The University of the South Pacific

School of Computing, Information & Mathematical Sciences

CS214 Design & Analysis of Algorithms

Lab Week 2

This tutorial covers an introduction to Java & Matlab. Students are required to do additional readings on their own. For this lab, do the following questions.

Question 1. (Learn Java) – 1 hour

A. ANZ call centre receives hundreds of calls per day and they want an efficient way to handle all the receiving calls. The clear directive from the customer service department is to give a fair chance to each customer on a first-come-first-serve basis.

   What is the best possible data structure for this application?

   A caller must hold the phone so that a consultant could attend to him/her when the caller gets his/her chance from the queue.

   Using *Netbeans* (or any other IDE), make a simulation for this call centre with appropriate features. Consultants should be able to see how many callers are currently in the queue.

B. If you have time, add some advanced features such as caller can hang up the phone by giving his/her name and message. Assume the caller's phone number is captured by the system automatically.

Question 2. (Learn Matlab) – 1 hour

A. Matlab is useful for quick calculations and dealing with matrices. It is also very easy to draw graphs in Matlab.

   An e-commerce website has five products whose unit prices are: [2.50, 1.00, 33.90, 7.00, 200.00]. Suppose, by the end of day the items purchased by different customers is given as:

```
[3 0 0 1 1;
0 1 1 0 0;
5 0 0 0 0;
3 4 2 1 0;
0 0 0 0 1
7 0 3 0 0];
```

Each row indicates the number of individual items purchased by a customer. For example, row 3 shows the customer has purchased 5 units of the first product only. There are 6 customers in the list and 5 items.

Calculate the total sale using appropriate equations in Matlab.

B. Toy problem: Try to draw a graph for $y = x^2$.

Question 3 (homework).

Learn about exception handling in Java and the use of cells in Matlab.