International College of Manitoba

Quiz 2 Version 1 Answer Key

Date: Feb 15, 2024 **Time: 45 Mins** **Marks:20 M**

Course No and name: COMP1020 and Introductory Computer Science 2

Instructor: Tadepalli Sarada

I. Short Answer Questions [5 * 2M = 10 M]

Q1) If an **ArrayList<Double>** named **arrList** already contains **[1.25, 3.67, 5.78]**, show the output after running the following code.

```
arrList.set(1, 7.82);
arrList.add(arrList.size() - 2, 9.12);
System.out.println(arrList.get(1));
arrList.add(4.22);
System.out.println(arrList);
```

9.12
[1.25, 9.12, 7.82, 5.78, 4.22]

1 mark each

Q2) Fill in the blank in the method below to extract the substring between the first and second '@' and convert the extracted word into uppercase.
Given, **String word = "john@doe@Winnipeg" ;**

```
public static String extractWord(String word) {

return word.substring(5, 8).toUpperCase();
```

Q3) Your friend is enthusiastic about gaming and has begun crafting a **GameCharacter** class for their project. Your friend has encountered a hurdle as they haven't yet completed the implementation of the **clone()** method. Assist your friend by finishing up the clone() method.

```
public class GameCharacter {
    private String name;
    private int health;

    public GameCharacter(String name, int health) {
        this.name = name;
        this.health = health;
    }
    public GameCharacter clone() {
        // Complete the clone() method

     return new GameCharacter(name, health);     } }
```

Q4) Given the declaration **int[] numbers={1,2,3};**
Write a try-catch block to handle a possible **ArrayIndexOutOfBoundsException** when accessing elements (e.g. numbers[3]). If the exception occurs, print "**Index out of bounds**" to the console.

```
try {
        int value = numbers[3];
        System.out.println(value);
    } catch (ArrayIndexOutOfBoundsException e) {

        System.out.println("Index out of bounds");
    }
```

1Mark each

Q5) What output would be produced by the code below?

```
import java.io.*;
public class Q5 {
    public static void main(String[] args) {
        String sFile = "data1.txt";
        String dFile = "data2.txt";
        try {

  BufferedReader br = new BufferedReader(new FileReader(sFile));
  PrintWriter pw = new PrintWriter (new FileWriter(dFile));
        String line;
        int count = 1;
         while ((line = br.readLine()) != null) {
          if (count % 2 != 0) {
             count++;
             pw.println(line);
                } }
            br.close();
            pw.close();

        } catch (IOException e) {
            System.out.println("File not found");
        }}}
```

Assume that the file **data1.txt** is valid, in the correct place, and contains these 4 lines:

Dog
Cat
Parrot
Rabbit

Dog

II LONG Answer Questions [10 M]

Q6) Develop a scenario where you are tasked with building a system to manage grocery items for an online grocery store. **[6M]**

Create a new class called **GroceryItemList:**

- Introduce an **ArrayList** itemList to manage a list of **GroceryItem** objects.
- Implement a **constructor** to initialize an empty ArrayList when a **GroceryItemList** object is created.
- Create a method named **addItem(GroceryItem g)** to add a given grocery item to the ArrayList.
- Override the **toString()** method to generate a string representation of all grocery items in the ArrayList.

You are provided with the **GroceryItem** class. Make changes to the class as described:

- Initialize the **gitemList** in the constructor.
- Provide a method named **addSubItem(GroceryItem g)** to add a given sub-item to the **gitemList**.
- Implement a method named **getListOfSubItemsString()** to generate a string representation of all sub-items in the gitemList.

```
public class GroceryItem {
    private String name;
    private double price;
    private int quantity;
    private GroceryItemList
gitemList;

    public GroceryItem(String name,
double price, int quantity) {
        this.name = name;
        this.price = price;
        this.quantity = quantity;
```

```
public String toString() {
     return "Item name: " + this.name + "
     item price: " + this.price + " item
     quantity: " + this.quantity + "Sub
     list Item: " +
     getListOfSubItemsString();    }
```

```java
public class GroceryItem {

    private String name;
    private double price;
    private int quantity;
    private GroceryItemList gitemList;

    public GroceryItem(String name, double price, int quantity) {
        this.name = name;
        this.price = price;
        this.quantity = quantity;
        gitemList = new GroceryItemList();

    }

    public void addSubItem(GroceryItem g) {
        gitemList.addItem(g);
    }

    public String toString() {
        return "Item name: " + this.name + " item price: " + this.price + " item
quantity: " + this.quantity
                + "Sub list Item: " + getListOfSubItemsString();
    }

    public String getListOfSubItemsString() {
        return " " + gitemList.toString();
    }

}
```

2 Marks for the changes

```java
import java.util.*;

public class GroceryItemList {

    ArrayList<GroceryItem> itemList;

    public GroceryItemList() {
        itemList = new ArrayList<GroceryItem>();
    }

    public void addItem(GroceryItem g) {
        itemList.add(g);
    }

    public String toString() {
        String s = "";
        for (int i = 0; i < itemList.size(); i++) {
            s += itemList.get(i) + "  ";
        }
        return s;
    }
}
```

4 Marks

Q7) Write a program to read the lines from **file1.txt** and calculate the total number of **lines, words, and characters (including spaces)** read from the file. Write the result in the **file2.txt**. **[4M]**

file1.txt

Dog barks

Cat Meows

Rabbit squeaks

Horse neighs

file2.txt

The total number of lines are : 4

The total number of words are: 8

The total number of characters are: 45

```java
import java.io.*;

public class FileQues {
    public static void main(String[] args) {
        try {
            FileReader fr = new FileReader("file1.txt");
            BufferedReader br = new BufferedReader(fr);
            String line;
            PrintWriter pw = new PrintWriter(new FileWriter("file2.txt"));
            int lineCount = 0, characterCount = 0, wordCount = 0;
            String[] w = new String[30];
            while ((line = br.readLine()) != null) {
                lineCount += 1;
                w = line.split(" ");
                wordCount += w.length;

                for (int ch = 0; ch < line.length(); ch++) {
                    characterCount += 1;

                }

            }
            pw.println("Line count: " + lineCount);
            pw.println("Words count: " + wordCount);
            pw.println("Character count: " + characterCount);
            br.close();
            fr.close();
            pw.close();
        }

        catch (IOException e) {
                 System.out.println("File not found");


        }
    }
}
```

1 Mark try-catch block

1 Mark file classes and import statements.

2 marks for lines, words, and character count.