**Black Box Testing and Test cases Design. (100 points)**

**Taxi Price Standards**

1. Within 3.0 kilometers (including 3.0 kilometers), the fee is ¥8, and the basic unit price for distances exceeding 3 kilometers is ¥2.2 /kilometer.

2. For non-electric vehicles, an additional fuel surcharge of ¥1 will be charged.

3. For driving over 15.0 kilometers, an additional 50% fee will be charged to the basic unit price. For driving over 30.0 kilometers, an additional 75% fee will be charged to the basic unit price.

4. The settlement of taxi fees shall be in yuan, and the amount below yuan should be rounded off.

5. Taxi mileage is limited to 80 kilometers (inclusive).

For example, if one of the test cases consisted of [electric vehicles, 1.1] ([Vehicle category, number of kilometers]), the expected output for this test case would be ¥8.

Please provide the **Equivalence Partitioning (40 points) and Boundary Value Analysis (30 points) and Test Cases (30 points).**

**Equivalence Partitioning Table**

|  |  |  |
| --- | --- | --- |
| **Conditions** | Valid | Invalid |
| **vehicle kind** | 1. **non-electric vehicles** 2. **electric vehicles** | 1. **not non-electric vehicles** 2. **not electric vehicles** |
| **mileage** | **3）(0,3]**  **4）(3,15]**  **5）(15,30]**  **6）(30,80]** | 1. **less than 0** 2. **more than 80** |
| **basic unit price** | **7）2.2**  **8）3.3**  **9）3.85** | 1. **not these three prices** |

**Boundary Value Analysis Table**

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Equivalence Partitioning** | **Valid Boundary** | **Invalid Boundary** |
| **1** | **vehicle kind** | 1. **non-electric vehicles** 2. **electric vehicles** | 1. **not these two kinds** |
| **2** | **mileage** | 1. **(0,3]** 2. **(3,15]** 3. **(15,30]** 4. **(30,80]** | 1. **< 0 or > 80** |
| **3** | **basic unit price** | 1. **2.2、3.3、3.85** 2. **if the kind of vehicle is non-electric, total price will add 1 more yuan.** | 1. **≠2.2** 2. **≠3.3** 3. **≠3.85** |

**Test Cases Table**

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Input** | **output** | **Covering equivalence class** |
| **1** | **[electric vehicles, 1]** | **8** | **2）、3）** |
| **2** | **[electric vehicles, 4]** | **10** | **2）、4）** |
| **3** | **[electric vehicles, 16]** | **38** | **2）、5）** |
| **4** | **[electric vehicles, 31]** | **88** | **2）、6）** |
| **5** | **[non-electric vehicles, 1]** | **9** | **1）、3）** |
| **6** | **[non-electric vehicles, 4]** | **11** | **1）、4）** |
| **7** | **[non-electric vehicles, 16]** | **39** | **1）、5）** |
| **8** | **[non-electric vehicles, 31]** | **89** | **1）、6）** |
| **9** | **[bicycle, 1]** | **error** | **1）、2）** |
| **10** | **[car, 1]** | **error** | **1）、2）** |
| **11** | **[bus, 1]** | **error** | **1）、2）** |
| **12** | **[ship, 1]** | **error** | **1）、2）** |
| **13** | **[tricycle, 1]** | **error** | **1）、2）** |
| **14** | **[motorbike, 1]** | **error** | **1）、2）** |
| **15** | **[electric vehicles, 0]** | **error** | **2）、3）** |
| **16** | **[electric vehicles, 80.1]** | **error** | **2）、6）** |
| **17** | **[electric vehicles, 3]** | **8** | **2）、3）** |
| **18** | **[electric vehicles, 15]** | **34** | **2）、4）** |
| **19** | **[electric vehicles, 30]** | **84** | **2）、5）** |
| **20** | **[electric vehicles, 80]** | **271** | **2）、6）** |
| **21** | **[non-electric vehicles, 0]** | **error** | **1）、3）** |
| **22** | **[non-electric vehicles, 80.1]** | **error** | **1）、6）** |
| **23** | **[non-electric vehicles, 3]** | **9** | **1）、3）** |
| **24** | **[non-electric vehicles, 15]** | **35** | **1）、4）** |
| **25** | **[non-electric vehicles, 30]** | **85** | **1）、5）** |
| **26** | **[non-electric vehicles, 80]** | **272** | **1）、6）** |
| **27** | **[non-electric vehicles, -1]** | **error** | **1）、3）** |
| **28** | **[electric vehicles, -1]** | **error** | **1）、3）** |
| **29** | **[electric vehicles, 2]** | **8** | **1）、3）** |
| **30** | **[electric vehicles, 14]** | **21** | **1）、4）** |
| **31** | **[electric vehicles, 29]** | **81** | **1）、5）** |
| **32** | **[electric vehicles, 79]** | **268** | **1）、6）** |
| **33** | **[non-electric vehicles, 2]** | **9** | **1）、3）** |
| **34** | **[non-electric vehicles, 14]** | **22** | **1）、4）** |
| **35** | **[non-electric vehicles, 29]** | **82** | **1）、5）** |
| **36** | **[non-electric vehicles, 79]** | **269** | **1）、6）** |