**Test design techniques Homework – 02**  Fani Shundovska

**BVA – Boundary Value Analysis**

**Exercise 1**

**In an Examination, a candidate has to score a minimum of 24 marks in order to clear the exam. The maximum that he can score is 40 marks.  Identify Boundary values if the student clears the exam.**

Answer:

Using Boundary Value Analysis Testing, to identify Valid Equivalence values: valid Equivalence values will be in a Valid Equivalence class (Class II).

- 0 / 1-24 / 25-40 / 41 +

invalid valid valid invalid

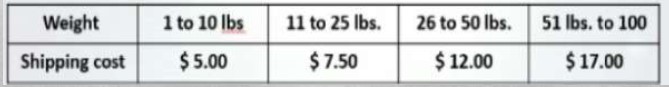
The classes will be as follows:  
Class I: values < 0  => invalid class  
Class II: 0 to 24, 25 to 40       => valid class  
Class III: values > 40 => invalid class

**Exercise 2**

You are testing a scale system that determines shipping rates for a regional web-based auto parts distributor. Due to regulations, shipments cannot exceed $17.00. You want to include boundary value analysis as part of your black-box test design.  Which values you should test? (Tabela od prezentacija ili viber)

Answer:

Using Boundary Value Analysis Testing, to identify Valid Equivalence values:



1. Weight:

- 0 / 1 – 10 / 11 -25 / 26 – 50 / 5 -100 / 101 +

1. Shipping Cost:

- 0/ 5.00 / 7.50 / 12.00 / 17.00 / 17.01 +

**Exercise 3**

If you are T-Mobile customer with package “Standard package”, for voice calls you make you have the possibility to pay different charges per minute in different periods of the day. When you make calls in period from 08:00:00 in the morning until 18:30:00 in the afternoon ('the rush hour'), you pay charge 0.1305 euro per minute plus 0.08333-euro startup fee (startup fee is fixed amount applied to every call regardless of the duration). You will pay same startup fee with cheaper prices 0.0764 euro per minute if you make calls in period 18:30:00 – 00:00:00 and period 00:00:00 – 08:00:00

Answer:

Using Boundary Value Analysis Testing, to identify Valid Equivalence values:

00:00:00 / 00:00:00 - 07:59:59 / 07:59:59 / 08:00:00 / 08:00:00 – 18:29:59 / 18:29:59/

0.0764/ 0.0764 / 0.0764 / 0.1305 / 0.1305 /0.1305 /

18:30:00 / 18:30:00 – 23:59:59 / 00:00:00

0.0764 / 0.0764 / 0.0764

1. Start time of the rush hour period (08:00:00)
2. End time of the rush hour period (18:30:00)
3. Start time of the cheaper price period (18:30:00)
4. End time of the cheaper price period (00:00:00)
5. Start time of the early morning cheaper price period (00:00:00)
6. End time of the early morning cheaper price period (08:00:00)
7. Test case 1: Make a call at 07:59:59 (just before the rush hour starts)
   * Expected result: The charge per minute should be 0.0764 euro, and the startup fee should be applied.
8. Test case 2: Make a call at 08:00:00 (the start of the rush hour)
   * Expected result: The charge per minute should be 0.1305 euro, and the startup fee should be applied.
9. Test case 3: Make a call at 18:29:59 (just before the rush hour ends)
   * Expected result: The charge per minute should be 0.1305 euro, and the startup fee should be applied.
10. Test case 4: Make a call at 18:30:00 (the start of the cheaper period)
    * Expected result: The charge per minute should be 0.0764 euro, and the startup fee should be applied.
11. Test case 5: Make a call at 23:59:59 (just before the cheaper period ends)
    * Expected result: The charge per minute should be 0.0764 euro, and the startup fee should be applied.
12. Test case 6: Make a call at 00:00:00 (the start of the new day and cheaper period)
    * Expected result: The charge per minute should be 0.0764 euro, and the startup fee should be applied.

