Day 2

* New language: Java.
* Syntax derived from that of C/C++, first released in 1995.
* Diffs between Java and Python
  + Python is an interpreted language, Java is a compiled language.
  + Interpreted language: program usually runs via an interpreter
    - A separate program that reads the code of your program, one line at a time, and runs each line it sees them.
    - When you run your programs in the Python notebook, they are being interpreted.
    - Analogy – interpreter in a foreign country
  + Compiled language: Run via a compiler –
    - Program that takes the entire source code file and translates it into another file containing machine code. Machine code can be directly executed by the CPU.
    - Translator for a language translating an entire book at once.
  + Takeaway: compilers usually produce programs that run faster than interpreters can run an equivalent program.
* Biggest difference: type system
  + - Python – dynamically typed language
      * Say you write a function like def square(x) return x \*\* x
      * You can call square(“two”)
    - Java: - statically typed language
      * Can’t do that, the program will not even start running, the Java compiler will flag it as an error.
  + In a statically typed language, the language can figure out before the program runs what data type each variable is. Python can’t do that.
* Biggest syntax difference so far:
  + curly braces instead of indentation.
  + semicolons at the end of every "command".
* Review:
  + System.out.print/println.
  + Variables. (Must be declared before being used. Each variable has a data type. Java always knows what data type each variable is. Unlike Python, a variable's type cannot change while the program is running.)
  + Remind that the declaration (type) is only used once, when the variable is first defined. After that, it's not needed in an assignment statement.
* New Stuff:
  + Input from keyboard. Introduce Scanner.
* Introduce first program we'll write: guess a number game.
* (introduce comments. line comments and block comments).  
  + What variables do we need? Two ints, for the computer's number and the user's guess.
  + Generate a random number (show how to do this). Show Javadoc for math.random. Show casting.
  + Print out the random number. Demonstrate that it's working.
  + Let the user enter a number. See if it's correct using comparisons (introduce comparisons and if/else).
    - Biggest diffs with Python: parentheses around the thing you're testing. No colon at the end of the test. Curly braces instead of indentation. "else if" instead of elif.
  + Demo while loops, integrate a while loop into the program to let the user guess until they get it right. Show do-while loop version and/or while true version.