**Question 3**

**Decision table:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Rule 1** | **Rule 2** | **Rule 3** | **Rule 4** |
| **Conditions** |  |  |  |  |
| 200.0 <= distance (feet) <= 1,000.0 | Y |  |  |  |
| 100.1 <= distance (feet) <= 199.9 |  | Y |  |  |
| 75.0 <= distance (feet) <= 100.0 |  |  | Y |  |
| 0.0 <= distance (feet) <= 74.9 |  |  |  | Y |
| **Actions** | | | | |
| greenLight | TRUE | FALSE | FALSE | FALSE |
| yellowLight | FALSE | TRUE | FALSE | FALSE |
| redLight | FALSE | FALSE | TRUE | TRUE |
| caution | FALSE | FALSE | TRUE | FALSE |
| warning | FALSE | FALSE | FALSE | TRUE |
| **Table implements "first-of" rule** | | | | |

**Test case table:**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Test Case Number** | Inputs | | | Expected Outputs | | | | | | Basis Path | MCDC stmt 22-26 |
| distance (ft.) | cruiseRequested | speed (mph) | redLight | yellowLight | greenLight | caution | warning | cruiseEngaged |
| 1 | 200.0 | TRUE | 40.1 | FALSE | FALSE | TRUE | FALSE | FALSE | TRUE | 9-10-22-23-24-25-26-27 |  |
| 2 | 100.1 | FALSE | 40.1 | FALSE | TRUE | FALSE | FALSE | FALSE | FALSE | 9-12-13-22-27 |  |
| 3 | 75.0 | FALSE | 40.1 | TRUE | FALSE | FALSE | TRUE | FALSE | FALSE | 9-12-16-17-22-27 |  |
| 4 | 74.9 | FALSE | 40.1 | TRUE | FALSE | FALSE | FALSE | TRUE | FALSE | 9-12-16-19-22-27 |  |
| 5 | 49.9 | TRUE | 40.1 | TRUE | FALSE | FALSE | FALSE | TRUE | FALSE | 9-12-16-19-22-23-27 | TFTT |
| 6 | 50.0 | TRUE | 40.0 | TRUE | FALSE | FALSE | FALSE | TRUE | FALSE | 9-12-16-19-22-23-24-27 | TTFT |
| 7 | 50.0 | TRUE | 65.1 | TRUE | FALSE | FALSE | FALSE | TRUE | FALSE | 9-12-16-19-22-23-24-25-27 | TTTF |
| 8 | 50.0 | TRUE | 65.0 | TRUE | FALSE | FALSE | FALSE | TRUE | TRUE | 9-12-16-19-22-23-24-25-26-27 | TTTT |
| 9 | 50.0 | FALSE | 40.1 | TRUE | FALSE | FALSE | FALSE | TRUE | FALSE | Missing MCDC | FTTT |
| 10 | 0.0 | TRUE | 65.0 | TRUE | FALSE | FALSE | FALSE | TRUE | FALSE | Extreme range test for distance |  |
| 11 | 1,000.00 | TRUE | 65.1 | FALSE | FALSE | TRUE | FALSE | FALSE | FALSE | Extreme range test for distance |  |
| 12 | 199.9 | TRUE | 0.0 | FALSE | TRUE | FALSE | FALSE | FALSE | FALSE | Extreme range test for speed |  |
| 13 | 100.0 | TRUE | 100.0 | TRUE | FALSE | FALSE | FALSE | TRUE | FALSE | Extreme range test for speed |  |

Code coverage achieved is: full boundary coverage, full statement coverage, full decision coverage and extreme range coverage.

The test cases support the description (logical expression).