Java - Collections - Assignment

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Section B
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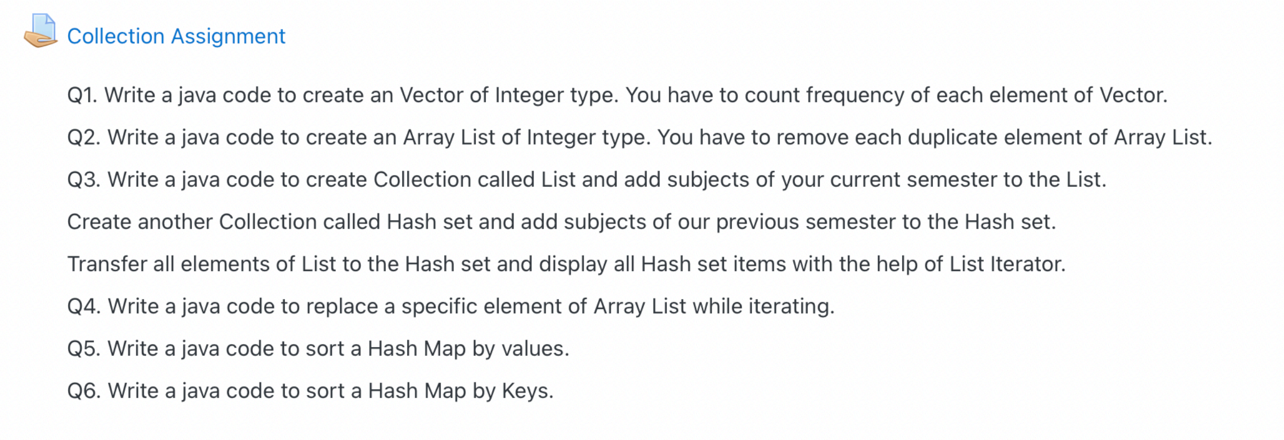

Collection Assignment

Q1. Write a java code to create an Vector of Integer type. You have to count frequency of each element of Vector.

Q2. Write a java code to create an Array List of Integer type. You have to remove each duplicate element of Array List.

Q3. Write a java code to create Collection called List and add subjects of your current semester to the List.

Create another Collection called Hash set and add subjects of our previous semester to the Hash set.

Transfer all elements of List to the Hash set and display all Hash set items with the help of List Iterator.

Q4. Write a java code to replace a specific element of Array List while iterating.

Q5. Write a java code to sort a Hash Map by values.

Q6. Write a java code to sort a Hash Map by Keys.

CODE @GitHub

I've uploaded the code to a GitHub repo also: link

https://github.com/rootz491/java-basics/tree/master/collection%20assignment%20soln

CODE @Here

From next page

Question 1

```
import java.util.Vector;
import java.util.Collections;
import java.util.HashMap;
import java.util.Map;

class Q1 {
    public static void main(String[] args) {
        Vector<Integer> list = new Vector<Integer>();
        HashMap<Integer, Integer> freq = new HashMap<Integer, Integer>();
        Collections.addAll(list, 1, 1, 1, 1, 2, 2, 2, 1, 3, 3, 3, 2, 4, 4);

        // System.out.println(list);

        //    find each element's frequency & store into hashMap
        for(int i=0; i<list.size(); i++) {
            if(!freq.containsKey(list.get(i))) {
                int num = 0;
                for (int j=0; j<list.size(); j++)
                    if(list.get(i) == list.get(j))
                        num++;
                freq.put(list.get(i), num);
            }
        }

        for (Map.Entry<Integer, Integer> i : freq.entrySet())
            System.out.format("%d -> %d%n", i.getKey(), i.getValue());

    }
}



/*

OUTPUT
======

% javac Q1.java
% java Q1
1 -> 5
2 -> 4
3 -> 3
4 -> 2

*/
```

Question 2

```
import java.util.Collections;
import java.util.ArrayList;
import java.util.List;
import java.util.HashSet;
import java.util.Iterator;

class Q2 {
	public static void main(String[] args) {
		List<Integer> list = new ArrayList<Integer>();
		HashSet<Integer> newList = new HashSet<Integer>();
		Collections.addAll(list, 1, 2, 3, 4, 5, 1, 2, 3, 4, 5, 10, 10, 20, 1, 20);

		//	original list
		System.out.printf("Original: ");
		System.out.println(list);

		//	add list into set & it'll automatically remove all dups
		newList.addAll(list);

		//	new list
		System.out.printf("new: ");
		System.out.println(newList);
	}
}




/*
OUTPUT
======

% javac Q2.java
% java Q2

Original: [1, 2, 3, 4, 5, 1, 2, 3, 4, 5, 10, 10, 20, 1, 20]
new: [1, 2, 3, 4, 20, 5, 10]
*/
```

