

Exam Application Development

Bachelor 1 *Industrial Design, ET*

Module/code: Module 4, 201400572 / 201300122 / 192801310
Datum: July, 3th, 2016 8:45
Time: 2.5h (+25% for students entitled to extra time)
Module-coordinator: H. Tragter
Lecturer: F. van Slooten

Type of exam: closed book, multiple choice + open questions

Appendices (2): Multiple Choice form, API documentation

Permitted aids: none

Indications:

The use of book, notes, calculator etc. is not allowed during this exam. Enter the multiple choice answers on the attached Multiple Choice Form. You can write the answers to the open questions on the additional examination paper. Write name, initials, student number and subject name on the Multiple Choice Form and exam paper. Make sure that you fill in the student number correctly and tick the corresponding boxes on the answer sheet. For example, if the student number would be s1234567 as shown on the right. Try to answer answers to open questions briefly (possibly explained with sketches).

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This exam consist of:

- Questions 1 to 16 on 5 pages
- An appendix with API documentation of 6 pages.

The Java code presented in the questions is working code, which has been tested and executed in Eclipse. For multiple-choice questions, the answers may display code that is incorrect.

Rating: question 1 to 10: 2 points, 11 to 16: 4 points (total points 44 / 4.4 = grade).

Name: _____
Student number: _____

Multiple choice questions

1. If you would like to know if an object is present or not in front of your product and save that associated value in a variable, what type of variable would be suitable to store this value?

- A. integer
- B. boolean
- C. String
- D. object

2. Which statement allows you to change the text of a Button b (JButton)?

If necessary, use the API documentation of the JButton class in the appendix.

- A. `b = setText("Hello world");`
- B. `b = new Text("Hello world");`
- C. `b.getText() = String("Hello world");`
- D. `b.setText("Hello world");`

3. See the definition of the class SoundBite. Which word can be filled in at the spot marked with `/*xxxx*/`?

If necessary, use the API documentation of the Math class in the appendix.

- A. void
- B. public
- C. double
- D. String

```
public class SoundBite {  
  
    private PlayClip dong;  
    private int ray;  
  
    public SoundBite() {  
        dong = new PlayClip("dong.wav");  
    }  
  
    private /*xxxx*/ area() {  
        return Math.PI * Math.pow(ray,2);  
    }  
}
```

4. What is the output of the following piece of Java code?

If necessary, use the API documentation of the Math class in the appendix.

```
double r = 2.5, circumference = 2 * Math.PI * r;  
System.out.print("circumference: " + Math.round(circumference) );
```

- A. circumference: 16
- B. circumference: 13
- C. 16
- D. 13

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5. Which of the loop statements would generate the following output?:

3 6 9 12 15 18

- A. for (int n=3; n < 19; n=n+3) System.out.print(" "+n);
- B. for (int n=1; n <= 18; n=n+3) System.out.print(" "+n);
- C. int n=0; while (n < 19) { n=n+3; System.out.print(" "+n); }
- D. int n=0; while (n <= 18) { n=n+3; System.out.print(" "+n); }

6. What is the output of the following piece of Java code?

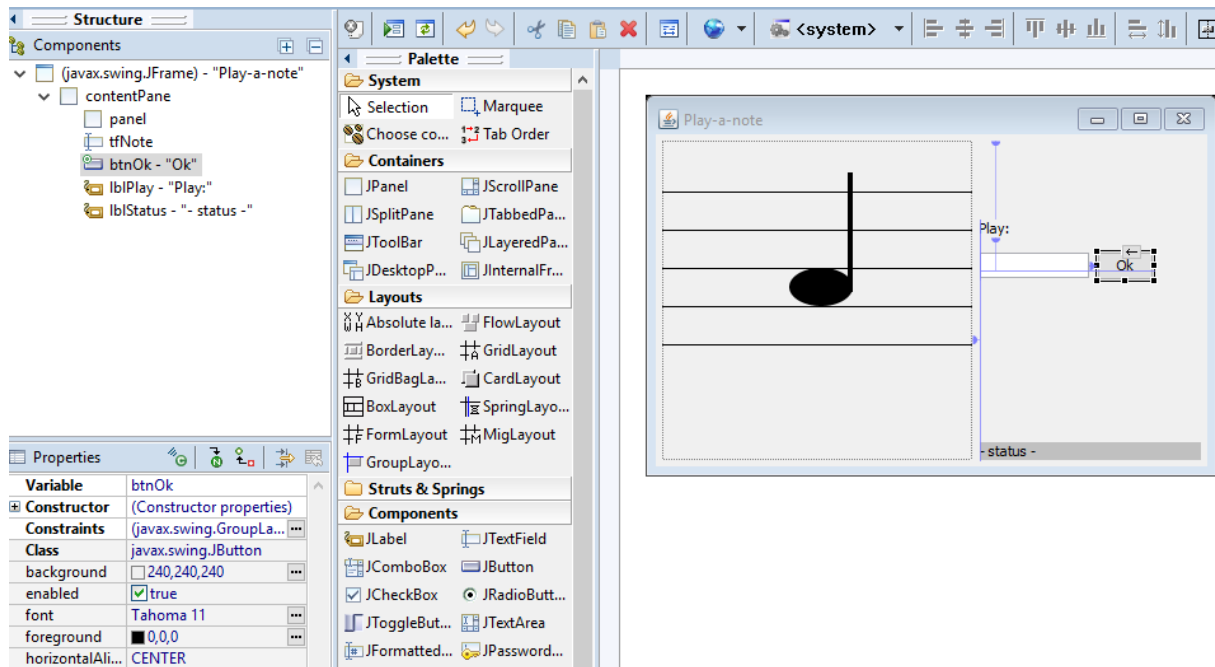
```
String s = "Sound Bite plays smart";
boolean start = true;
for (int i=0; i<s.length(); i++) {
    if (start)
        System.out.print(" "+s.charAt(i));
    if (s.charAt(i) == ' ')
        start = true;
    else
        start = false;
}
```

