1001ICT Introduction To Programming 2015-2
Laboratory 9

School of Information and Communication Technology
Griffith University
September 22, 2015

<table>
<thead>
<tr>
<th>When</th>
<th>Teaching week 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goals</td>
<td>In this laboratory you will create programs that draw in a window.</td>
</tr>
<tr>
<td>Marks</td>
<td>6</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 sections 20 to 22 of the lecture notes.
- You can start work before your lab class. If you can’t write the complete programs, you could at least create the program files, with header comments, imports, and `main` method.

## 2 Pre-laboratory questions (0.5 marks)

Using the background information above and the latest version of the documentation for the graphics environment, answer the following questions in the space provided, before your laboratory class.

1. Can the `paintWindow` method be called directly from the `main` method? ______

2. What method can you use to draw the outline of a rectangle? ______________

3. What method can you use to draw a filled in circle? (Hint: a circle is a special case of what other shape?) ______________

4. What RGB values give black? ____ ____ ____

5. What RGB values give white? ____ ____ ____

6. What RGB values give green? ____ ____ ____
3 Activities

3.1 Graphics program 1 (1.5 marks)
- Write a program that draws a white chess pawn on a coloured background.

3.2 Graphics program 2 (2 marks)
- Create a program that draws a chessboard of alternating coloured squares like this:

3.3 Graphics program 3 (1 mark)
- Modify the chessboard program so it draws a white pawn in a starting position, like this:
3.4 Graphics program 4 (1 mark)

- Make an animated program that starts all the white pawns in their starting positions and randomly races them to the top, moving one randomly selected pawn every second.
- Hint: Use an array of 8 ints.

3.5 Graphics program 5 (no marks, just kudos)

- Create a program that draws a Yin Yang like this:
3.6 Graphics program 6 (no marks, just kudos)

- Animate the Yin Yang, so that the black areas slowly fade to white and vice-versa so that the blacks and whites continually change places.

- Hint: Use a global variable that remembers what gray level the paintWindow used last time it ran.

3.7 Graphics program 7 (no marks, just kudos)

- Animate the Yin Yang, so that it appears to spin.

3.8 Graphics program 8 (no marks, just kudos)

- Modify the animated chessboard so that the pawns move smoothly from one square to another.

3.9 Graphics program 9 (no marks, just kudos)

- Write an animated program that moves a knight randomly around the board.

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?