



For Loops, Ifs, and math







February 14, 2012

CMPSCI 121, Spring 2012

Introduction to Problem Solving with Computers

Prof. Learned-Miller

Assignments: Check OWL

Requirement Status	Assignment	Due Date
	Bank Accounts	2/9/2012 11:30 PM
	 Chapter 3 Exercises	2/13/2012 11:30 PM
	 eBook - Chapter 4: Looping and Conditionals	2/14/2012 11:30 PM
	Chapter 4 Exercises	2/16/2013 11:30 PM

E-book embedded exercises

- They ARE graded.
- OWL doesn't know about them, so it will say confusing stuff.

Bugs in Section 4.4

- E-book Section 4.4. Problems have been fixed.

Today

- A break from objects, sort of.
- Math
- For loops
- If statements
- Fun with graphics

Converting between types

- `int i=3;`
- `double d;`
- `d=i; // No problem.`
- `d=3.5;`
- `i=d; // Java doesn't like.`
- `i= (int) d; // This is OK.`

Some basic math

- `int j=3;`
- `j=j+1;`
- `j=j*2;`
- `j=j/j;`
- `j=10-j;`

Shortcuts

- Instead of
 - `j=j+1;`
 - `j++;`

Shortcuts

- Instead of

- `j=j-1;`

- `j--;`

Shortcuts

- Instead of

- `j=j+5;`

- `j+=5;`

Shortcuts

- Instead of

- $j = j - 7;$

- $j -= 7;$

Shortcuts

- Instead of

- `j=j*7;`

- `j*=7;`

Booleans: true or false

- `boolean b=true;`
- `boolean c=false;`

Booleans: true or false

- `boolean b;`

- `b = (3 == 3); // This is weird!`

Booleans: true or false

- `boolean b;`

- `b = (3 == 3); // This is weird!`

- `boolean c;`

- `c = (3 == 4); // This is weirder!`

Booleans: true or false

- `int x=3;`
- `int y=4;`
- `if (x<y)`
 `S...println("y is bigger");`

Booleans: true or false

English Name	Java Symbol	Example
and	&&	safe && sound
or		paidDues hasQuit
not	!	!okSoFar