**EP – Equivalence Partitioning:**

**Exercise 1**

**One of the fields on a form contains a text box that accepts numeric values in the range of 18 to 25. Identify the valid and invalid Equivalence classes**

Answer:

Using Equivalence Partitioning Testing:

- 0 / 1- 18 / 18 -25 / 25 +

Invalid valid valid invalid

Identified invalid Partitions and valid Partitions:

- 1200 / 9 / 21 / + 3600

Invalid valid valid invalid

**Exercise 2**

In a program statement that accepts only one choice from among 10 possible choices, numbered 1 through 10 define the valid partition.

Answer:

Using Equivalence Partitioning Testing:

- 0 / 1 – 10 / 11 +

Invalid value / valid value / invalid value

Identified invalid Partitions and valid Partitions:

- 11 / 5 / 11 +

Invalid value / valid value / invalid value

**Exercise 3**

If you are T-Mobile customer with package “Standard package”, for voice calls you make you have the possibility to pay different charges per minute in different periods of the day. When you make calls in period from 08:00:00 in the morning until 18:30:00 in the afternoon ('the rush hour'), you pay charge 0.1305 euro per minute plus 0.08333-euro startup fee (startup fee is fixed amount applied to every call regardless of the duration). You will pay same startup fee with cheaper prices 0.0764 euro per minute if you make calls in period 18:30:00 – 00:00:00 and period 00:00:00 – 08:00:00

Answer:

Using Equivalence Partitioning Testing:

/ 00:00:00 - 07:59:59 / 08:00:00 – 18:29:59 / 18:30:00 – 23:59:59 /

/ 0.0764 / 0.1305 / 0.0764

Identified invalid Partitions and valid Partitions:

/ 00:10:00 – 00:12:00 / 10:05:00 – 10:10:00 / 21:04:00 – 21:14:00 /

In the given scenario, the different periods of the day can be considered as equivalence partitions. We can define three partitions:

1. Rush Hour (08:00:00 - 18:30:00): In this period, the charge per minute is 0.1305 euro, and the startup fee is 0.08333 euro.
2. Evening (18:30:00 - 00:00:00): In this period, the charge per minute is 0.0764 euro, and the startup fee is 0.08333 euro.
3. Night (00:00:00 - 08:00:00): In this period, the charge per minute is 0.0764 euro, and the startup fee is 0.08333 euro.

* Test Case 1: Make a call for 5 minutes during the rush hour.
* Test Case 2: Make a call for 10 minutes in the evening.
* Test Case 3: Make a call for 2 minutes at night.

**Exercise 4**

You are testing a medical application that is used only by teenagers. Define the valid and invalid partitions.

Answer:

Using Equivalence Partitioning Testing:

- 12 / 13-19 / 20+

Age, Gender, Medical History, Medications, Allergies

In the case of a medical application used only by teenagers:

the valid partitions would be:

1. Age: 13-19 years old
2. Gender: Male or Female
3. Medical history: No pre-existing medical conditions
4. Medications: No current medications
5. Allergies: No known allergies

the invalid partitions would be:

1. Age: Under 13 years old or over 19 years old
2. Gender: Other gender identities
3. Medical history: Pre-existing medical conditions
4. Medications: Current medications
5. Allergies: Known allergies

**Exercise 5**

An employee’s bonus is to be calculated. It cannot become negative, but it can be calculated to zero. The bonus is based on the duration of the employment.  An employee can be employed for less than or equal to 2 years, more than 2 years but less than 5 years, 5 to 10 years, or longer than 10 years. Depending on this period of employment, an employee will get either no bonus or a bonus of 10%, 25% or 35%

How many valid equivalence partitions are needed to test the calculation of the bonus? Write them down.

Answer:

Using Equivalence Partitioning Testing:

0-2 / 2 – 5 / 5-10 / 10 +

1 / 3,5 / 7 / 35

1. Less than or equal to 2 years (Bonus: 0%)
2. More than 2 years but less than 5 years: (Bonus: 10%)
3. 5 to 10 years (Bonus: 25%)
4. Longer than 10 years (Bonus: 35%)