CS125 – Craig Zilles Lecture 9 "Express Yourself" 9/16/2013

Objectives: Postfix Increment. Building expressions. Short-circuiting. Truth tables. Introduction to conditions and loops.
Walk-in Lab Session in SC 0224 tonight 6-8pm
Deadlines: MP1 graded tonight 8pm. MP2 next Mon8pm
Watch out for surprise lecture quiz

1. Which code snippets increment the value of count?

```
count + 1;
count = count +1;
count += 1;
count ++;
++count;
count = 1 + count;
```

2. Fix and/or simplify the following statements

```
 boolean output = line.indexOf("spoon") == true;

 boolean output = line.indexOf("spoon") != false;

 if (score > 80 == true) TextIO.putln("First");

 if (score > 70 == false) TextIO.putln("Second");

 if (score > 60 == false) TextIO.put("");
```

3. Pre & Post Increment Challenge (aka unreadable code)
Why does the following code print "x=2, ~yPost=1, yPre=6"?

```
int x = 0;
int yPost = 2 * x++ + x;
int yPre = 2 * ++x + x;
System.out.println("x="+x+",yPost="+yPost+", yPre="+yPre);
```

4. Complete the following using 'true' or 'false'
'anything' means any value as long as it is 'true' or 'false'!
||: _____ OR'd with anything is _______
&&: _____ AND'd with anything is _______

5. Spot the Mastikes

Some code starts with the following :

```
  String s = TextIO.getln();
  boolean ok = ____ see erroneous expressions below
```

We need you to fix the following to be correct and accurate Java expressions.
Note, “iff” means “if and only if”
Evaluates to true iff *s* contains "Jim" or "Fred".
(Ignore upper/lower case e.g. “jiM” should evaluate to true)

```
  s.toLowerCase.indexOf('jim') > 0 | s.toLowerCase.indexOf('Fred') == true
```

Should be true iff *s* has at least four characters and starts with "ABCD":

```
  s.length = 4 & s.substring(1,4) = "ABCD"
```

Write an expression that is true iff *s* starts with "ABC" or *s* is an empty string and false otherwise:

6. Code Analysis

```
// What happens if it reads "Help"?
// What happens if it reads "Think Secret!"?

public static void main(String[] args) {
  TextIO.readFile(“data.txt”);
  String word = TextIO.getln();
  int posn = word.toLowercase().indexOf("secret");
  if (posn != -1)  TextIO.putln(word.substring(0, posn));
}
```

7. Short circuiting - a cool trick (and it might be on the exam...)

Avoiding division-by-zero using short circuiting
Modify the expression so that canAccelerate is also true if *speed* is exactly zero. Assume distance and speed are double types.

```
double distToObstacle = ... , speed = ...
boolean canAccelerate = (distToObstacle / speed) > 3.5;
```

Under what conditions will the last term of each of these expressions be evaluated?

```
boolean openVault = businessHours && key1 && key2;
boolean bounce = (x < 0) || (x >100);
```

Under what conditions will the last term '10/c <=3' be evaluated?

```
if ((a >= b)  || ((b<5) && (10/c <= 3))) TextIO.putln("Go");
```

8. Truth Tables – (Homework hint)

Write out a Truth Table for the following expression and then simplify the expression. Variables *a* and *b* are boolean.
boolean c = (a || !b) != (a && b)

a	b	a || !b	a &&b	c

9. Conditions and Loops Blitz
Find and fix all of the mistakes (too many semicolons; code blocks...)

```
if (hasText);
TextIO.putln(line);
hasText = line.indexOf("spoon") > 0; // true if line contains spoon.
```

```
int count = 0;
int dice = (int) (Math.random() * 6);
while (dice != 6);
TextIO.put("Rolling ...")
count ++;
TextIO.putln("\n# dice rolls required:"+count);
```

10. [Advanced] Ternary operator examples.
___ ? ___ : ___ is useful if you know how to use it...

```
int value = TextIO.getlnInt();

int bounded = (value > 10) ? 10 : value;

double average = (count > 0) ? (sum / (double)count) : 0;

String mesg = "File"+ ((count!=1) ? "s" : "") + " copied.";
```