DATA COLLECTIONS – LAB 02

EC 5080

SOFTWARE CONSTRUCTION

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SEMESTER 05

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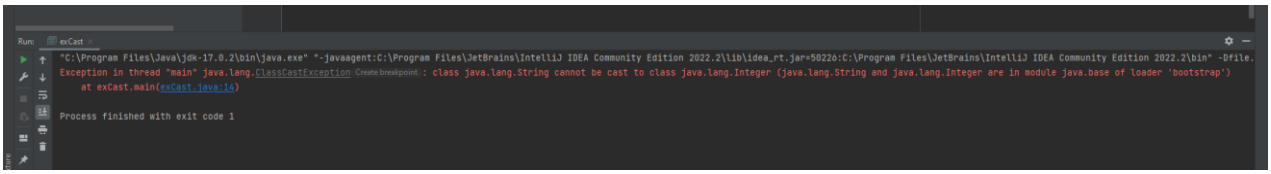
QUESTION 01:

PART 01:

02.



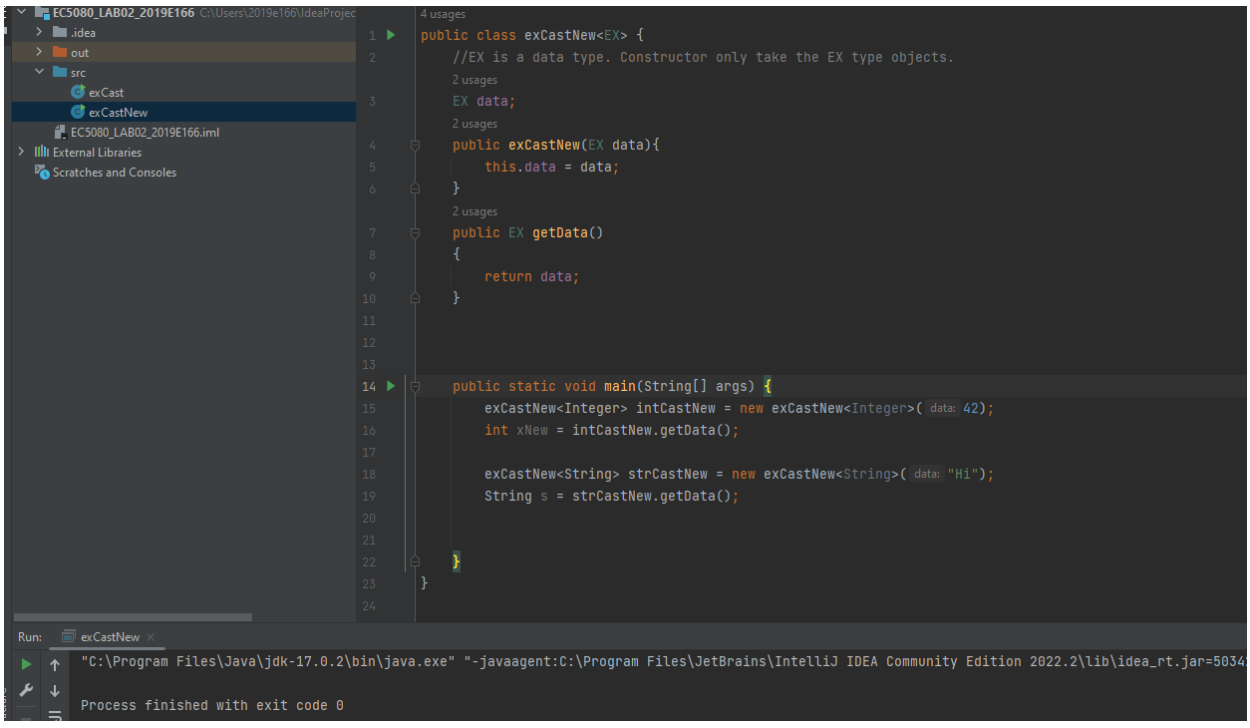
Here we can get a run time error because the casting did not happen properly. According to the compiler the error is detected on int x = (Integer) strCast.getData(); line.

03.

```
public static void main(String[] args) {
    exCast intCast = new exCast( data: 42);
    exCast strCast = new exCast( data: "hi");
    int x = (Integer) strCast.getData();
    intCast = strCast;
    // Equalising the intCast variable to strCast then the error occur at compile time.
```

When intCast = strCast line added at the end it will give compile time error.

04.

