CSSE 220

Types, Loops, and Strings

Check out LoopsAndStrings from SVN

What are Types?

- All variables in Java have a “type”
- Describes the data that can be stored in a variable
  - String – text only
  - short/int/long – whole numbers only
  - float/double – numbers with decimals
  - boolean – true or false
  - char – a single text character
- Classes – Class names are also types, let you define your own, more complex, types

Strings

- String myString = “hello”;
- String otherString = new String(“hello2”);

- Java’s way of storing text data
- Has many handy functions like substring, charAt, etc. that you will slowly learn
- But how do you find out about these cool functions?

Java API Documentation

- What’s an API?
  - Application Programming Interface

- The Java API on-line
  - Google for: java api documentation 7

You need the 7 (or 8) to get the current version of Java

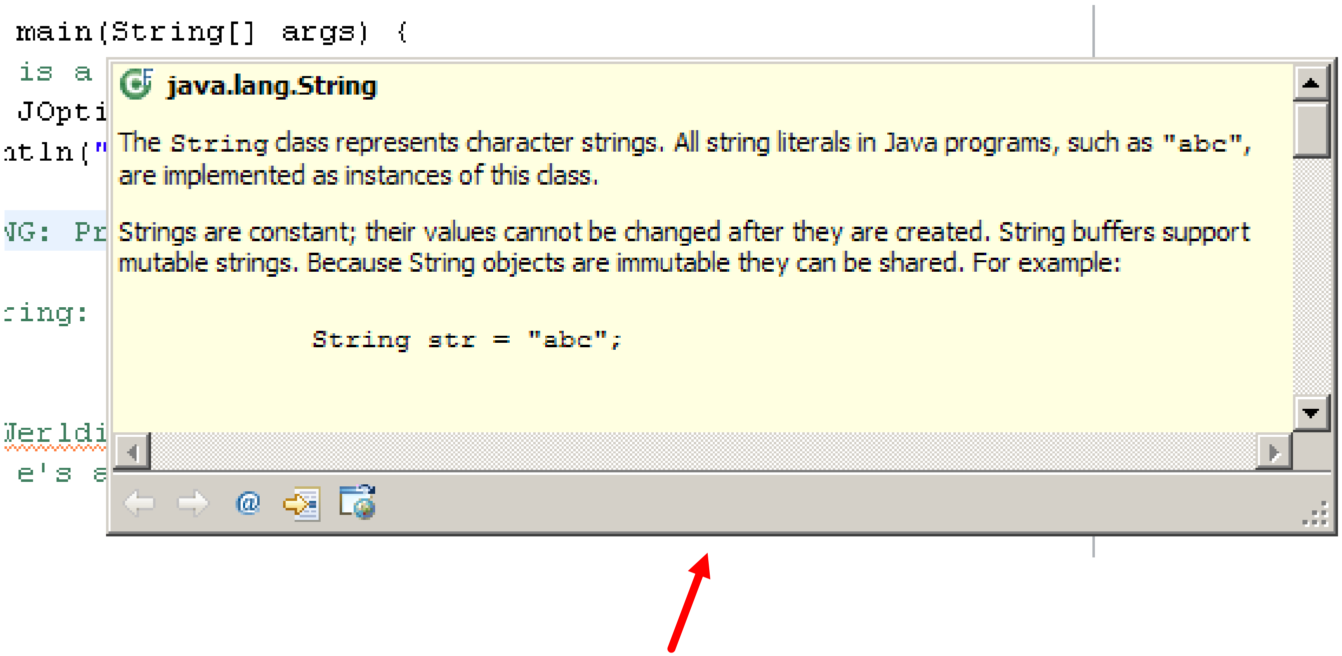
- Or go to: http://download.oracle.com/javase/7/docs/api/

- Also hopefully on your computer at
  C:\Program Files\Java\jdk1.7.0_9\docs\api\index.html

Note: Your version may be something other than 7.0_9.
We recommend that you bookmark this page in your browser, so you can refer to it quickly, with or without an internet connection.

Java Documentation in Eclipse

- Setting up Java API documentation in Eclipse
  - Should be done already,
- Using the API documentation in Eclipse
  - Hover text
  - Open external documentation (Shift-F2)



```
main(String[] args) {
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java.lang.String

The `String` class represents character strings. All string literals in Java programs, such as `"abc"`, are implemented as instances of this class.

Strings are constant; their values cannot be changed after they are created. String buffers support mutable strings. Because String objects are immutable they can be shared. For example:

```
        String str = "abc";
```

Exercise

- Work on UsingStrings.java

Out of order!

Q7

Review Loops: while & for Loops

- While loop syntax: Similar to Python

