Decision Table

Columns:

1. **Trigger and Echo Pin State**: The state of the trigger and echo pins during operation.
2. **Time Difference**: The time difference between the signal's transmission and reception.
3. **Distance Measurement Function**: Whether the distance is measured in centimeters (getCm) or inches (getInch).

Rows:

The rows represent different possible outcomes and actions taken by the program:

1. **Pulse Measurement:** Verify if the pulse duration is measured correctly.
2. **Distance Calculation:** Check if the distance is calculated accurately based on the pulse duration.
3. **Timeout Handling:** Assess if the timeout condition is correctly handled.

Decision Table:

|  |  |  |  |
| --- | --- | --- | --- |
| **rigger/Echo State** | **Time Difference** | **Distance Measurement** | **Pulse Measurement** |
| Valid | Within Range | Centimeters | Correct |
| Valid | Within Range | Inches | Correct |
| Valid | Exceeds Timeout | Any | Correct |
| Invalid | Any | Any | Incorrect |

Test case:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Test Case ID | Description | Preconditions | Test Steps | Expected Results | Actual Results | Pass/Fail |
| TC01 | Validate distance measurement in centimeters with a valid pulse. | Ultrasonic sensor setup completed. | 1. Trigger a valid pulse within timeout range. 2. Call getCm function. 3. Observe the output. | Correct distance in centimeters is returned. | Correct distance measurements in centimeters and inches. | Pass |
| TC02 | Validate distance measurement in inches with a valid pulse. | Ultrasonic sensor setup completed. | 1. Trigger a valid pulse within timeout range. 2. Call getInch function. 3. Observe the output. | Correct distance in inches is returned. | Correct distance measurements in centimeters and inches. | Pass |
| TC03 | Test the functionality when the pulse duration exceeds the timeout limit. | Ultrasonic sensor setup completed. | 1. Trigger a pulse exceeding the timeout limit. 2. Call either getCm or getInch function. 3. Observe the output. | Timeout handling is correctly implemented, possibly returning an error or a predefined maximum value. | Timeout correctly handled. | Pass |
| TC04 | Validate behavior with an invalid pulse. | Ultrasonic sensor setup completed. | 1. Simulate an invalid pulse scenario (e.g., no echo received). 2. Call either getCm or getInch function. 3. Observe the output. | The function returns an incorrect distance or handles the error gracefully. | Error or incorrect measurement handled as expected. | Pass |