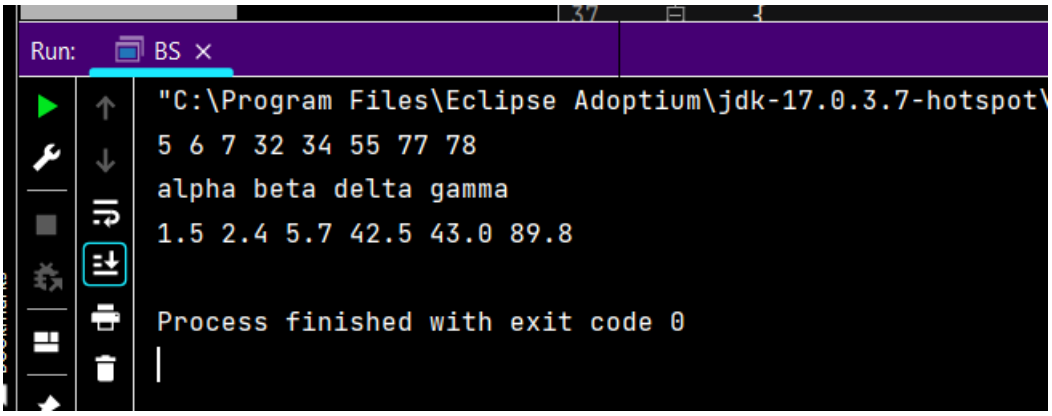


PART 02

01.

```
//https://big-o.io/examples/bubble-sort/java-generic/ - get the idea for object comparison.
public class BS {
   public static<E extends Comparable<E>> void BS(E [] arr)
   {
      boolean Pass = true; //fill
      int n = arr.length;
      for (int i = 0; i < n && Pass; i++)
      {
         Pass = true; //fill
         for (int j = 0; j < n - i-1; j++)
         {
           if ((arr[j].compareTo(arr[j+1]) > 0))
            {
               swap(j,j+1,arr);
               Pass = true;
            }
         }
      }
   }
   public static void swap(int i , int j,Object [] arr)
   {
      Object temp = arr[i];
      arr[i] = arr[j];
      arr[j] = temp;
   }
   public static void print(Object arr[])
   {
      int i = 0;
      while(i < arr.length)
      {
         System.out.print(arr[i] + " ");
         i++;
      }
      System.out.println();
   }
   public static void main(String args[])
   {
      Integer[] intArray = {34,6,7,5,32,77,78,55};
      Double[] doubleArray = {5.7,89.8,43.0,42.5,2.4,1.5};
      String[] stringArray = {"alpha","gamma","beta","delta"};
      BS(intArray);
      BS(doubleArray);
      BS(stringArray);
      print(intArray);
```

```
        print(stringArray);
        print(doubleArray);
    }
}
```



QUESTION 02:

01.
a. Set

b.

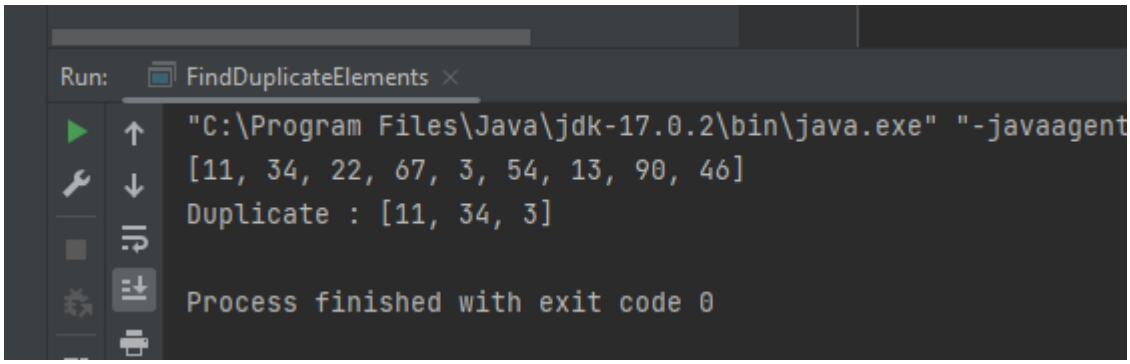
```
// I certify the code of this lab is entirely my own work, but I referred the lecture notes attached.
import java.util.LinkedHashSet;
import java.util.Set;

public class FindDuplicateElements {
    public static void main(String[] args) {
        int[] data = {11,34,22,67,11,3,54,13,34,90,3,46};
        Set<Integer> set = new LinkedHashSet<Integer>();
        Set<Integer> duplicateSet = new LinkedHashSet<Integer>();
        int j = 0;
        for(int i =0; i< data.length; i++)
        {
            set.add(data[i]);
            if((j+1) == set.size())
            {
                j++;
            }
            else
            {
                duplicateSet.add(data[i]);
            }

        }
        System.out.println(set);
```

```
        System.out.println("Duplicate : "+duplicateSet);
    }
}
```

c.



