

Time Difference Calculator

Overview

This Java program calculates the difference between two times provided by the user in the format HH:MM:SS. It consists of three main classes: 'Main', 'Time', and 'Difference_Time'.

Files and Classes

1. Main.java

- Package: 'Time'
- Class: 'Main'
- Purpose: This class serves as the entry point for the program. It handles user input, initializes 'Time' objects, and computes the time difference using the 'Difference_Time' class.

2. Time.java

- Package: 'Time'
- Class: 'Time'
- Purpose: This class represents a time object with hours, minutes, and seconds. It also contains fields and methods to store and retrieve the difference in time components (hours, minutes, seconds).

3. Difference_Time.java

- Package: 'Time'
- Class: 'Difference_Time'
- Purpose: This class calculates the difference between two 'Time' objects and sets the difference in the provided 'Time' object.

Functionality

1. Main.java

- User Input:
 - The program prompts the user to input two times in the format HH:MM:SS.
 - Example:
 - Enter the Time 1 (HH:MM:SS) = 12:30:45
 - Enter the Time 2 (HH:MM:SS) = 14:45:30
- Time Object Creation:
 - The input strings are parsed to extract hours, minutes, and seconds.
 - Two `Time` objects are created with the parsed values.
- Time Difference Calculation:
 - An empty `Time` object (`diffTime`) is created to store the time difference.
 - The `Difference_Time` object is used to calculate the difference between the two `Time` objects.
 - The result is printed in the format: `'X Hours Y Minutes Z Seconds'`.

2. Time.java

- Fields:
 - `'Hours'`, `'Minutes'`, `'Seconds'`: Stores the time components.
 - `'hoursDifference'`, `'minutesDifference'`, `'secondsDifference'`: Stores the differences in the time components.
- Constructors:
 - `Time(int hours, int minutes, int seconds)`: Initializes the `Time` object with the given hours, minutes, and seconds.
- `Time()`: Default constructor.
- Getters and Setters:
 - Methods to get and set the values of the time components and their differences.

- toString() Method:

- Overrides the `toString` method to provide a string representation of the `Time` object.

3. Difference_Time.java

- Constructor:

- `Difference_Time(Time t1, Time t2, Time t)`: Calculates the difference between `t1` and `t2`, and sets the difference in `t`.

- Difference Calculation:
 - Converts the times to total seconds.
 - Calculates the difference in seconds.
 - Adjusts for negative differences by adding 24 hours in seconds.
 - Converts the difference back to hours, minutes, and seconds.
 - Sets the differences in the provided `Time` object using its setters.

Example Usage

Input

Enter the Time 1 (HH:MM:SS) = 12:30:45

Enter the Time 2 (HH:MM:SS) = 14:45:30

Output

Time [Hours=12, Minutes=30, Seconds=45]

Time [Hours=14, Minutes=45, Seconds=30]

2 Hours 14 Minutes 45 Seconds

This set of classes and their interactions allows for the straightforward calculation and display of time differences, ensuring accurate results even when the difference spans midnight.