Programming Fundamentals

Lab #1

Topics
- Basic Java syntax
- Eclipse IDE
- Storing and Manipulating Data
- Basic Input/Output

Concepts
println
class, main
comments
string concatenation
escape sequences
variable declarations, init, assignment
constants
primitive data types
arithmetic expressions (++,--,%,/,+,-,*,+=,-=,...)
data conversions (casting)
Scanner, System.in
nextLine,nextInt,nextDouble

Exercise 1

Use the "Eclipse IDE Tutorial" posted on BlackBoard to enter, compile, and run the following application:

```java
public class Lab1Ex1 {
    public static void main(String[] args) {
        System.out.println("Hello World");
    }
}
```

```
<terminated> Lab1Ex1 [Java Applicati
Hello World
```

After you are done, try to do the following and predict what will happen:

a) Change Lab1Ex1 to Hello
- **Program will not run**

```
<terminated> Lab1Ex1 [Java Application] C:\Program Files\Java\jdk-14.0.1
Error: Could not find or load main class Lab1Ex1
Caused by: java.lang.ClassNotFoundException: Lab1Ex1
```

b) Remove the first quotation mark in the String
- **Program will not run**

```
<terminated> Lab1Ex1 [Java Application] C:\Program Files\Java\jdk-14.0.1\bin\javaw.exe (Jul 7, 2020, 10:13:20 PM – 10:13:26 PM)
Exception in thread "main" java.lang.Error: Unresolved compilation problems:
        Syntax error on token(s), misplaced construct(s)
        Hello cannot be resolved to a type
        Syntax error, insert ";" to complete BlockStatements
        String literal is not properly closed by a double-quote
        String literal is not properly closed by a double-quote

        at Lab1Ex1.main(Lab1Ex1.java:5)
```

c) Remove the semicolon
- **Program will not run**

```
<terminated> Lab1Ex1 [Java Application] C:\Program Files\Java\jdk-14.0.1\bin\javaw.exe (Jul 7, 2020, 10:13:24 PM – 10:13:29 PM)
Exception in thread "main" java.lang.Error: Unresolved compilation problem:
        Syntax error, insert ";" to complete BlockStatements

        at Lab1Ex1.main(Lab1Ex1.java:5)
```

d) Remove the last brace in the program
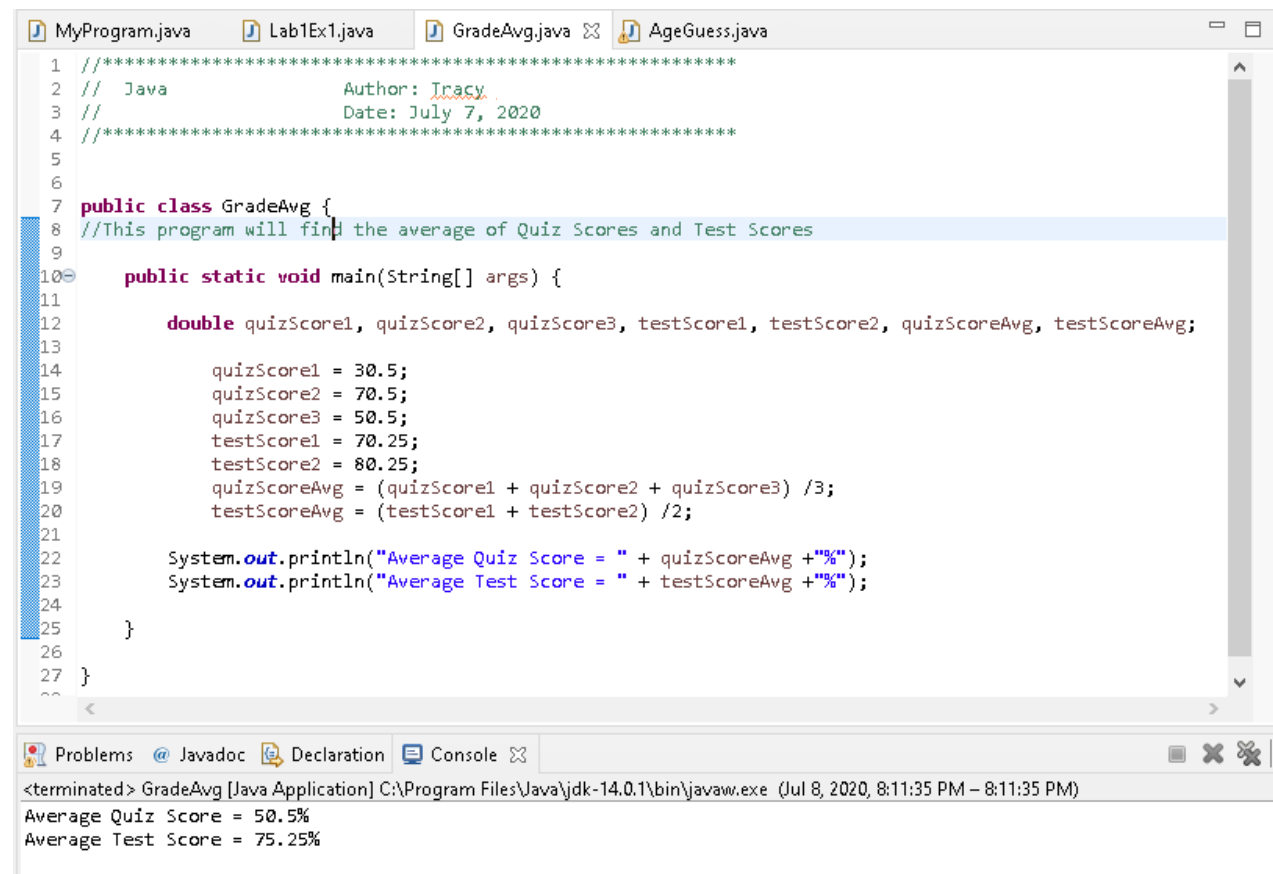- **Program will not run because there is no stop**

```
<terminated> Lab1Ex1 [Java Application] C:\Program Files\Java\jdk-14.0.1\bin\javaw.exe (Jul 7, 2020, 10:18:0
Exception in thread "main" java.lang.Error: Unresolved compilation problem:
        Syntax error, insert "}" to complete ClassBody

        at Lab1Ex1.main(Lab1Ex1.java:7)
```

