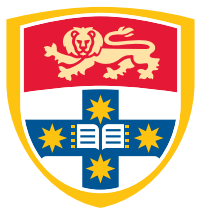
INFO1103: Introduction to Programming

School of Information Technologies, University of Sydney



Week 9: Classes continued and Testing

We will cover: Enumeration class, Designing classes and methods, Testing

You should read: §§6.2 – 6.6

Lecture 18: Classes and methods continued

Defining, testing and refining classes

Enum

Another type

Enumeration : a special kind of class

An enumeration is a collection of predefined values that a variable will take.

We can make simple classes by using `enum`.
Suit.java:

```
1 public enum Suit
2 {
3     CLUBS,
4     DIAMONDS,
5     HEARTS,
6     SPADES;
7 }
```

It's defined in a similar way to a `class`.

This example sets up constant values that can be used later.

In Java these values can only be compared with equals. They are not numbers.

Enumeration : a special kind of class (cont.)

EnumDemo.java:

```
1  public class EnumDemo {
2      public static void main(String[] args) {
3          Suit s = Suit.CLUBS;
4          Suit t = Suit.HEARTS;
5          if (s == t) {
6              System.out.println("Hearts are the same as clubs!");
7          }
8          if ( s == Suit.CLUBS )
9              System.out.println("s is CLUBS");
10         if ( s == Suit.HEARTS)
11             System.out.println("s is HEARTS");
12         if ( s == Suit.SPADES )
13             System.out.println("s is SPADES");
14         if ( s == Suit.DIAMONDS )
15             System.out.println("s is DIAMONDS");
16     }
17 }
```

Enumeration : a special kind of class (cont.)

Define the 8 directions for a compass in `enum` Direction.java:

```
1  public enum Direction
2  {
3
4
5
6
7
8
9
10
11
12
13 }
```

Suppose you want to test if two directions are opposite, what would you do? (hint `enum` is still a `class`)

A public landline telephone

A small telecommunications company (telco) has requested software for it's landline public telephone.

The phone has a handset, a limited resolution display, button keypad for numbers and 6 more buttons for navigating the screen, coin slot, card slot.

Figure 1: Similar to the Blue Payphone

Image: New Scientist 13 December 1979

A public landline telephone

The phone will give a dial tone to the speaker when it is off the handset.

The phone has a built in address book. It contains a list of commonly called public service numbers, optionally stored with a name. This is visible on the attached display when numbers are first pressed.

The phone accepts coins as a form of payment

The phone accepts a telco phone card which has a credit stored on the magnetic strip. After each second, the counter will decrement by the call cost rate

Each call is charged at a fixed call cost measured in cents per second

The phone software automatically debits the payment amount after the number is dialled

Do we need objects?

What kinds of information are there?

What are the attributes of information?

What are the processes of this system, the interactions between various parts?

Is there any separation of information kept among those parts?

How many objects do we need? What are they? and what can they do?

Requirements change

6 months later
Customers with a card are allowed to store 10 phone numbers in the phone memory

12 months later
Regular customer can only store 2 numbers on the phone locally for 1 day. 10 phone numbers are stored with the company if you are a premium customer. When a premium customer uses the card on any phone in the network, the data is downloaded and remains locally stored for a further 3 days. Premium Professional Plus Ultimate Titanium customers can store 500 numbers for 12 months.

The fixed call cost rate is now different among the 3 customer types with card, and the 1 coin paying customer. The coin paying customer is the regular card customer's fixed call cost rate plus 1 cent.