FIT1008 – Intro to Computer Science
Tutorial 6

Semester 1, 2017

Objectives of this tutorial

- To understand Quick sort and Merge sort.

- To understand Exceptions.

- To understand how to work with ADT.

- To understand how to design test cases.

Exercise 1

Show the steps taken to sort the following array:

3	9	1	12	8	4	10	2

using Quick sort and using Merge sort.

Exercise 2

In the Quick sort algorithm, the choice of pivot is crucial. Discuss the reasons for this and give some examples of good/bad choices.

Exercise 3

Are Merge sort, or Quick sort stable? Discuss and provide examples.

Exercise 4

- What does the following snippet of code do? Discuss.

```
a = [0, 1]
try:
    b = a[2]
    print('that worked!')
except ValueError:
    print("no it didn't!")
```

- You can catch all exceptions by using a bare except statement, such as the one shown in the example below. However, this is in general acknowledged as a bad idea. Why do you think this is the case? And what would be the correct way to do it?

```
1   a = [0, 1]
2   try:
3       b = a[2]
4       c = int('foo')
5       d = e
6       f = 1/0
7       print(1 + '1')
8   except:
9       print("what happened!?")
```

Exercise 5

You want to unit test a sorting algorithm. What are good test cases to design your unit test? Explain the rationale behind each case.

Exercise 6

Given below is a snippet of a problem description:

A coffee store in a popular shopping centre is planning to introduce a customer loyalty system. This program is designed to offer rewards for their frequent customers, as well as make their ordering process easier. Each customer has an ID (assigned automatically by the system), name, phone number, and a count of loyalty points. The system will record points earned, accumulated by each customer when they order their coffee. These points can then be redeemed (used) for free coffee on subsequent visits. The system also manages up to 5 different coffees that the store makes. Each coffee has a name and price (in whole dollars). Each coffee is also half price on one day of the week. This day is different for each coffee, and is checked when an order is placed.

1. Describe the ADT's you would require for a program to implement this customer loyalty system.