Question 3

```
import java.util.Collections;
import java.util.ArrayList;
import java.util.List;
import java.util.HashSet;
import java.util.Iterator;

class Q3 {
        public static void main(String[] args) {
                List<String> current = new ArrayList<String>();
                HashSet<String> prev = new HashSet<String>();

                Collections.addAll(current, "Java", "DBMS", "OS", "Microprocessor", "Career
Skills", "Software management");

                Collections.addAll(prev, "Python", "Manangement", "Networking", "computer
Architecture");

                //      add current sem subjects to previous sem subjects
                prev.addAll(current);

                //      listIterator can only traverse through List-type object, but not set-type
object.
                Iterator itr = prev.iterator();
                while(itr.hasNext())
                        System.out.format("%s%n",itr.next());
        }
}



/*
OUTPUT
======
% javac Q3.java
% java Q3
computer Architecture
Java
Networking
OS
Career Skills
Software management
Manangement
DBMS
Microprocessor
Python
*/
```

Question 4

```
import java.util.Collections;
import java.util.ArrayList;
import java.util.List;
import java.util.ListIterator;

class Q4 {
        public static void main(String[] args) {
                List<Integer> list = new ArrayList<Integer>();
                int replacement = 53, index = 4;

                Collections.addAll(list, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10);

                //      original list
                System.out.printf("Original: ");
                System.out.println(list);

                System.out.printf("new: \t");
                ListIterator<Integer> itr = list.listIterator();
                while(itr.hasNext()) {
                        if (itr.nextIndex() == index)
                                list.set(index, replacement);
                        System.out.format("%d ", itr.next());
                }
        }
}



/*
OUTPUT
======
% javac Q4.java
% java Q4
Original: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
new:    1 2 3 4 53 6 7 8 9 10
*/
```

Question 5

```
import java.util.Collections;
import java.util.HashMap;
import java.util.ArrayList;
import java.util.Map;
import java.util.ListIterator;
import java.lang.Math;

class Q5 {
	public static void main(String[] args) {
		Map<Integer, Integer> initial = new HashMap<Integer, Integer>();

		//	make a map of 5 random pairs
		for(int i=0; i<5; i++)
			initial.put((int)(Math.random()*100), (int)(Math.random()*100)/2);

		System.out.println("unsorted ->\t" + initial);

		//	get list of keys
		ArrayList<Integer> temp = new ArrayList<Integer>(initial.keySet());

		Collections.sort(temp);
		System.out.println("sorted map%n");

		ListIterator itr = temp.listIterator();
		while(itr.hasNext()) {
			int item = (int)itr.next();
			System.out.printf("%d -> %d\n", item, initial.get(item));
		}
	}
}




/*
OUTPUT
======
% javac Q5.java
% java Q5
unsorted ->	{70=26, 71=1, 23=46, 25=7, 46=3}
sorted map
23 -> 46
25 -> 7
46 -> 3
70 -> 26
71 -> 1
*/
```

Question 6

```java
import java.util.Collections;
import java.util.LinkedHashMap;
import java.util.HashMap;
import java.util.LinkedList;
import java.util.List;
import java.util.Map;
import java.lang.Math;
import java.util.Collections;
import java.util.LinkedHashMap;
import java.util.HashMap;
import java.util.LinkedList;
import java.util.List;
import java.util.Map;
import java.lang.Math;


class Q6 {

    public static Map<Integer, Integer> sortByValue(Map<Integer, Integer> init) {
        List<Integer> initVal = new LinkedList<Integer>(init.values());
        Map<Integer, Integer> sorted = new LinkedHashMap<Integer, Integer>();

        Collections.sort(initVal);

        for(Integer val : initVal)
            for(Integer key : init.keySet())
                if(val.equals(init.get(key))) {
                    if(sorted.containsKey(key))
                        continue;
                    sorted.put(key, val);
                    break;
                }

        return sorted;
    }


    public static void main(String[] args) {

        Map<Integer, Integer> initial = new HashMap<Integer, Integer>();

        //      add 5 random pairs to map
        for(int i=0; i<5; i++)
            initial.put((int)(Math.random()*100), (int)(Math.random()*100)/2);

        //      add 3 random keys with same values to map
        for(int i=0; i<3; i++)
            initial.put((int)(Math.random()*100), 5);

        System.out.println("unsorted ->\t" + initial);

        Map<Integer, Integer> sorted = sortByValue(initial);

        System.out.println("sorted ->\t" + sorted);
    }
}
```

```
/*
OUTPUT
======

% javac Q6.java
% java Q6
unsorted ->     {87=30, 50=20, 0=37, 43=3, 13=32, 93=5, 84=5, 39=5}
sorted ->       {43=3, 93=5, 84=5, 39=5, 50=20, 87=30, 13=32, 0=37}
*/
```