CSE1007 - Java Programming

Lab Assessment 6

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LAB - L5 + L6
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Question/Task

1. **Multithreading**

Marks (x_i)	1	2	3	4	5	6	7	8	9	10
Student count (f_i)	3	4	17	8	23	10	4	6	5	2

Your Java faculty evaluates Digital Assignment-I and stores the count of students who have scored 1 mark, 2marks and so on, as shown in the table above. She/He wants to calculate the mean of the distribution given by

$$mean = \frac{\sum_{i=1}^{n} f_i x_i}{\sum_{i=1}^{n} f_i}$$

Assist her in completing this task by spawning two threads out of which one works for calculating $\sum_{i=1}^{n} f_i x_i$ and the other for calculating $\sum_{i=1}^{n} f_i$. The main thread should calculate mean of the marks.

Source Code

```
class fixi extends Thread {
    float student_count[] = new float[10];
    float marks[] = new float[10];
    private float sum;

    fixi(float a[], float b[]) {
        student_count = a;
        marks = b;
    }

    public float fixi_get() {
        return sum;
    }

    public void run() {
        try {
            for (int i = 0; i < student_count.length; i++) {
                sum += student_count[i] * marks[i]; // f1*xi
formula
            }
            System.out.println("\nResult of FiXi from thread1 :" +
sum);

        } catch (Exception e) {
            System.out.println(e);
        }
    }
}

class marks extends Thread {
    float marks[] = new float[10];
    private float sum;

    marks(float b[]) {
        marks = b;
    }

    public float marks_get() {
```

```
        return sum;
    }

    public void run() {
        try {
            for (int i = 0; i < marks.length; i++) {
                sum += marks[i];
            }
            System.out.println("Result of Xi from thread2 :" +
sum);
        } catch (Exception e) {
            System.out.println(e);
        }
    }
}

public class assessment6_v1 {
    public static void main(String args[]) {

        // initialise data
        float marks[] = { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 };
        float student_count[] = { 3, 4, 17, 8, 23, 10, 4, 6, 5,
2 };

        // spawn threads
        fixi thread1 = new fixi(student_count, marks);
        marks thread2 = new marks(marks);

        // start threads
        thread1.start();
        thread2.start();

        // wait for thread execution
        try {
            thread1.join();
            thread2.join();
        } catch (Exception e) {
            System.out.println("Error: Join Thread Exception");
        }
```

```
        // calculate average in main thread
        float avg = thread1.fixi_get() / thread2.marks_get();
        System.out.println("\nThe Average Calculated in the main
thread is: " + avg + "\n");
    }
}
```

Output

```
sanjitkumar@Sanjits-MacBook-Air java-programming %  cd "/Users/sanjitkumar/Documents/VIT_DOC/vit_semeste
r_6/C2 - Java Programming/java-programming" ; /usr/bin/env /Library/Java/JavaVirtualMachines/jdk-14.0.1.
jdk/Contents/Home/bin/java -XX:+ShowCodeDetailsInExceptionMessages -Dfile.encoding=UTF-8 -cp "/Users/san
jitkumar/Library/Application Support/Code/User/workspaceStorage/eda6a1a68a038b6c9c81a267fdf133f4/redhat.
java/jdt_ws/java-programming_bc1b874e/bin" assessment6_v1

Result of FiXi from thread1 :410.0
Result of Xi from thread2 :55.0

The Average Calculated in the main thread is: 7.4545455

sanjitkumar@Sanjits-MacBook-Air java-programming %
```