



Försättsblad Prov Original

Kurskod	Provkod	Tentamensdatum
D T 0 0 7 G	T 1 0 4	2 0 1 8 - 0 6 - 1 3
Kursnamn	Datateknik GR (A), Java II	
Provnamn	Tentamen	
Ort	Sundsvall	
Termin	V18	
Ämne	Datateknik	

Tentamen
dt007g Java II

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Instructions

Carefully read the questions before you start answering them. Note the time limit of the exam and plan your answers accordingly. Only answer the question, do not write about subjects remotely related to the question.

Write your answers on separate sheets, not on the exam paper. Only write on one side of the sheets. Start each question on a new sheet.

Make sure you write your answers clearly, if I cannot read an answer the answer will be awarded no points – even if the answer is correct. The questions are *not* sorted by difficulty.

Time 5 hours, no breaks.

Aids None.

Maximum points 50

Questions 12

Preliminary grades

E \geq 50%, D \geq 60%, C \geq 70%, B \geq 80%, A \geq 90%.

Questions

- (4p) 1. Describe the difference between an inner class defined as

```
private class Inner{  
    // ...  
}
```

and an inner class defined as

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```
private static class Inner{
    // ...
}
```

- (4p) 2. What are the possible states of a Java thread. Describe the states and their transitions.
- (6p) 3. Provide code that shows how to implement a Timer that outputs *tick* every second. Show how to implement and start the Timer by specializing Thread, as well as by implementing a Runnable.
- (4p) 4. Consider the following class

```
public class ExamClass{
    private int ints;
    private int decimals;
}
```

Provide additions to ExamClass so that the following statements

```
ExamClass ce = new ExamClass(3, 14159265);
System.out.println( ce );
```

Results in the output: 3.14159265

- (3p) 5. When reading from a `BufferedReader br`; there is a particular compound while-condition that is necessary to read each `String line`; to the end of the datasource.
What is the condition?
- (4p) 6. Describe the design principle "Open-Closed principle".
Why is this principle desirable?
- (4p) 7. Describe the differences between a `HashSet` and a `TreeSet`.
- (7p) 8. There is an interface definition:

```
/** interface RandomRange
 * Represents a random value in an interval.
 */
public interface RandomRange{
    public int getMaxValue();
    public int getMinValue();
    public int getRandomValue();
}
```

Provide a *complete* and sensible implementation for the following `getRandomRange` method

```
public class ExamQ{
    public static RandomRange getRandomRange(int minValue, int maxValue){
        ...
    }
}
```

- (3p) 9. What is the relationship between the types `MouseListener` and `MouseAdapter`?

(3p) 10. What classes can be used to read and write any java object implementing Serializable?

What members does Serializable define?

(5p) 11. Provide code that can connect two clients over a tcp-connection on port 32100.

When the connections have been made, every line of text written by client 1 should be passed on to client 2. Anything sent by client 2 is ignored.

Provide a resonable amount of error handling.

(3p) 12. When is it preferable to use a StringBuffer instead of a regular String?

Good luck,
Martin