```
while (condition) {
  statements
}
```

- For loop syntax: Different from Python

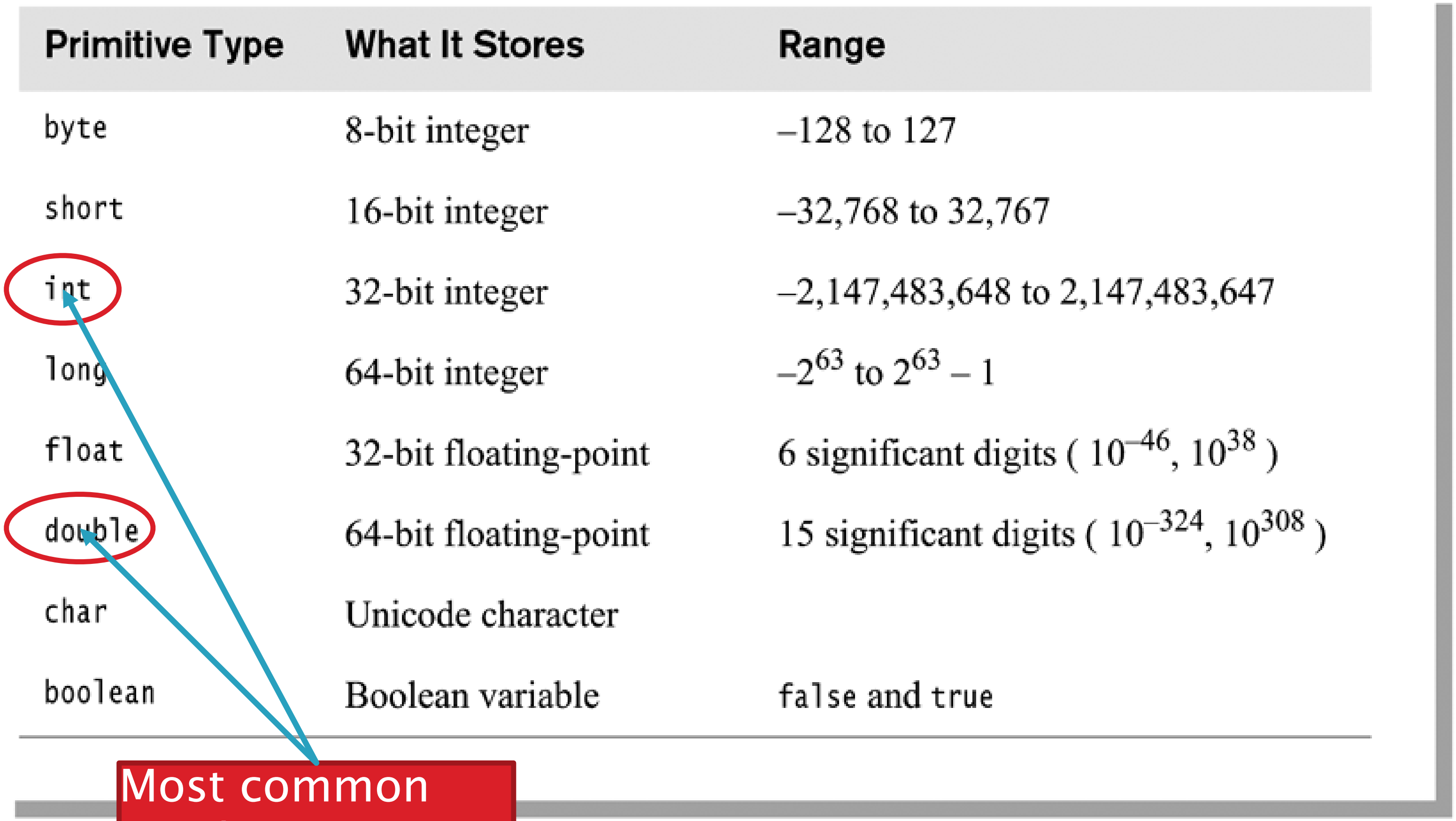
```
for (initialization ; condition ; update) {
     statements
}
```

In both cases, curly braces optional if only one statement in body; but be careful!

Let’s practice some loops

- Go to http://codingbat.com/java/Warmup-2
- We’ll do countXX together
- Then you do doubleX, stringBits, and (if you have time) stringSplosion

Primitive types



Primitive Type	What It Stores	Range
`byte`	8-bit integer	–128 to 127
`short`	16-bit integer	–32,768 to 32,767
`int`	32-bit integer	–2,147,483,648 to 2,147,483,647
`long`	64-bit integer	-2^{63} to $2^{63} - 1$
`float`	32-bit floating-point	6 significant digits (10^{-46}, 10^{38})
`double`	64-bit floating-point	15 significant digits (10^{-324}, 10^{308})
`char`	Unicode character	
`boolean`	Boolean variable	`false` and `true`

figure 1.2

The eight primitive types in Java

Most common number types in Java code

Q1

Exercise

- Work on SomeTypes.java

Java Loop Examples

- Look at `Investment.java`, `InvestmentTest.java` and `InvestmentRunner.java`
  - Practice using a single while loop
  - Study and run the code, then answer quiz questions

- Do the Rates exercise in the Rates.java file
  - You’ll practice using a single for loop in that exercise
  - Hint: in printf’s format string, use %% to display a single %

Q2–Q3

Sentinel Values: A Loop and a Half

- Sentinel value—a special input value not part of the data, used to indicate end of data set
  - `Enter a quiz score, or Q to quit:`

- A loop and a half—a loop where the test for termination comes in the middle of the loop

- Examples… (on next slide)

Q4–Q5

Two Loop-and-a-half Patterns

```
// Pattern 1

boolean done = false;
while (!done) {
   // do some work

   if (condition) {
      done = true;
   } else {
      // do more work
   }
}
```

The variable *done* here is called a *flag*

```
// Pattern 2

while (true) {
   // do some work

   if (condition) {
      break;
   }

   // do more work
}
```

Q6

Work Time

- Wrap up Rates and UsingStrings if you haven’t already, then continue working on TwelveProblems

Q8–Q9, turn in quiz now