the OOP toolkit

reviewing 95% of the java language

```
int trueCount = 0;
int falseCount = 0;
```

- variables
- what are the key variables we need to solve a problem
- define them early, so we can manipulate them later
- here, these variables are the crux of the problem solving operation

evaluation

- if
- if-else

```
if(x == true) //less than 1 bil
{
    trueCounter++; //when trueCounter is incremented, main() can see it
}
if (x != true)
{
    falseCounter++; //when falseCounter is incremented, main() can see it
}
```

- true or false evaluations of statements, which direct the flow of a program
- meant for small decision making, done on the spot, once, small strategic moves, decisions

iteration: for loops

- for loops work their way through any collection of data, a pile of facts, the contents of a file
- or they deliver a repetitious set of operations
- in our first example, they created a series of things, like situations
- more apropos for simulations, which are pretty special, and a little rare

```
for(int i = 1; i <= 5 ; i++)
{
    Situation s = new Situation();
    s.runSimulation();

    trueCount = trueCount + s.trueCounter;
    falseCount = falseCount + s.falseCounter;
}
```

anatomy of a for loop

- they contain three variables:
  - a start,
  - a stop
  - an increment
- connotes the calculus idea of limit (lim)

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fors, in general

- workhorse of CS
- deliver us the best opportunites for machine learning, data mining
- working through data, deep problem solving
- they're the hardest part of programming
- most valuable,
- biggest algorithms

objects

- containers for data
- repositories for proven, bug free programming tools

objects, cont

- methods (functions) are inside the object body
- variables, stored in the object
- they are the original intelligent actors, able to do things and know stuff

toolkit

- if: the ability to evaluate facts and make decisions

- objects: represent real things

- fors: move through large numbers of facts or things, populate landscapes of abstract facts

- variables: facts in themselves: words, values