Announcements:
Ch 4 OWL due thur; prog 3 due fri; ch 5 embedded due mon
Midterm: Wednesday, 10/14, 7-8:15 Thompson 102, 104

Lecture Summary: ch 4, most attention to for loops, Math class, random(). Static methods introduced. Casting introduced- (char)97.

1. Some arithmetic: what are the values of these expressions?
   (119 / 10)
   (119 % 10)
   (5/4/3/2)
   (4/2 == 2)
   ((5/3 > 2) || (11 % 7 > 3))
   ((7%2 != 4) && (6/5 <= 2))
   if (n%10 == 3) is true, what’s a possible value for n?

2. What does this print?
   int k = 5;
   if (k >= 5) System.out.println(9/k);
   if ((k < 6) && (k > 5)) System.out.println(5%3);

3. Below do an accurate trace of everything that happens during the execution of this loop:
   for(int j = 0; j < 2; j++){
      if (j % 2 == 0) System.out.println(j);
   }

4. public static void main(String[] args){
   // this does what?
   for(int j = 0; j < 5; j++){
      System.out.println(j);
      System.out.println(j*j); }
}

5. public static void main(String[] args){
   // this does what?
   int sum = 0;
   for( j = 0; j < 5; j++){
      sum = sum + j; // or: sum += j;
      System.out.println(sum);
   }

6. for (int n = 0; n < 50; n++){
   // this does what?
   if (((n % 3 == 2) && (n % 5) == 0)
   System.out.println(n);
   }

7. double r = 2.0;
   for (int n = 0; n < 5; n++){
   // this does what?
   r = Math.sqrt(r);
   System.out.println(r);
   }

8. for (int n = 0; n < 20; n++){
   System.out.println((int)(Math.sqrt(20)));
}
Create a class that includes a main method and works as follows: You should create two Infant objects in the application, myKid and yourKid. Use a Scanner object to read in the name field for each object. For the age field, generate a "month" (between 0 and 9) for each kid using Math.random(). Finally, print the age of the older kid. (Hint: pull off the first digit to right of decimal point)

Look over this program, which gives an estimate of square root of 3:

```java
import java.util.*;
public class RootThree{
    public static void main(String[] args){
        Scanner s = new Scanner(System.in);
        System.out.println("Enter a number of trials");
        int trials = s.nextInt();
        double target = 3.0;
        double cur;
        int below = 0;
        for (int n = 0; n < trials; n++){
            cur = 1 + Math.random();  // root is between 1 and 2
            if ((cur*cur) < target) below++;
        }
        System.out.println("root est for "+ target + ": " +
                         (1 + (double)below/trials));
        System.out.println("actual: "+ Math.sqrt(target));
    }
}
```

1. why the import statement?
2. What are the types of the operands of the very last division, and why the expression (double)below?
3. Explain in your own words why this program approximates sqrt of 3

4. Write a program that reads in a string, then prints its characters in a column.

5. Write a program that reads in a string, then prints in a column, any digits in the string.

6. Write a program that reads in a string, then prints, how many a’s, and b’s there are (upper or lower case).

7. Write a program that reads in a string, then reports, true or false, if there are strictly more a’s than b’s (upper or lower case).

8. Write a program that reads in a string, then prints that string, only with all its a’s replaced with *’s.

9 Write a program that reads in a string, then prints the sum of the numbers associated with the chars in the string. (The number associated with a char is the value you get when you cast the char as an int).

10. Write a program that reads in a positive int, and then continually halves that number and prints the result until 0 is reached. So if 100 is read in then your program should print: 50 25 12 6 3 1