1005ICT Object Oriented Programming 2015-2
Laboratories 7 & 8
School of Information and Communication Technology
Griffith University
September 16, 2015

<table>
<thead>
<tr>
<th>When</th>
<th>Teaching weeks 8 &amp; 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goals</td>
<td>In these laboratories you will design and write a program that draws some graphics.</td>
</tr>
<tr>
<td>Marks</td>
<td>10</td>
</tr>
</tbody>
</table>

1 Preparation

Before your lab class:

- Print these lab notes. You need to refer to them a lot before the lab class and during it.
- Read up to section 14 of the lecture notes.
- Revise the design from workshop 6.
- You can start work before your lab class.

2 Pre-laboratory questions (0.5 marks)

Answer the following questions in the space provided, before your laboratory class in week 8. The answers are all in the Java API.

1. What method of class Graphics2D is used to set a color to draw with? ________________

2. What class was that inherited from? ________________

3. What method of class Graphics2D can be used to draw each segment of a pie chart? ________________

3 Activities

3.1 Design 1 (1.5 marks)

The last example from the lecture notes section 14 consists of two classes, JustABox and ABox. Draw a UML class diagram that shows the relationships between these classes, and the classes JFrame and JComponent. You do not need to show the members of any of these classes. Hint: One relationship is of the is a kind, and the rest are of the has a kind.

3.2 Design 2 (2 marks)

Draw a UML class diagram for the program described below. It should consist of at least four classes, including JFrame, JComponent, your Main class, and the class that will be drawing the pie chart.

The pie chart class will need to store the labels for the chart categories and some numbers. Show the details of all fields required for this, and show the details of the constructors/methods that the class will have.
3.3 Program 1 (6 marks)

- Write a program that accepts one command line argument, the name of a file containing data to be drawn as a pie chart, and draws the pie chart in a window.

- Sample data file, `birds.txt`, contains the one-word categories of some birds I saw on a bush walk, and the number that I saw of each kind.

  swallow 10
  magpie 5
  fairywren 7
  osprey 2
  fantail 3

- The pie chart must use a different colour for each pie segment, and display a legend that shows the labels and the percentage for each. For example:

  ![](pie_chart.png)

- Your program should support up to 10 categories.

- Important: ask your tutor to validate and mark your design before you start coding.

3.4 Program 2 (no marks, just kudos)

- Extend your program so that if there is a second command line argument, use it to select the category to highlight, by shifting its segment away from the centre. For example:

  ![](pie_chart2.png)

4 After the Laboratory

- Organise the work you have done into folders on your network drive.

- Please answer these feedback questions.
- What was the most difficult aspect of this laboratory?
- Did you find an error in these lab notes?