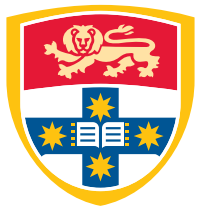
INFO1103: Introduction to Programming

School of Information Technologies, University of Sydney



Week 9: Classes continued and Testing

We will cover: Designing classes and methods, Testing

You should read: §§7.2 – 7.3

Lecture 17: Classes and methods

Defining, testing and refining classes

A taxi meter

A taxi company needs software for it's taximeter

A taximeter is a device to record and show the fare payable for the journey

Figure 1: A taximeter

A taxi meter

At the beginning of each new trip, there is an initial charge of $3

The distance rate $2 per kilometre

The taximeter will update the calculation every second

At the end of the trip, the driver will press a button to stop the update and display the total.

The input is the speed of the vehicle in km/h and is received each second

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?

Push or pull?

The speed information is passed from one place to another, how is it done?

Is the taxi meter retrieving the vehicles speed reading? Pull

OR

Is the speed being sent to the taxi meter? Push

New requirement: fractional rates

The company revised the rates which now require accuracy lower than one cent

At the beginning of each new trip, there is an initial charge of $3.60

The distance rate $2.19 per kilometre

A waiting time rate is 94.4c per minute. It applies when the vehicle speed is less than 26 km/h

The hardware only accepts IEEE754 floating point numbers (`double`) as the current vehicle speed

New requirement: Night distance rate

In a recent hardware upgrade, each new trip is now initialised with the current time value (24 hour).

e.g. `beginTrip(int hours, int minutes, int seconds)` where hours have range: [0, 23]

There is now a Night Distance Rate. It is a fixed amount payable per kilometre, calculated by applying the night-time surcharge of 20% of the Distance Rate.

Night Distance Rate applies to a journey commencing between 10pm and 6am daily.

New requirement: asynchronous updates

In a recent hardware downgrade, the speed is no longer received each second

The taxi meter receives zero or more speed values, each representing one second which has passed since the last update

e.g. 45, 46, 47, 48

- 4 seconds ago the speed was 45
- 3 seconds ago the speed was 46
- 2 seconds ago the speed was 47
- 1 seconds ago the speed was 48

The company boss splurged on a new watch with the money saved