What did you sign up for?

- Fundamentals of computer programming
  - Control flow
  - Variables and arithmetic
  - Objects
  - etc
- Java syntax
- Problem solving using programming concepts
Introduction

- Neal Holtschulte
- Math major at Williams College
- Taught high school Algebra at the Culver Academies
- Worked as a tech consultant at a steel company in Rochester, NY
- Came back to school in 2010 to get my PhD in Computer Science.

Goal: college professor.
Introductions

- Name
- Hobby or interest
- Computer experience
- What you hope to get out of the class
Course website

cs.unm.edu/~neal.holts/
cs152summer2013
I have no idea what I'm doing.
...to here
What we will learn

We will learn the basics of programming in Java.
What is Java, where does it come from?

- Java is a programming language
- Java was developed at Sun Microsystems
- It is designed to be able to run on almost any computing platform
- Java derives much of its syntax from C and C++

Source: en.wikipedia.org/wiki/Java_(programming_language)
What is a programming language?

- A programming language is a language that a machine understands.
- There are many different programming languages, most of which are for the benefit of humans.
- The machine, after all, sees only bits: 11000100000000101011000000
What is a programming language?

Assembly Language

LOAD r1, X
SET r2, 10
CMP r1, r2
JMP NEQ, ELSE1
... ; then part 1
JUMP END1
ELSE1:
... ; else part 1
END1:

LOAD r1, X
SET r2, 10
CMP r1, r2
JMP NEQ, TEST2
JUMP END2
TEST2:
LOAD r1, Y
SET r2, 20
CMP r1, r2
JMP GT, THEN2
JUMP END2
THEN2:
... ; then part 2
END2:

Java

if (x == 10) {
    ... // then part 1
}
else {
    ... // else part 1
}

if ((x!=10) && (y>20)) {
    ... // then part 2
}

Source:
www.cs.utah.edu/contest/1996/takehome/node11.html#SECTION00053300000000000000
QUESTION: How will we write code?
ANSWER: Very carefully. Also, we will write code using Eclipse.
Eclipse

- What is Eclipse?
- Eclipse is an **Integrated Development Environment**
- What Microsoft Word is to text documents, Eclipse is to programs.
- Fun fact: Eclipse is written in Java.

en.wikipedia.org/wiki/Eclipse_(software)
What will we learn?

Variable assignment

```java
String greeting = "Hola, Mundo";
greeting = "Dia dhuit an domhain";
```
What will we learn?

Printing output

String greeting = "Hello, World";
System.out.println(greeting);
What will we learn?

Reading input

Scanner in = new Scanner(System.in);
int n = in.nextInt();
What will we learn?

Booleans

boolean isTrue = true;
boolean isFalse = 7 > 8;
What will we learn?

Comments

/*The following line prints out the string "greeting" to standard output.*/
System.out.println(greeting);
//Just a short comment.
What will we learn?

If statements

String greeting = "Hello, World";
if(speaks_spanish){
    greeting = "Hola, Mundo";
}
What will we learn?

Arithmetic

```java
int n = 4;
n = n/2;
n = 3*n+1;
```
What will we learn?

While Loops

```java
int n = 3;
while(n>1){
    System.out.println(n);
    n = n-1
}
```
What will we learn?

For Loops

```
for(int i=0; i<10; i++){
    canvas.drawOval(250+15*i,200,10,10);
}
```
What will we learn?

Methods

```java
int sum = add(1, 2);
String quietly = toLowercase("HELLO!");
```
What will we learn? Arrays

// declares an array of Strings
String[] bookshelf;
// allocates memory for 3 Strings
bookshelf = new String[3];
// initialize the elements
bookshelf[0] = "Java an Introduction to Problem Solving and Programming";
bookshelf[1] = "The Diamond Age";
bookshelf[2] = "The Things They Carried";
What will we learn?

Error Handling and Debugging

```java
int n = 7;
try{
    System.out.println(n);
}catch(Exception e){
    System.out.println(e.getMessage());
}
```
What will we learn?

File input / output

PrintWriter out = new PrintWriter(new FileWriter("K:\location\outputfile.txt"));
out.print("Hello ");
out.println("world");
out.close();

Source: http://www.cs.carleton.edu/faculty/dmusican/cs117s03/iocheat.html
What will we learn?

String processing

String normalSpeak = "A car will take you far."
String likeAPirate = normalSpeak.replace("ar", "Aarrr!");
Go over the homework.
Questions? Comments?