

User Manual: Java Program to Convert Three Temperatures from Fahrenheit to
Celsius

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The purpose of this program is to aid users in quickly converting three temperatures from Fahrenheit to Celsius. In order to run the program, a Java compiler and an integrated development environment (IDE) are necessary. Usable, free IDE's include BlueJ, Eclipse, and NetBean. These IDE's are "available for Windows, Mac OS, and other systems as well" (Savitch, 2015). The Java compiler can be downloaded from Oracle as part of the Java SE Development Kit (JDK) from <http://www.oracle.com/technetwork/java/index.html> (Savitch, 2015).

Once the proper software has been acquired and the program is open in the chosen IDE, the user can command the program to run in a few ways. Clicking on the "run" button on the top task bar in the IDE will initiate the program. Another way to execute the program is through using the command "java" (Savitch, 2015). For example, since the name of the class in this particular program is FinalTemp, the command would be "java FinalTemp."

The first command that the program gives the user is to enter "temperature 1". The order of the three temperatures entered does not matter, since the final output identifies the original values entered. The command instructs the user to enter the temperature in Fahrenheit as an integer. This is important, since the data type of the declared variable for the three original temperatures is "int". If a user has more than three temperatures that they would like to convert from Fahrenheit to Celsius, the end of the program allows the user to repeat the process through the function of a "do-while" loop.

After the user enters the three temperatures, the programs asks the user for confirmation that the three temperature values they entered is correct. This question is at the end of a block of code comprising an embedded "do-while" loop. This loop is a block of code within the larger "do-while" loop. The smaller "do-while" loop instructs the program to continue repeating the

first block of code, which requests three temperatures from the user. The loop only ends once the user answers the confirmation question “yes,” that the values they entered are correct. If the user answers the confirmation question “no,” the program loops back to request the three temperatures from the user again.

Once the user has confirmed that the three values entered are correct, the program then converts each of the three initial temperatures (temp1, temp2, and temp3) to the corresponding value in degrees Celsius (Celsius1, Celsius2, Celsius3). The function used to do this computation is $C = (F-32) * 5.0/9.0$. Since the temperature values entered are of data type “int”, this computation also involves a type conversion from “int” to “float”, since the final data type of the temperatures (Celsius1, Celsius2, Celsius3) is “float”.

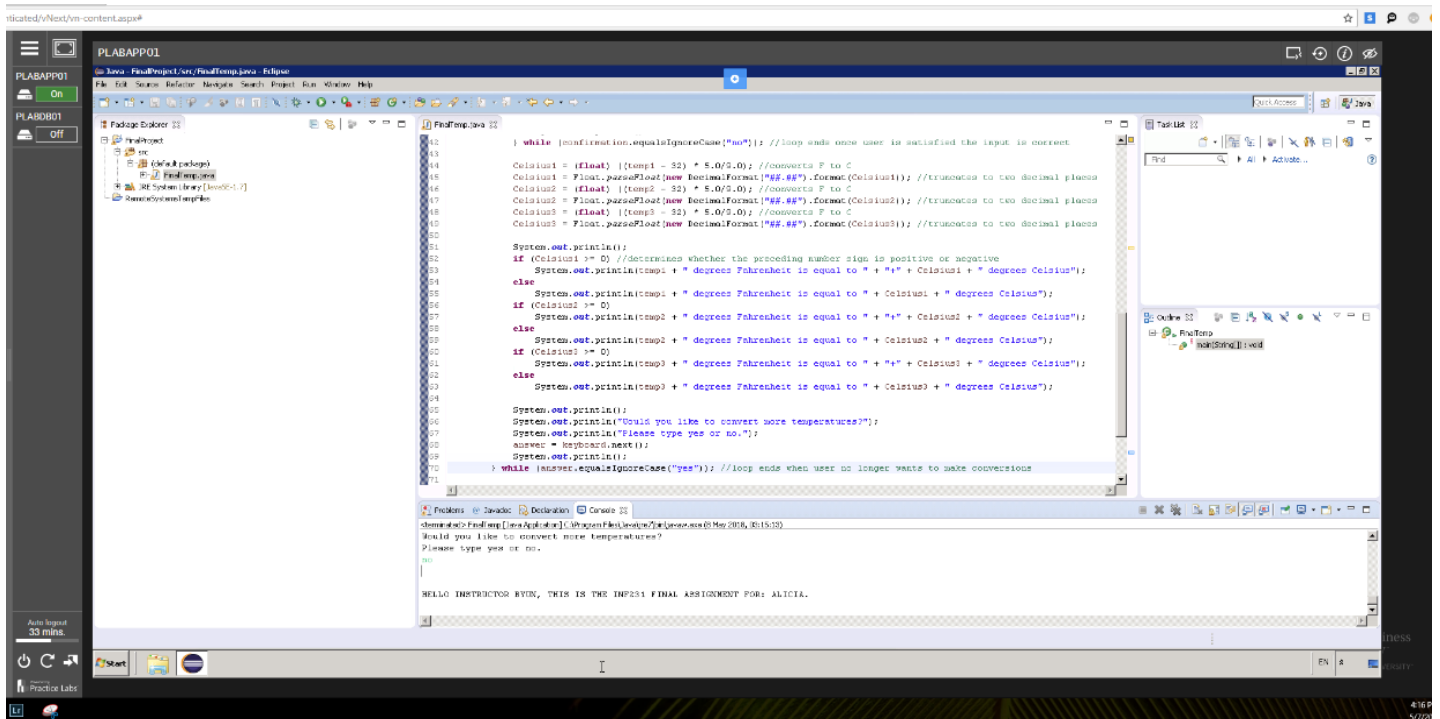
Once the temperatures are converted from Fahrenheit to Celsius, the program then truncates the “float” values to have two digits of precision. The method used to invoke this decimal format change is `Float.parseFloat(new DecimalFormat("##.##").format(Celsius1)`. When the program is run, the user will see that the output values for the converted temperatures all have two digits of precision.

