Assignment 3
GUI & Polymorphism

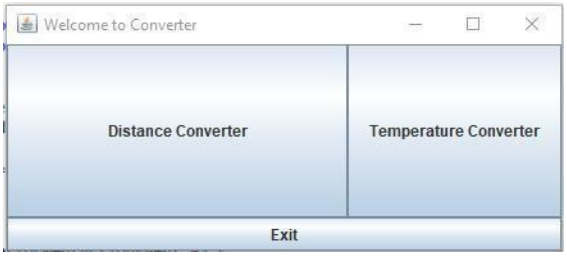
Before attempting this project, be sure you have completed all the reading assignments, non-graded exercises, discussions, and assignments to date.

Design and implement Java program as follows:

1) Implement converter class hierarchy as follows:
    a. **Converter** class which includes:
        - Private attribute for input of data type double
        - Default constructor with no parameter which sets input to Double.NaN
        - Overloaded constructor with input for parameter
        - Get and set methods for input attribute
        - Method convert() which returns input value
    b. **TemperatureConverter** class which is a child of Converter and includes:
        - Constructors which call parent constructors
        - Overridden convert() method to convert input (Fahrenheit temperature) to Celsius and returns the value. If the instance has no input value, it should return Double.NaN
        - Use the following formula for conversion: C = ((F-32)*5)/9
    c. DistanceConverter class which is a child of Converter and includes:
        - Constructors which call parent constructors
        - Overridden convert() method to convert input (distance in miles) to distance in kilometers and returns the value. If the instance has no input value, it should return Double.NaN

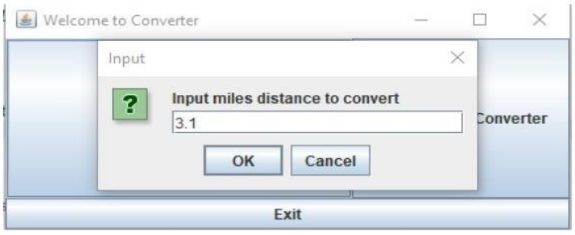
d. Use the following formula for conversion: KM = M * 1.609

2) Implement GUIConverter class using JFrame and JPanel as follows:
    a. GUI will have 3 buttons: “Distance Converter”, “Temperature Converter”, and “Exit”.

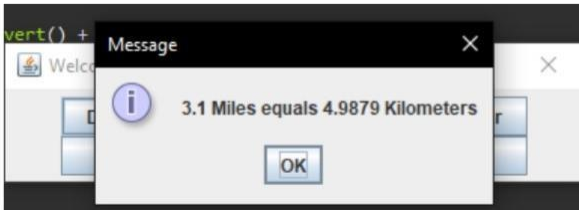


    b. When user clicks Exit, the program will terminate

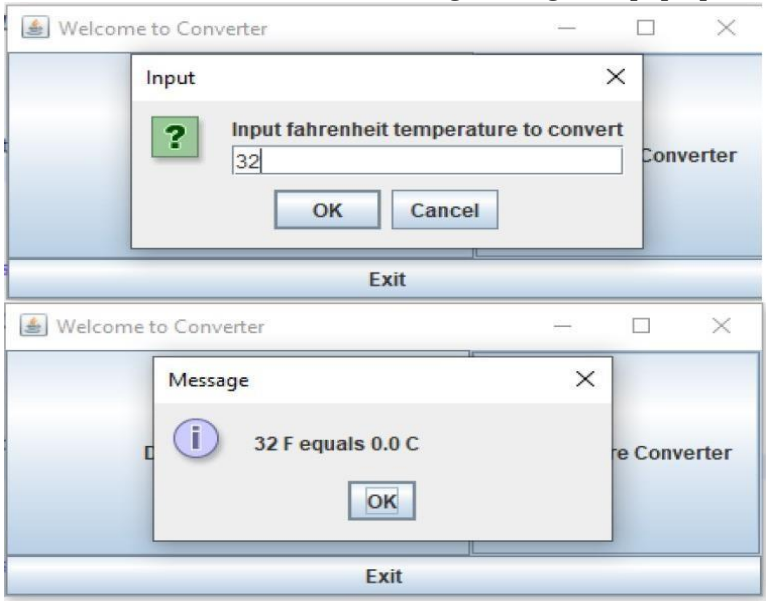
c. When user clicks Distance Converter, an input dialog will pop up where user can type value and click OK:



d. Once user clicks OK, message dialog will pop up:



e. When user clicks on Temperature button, an input dialog will pop up to input value and then when clicks OK, the message dialog with pop up with converted result:



f. **SUGGESTIONS**:
   - For the input dialog you can use JOptionPane.showInputDialog
   - The ActionListener for each Converter button should create the appropriate Converter child instance, set the input, and call its convert() method
   - For the pop up with converted value you can use JOptionPane.showMessageDialog

Style and Documentation:

Make sure your Java program is using the recommended style such as:

- Javadoc comment up front with your name as author, date, and brief purpose of the program

- Comments for variables and blocks of code to describe major functionality
- Meaningful variable names and prompts
- Class names are written in upper CamelCase
- Constants are written in All Capitals
- Use proper spacing and empty lines to make code human readable

Capture execution:
You should capture and label screen captures associated with compiling your code, and running a passing and failing scenario for each functionality

Submission requirements

Deliverables include Java program (.java) and a single Word (or PDF) document. The Java files should be named appropriately, and the Word/PDF file should be named as Assignment3.

The word (or PDF) document should include screen captures showing the successful compiling and running of each of the test scenario. Test scenarios should include all required functionality of the program. Each screen capture should be properly labeled clearly indicated what the screen capture represents.

Submit your files to Assignment 3 submission area no later than the due date listed in your online classroom.

Grading Rubric:
The following grading rubric will be used to determine your grade:

Attribute	**Level 3 (151-200 points)**	**Level 2 (51-150 points)**	**Level 1 (0 - 50 points)**
The Converter class hierarchy	Correct or almost correct attributes and inheritance structure and polymorphism (overloading and overriding)	Mistakes in implementation	Missing or significantly incorrect implementation
Welcome screen with buttons	Correct or almost correct code to display three buttons	Mistakes in implementation	Missing or significantly incorrect implementation
Distance Converter	Correct or almost correct code for distance converter button	Mistakes in implementation	Missing or significantly incorrect implementation

Temperature Converter	Correct or almost correct code for temperature converter button	Mistakes in implementation	Missing or significantly incorrect implementation
Program documentation and style, screen captures	Correct or almost correct menu, program comments, identifiers, and screen captures	Mistakes or incomplete menu, documentation and/or style, and screen captures	Missing or significantly incorrect menu, documentation and/or style, or screen captures