

Unit Converter

A Java application suite for converting between different units of measurement, including temperature, distance, and time conversions.

Applications

1. TempConverter

Converts temperatures between Fahrenheit and Celsius.

- Reads Fahrenheit temperature from user input
- Converts to Celsius using the formula: $C = (F - 32) \times 5/9$
- Shows bidirectional conversion

2. DistanceConverter

Converts distances between miles and kilometers with continuous menu selection.

- Presents menu options: 1) Miles to Kilometers, 2) Kilometers to Miles, 3) Exit
- Runs continuously until user chooses to exit (option 3)
- Allows multiple conversions without restarting the program
- Converts using the conversion factor: 1 mile = 1.60935 kilometers
- Handles invalid menu choices with error messages
- Provides clean exit option with goodbye message

3. TimeConverter

Converts time components to total seconds.

- Reads hours, minutes, and seconds from user input
- Converts to total seconds using: $\text{total} = \text{hours} \times 3600 + \text{minutes} \times 60 + \text{seconds}$
- Shows calculation breakdown

Test Coverage

Each application includes comprehensive test suites that verify:

- Correct mathematical conversions
- Input validation and handling
- Menu functionality and user choices
- Edge cases and boundary conditions
- Scanner input functionality
- Error handling
- Loop behavior and continuous operation

Requirements

- Java 11+
- Maven 3.6+
- JUnit 5 for testing