02.

a. List

b.

```
/** I certify the code of this lab is entirely my own work,
 * https://www.geeksforgeeks.org/sort-string-characters/ this helps to get an idea about sorting strings.
 */

import java.util.Arrays;
import java.util.LinkedList;
import java.util.Random;

public class Cards {

    LinkedList cards = new LinkedList<String>();

    public void setCards(Object[] cardsArray)
    {
        for(int i =0; i<cardsArray.length; i++)
        {
            cards.add(cardsArray[i]);
        }
        System.out.println("Added");
    }
    public void SortTheCard(Object[] cardsArray)
    {
        Arrays.sort(cardsArray,0,(cardsArray.length));
        System.out.println("Sorted card : ");
        for(int i =0; i<cardsArray.length; i++)
```

```
        {
            System.out.print(cardsArray[i] + " ");
        }
        System.out.println();
    }


    public void shuffleTheCards()
    {
        System.out.println("Shuffle the cards : ");
        for(int i =0; i<cards.size(); i++)
        {
            int s = new Random().nextInt(cards.size());
            System.out.print(cards.get(s) + " ");
        }
        System.out.println();
    }

    public void reverseTheCards()
    {
        System.out.println("Reverse Order : ");
        for (int i = cards.size(); i>0; i--)
        {
            System.out.print(cards.get(i-1)+" ");
        }
        System.out.println();
    }

    public static void main(String[] args) {
        String[] cardArray =
{"ClubsA","SpadeK","HeartsQ","DiamondJ","Clubs10","Spade9","Hearts8","Diamond7","Clubs" +
            "6", "Spade5","Hearts4","Diamond3"};
        Cards object = new Cards();
        object.setCards(cardArray);
        object.SortTheCard(cardArray);
        object.shuffleTheCards();
        object.reverseTheCards();
        object.shuffleTheCards();
    }
```

c.

03.

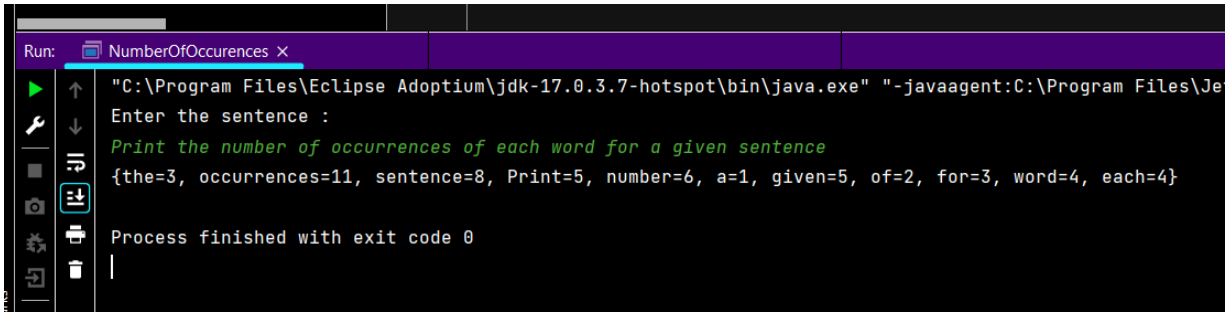
a. Map

b. import java.util.*;

```
public class NumberOfOccurences {
   Scanner scanner = new Scanner(System.in);
   public void divideWord()
   {
      System.out.println("Enter the sentence : ");
      String sentence = scanner.nextLine();
      String[] word = sentence.split(" ");
 HashMap<String,Integer> wordDetails = new HashMap<>();
      for (int i =0; i<word.length; i++)
      {
         String temp = word[i];
         wordDetails.put(temp,temp.length());
      }
      System.out.println(wordDetails);
   }

   public static void main(String[] args) {
      NumberOfOccurences object = new NumberOfOccurences();
      object.divideWord();
   }
}
```

c.


Run:
NumberOfOccurences
"C:\Program Files\Eclipse Adoptium\jdk-17.0.3.7-hotspot\bin\java.exe" "-javaagent:C:\Program Files\Je
Enter the sentence :
Print the number of occurrences of each word for a given sentence
{the=3, occurrences=11, sentence=8, Print=5, number=6, a=1, given=5, of=2, for=3, word=4, each=4}
Process finished with exit code 0