

AP Computer Science Programming, Java

A decorative graphic at the bottom of the slide. It features a horizontal band with a gradient from orange to grey. Overlaid on this band is binary code (0s and 1s) in a light orange color. To the right, there are several overlapping circles in shades of orange and grey, some with a darker center. The overall design is modern and tech-oriented.

01001010100111101000010010111010010 110101010111010000100101001001
001000010100101001001010000101101001010100001110100101010011101000010010111010010
11010101011101000010000101001001001000010110100101010000111101001010

Google Interview Questions

- You are given 8 identical looking balls. One of them is heavier than the rest of the 7 (all the others weigh exactly the same). You are provided with a simple mechanical balance and you are restricted to only 3 uses. Find the heavier ball. Can you find it with 2 uses?



- How would you cut a rectangular cake into two equal pieces if a rectangular piece has already been cut out of it? The cut piece can be of any size and orientation. You are only allowed to make one straight cut.



Introductions!

- Your name
- Why you're here (future career? just curious?)
- Most interesting thing you've done with a computer



Expectations

- Ask for help
- Don't cheat
- Turn stuff in on time
- Contribute



Goals

- Basics of procedural, object-oriented design
- Interesting application domains
- Beautiful code, NOT hacks
- Java syntax

Grading

- **20% - Daily class work:**
 - Readings, worksheets, readings, reflections and “warm up exercises”
 - Collaboration, respect, leadership and participation
- **45% - Programming projects**
 - Where the learning happens! Applying new knowledge & skills
 - Primarily in-class
- **35% - Tests & Quizzes**
 - Key for succeeding on the AP Exam
 - Demonstrate long-term retention of essential content and application of new skills



Getting help

- Cliche but true: no stupid question
- Ask early, ask often
- Seek help from classmates and try looking online
- I am often in class after school; ask if you want to meet
- email: embergquist@seattleschools.org and consult the class website for more resources.

Dive in... in style!



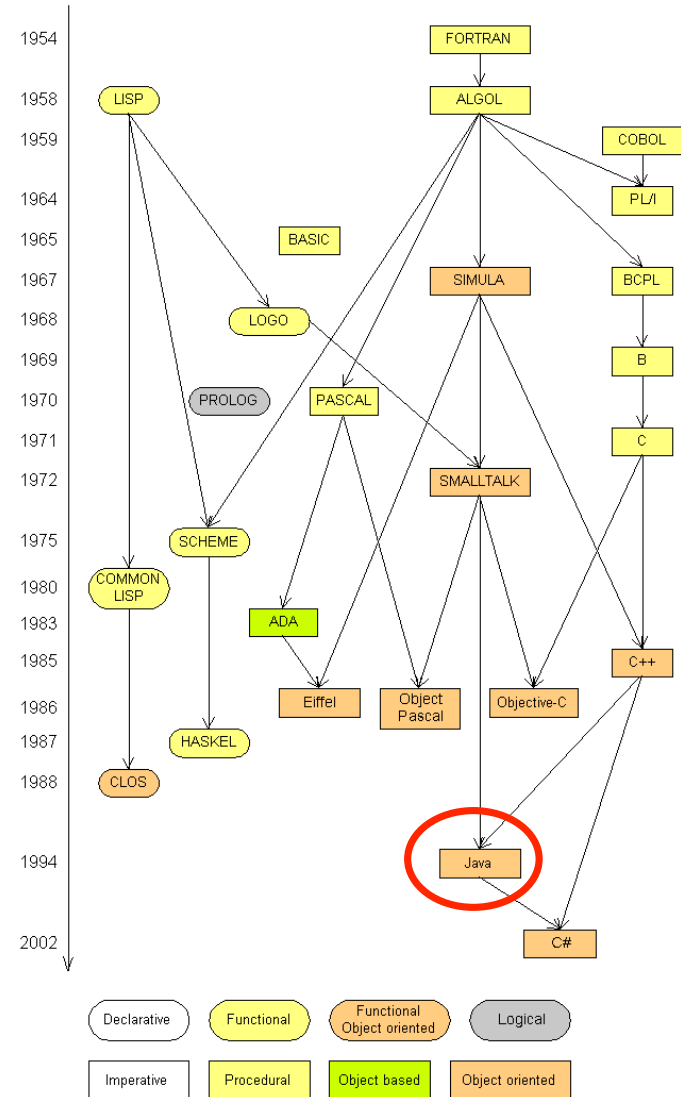
Programming?

