Test Plan

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**Program Goals & Objectives**

The primary objective of this program is to format an integer by adding leading zeros based on a user-specified width. The program prompts the user to enter an integer and a desired width, then displays the formatted number accordingly. If the specified width is less than or equal to the length of the integer, the original number is displayed without additional zeros. Otherwise, the program prepends zeros to the integer to match the specified width. This program is designed to practice string manipulation, conditional logic, loops, and user input handling in Java.

**Program Functional Requirements**

1. User Input
   1. The program should prompt the user to enter a number (integer).
   2. The program should prompt the user to enter a width (integer).
2. Data Processing
   1. Convert the integer to its string representation.
   2. Determine the length of the integer string.
   3. Compare the specified width with the length of the integer string.
      1. If the width is less than or equal to the length of the integer string then…
         1. Use the integer string as is.
      2. If the width is greater than the length of the integer string then…
         1. Calculate the number of leading zeros needed (width minus the length of the integer string).
3. Output
   1. Display the formatted number with the appropriate number of leading zeros.

**Program Pseudocode**

START

Display prompt asking user for milliseconds

Input milliseconds from user

Convert milliseconds to formatted time:

Calculate total seconds by dividing milliseconds by 1000

Extract remaining seconds using modulo 60

Calculate total minutes by dividing total seconds by 60

Extract remaining minutes using modulo 60

Calculate hours by dividing total minutes by 60

Combine hours, minutes, and seconds into time string

Display formatted time

END

**Program Flowchart**

**A green rectangular object with white text

Description automatically generated**

**Table 1 – Traceability Matrix**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Case | Input/Output | Expected Result | Actual Result | Outcome  (Pass/Fail) |
| 1a | Enter an integer: 1  Enter the width: 5 | The formatted number is 00001 | The formatted number is 00001 | Pass |
| 2a | Enter an integer: a | Invalid input handling | Exception in thread "main" java.util.InputMismatchException | Fail |
| 3a | Enter an integer: 10  Enter the width: 2 | The formatted number is 10 | The formatted number is 10 | Pass |