Week1Lab – 10 pts

Pre-lab questions

1. It is a good idea to commit as many errors as you can think of, so that you see what error messages the compiler produces. Sometimes the compiler tells you exactly what is wrong, and all you have to do is fix it. But sometimes the error messages are misleading. Over time you will develop a sense for when you can trust the compiler and when you have to figure things out yourself.  
   Starting with the TempConv program, try out each of the following errors. After you make each change, compile the program, read the error message (if there is one), and then fix the error. If there is no error, record “no error”. Record what happened after each one:
   1. Remove one of the opening curly braces  
        
      There is a syntax error saying that the braces are expected because that is what ensures that the method or class is closed.
   2. Remove one of the closing curly braces

Like A, there is a syntax error saying to complete the class body.

* 1. Instead of main, change it to mane  
       
     The main method is undefined.
  2. Remove the word static  
       
     There is an error saying that the main method must be static
  3. Remove the word public  
       
     There is an error saying that the main method is not defined (not found)
  4. Remove the word System  
       
     There is a syntax error saying that “.out” cannot be resolved
  5. Replace println with PrintLn  
       
     The method is undefined for the type print stream
  6. Replace println with print

No error and the output is exactly the same

* 1. Delete one of the parentheses   
       
     There is a syntax error and it says that an extra closing one needs to be added.
  2. Add an extra parentheses  
       
     There is a syntax error on the extra parentheses and it must be deleted to close the function properly. If it was an open parentheses, it would state that an extra closing one needs to be added.

1. There are plenty of Math methods available to us in Java. Go to the official documentation for the Math class ([Math (Java Platform SE 8 ) (oracle.com)](https://docs.oracle.com/javase/8/docs/api/java/lang/Math.html)) and read down the list of what is available. Choose three of them that you believe you will use frequently enough to be worth memorizing them. List them here and explain why you think you should know them without having to look them up.

I would say the pow, sqrt, and round methods I would use. They are very basic methods that are frequently used in mathematics. I would need to use pow to exponentiate a number, sqrt to find square root, and round, which is especially important if you need to generate integer values or truncate to a certain number of decimal places.

Choose one of the following problems to solve with a small Java program.

1. Dining out
2. Comparing cars
3. Burning calories

Choose a problem, restate it to make sure you fully understand the problem you are solving. Create a plan to solve it by writing it out in English and/or pseudocode. (The English is optional; the pseudocode is not). Then implement your solution in Java in the same iterative way we modeled in class. Start with a working program, then add to it. Use the Scanner class to collect input from the user (remember, you may want to add that functionality AFTER you know your algorithm works correctly). You must provide an answer to the user in a user-friendly way...just giving them a number is not very friendly! Test your solution with several different sets of input values to make sure your algorithm is producing correct results (check with a calculator).

Dining Out

A group of your friends like to meet for dinner at different restaurants. You are frustrated by how long it takes to figure out each person’s share of the bill. You always divide equally. Your city has a 7% tax rate and your friends typically tip about 20%. You have access to the bill, including the tax amount, if you want to make use of it.

Comparing Cars

You are trying to decide between two cars. You want to know the total operating cost for each based on your typical usage. You need to consider the purchase price, the cost to fuel it (you should use a 12-month average), miles you drive in a year, the mpg of the car for your type of driving, and the service cost per year. You can use $500 in service for an internal combustion car and $10 for an electric.

Burning Calories

You’ve decided to take up walking to burn calories and get fit. You want to know how long (in minutes) you should walk to burn a given number of calories. Hint, one Oreo cookie is 40 calories! Researchers Vikash Sharma and Peter Wayland have developed the following formula:

Calories burned per minute = (0.035 \* weight in kg) + ((walking velocity in m/s)2  / height in meters)) \* 0.029 \* weight in kg

Consider 0.035 a weight modifier and 0.029 a height modifier. These values are constant.

# 1. Get Inputs

float weight = float(input(“Enter weight in kg”));

float height = float(input(“Enter height in meters”));

int walkVelocity = int(input(“How fast do you normally walk in m/s”));

int totalCalories = int(input(“How many Calories do you want to burn?”));

# 2. Calculate Calories Burned per minute

float calsBurnedRate = 0.035 \* weight + ((walkVelocity)^2 / height) \* 0.029;

# 3. Calculate Time Needed

int totalTime = totalCalories / calsBurnedRate