Week 3 Synchronisation Session – Module 3 starting on Java Collections

Expected runtime 75~90min

Pre-session checklist

- You have gone through Lesson 3.1-3.7 in Ed and in a process of going through Lesson Rolling Project part 3

Rundown

1. Arrays - Given the following:

   ```
   double[] scoreList = {56.5, 34.5, 98, 67.4, 12.5, 99};
   ```
   write the code to:

   i. Access the third element (i.e. 98) of the array

   _____

   ii. Access the first element (i.e. 56.5) of the array

   _____

   iii. Set the value of the 5th element to be 76.5.

   _____

   iv. Set the value of the last element to be 89

   _____

   v. Display all of the values in the array on a single line

   _____

   vi. Display all of the values in the array on separate line

   _____

2. Array v.s ArrayList, some samples on using the two data structures have been provided for you, fill in the other missing code snippets below.

Steps	Array	ArrayList
Initialise the data structure as an object	int[] intArray = new int[4];	
Create one element within the data structure		intList.add(new Integer(1));
Get the element created above from the data structure		
Get the length of elements in the data structure		
Change the element at the 1st position to the value of 100		

3. For-loop v.s for-each-loop - Complete the following code that will calculate and display the average test score:

```
public class ArrayBasics
{
     public static void main(String[] args)
     {
          double[] testScores = {2.0, 3.0, 5.0, 7.0};
          double total=0, average;

          // Using for-loop
          for(int i = 0; i < testScores._____________; i++)
          {
               total += ___________________;
          }
          average = ____________________________________;
          System.out.println("Average: " + _________);

          // Using for-each-loop
          total = 0.0;
          for(_____________ : testScores)
          {
              total += ___________________;
          }
          average = ____________________________________;
          System.out.println("Average: " + _________);
     }
}
```

4. Using the code in ArrayBasics.java above as a starting point, add a new for-loop for each of the following:
    - Calculate and display the maximum test score
    - Calculate and display the minimum test score

5. Continue working on the Rolling Project - part 2 (link https://edstem.org/au/courses/19006/lessons/59786/slides/406429) by making the necessary changes in Enrolment and University class following the class diagram

Extra exercises for you to practice your programming skills. Use your workspaces to write the following code.

6. While-loop exercise - complete the code below in your workspace for getting the user input, and keep asking until the user inputs the correct option, which can be upper or lower case.

```
/**
 * Class which prints out the menu and gets user input option
 *
 * @author XXX
 * @version 01 July 2023
 */
public class W4LoopMenuInput
{
    /**
     * Constructor for objects of W4LoopMenuInput class
     */
    public W4LoopMenuInput()
    {
    }

    /**
     * Class method to get character input from keyboard
     *
     * @param   msg    a message in String to inform user on the input
     * @param   charPosition the index position for the desired character
     * @return   the character from user input based on the index position
     */
    public static char acceptCharInput(String msg, int charPosition)
    {
        Scanner sc = new Scanner(System.in);
        System.out.println(msg);
        String input = sc.nextLine().trim();
        if (input.length() > 0)
            return input.charAt(charPosition);
        return ' ';
    }

    /**
     * Class method to print out the menu
     */
    public static void displayMenu()
    {
        System.out.println("A. Do something");
        System.out.println("B. Get a rest");
        System.out.println("C. Exit!");
    }

    /**
     * Class method to print out menu and get user input
     * @return menu option
     */
```

```
    public static char getMenuOption()
    {
        char val = '*';
        boolean cont = true;

        // Write your code to display menu, get input, validate input
        // If the input does not match the option
        // keep asking for user input using do-while-loop


        _____________________________________
        return val;
    }

    /**
     * Main method to run the class
     *
     * @param   args    String array of command line arguments
     */
    public static void main(String[] args)
    {
        char option = W4LoopMenuInput.getMenuOption();
        System.out.println(option);
    }
}
```