The next section of code determines whether an output value for temperature in degrees Celsius will have a leading positive or negative number sign. This “choice of two actions” (Savitch, 2015) is controlled by an if-else statement. The program “checks the expression inside the parentheses after the keyword *if*” (Savitch, 2015). If the expression is true, the program executes the line of code directly following the *if* expression. If the expression is false, the program executes the line of code after the *else*. The user only sees whether the temperature value in Celsius is positive or negative.

Once the if-else statements have been evaluated and output to the screen with the conversions for the three original temperatures, the program allows the user to choose whether or not they would like to convert more temperatures. This is controlled through the “do-while” loop that encompasses the larger block of code. If the user selects “yes,” the program loops back to the beginning and requests that the user input three more temperatures. If the user selects “no,” the loop ends and the program moves on to the next line of code, which is the final closing statement, “HELLO INSTRUCTOR BYUN, THIS IS THE INF231 FINAL ASSIGNMENT FOR: ALICIA.”

Resources

Savitch, W. (2015). *Java: An introduction to problem solving and programming* (7th ed.). Upper Saddle River, NJ: Pearson.



```
import java.text.DecimalFormat;
```

```
import java.util.Scanner;
```

```
/**
```

```
* Program to convert three temperatures at a time from Fahrenheit to Celsius.
```

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* Class: INF231
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* Instructor: Dr. Byun
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```
* Final Project
```

```
* Last Updated: May 7, 2018
```

```
*/
```

```
public class FinalTemp {
```

```
    public static void main(String[] args) {
```

```

float Celsius1; //will be a decimal with two digits of precision
float Celsius2; //will be a decimal with two digits of precision
float Celsius3; //will be a decimal with two digits of precision
int temp1; //integer in Fahrenheit
int temp2; //integer in Fahrenheit
int temp3; //integer in Fahrenheit
String confirmation; //confirms whether input from user is correct
String answer; //asks user if they want to do more conversions
Scanner keyboard = new Scanner(System.in);

do
{
    do
    {
        System.out.println("Please enter temperature 1 in Fahrenheit as an
integer.");
        temp1 = keyboard.nextInt();
        System.out.println("Please enter temperature 2 in Fahrenheit as an
integer.");
        temp2 = keyboard.nextInt();
        System.out.println("Please enter temperature 3 in Fahrenheit as an
integer.");
        temp3 = keyboard.nextInt();
        System.out.println();
        System.out.println("The temperatures that you entered are: " + temp1 +
", " + temp2 + ", " + temp3);
        System.out.println("Is that correct? Please type yes or no.");
        confirmation = keyboard.next();
        System.out.println();
    }
}

```

```
    } while (confirmation.equalsIgnoreCase("no")); //loop ends once user is satisfied  
the input is correct
```

```
    Celsius1 = (float) ((temp1 - 32) * 5.0/9.0); //converts F to C  
    Celsius1 = Float.parseFloat(new DecimalFormat("##.##").format(Celsius1));  
//truncates to two decimal places
```

```
    Celsius2 = (float) ((temp2 - 32) * 5.0/9.0); //converts F to C  
    Celsius2 = Float.parseFloat(new DecimalFormat("##.##").format(Celsius2));  
//truncates to two decimal places
```

```
    Celsius3 = (float) ((temp3 - 32) * 5.0/9.0); //converts F to C  
    Celsius3 = Float.parseFloat(new DecimalFormat("##.##").format(Celsius3));  
//truncates to two decimal places
```

```
    System.out.println();  
    if (Celsius1 >= 0) //determines whether the preceding number sign is positive or  
negative
```

```
        System.out.println(temp1 + " degrees Fahrenheit is equal to " + "+" +  
Celsius1 + " degrees Celsius");
```

```
    else  
        System.out.println(temp1 + " degrees Fahrenheit is equal to " + Celsius1  
+ " degrees Celsius");
```

```
    if (Celsius2 >= 0)  
        System.out.println(temp2 + " degrees Fahrenheit is equal to " + "+" +  
Celsius2 + " degrees Celsius");
```

```
    else  
        System.out.println(temp2 + " degrees Fahrenheit is equal to " + Celsius2  
+ " degrees Celsius");
```

```
    if (Celsius3 >= 0)  
        System.out.println(temp3 + " degrees Fahrenheit is equal to " + "+" +  
Celsius3 + " degrees Celsius");
```

```
    else  
        System.out.println(temp3 + " degrees Fahrenheit is equal to " + Celsius3  
+ " degrees Celsius");
```

```
        System.out.println();
        System.out.println("Would you like to convert more temperatures?");
        System.out.println("Please type yes or no.");
        answer = keyboard.next();
        System.out.println();
    } while (answer.equalsIgnoreCase("yes")); //loop ends when user no longer wants to
make conversions
```

```
        System.out.println();
        System.out.println("HELLO INSTRUCTOR BYUN, THIS IS THE INF231 FINAL ASSIGNMENT
FOR: ALICIA.");
```

```
        // TODO Auto-generated method stub
```

```
    }
```

```
}
```