

# TimeConverter

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A Java application that converts time components (hours, minutes, seconds) into total seconds with interactive looping functionality.

## Overview

The TimeConverter application prompts users to enter time values in hours, minutes, and seconds, then calculates and displays the equivalent total seconds. The application includes a calculation breakdown showing how the conversion is performed and allows users to perform multiple conversions in a single session.

## Features

- **Interactive Input:** Prompts for hours, minutes, and seconds
- **Total Seconds Calculation:** Converts time components to total seconds
- **Calculation Breakdown:** Shows step-by-step conversion process
- **Continuous Operation:** Allows multiple conversions until user chooses to exit
- **Flexible Formatting:** Focuses on mathematical accuracy over specific formatting

## Example Session

```
Convert time to total seconds
```

```
Enter hours: 1
Enter minutes: 28
Enter seconds: 42
```

```
Time Conversion:
Input: 1 hour, 28 minute, and 42 second
Total seconds: 5322 seconds
```

```
Calculation:
1 hours × 3600 = 3600 seconds
28 minutes × 60 = 1680 seconds
42 seconds = 42 seconds
Total: 5322 seconds
```

```
Do you want to convert another time? (y/n): y
```

```
Convert time to total seconds
```

```
Enter hours: 2
Enter minutes: 15
Enter seconds: 30
```

```
Time Conversion:
Input: 2 hour, 15 minute, and 30 second
```

Total seconds: 8130 seconds

Calculation:

2 hours  $\times$  3600 = 7200 seconds

15 minutes  $\times$  60 = 900 seconds

30 seconds = 30 seconds

Total: 8130 seconds

Do you want to convert another time? (y/n): n

Goodbye!

## Conversion Formula

Use the standard time conversion formula, you should know this!

## Test Cases

The application includes comprehensive test coverage:

- **Program Structure:** Validates proper prompts and looping functionality
- **Example Conversion:** Tests the standard 1 hour, 28 minutes, 42 seconds example
- **Unit Conversions:** Tests individual hour, minute, and second conversions
- **Complex Conversions:** Tests multi-component time values
- **Calculation Breakdown:** Verifies step-by-step calculation display
- **Input Prompts:** Validates proper user input prompts
- **Output Formatting:** Checks flexible output formatting
- **Large Time Values:** Tests larger time conversions
- **Mathematical Accuracy:** Verifies correct calculations
- **Looping Functionality:** Tests continuous operation and exit behavior
- **Multiple Conversions:** Validates multiple conversions in sequence