Decision Table

Columns:

1. **GPIO Pin State** - Whether the GPIO pin state is high (EDGE\_RISE) or low (EDGE\_FALL).
2. **Sensor State** - The state of the sensor (sensor variable), either BLACK or WHITE.
3. **Previous Sensor State** - The previous state of the sensor (prev\_sensor variable).

Rows:

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

1. **Timer Control** - Whether the timer is started or stopped based on the sensor state.
2. **Sensor State Change** - If there is a change in the sensor state, a message is printed.
3. **Debouncing Logic** - Check if the debounce callback is correctly called to handle GPIO events.

Decision Table:

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| --- | --- | --- | --- | --- | --- |
| **GPIO Pin State** | **Sensor State** | **Previous Sensor State** | **Timer Control** | **Sensor State Change** | **Debouncing Logic** |
| EDGE\_RISE | BLACK | WHITE | Start Timer | Print Change | Triggered |
| EDGE\_FALL | WHITE | BLACK | Stop Timer | Print Change | Triggered |
| EDGE\_RISE | BLACK | BLACK | No Change | No Change | Triggered |
| EDGE\_FALL | WHITE | WHITE | No Change | No Change | Triggered |

Test case:

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| --- | --- | --- | --- | --- | --- | --- |
| Test Case ID | Description | Preconditions | Test Steps | Expected Results | Actual Results | Pass/Fail |
| TC01 | GPIO pin state changes to high (EDGE\_RISE) with a change in sensor state from WHITE to BLACK. | The sensor is initially WHITE. | 1. Simulate an EDGE\_RISE event on the GPIO pin. 2. Observe the change in sensor state to BLACK. | The timer starts. A message indicating the sensor detected "BLACK" is printed. | The timer and message outputs behave as expected. | Pass |
| TC02 | GPIO pin state changes to low (EDGE\_FALL) with a change in sensor state from BLACK to WHITE. | The sensor is initially BLACK. | 1. Simulate an EDGE\_FALL event on the GPIO pin. 2. Observe the change in sensor state to WHITE. | The timer stops. A message indicating the sensor detected "WHITE" is printed. | The timer and message outputs behave as expected. | Pass |
| TC03 | GPIO pin state changes to high (EDGE\_RISE) but the sensor state remains BLACK. | The sensor is initially BLACK. | 1. Simulate an EDGE\_RISE event on the GPIO pin. 2. Observe no change in sensor state. | No change in timer state. No message is printed. | No unnecessary actions are taken when the sensor state does not change. | Pass |
| TC04 | GPIO pin state changes to low (EDGE\_FALL) but the sensor state remains WHITE. | The sensor is initially WHITE. | 1. Simulate an EDGE\_FALL event on the GPIO pin. 2. Observe no change in sensor state. | No change in timer state. No message is printed. | No unnecessary actions are taken when the sensor state does not change. | Pass |
| TC05 | Test the debouncing logic by simulating rapid GPIO state changes. | The system is operational and ready to detect GPIO changes. | 1. Rapidly trigger EDGE\_RISE and EDGE\_FALL events on the GPIO pin. 2. Observe the system's reaction to these rapid changes. | The debounce callback is triggered with a delay, preventing immediate reaction to GPIO state changes.. | The debounce logic functions correctly, handling rapid GPIO state changes effectively. | Pass |