- A. s p B S
- B. o i l m
- C. s b P S
- D. S B p s

7. At the next page, a definition of a user interface in Eclipse is given. What is the correct declaration and initialization of the selected component?

- A. JButton btnOk; btnOk = new JButton("Ok");
- B. btnOk = new JButton("Ok");
- C. JButton("Ok") = new btnOk;
- D. JButton btnOk; new JButton("Ok");

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8. See the above definition of a user interface. Pressing the "Ok" button (btnOk) will read a value from the text field (tfNote). Shown are lines of code that could be placed in the method that handles the button pressed event.

Which line will get the text from the text field and store it in a local variable?

If necessary, use the API documentation of the classes JButton, JTextField and String in the appendix.

- A. btnOk.isPressed(tfNote.getText());
- B. btnOk.isPressed(): note = tfNote.getText();
- C. note = tfNote.getText();
- D. String note = new tfNote.getText();

9. String note contains the value from the text field (tfNote). This value has been converted to uppercase. Which expression can be used to check if note contains a valid note? A valid note consists of one character with values between 'A'...'G'.

If necessary, use the API documentation of the String class in the appendix.

- A. note.length()==1 && note.charAt(0)>='A' && note.charAt(0)<='G'
- B. note.length()==1 && note.contains("ABCDEFGG")
- C. note[0]>='A' && note[0]<='G'
- D. note.consists()==1 && note.valid('A','G')

10. What would be a valid header for a method which plays a note? The method receives a String as a parameter which contains the note to be played.

- A. Speaker return playNote(String note)
- B. public void playNote(String s)
- C. public void play note (String)
- D. playNote Speaker (String note)

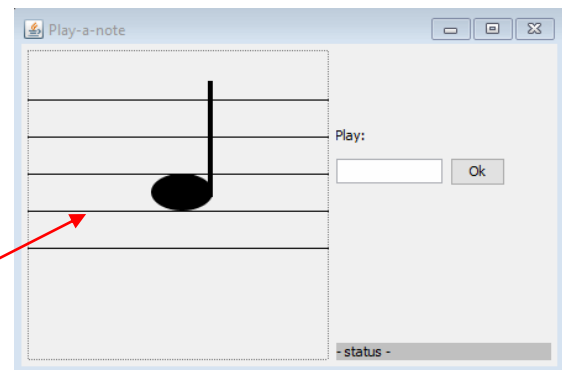
Name: _____
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Open questions

11. Write the body of the method `paint3Notes()` given below, which draws 3 different music notes in a panel (E.g. notes A, B and C).

The note is a class-variable of type `char`. You may use a selection statement, which checks the value of the note, for example to check if note is an A, use:
`note == 'A'`

Notes are drawn at different positions on the staff*. You do not have to draw the staff, only the notes. Values for the positions and the size of the note you may devise (make up) yourself.



* The staff is a set of five parallel lines and the spaces between them, on which notes are written to indicate their pitch.

If necessary, use the API documentation of the Graphics class in the appendix.

```
public void paint3Notes(Graphics g) {  
}
```

12. Write Java code for a class `Flower`, which is used in an application which is used to make bouquets. The class realizes the name, position (a whole number, which indicates its position in the bouquet's flower list), type and color of a flower.

13. Write a method for the class `Flower` which can set the position to a given value. The value is a parameter of the method. For example, the method can be used to adjust the position inside a bouquet.

14. Write a complete method for the `Flower` class that can be used to get all data (all values of the class-variables) from an object of this class as a `String`.

15. See the previous 3 questions. Write a method named `"testAddFlowers"` which:
- Adds 2 new flowers to a list of flowers made with an `ArrayList`
- Calls method `displayList()` to show all flowers in the list (you do not have to write the method `displayList()` yourself).

If necessary, use the API documentation of the `ArrayList` class in the appendix.

16. Sketch a design for a user interface which allows access to an electronic box for postal delivery. The user interface must contain the following components:

- Element(s) to enter a numeric code
- Buttons to: open and close the box, change the code
- A separate element which allows the box to stay open for a fixed amount of time
- An element used to display status information and other short messages (one line of text)

Add a list of the types of user interface components that you have used.