to create for solving this question:

1. SetOps.h (This is the interface file which contains the declarations of the functions and constants in the program).
2. SetOps.c (This is the implementation file which contains the definitions of all the functions used in the program).
3. MainProgram.c (This is the driver file which reads 2 sets from the user and performs all the set operations and prints the result.

Functions to be included in the interface file:

```
/*   Pre condition: A should be an integer array with length > 0
    Post condition: Returns N, the number of set elements read.
*/
extern int readSet(int A[]);

/*   Pre condition: N should be >= 0
    Post condition: Prints N elements of the set A.
*/
extern void printSet(int A[], int N);

/*   Pre condition: A and B are sets, N and M >=0
    Post condition: Returns the number of set elements in the
    Union U.
*/
extern int Union(int A[], int N, int B[], int M, int U[]);

/*   Pre condition: A and B are sets, N and M >=0
    Post condition: Returns the number of set elements in the
    Intersection I.
*/
extern int Intersection(int A[], int N, int B[], int M, int I[]);

/*   Pre condition: A and B are sets, N and M >=0
    Post condition: Returns the number of set elements in the Set
    Difference D.
*/
extern int SetDiff(int A[], int N, int B[], int M, int D[]);
```

Sample Input1:

Reading Elements for Set A:
Enter Number of Elements: 5
Elements:
2 3 4 5 6
Reading Elements for Set B:
Enter Number of Elements: 5
Elements:
3 6 7 8 9

Sample Output1:

Set A is: { 2, 3, 4, 5, 6 }
Set B is: { 3, 6, 7, 8, 9 }
A U B is: { 2, 3, 4, 5, 6, 7, 8, 9 }
A I B is: { 3, 6 }
A - B is: { 2, 4, 5 }

Sample Input2:

Reading Elements for Set A:
Enter Number of Elements: 4
Elements:
2 13 4 16
Reading Elements for Set B:
Enter Number of Elements: 2
Elements:
9 7

Sample Output1:

Set A is: { 2, 13, 4, 16 }
Set B is: { 9, 7 }
A U B is: { 2, 13, 4, 16, 9, 7 }
A I B is: { }
A - B is: { 2, 13, 4, 16 }
