

PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING
Department of Computer Engineering

Final Examination: Semester 2

Date: 20th February, 2010

Subject Number: 241-211

Subject Title: Object Oriented Programming

Lecturer: Aj. Andrew Davison

Academic Year: 2009-2010

Time: 13:30 – 16:30 (3 hours)

Rooms: Robot Head (Sec 1 & 4)

R200 (Sec 2)

R201 (Sec 3)

Exam Duration: 3 hours

This paper has 3 pages.

Authorised Materials:

- Writing instruments (e.g. pens, pencils).
- Books (e.g. dictionaries) and calculators are **not** permitted.

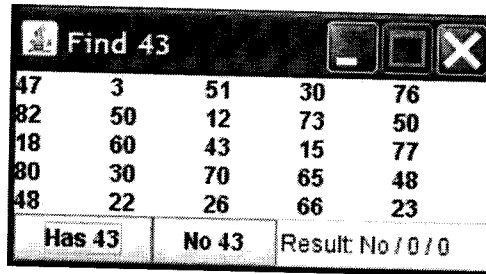
Instructions to Students:

- *Answer questions in English.* Perfect English is **not** required.
- Attempt all questions.
- Write your answers in an answer book.
- Start your answer to each question on a new page
- Clearly number your answers.
- Any unreadable parts will be considered wrong.
- When writing programs, use good layout, and short comments; marks will not be deducted for minor syntax errors.
- The marks for each part of a question are given in brackets (...).

Question 1

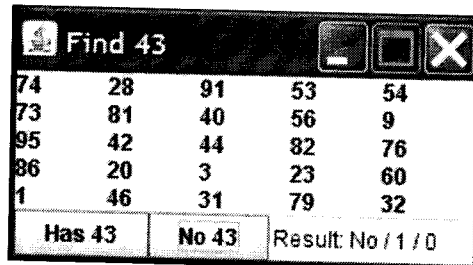
(70 marks; 70 minutes)

Implement the Find43 application. Its GUI interface has the form:



A grid of 25 random integers between 0 and 99 are shown in the top half of the window. The player must press one of two buttons depending on whether "43" is in the grid. In this example, the user pressed the "No 43" button, which is incorrect since there is a "43" in the numbers grid.

The textfield on the right is then updated with the game number and the score, and a new grid of random integers is displayed:



If the user had pressed the correct button ("Has 43"), then the text field would show "Result: Yes / 1 / 5". The first number is the number of games played, the second is the total score. The score depends on the amount of time that has passed since the grid was generated and when the user pressed on a button.

The user can keep playing until he presses the window's close box.

Hints

The GUI should use a BorderLayout, GridLayout, and JPanels for organizing the components. You may need other layout managers as well.

The grid of random numbers should be represented by an array of JLabels.

An ActionListener should be attached to both buttons.

Use System.currentTimeMillis() to get the current time in milliseconds.

Question 2

(30 marks; 30 minutes)

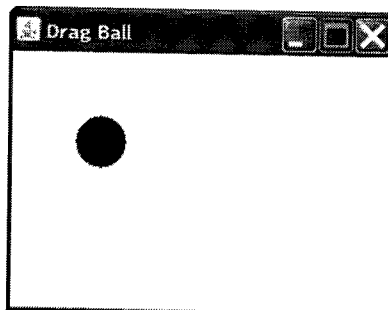
What are the *three* main uses of the interface type?

Your answer should include diagrams and **small** code fragments where possible.

Question 3

(60 marks; 60 minutes)

Implement the DragBall application. Its GUI interface has the form:



The black ball is dragged along with the mouse whenever the mouse cursor is pressed on the ball and dragged.

The ball stops moving when it touches a panel side and when the mouse cursor moves outside the panel.

The white drawing area and black ball should be implemented by subclassing JPanel and by using *both* kinds of Java mouse listener.

Question 4

(20 marks; 20 minutes)

What are the *three* ways of implementing a listener?

Your answer should include diagrams and **small** code fragments where possible.

For your code examples, you may refer back to your coding in questions 1 and 3 if that is useful.

--- *End of Examination* ---