Booleans: true or false

- `boolean x = (3==4 || 3<4);`

Booleans: true or false

- `boolean x = (5 > 2 && 10 > 8);`

Booleans: true or false

- `boolean x = (5 > 2 && 10 > 10);`

Booleans: true or false

- `boolean x = (5 > 2 && 10 >= 10);`

Booleans: true or false

- `boolean x= !false;`

Booleans: true or false

- `boolean x= !!false;`

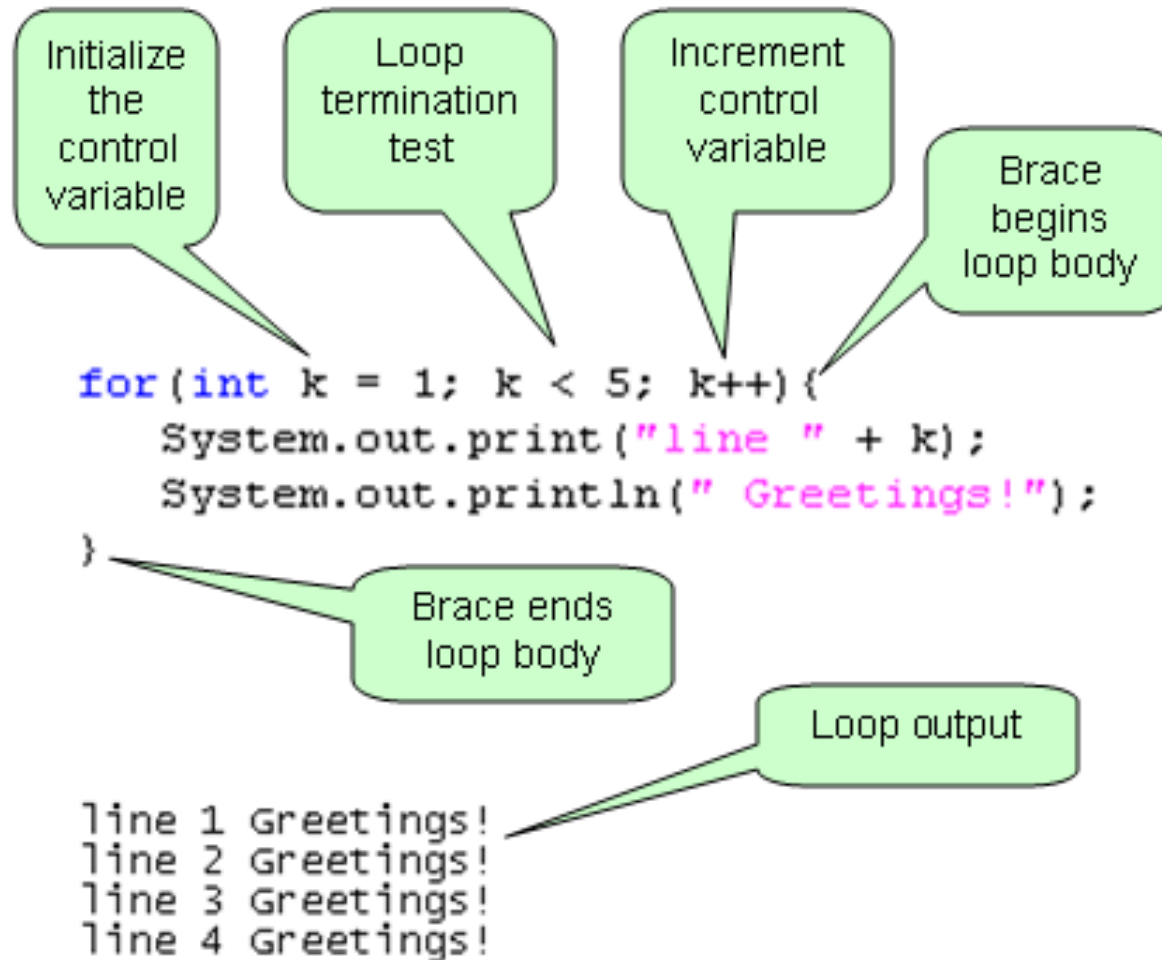
Booleans: true or false

■ `boolean x= !!!!!false; // 6`

Loops! Finally!

- ```
for (int i=0; i<10; i=i+1)
 System.out.println(i);
```

# Loops



# Booleans: true or false

| English Name          | Java Symbol | Example  |
|-----------------------|-------------|----------|
| less than             | <           | (a < b)  |
| less than or equal    | <=          | (a <= b) |
| equals                | ==          | (a == b) |
| not equal to          | !=          | (a != b) |
| greater than          | >           | (a > b)  |
| greater than or equal | >=          | (a >= b) |

# Loops

```
1 import java.util.*;
2
3 public class AddNums
4 {
5 public static void main(String[] args)
6 {
7 Scanner scan = new Scanner(System.in);
8 System.out.println("Enter two numbers");
9 System.out.println("Separate with spaces");
10 System.out.println("Code sums from first to second");
11 int first = scan.nextInt();
12 int second = scan.nextInt();
13 int sum = 0;
14 for(int i = first; i <= second; i++)
15 {
16 sum += i;
17 }
18 System.out.print("Sum from " + first + " to " + second);
19 System.out.println(" is " + sum);
20 }
21 }
```

# Ifs (or *conditionals*)

Test:  
A boolean

```
if (i < j)
{
 System.out.print("the number " + i);
 System.out.println(" is smaller");
}
```

Execute body  
If test is true

# Ifs (or *conditionals*)

Test:  
A  
boolean

```
if (i < j)
{
 System.out.print("the number " + i);
 System.out.println(" is smaller");
}
else
{
 System.out.print ("the number " + i);
 System.out.println(" is not smaller");
}
```

Execute if test is true  
Note: a block

Execute if test is false  
Note: a block

End for today