Inter American University of Puerto Rico

Bayamon Campus

School of Engineering

Electrical and Computer Engineering Department

COEN 2310 – Discrete Mathematics for Computer Engineering

Homework Report N°: 1

Student Name	:	Raúl A. Torres Cobián
Name of homework	:	Computer Assignment 1
Percent task complete (0%100%)	:	100%
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1. Exercise-1

a. Let A = {1,2}, B = {x| x 3 − 6x 2 + 11x = 6} Write a program to determine whether A ⊆ B

- This solution on this exercise 1 is find subsets the elements array. The only I solve this is by using nested for loop to determine the specific elements after calculating factor manual to find the solutions. After I calculate the factor the result is x= 1, x=2 and x=3. This is the result factor to put the value of array in B integer. Create one control flow if statement the subsets[i] = b[i] is the result to put equal for result (It can also put Subsets[i] = a[i] is the same result) then print the output for the results.

Source code

```
1  public class Exercise1{
2  //1. Let A = {1,2} B = {x|x^3 - 6x^2 + 11x = 6} Write a program to determine whether A subsets B.
       Run | Debug
3      public static void main(String[] args) {
4
5          //declaring variable arrays to determine A subsets B
6          int [] A = {1,2};
7          int [] B = {1,2,3};  // x|x^3 - 6x^2 + 11x = 6 calculating using factor
8          int [] Subsets = new int [A.length + B.length]; //declaring subsets for addition a + b array
9
10         //im using nested loops for finding subsets
11         System.out.print("The Subset for A or B is ");
12         for (int i = 0; i < A.length; i++) {
13
14           for (int j = 0; j < B.length; j++) {
15
16               //Using if statement for the result.
17               if (A [i] == B [j]) {
18                   Subsets[i] = B[i];
19                   //Print the subets betweem A and B
20                   System.out.println(Subsets[i] + " ");
21
22               }
23             }
24         }
25        } // end class
26     } //end program
```

Output of exercise #1

```
The Subset for A or B is 1 2
```

c. The most issue I encountered the exercise is the B equations. I try to use that symbol into array and the error said, ‘out of bounds error’ and I forgot how to calculate factor. The only I found the solutions is calculate factorizing the number and the result gave me x=1, x=2 and x=3. I added these three numbers to array and start coding which is easy by using nested loop to find the subsets number for A and B.

d. There is no added, extended or suggesting because this exercise is well done in exercise #1 for the people who want to start refreshing coding.

2. Exercise-2

a. If A = {1,2,3} and B = {2,3,4,5} find A Δ B

- The solution I start is by using nested for loop like a previous exercise one but this exercise I use two nested for loop with adding a Boolean flag with range based for loop to find a set difference these two elements to get a solution. The if statement for two for loops if the number are equal, I must use break to cancel the subsets number to obtain differences and another one if the flag number is not false it turns true and adding a counter the index to obtains different number. The variable I add counter with temp the A + B array to merge them together like previous one. I did another two loops to find difference using one for loop equal to temp the elements both number the array A + B and last the print for result is using another loop to obtain the different value using length print the results and it works. I did hardcode without using array list or hash in general.

Source code

```java
public class Exercise2 {
//If A = {1,2,3} and B = {2,3,4,5} Find A difference B
Run | Debug
public static void main(String[] args) {

    //declaring variables arrays
    int A[] = {1, 2, 3};
    int B[] = {2, 3, 4, 5};
        //adding temp the array between A and B
    int temp[] = new int [A.length + B.length];
    int counter = 0;

    //1rst nested loop using for loop condition double points
    for (int i : A) {
        //declaring boolean flag
        boolean flag= false;
        for (int j : B) {
            if (i == j) {
                flag = true;
                //break to cancelled the same elements to find different
                break;
            }
        }
        //condition flag boolean to count element to avoid logic error
        if (!flag) {
            temp[counter++] = i;
        }
    }
    //another for loop using a coffe method A=B B=A
    //secound nested loop
    for (int itwo : B) {
        //declaring boolean flag
        boolean flag2 = false;
        for (int value : A) {
            //condition same
            if (itwo == value) {
                flag2 = true;
                break;
            }
        }
```

```
40          //condition flag boolean to count element to avoid logic error
41          if (!flag2) {
42              temp[counter++] = itwo;
43          }
44      }
45
46       //declaring variables for diference to find difference results
47      int differences[] = new int[counter];
48      for (int i = 0; i < counter; i++) {
49          differences[i] = temp[i];
50      }
51
52       //final print output with another for loop to find difference value and final result
53      System.out.print("Difference of A and B is: ");
54      for (int i = 0; i < differences.length; i++)
55      {
56      System.out.print(differences[i] + " ");
57      }
58
59      }//end class
60  }//end program
```

Output of exercise #2

```
Difference of A and B is: 1 4 5
```

c. The difficult I made is this exercise that gave me tons of error logic like it print: 000, 004, 444, 464 etc. I tried to use Boolean flag and it result the same. I was stuck this problem, so I take a break and try again until I got an idea by using that someone taught me using, I called myself ‘coffee method’. Is by using A=B and B=A to get the different number like geeter and seeter but without using them. The solution I build new pseudocode thinking carefully and I use range-based loop to get a different 2 elements into one element I finally solve this problem.

d. I do not add or extended of this exercise two because this is more challenging than the first one and it is a great exercise to train coding challenge to work data structure and algorithms. Thanks to give me complex exercise to train.