CST 183 Java Programming
Programming Assignment 3 (30 pts)

Purpose   To build a well-documented Java application focusing on basic input/output, arithmetic and date type conversions, and the selection (if) control structure.

Requirements Write a Java program that will calculate various parameters related to health and exercise.

Step 1: Understand the problem.

Your program should prompt user to enter basic facts about their body. Input should be via dialog-based and should include the following parameters:

- Height (inches)
- Weight (pounds)
- Age (years)
- A yes/no answer whether they are an "elite" athlete or not

Validate the input data such that the height, weight, and age are above zero. These are the only required data validation checks but feel free to add any "common sense" tests for the input data. If any of the input values are out-of-range, then provide an error message (via a dialog box) and do not perform any calculations. If all values are OK, then continue with the calculations below.

From this information, first calculate the user's **body mass index** (BMI) using the following formula:

$$BMI = \frac{703w}{h^2}$$

where h is the height (inches) and w is the weight (pounds)

From the body mass index, classify the user using the following criteria:

If the BMI is . . .	then the user is . . .
Below 18.5	Underweight
18.5 to 24.99	Normal
25.0 to 29.99	Overweight
30.0 to Up	Obese

Next, calculate the user's **heart rate target zone**. This requires determination of

the maximum heart rate (MHR) for the user:

The initial formula is: MHR = 217 - (0.85 x Age). Then,

Subtract 3 beats for elite athletes under 30
Add 2 beats for 50-54 year old elite athletes
Add 4 beats for 55+ year old elite athletes

Finally, from the MHR, determine the heart rate zone an athlete should use for optimal training. This would be:

60% * MHR to 80% * MHR

Consider the following example:

Input	Output
71 inches	Body Mass Index: 21.6 (Normal)
155 lbs	Your training heart rate should be between 118 and 157
25 years old	
not an elite	
athlete	

Write the output message to a dialog box.

Step 2: Develop Logic Plan

Draw a basic flowchart or write pseudocode that details your logic plan for solving this problem and helps you plan the program.

Step 3: Code It

Use jGRASP or your IDE to write the Java program `BodyMassIndex.java` that calculates BMI and MHR.

1. Type in your program code
2. **Compile** your program and correct all the syntax errors
3. **Run** your program and evaluate the output for correctness

Deliverables   Submit the Java source code file (the .java file you completed) to the **Program 3 Dropbox** within the Delta eLearning System.

Create a hardcopy for turn-in and grading containing the following:

a) Title Page

b) Flow chart or pseudocode for program
c) Source Code (copy and paste from your IDE)
d) Output (copy and paste from your IDE and do a screen capture to get the output window).