

Tentamen

Objectgeoriënteerd Programmeren

5082IMOP6Y

maandag 16 november 2015 13:00–15:00

Schrijf je naam en studentnummer op de regel hieronder.

Sla deze pagina niet om tot de surveillant vertelt dat het tentamen begonnen is.
Leg je collegekaart of identiteitsbewijs klaar op je tafel.

~

Je mag gewoon in het Nederlands antwoorden!!

~

Dit tentamen is “gesloten boek.” Je mag echter tijdens het tentamen één tweezijdig beschreven of bedrukt A4'tje gebruiken. Daarnaast mag je een pen of potlood gebruiken, maar verder niets.

~

Je moet je antwoorden invullen in dit document. Scheur de bladzijden niet af. De opgaven worden t.z.t. gepubliceerd op de website van het vak.

~

Kladpapier kun je vinden op de achterkant van dit boekje. Tenzij anders vermeld mag je alle functies gebruiken die in opgaven, colleges en leeswerk van de cursus zijn behandeld. Je hoeft bij code geen commentaar te schrijven, maar het kan helpen in het geval je programma niet correct blijkt te zijn. Als je te weinig tijd hebt kun je uitwijken naar het schrijven van pseudocode om een deel van de punten te halen.

SUCCES :-)

Java Basics.

For each of the first two questions, circle the letter (a, b, c or d) of the one response that best answers the question or completes the statement; you need not explain your answers.

1. (1 point.) If a rich pensioner is a person of at least 67 years of age who receives more than €50,000 a year, which expression would define a rich pensioner?

- a. `(age > 67) || (pension > 50000)`
- b. `(age > 67) || (pension >= 50000)`
- c. `(age >= 67) && (pension > 50000)`
- d. `(age >= 67) && (pension >= 50000)`

2. (1 point.) What are the values of `laptops`, `desktops`, and `computers` after the following code has been executed?

```
int laptops = 15;
int desktops = 0;
int computers = laptops + desktops;
laptops = 0;
desktops = 12;
```

- a. 0, 12, 15
- b. 0, 12, 27
- c. 15, 12, 15
- d. 15, 12, 27

3. (2 points.) What is the result of evaluating the following expressions, and what is the resulting *type*?

expression	result	type
<code>3 / 6 * 6 + 1</code>		
<code>4 % 3 == 4 / 6 && true false</code>		
<code>3 + 3 + "A" + 3 + 3</code>		

What does it DO?

Consider the ConsoleProgram below.

```
import acm.program.*;

public class What extends ConsoleProgram {

    public void run() {
        println(does(1, 3));
    }
    private int does(int a, int b) {
        int c = it(a, b);
        int d = it(b, a);
        return do(c, d);
    }
    private int it(int a, int b) {
        int c = a * a;
        b += c;
        return c;
    }

    private int do(int a, int b) {
        a += b;
        b += a;
        return b;
    }
}
```

4. (4 points.) What exactly is printed to the console as a result of running this program?

Computer says no.

The following program fragment contains a method that will produce an error during compilation.

```
public String exclaim(String str)
{
    String result = "";
    for (int i = 0; i < str.length(); i++) {
        char ch = str.charAt(i);
        String letter = Character.toString(ch);
        result += letter.toUpperCase;
    }
    return result;
}
```

5. (2 points.) How could you fix the error?

6. (2 points.) What will be written to the console if you fix the error and insert the following line in a `run` method?

```
println(exclaim("Hello World!"));
```

Writing exercise

7. (6 points.) Write a Console program that asks the user to input an integer. If the integer is 0 (the sentinel value), the program stops. Otherwise, the program ask for another integer. When program is stopped by means of entering the sentinel, it should print the length of the longest sequence of positive or negative numbers, whichever is longer. For example:

```
jh@localhost:~$ java -cp .:acm.jar LongestSequence
? 1
? -2
? 3
? 5
? 9
? -4
? 0
The longest sequence was 3 positive numbers
```

```
import acm.program.*;
```

```
public class LongestSequence {
```

Back to recursion to back to recursion.

The following program fragment is a method that sums all integers from 1 to a given number n .

```
public static int sumTo(int n)
{
    if (n == 0)
    {
        return 0;
    }
    else
    {
        int recurse = sumTo(n - 1);
        int result = n + recurse;
        return result;
    }
}
```

8. (2 points.) Re-write this method without recursion, using a for loop.

9. (2 points.) Re-write this method without recursion, using a while loop.

2001.

Consider the following `GraphicsProgram`. Unfortunately, an error will occur if this program is run.

```
import acm.program.*;
import acm.graphics.*;
import java.awt.*;

public class Monolith extends GraphicsProgram
{
    GRect monolith;

    public void run()
    {
        monolith.setColor(Color.BLACK);
        add(monolith);
    }
}
```

10. (2 points.) What kind of exception will occur?

11. (2 points.) Explain, in no more than three sentences, why this exception occurs.

12. (2 points.) Propose a fix for the code.

Paint 1.0.

We would like to create a `GraphicsProgram` that can draw lines on the canvas. A click should define the starting point of a line and then the second click should be the endpoint of that line. The program should be capable of handling multiple lines, so the 3rd and 4th click should produce another line, as should the 5th and 6th, etc.

13. (6 points.) Complete the program, below, to implement the functionality described above.

```
import acm.graphics.*;
import acm.program.*;
import java.awt.event.*;

public class Lines extends GraphicsProgram {

    public void run() {

        addMouseListeners();

    }

    public void mouseClicked(MouseEvent e) {

    }

}
```

Scrap Paper.

Nothing on this page will be examined by the staff unless otherwise directed.