For each part, try to recompile and run your program. Note the error you are getting. Then fix the error by reversing what you did and rerun the program. Then try the next part.

Exercise 2

Make a Java program called GradeAvg that:
1. Creates 7 double variables named the following way:
quizScore1, quizScore2, quizScore3, testScore1, testScore2, quizScoreAvg, and testScoreAvg
2. Initializes those variables to % scores (make up some numbers between 0 and 100).
3. Initializes each to the corresponding average by using an appropriate expression.
4. Prints out the values of the variables containing the averages. Make sure to label each value.

```
J MyProgram.java      J Lab1Ex1.java      J GradeAvg.java ⊠   J AgeGuess.java

1  //**********************************************************
2  //  Java                   Author: Tracy
3  //                         Date: July 7, 2020
4  //**********************************************************
5
6
7  public class GradeAvg {
8  //This program will find the average of Quiz Scores and Test Scores
9
10     public static void main(String[] args) {
11
12         double quizScore1, quizScore2, quizScore3, testScore1, testScore2, quizScoreAvg, testScoreAvg;
13
14             quizScore1 = 30.5;
15             quizScore2 = 70.5;
16             quizScore3 = 50.5;
17             testScore1 = 70.25;
18             testScore2 = 80.25;
19             quizScoreAvg = (quizScore1 + quizScore2 + quizScore3) /3;
20             testScoreAvg = (testScore1 + testScore2) /2;
21
22         System.out.println("Average Quiz Score = " + quizScoreAvg +"%");
23         System.out.println("Average Test Score = " + testScoreAvg +"%");
24
25     }
26
27 }
```

```
Problems  @ Javadoc  Declaration  Console ⊠

<terminated> GradeAvg [Java Application] C:\Program Files\Java\jdk-14.0.1\bin\javaw.exe  (Jul 8, 2020, 8:11:35 PM – 8:11:35 PM)
Average Quiz Score = 50.5%
Average Test Score = 75.25%
```

Exercise 3

Create a new Java program called AgeGuess which
1. Creates a new Scanner object
2. Declares two variables:
        String name;
        int ageGuess;
3. Uses the Scanner object's methods to read in the name and ageGuess from the keyboard. Make sure to prompt the user for each value. The value entered should be on the same line as the prompt.
4. Displays the ageGuess and name variable values. Make sure to label each.

```java
 1  //******************************************************
 2  //    Java                      Author: Tracy
 3  //                              Date: July 8, 2020
 4  //******************************************************
 5
 6  import java.util.Scanner;
 7
 8  public class AgeGuess {
 9  //This program prompts for the users name and age.
10
11      public static void main(String[] args) {
12
13          String name;
14          int ageGuess;
15
16          Scanner scan = new Scanner(System.in);
17
18          System.out.print("Enter your name: ");
19          name = scan.nextLine();
20
21          System.out.print("Enter your age: ");
22          ageGuess = scan.nextInt();
23
24          scan.close();
25
26
27      }
```

Problems   @ Javadoc   Declaration   Console ⊠

<terminated> AgeGuess [Java Application] C:\Program Files\Java\jdk-14.0.1\bin\javaw.exe (Jul 8, 2020, 8:28:29 PM – 8:28:45 PM)
Enter your name: tracy
Enter your age: 24

Exercise 4
Create a new Java program called TimeComp that reads a value representing a number of
seconds, and then prints the equivalent amount of time as a combination of hours, minutes,
and seconds. For example, 9999 seconds is equivalent to 2 hours, 46 minutes, and 39 seconds.

```
1⊖ //************************************************
2  //  Java                    Author: Tracy
3  //                          Date: July 8, 2020
4  //************************************************
5
6  import java.util.Scanner;
7
8  public class TimeComp {
9  //This program prompts for the user for a number and then converts into hours, minutes and seconds.
10
11⊖     public static void main(String[] args) {
12
13         int number;
14         int timeHours;
15         int timeMinutes;
16         int timeSeconds;
17
18
19         Scanner scan = new Scanner(System.in);
20
21         System.out.print("Enter a number: ");
22         number = scan.nextInt();
23
24         timeHours = number / 3600;
25         timeMinutes = (number % 3600) / 60;
26         timeSeconds = number % 60;
27
28         System.out.print(timeHours + " hours " + timeMinutes + " minutes " + timeSeconds + " seconds");
29
30         scan.close();
31
32
33     }
34
35 }
36
```

Problems @ Javadoc Declaration Console ⊠

<terminated> TimeComp [Java Application] C:\Program Files\Java\jdk-14.0.1\bin\javaw.exe (Jul 8, 2020, 9:45:48 PM – 9:45:53 PM)

Enter a number: 9999
2 hours 46 minutes 39 seconds