- **program:** A set of instructions to be carried out by a computer.
- **program execution:** The act of carrying out the instructions contained in a program.
- **programming language:** A systematic set of rules used to describe computations in a format that is editable by humans.

```
sub leap {  
    my $yr = $_[0];  
    if ($yr % 100 == 0) {  
        return ($yr % 400 == 0);  
    }  
    return ($yr % 4 == 0);  
}  
(Finding leap years in Perl!)
```

Programming languages

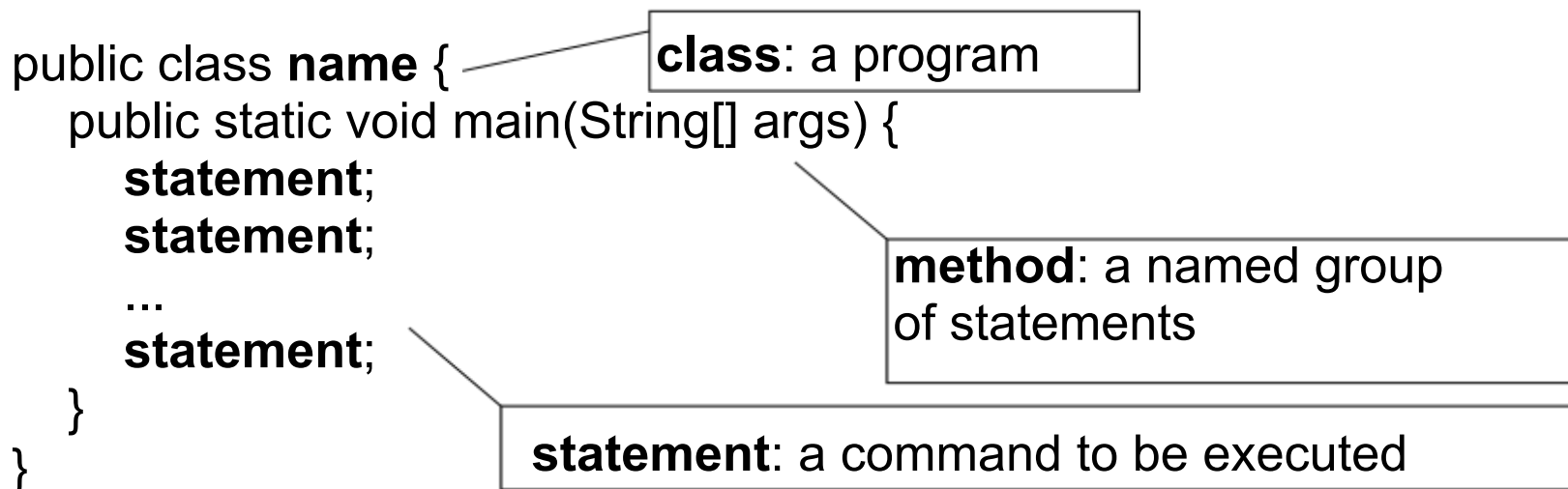
- Formal expression
- Run on real machines
- Come in lots of flavors
- See rosettacode.org



Why Java?

- Relatively simple
- Object-oriented (modern!!)
- Existing libraries
- Platform independent
- Widely used
 - #1 in popularity ie <http://langpop.com/>

Structure of a Java program



- Every executable Java program consists of a **class**,
 - that contains a **method** named main,
 - that contains the **statements** (commands) to be executed.

Compiling/running programs

1. Write it.

- **code** or **source code**: The set of instructions in a program.

2. Compile it.

- **compile**: Translate a program from one language to another.
- **byte code**: The Java compiler converts your code into a format named *byte code* that runs on many computer types.

3. Run (execute) it.

- **output**: The messages printed to the user by a program.

