Week3Lab – 10 pts

Pre-lab questions

Conditional statements can take some practice. Work each of these out to see what they evaluate to. You may find it useful to create truth tables in your notes (p. 195, section 5.1)

```
1. String apple = "Rome";                    int count = 10;
   String city = "Rome";                     int qty =80;
   String fruit = "apple";                   Boolean old = false;
   double cost = 5.25;                       Boolean smart = true;
   double value = 3.0;
      a. apple == fruit false
      b. city.equals(apple) true
      c. cost > value true
      d. apple != city false
      e. !old ||smart true
      f. smart && (value <= cost/2.0) false
      g. (value == cost) && (count < 10) false
      h. (qty < value) || (qty < cost) false
      i. !(qty < value) && (value < cost) true
```

2. If statements in Java are related to if sentences in English. Convert each of these sentences into their Java equivalent. Remember to declare any variables needed:

   a. If there are more than 10 cookies on the tray, I will take one.

```
              int numCookies = 15;
              int cookiesEaten = 0;

              if (numCookies > 10) {
                  numCookies--;
                  cookiesEaten++;
                 System.out.printf("I will take %d cookie",
      cookiesEaten);
              }
```

   b. If the cookie tray has Oreo's and there are more than 10 cookies on the tray, I will take an Oreo.

```
              int numOreos = 11;
               boolean oreos = true;
              int OreosEaten = 0;

              if (oreos && (numOreos > 10)) {

                  numOreos--;
                  OreosEaten++;
```

```
System.out.printf(“I will take %d oreo”, OreosEaten);
}
```

c. If the top is on sale for less than $25 or more than 50% discount and I have at least twice the cost of the top in my wallet, I will buy it.

```
                   double salePrice = 30.45;
                   double discount = 0.35; // Between 0 and 1

                  double cost = salePrice * (1 – discount);
                  double walletAmt = 150.25;


if ((salePrice < 25.0 || discount > 0.5) && (walletAmt > 2 * cost)) {

                     walletAmt -= cost;

           System.out.println(“I will buy the top”);
           }
```

d. I will go swimming is the weather is sunny and the temperature is over 85.

```
String weather = “Sunny”;
double temperature = 90.4;

if (weather == “Sunny” && temperature > 85) {
    System.out.println(“I will go swimming”);
}
```

Help me set my alarm clock. I get up at 8 am most days, but on Thursday I have to get up at 7 am and on Saturday and Sunday I get to sleep until 9 am.

```
     String dayOfWeek = “Saturday”;
     int hour;

if (dayofWeek == “Thursday”) {

         hour = 7;

 }
else if ((dayofWeek == “Saturday”) || (dayofWeek ==
“Sunday”)){
         hour = 9;
}
```

```
else {
hour = 8;
}

System.out.printf("I will get up at %d AM", hour);
```

Choose one of the following to develop into a program that uses at least one class outside of the class that contains the main method. Once chosen, do the following:

Understand the problem (restate in your own words, make any assumptions clear):

UML diagrams of any classes needed, including the one with main:

Pseudocode of each class:

Name of files (.java) submitted:

Smart Mailbox

With the availability of cheap sensors and processors, you have an idea to improve the common roadside mailbox. Develop and write an object oriented program that represents the mailbox. Think about the things a smart mailbox would know about itself (the state) and what a smart mailbox should be able to do (the behaviors).

Also think about how the homeowner/renter would interact with the smart mailbox. Write a sample driver program (with a main method) that uses the mailbox class you created.

Binary / Decimal Quiz Generator

Someone important to you needs to practice their binary to decimal conversions and decimal to binary conversions. You decide to practice your object oriented programming skills to solve this problem. Develop and write a program that will generate a problem of each type with randomness. Each time you ask for a quiz, it creates two questions, each based on a random decimal number.

You will also need to create the class with a main method that will print out the problems. Don't worry about the answer key, just generate the problems.

Tracking EBooks

You've recently gotten into reading ebooks and now have several apps and formats, some are rented and some are yours, some are on your phone and some are in the cloud, etc. You need to get a handle on this AND you want one easy way to see what you have, what you've read and what you want. Design an ebook class with all the information you think an ebook should know about itself (format, title, author, etc) in addition to the information you WANT it to know (whether you've read it, own it, want it, etc.). Then design its behaviors, which should be related to those variables as you will want to set or change some of them such as marking a book read once you finish it.

You will then create the class with main that you will use to create several ebook objects, setting their variables and using their methods. Don't forget to write a toString method so you can print an ebook out in a way that makes sense.

We need to create a Book class. This class contains title, author, format, and status attributes (own, read, want). The user should have the ability to set these attributes and change their progress status using methods.

Book

title : String

format: String

year: int

author: String

status: String

read: boolean

setTitle(title)-> void

setFormat (format)-> void

setYear(year) -> void

setAuthor(author) - > void

setStatus(status) -> void -> Will also set read equal to true or false depending on the status value

ToString() -> String

Files: BookTracking.java, Book.java

```
constructor Book ():
    this.title = ""
    this.format = ""
    this.year = 0
    this.author = ""
    this.status= ""
    this.read = false

def setTitle(String title) :
    this.title = title

def setYear(int year):
    this.year = year


def setAuthor(String author):
    this.author = author



def setFormat(String format)
    this.format = format

def setStatus(String status) :
         this.status = status
         if (status.equals("finished") or status.equals("read"))
             this.read = true
def readIt():
    return this.read

 def public String toString():
   info = "Title: "+this.title+"\n"+
          "Year: "+this.year+"\n"+
          "Format: "+this.format+"\n"+
          "Author: "+this.author+"\n"+
          "Status: "+this.status+"\n"
   return info
```