

<p>Objective:</p> <ul style="list-style-type: none"> <li>○ Know the basic elements of Computer Programs</li> <li>○ Fetch and Execute; Load and Store; Executing Java bytecodes</li> <li>○ Problem decomposition</li> <li>○ Algorithms underlie programs</li> </ul> <p>To do before next lecture</p> <ul style="list-style-type: none"> <li>○ Read Java notes ch2.1 and ch3.2 (Syntax..., Programming is difficult)</li> <li>○ Complete Turings Craft questions</li> </ul>	<p>1. Computer Science Terminology – or, did your neighbor understand the readings?</p> <p>A _____ is a memory location (or locations) that has been given a name.</p> <p>A _____ is a kind of control structure</p> <p>A _____ is a named sequence of instructions</p> <p>Why does Java use a virtual machine? What are the advantages? What is a virtual machine?</p> <p>What is a compile error?</p>
<p>2. Java as a high-level language: What happens 'under the covers' in the following code? How often do we read 'score' ? _____, write to score? _____</p> <p>How many bytes are used to hold the value of score?</p> <pre>int score=0; score = score + 1; if(score&gt;0) ...</pre>	<p>4. While talking to the nice people in the student ACM office at Siebel you accidentally signed up for the ACM-credit card and now you're behind on the payments. The ACM mob will not look for you until your arrears are greater than \$12000. Currently you owe \$1000 and the compound interest rate is 20% per month (this rate also increases by 5% per month). How many complete months remain before they knock on your door? Write some pseudo-code or Java code to determine when you should go into hiding.</p>
<p>3. Complete the <b>Java source code</b> below for a program that displays the following message: Boing! followed by a newline. Your code must compile and work exactly as described.</p> <p>Pseudo code: Print “Boing!” to the screen, followed by a newline</p> <p>Java Code:</p> <pre>class BoingPrinter {</pre>	<p>5. Why is the list in a residential telephone book sorted by name?</p> <p>6. If the number of residents doubled why does it <i>not</i> take twice as long to lookup a number for a given name?</p> <p>7. Why must you use a different search algorithm to find a name given a number?</p> <p>8. If the number of residents doubled why does it take twice as long to lookup a name?</p> <p>9. Why are some algorithms more efficient than others? When and why is this efficiency important? How should we measure or describe efficiency?</p>

10. Recursion: Write a recursive algorithm in pseudo-code to find the page number of a particular last name in a telephone book:

Thinking about Algorithms - Algorithm Analysis

11. I have 100 boxes labeled 1,2,3,... 100. When I open a box I will find a piece of paper with a number written on it. I see the written number as the box I should open next. After I read the number I put the paper back and close the box. If I start at box 1 and only stop when I open box 100, what's the worst case scenario - how many boxes might I open before I stop?

12. In the best case scenario how many boxes do I open? (i.e. how few boxes might I open)

13. I want to find which box contains the number 100. Write an **iterative** algorithm in plain English / pseudo-code to find it:

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