Competitive Programming Lab - 1

Academic year: 2020-2021   **Semester:** Long Sem

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Q1.) Half array Reverse

CODE:

```java
public class Main {

  static void reverse_half_array(int num_array[], int n) {
      if (n % 2 == 0) {
      int[] f_array = new int[n];
      int j = n / 2;
      int l = n;
      for (int i = 0; i < n / 2; i++) {
      f_array[j - 1] = num_array[i];
      j = j - 1;
      }
      for (int i = n / 2; i < n; i++) {
      f_array[l - 1] = num_array[i];
      l = l - 1;
      }

      System.out.println("Reversed array: ");
      for (int k = 0; k < n; k++) {
      System.out.print(f_array[k] + " ");
      }
      } else {
      int[] f_array = new int[n];
      int j = n / 2;
      int l = n;
      for (int i = 0; i < n / 2; i++) {
      f_array[j - 1] = num_array[i];
      j = j - 1;
      }
      f_array[n / 2] = num_array[n / 2];
      for (int i = n / 2 + 1; i < n; i++) {
```

```java
        f_array[l - 1] = num_array[i];
        l = l - 1;
        }

        System.out.println("Reversed array: ");
        for (int k = 0; k < n; k++) {
        System.out.print(f_array[k] + " ");
        }
        }
    }

    public static void main(String[] args) {
        int[] num_array = {3, 5, 8, 1, 0, 7, 4, 9, 2};
        System.out.println("Original array: ");
        for (int k = 0; k < num_array.length; k++) {
        System.out.print(num_array[k] + " ");
        }
        System.out.println();
        reverse_half_array(num_array, num_array.length);
    }
}
```

Output:

Result
CPU Time: 0.11 sec(s), Memory: 33316 kilobyte(s)

```
Original array:
3 5 8 1 0 7 4 9 2
Reversed array:
1 8 5 3 0 2 9 4 7
```

Result
CPU Time: 0.13 sec(s), Memory: 33524 kilobyte(s)

```
Original array:
3 5 8 1 7 4 9 2
Reversed array:
1 8 5 3 2 9 4 7
```

Q2.) Duplicate Sum in a Array

CODE:

```java
import java.util.ArrayList;

public class Main {

    static void SumOfDuplicates(int arr[], int len)
    {
```

```java
        int sum=0;
        boolean ifPresent = false;

//            Using ArrayList for storing duplicate elements
        ArrayList<Integer> store = new ArrayList<Integer>();

        for (int i = 0; i < len - 1; i++) {
                for (int j = i + 1; j < len; j++) {
                        if (arr[i] == arr[j]) {

                                if (store.contains(arr[i])) {
                                        break;
                                }
                                else {
                                        store.add(arr[i]);
                                        ifPresent = true;
                                        sum =sum+arr[i];
                                }
                        }
                }
        }

        if (ifPresent == true) {

                System.out.println("Sum of all the duplicates : "+sum);
        }
        else {
                System.out.print("No duplicates found");
        }
    }

    public static void main(String[] args)
    {

        int arr[] = {10, 20, 30, 40, 50, 60, 40, 20, 10, 40, 10};
        int n = arr.length;

        SumOfDuplicates(arr, n);
    }
}
```

Output:

Result
CPU Time: 0.11 sec(s), Memory: 33240 kilobyte(s)

```
Sum of all the duplicates : 70
```

For Input: {10, 20, 30, 40, 50, 60, 50, 20, 10, 40, 10}

Result
CPU Time: 0.09 sec(s), Memory: 33332 kilobyte(s)

```
Sum of all the duplicates : 120
```

Q3.) Comparing two arrays and printing common elements

CODE:

```java
import java.util.*;

public class Main {
    public static void main(String args[]) {

    int arr1[] = {10, 35, 45, 20, 75, 40, 55};
    int arr2[] = {25, 30, 10, 55, 85, 20, 75};

    System.out.println("Array1 : "+Arrays.toString(arr1));
    System.out.println("Array2 : "+Arrays.toString(arr2));
    System.out.println("common elements found : ");
    for(int i=0;i<arr1.length;i++){
        for(int j=0;j<arr2.length;j++){
        if(arr1[i] == arr2[j]){
            System.out.print(" "+arr1[i]);
        }
        }
    }
    System.out.print("\n ----------");
    }
}
```

Output:

Result
CPU Time: 0.09 sec(s), Memory: 33208 kilobyte(s)

```
Array1 : [10, 35, 45, 20, 75, 40, 55]
Array2 : [25, 30, 10, 55, 85, 20, 75]
common elements found :
 10 20 75 55
 ----------
```

Result
CPU Time: 0.10 sec(s), Memory: 33140 kilobyte(s)

```
Array1 : [18, 19, 45, 34, 78, 46, 32]
Array2 : [34, 78, 10, 45, 85, 20, 75]
common elements found :
 45 34 78
 ----------
```