Announcements: Lecture text available at website in pdf; Discussion session texts also be available. Third OWL assignment due Tuesday. Read text Ch 4 for Tuesday. Midterm 7PM 10/16, Bartlett 65 (ch 1-5) There’s also a short online survey – PLEASE do it (worth one OWL point..) Second programming assignment due Wednesday. Hand in through OWL: Programming Assignment 2 Office hours in LGRT 213 (a computer lab). Here are the hours: TA Office hours: (in LGRT 213): M 12:30 - 2:30; Tu 1-5; W 230-330, 4-5; Th 10-11, 2:45-3:45; F 12:30 - 4:30 Website: http://twiki-edlab.cs.umass.edu/bin/view/Moll121/WebHome

Lecture Synopsis–Talked mainly about the coordination between class definitions, and constructor and method invocations in driver class. I also talked about assignment, primitive types, String class. Introduced Scanner.

Reality Check: What are the final values of n and k? Give “cell model of variables” view of the second line.

```java
int n = 3; int k = 2;
n = n + 3;
k = k*2 + k * n;
```

Here is the BookShelf class:

```java
public class BookShelf{
    private String kind; // material, e.g. wood, etc
    private int shelfCount;
    private int width; // in inches
    private int books = 0; // what’s going on here?
    public BookShelf(String whatKind, int shelfCt, int wdth){
        kind = whatKind;
        shelfCount = shelfCt;
        width = wdth;
    }
    public int getShelfCount(){return shelfCount;}
    public int getWidth(){ return width;}
    public int getbooks(){return books;}
    public String getKind(){ return kind;}
    
    public void setBooks(int num){books = num;}
}
```

What are the class’s attributes? Which attributes are unchangeable after they are set via a constructor call? Which can change? Suppose you want to add a method that allows you to add a single shelf. How would you do it? Suppose you’re inside a main method in a Driver class. How many books are in the bookcase when you first create one? Write a statement that creates a 3 shelf wooden bookcase, width is 30. How many books are in this bookcase? How would you set its book count to 20? Now reduce that count to 19.
Here is the Car class:

```java
public class Car{
    String make; // manufacturer
    double fuelCapacity;
    double fuelAmount;

    public Car(String what, double cap, double amt){
        make = what;
        fuelCapacity = cap;
        fuelAmount = amt;
    }

    public String getMake(){
        return make;
    }

    public double getCapacity(){
        return fuelCapacity;
    }

    public double getFuel(){
        return fuelAmount;
    }

    public void setFuel(double amt){fuelAmount = amt;}

    public double unusedCap(){ // noteworthy: does a calculation
        return (fuelCapacity - fuelAmount); }
}
```

Make a car called myCar, a “Ford”, fuel capacity = 15.0, tank is half-filled.
Make a second car, called herCar, an Audi, cap = 16.0, amt = 12.0.
Write a statement that prints the unused capacity of the Audi.
Write a statement that prints the sum of the capacities of the cars.
Steal exactly the right amount of gas from the Ford to fill the Audi.
Write a statement that copies into variable fordGas the gas now in Ford.

Here is the TubTester driver class [note: gallon of water weighs 8.6 lbs]

```java
public class TubTester{
    public static void main(String[] args){
        BathTub b = new BathTub("King",60); //60 gal capacity
        BathTub t = new BathTub("Queen",70);
        System.out.println("total capacity: " +
            (b.getCapacity() + t.getCapacity()));
        System.out.println("filled wt of larger tub: " + t.totalWt());
    }
}
```

What outside class does it make use of?
What are that class’s attributes? Methods? Any mutator methods?
Can you write the constructor?
Can you write the getCapacity() method?
Set up a driver that uses a Scanner object to read BathTub characteristics, then make one.

Answer to the last question:
File Bathtub.java:

```java
public class Bathtub {

    // these are the attributes
    private int capacity; // in gallons
    private String type;

    // this is the constructor
    public Bathtub(String tubType, int cap) {
        capacity = cap;
        type = tubType;
    }

    public int getCapacity() { return capacity; }

    public double totalWt() { return capacity * 8.6; }
}
```

File TubScanner.java:

```java
public class TubScanner {

    public static void main(String[] args) {
        Scanner scan = new Scanner();
        String name = scan.nextLine();
        int capacity = scan.nextInt();
        Bathtub tub = new Bathtub(name, capacity);
        System.out.println(“Created tub with capacity: “ + tub.getCapacity());
    }
}
```