Software Testing Mentor

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ISTQB Foundation Level and Software Testing Training

Module 4
Test Design Techniques

Session 3 – Part 1 – Specification-based or Black-box Techniques

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In part 1 of session 3 we will learn about following Specification based or black box Techniques

- Equivalence Partitioning
- Boundary Value Analysis

Equivalence Partitioning

Equivalence partitioning is a black box test design technique

Can be applied at all levels of testing

Idea behind EP is to divide or partition a group of test conditions into a set that is considered same by the software

We need to test just once condition from that partition as it is assumed that all the values in that partition will be treated in same way

- If one of the value in a partition will work then we assume all the values in that partition will work.
- If one of the value in that partition fails then it is assumed that all the values in that partition will fail

These conditions may not always be true however testers can use better partitions and also test some more conditions within those partitions to confirm that the selection of that partition is fine.

Equivalence partitions are also known as equivalence class

Equivalence Partitioning Example

A store in city offers different discounts depending on the purchase amount.

If purchase is in the range of $0.00 up to $50.00 - no discounts

Purchase over $50.01 and up to $200.00 - 5% discount

Purchase of $200.01 and up to $500.00 - 10% discounts

Purchase of $500.01 and up to $max - 15% discounts.

Now to test this we can identify 4 valid equivalence partitions and 2 invalid partition as shown below.

Invalid Partition	Valid Partition(No Discounts)	Valid Partition(5%)	Valid Partition(10%)	Valid Partition(15%)	Invalid partition
-$0.01	$0.00-$50	$50.01-$200	$200.01-$500	$500.01-$max	$max+$0.01

Boundary Value Analysis (BVA)

A boundary value is any input or output value on the edge of an equivalence partition.

Boundary value analysis is based on testing at the boundaries between partitions

Boundary Value Analysis is a black box test design technique where test case are designed by using boundary values, BVA is used in range checking.

To apply BVA you need to take maximum and minimum values from valid partition together with first or last value respectively in each of the invalid partition adjacent to the valid partition

Boundary Value Analysis (BVA) example

Suppose you have a text field on webpage which accepts values between 1-1000, so the valid partition will be (1-1000), equivalence partitions will be like:

Invalid Partition	Valid Partition	Invalid Partition
0	1-1000	1001 and above

And the boundary values will be 1, 1000 from valid partition and 0,1001 from invalid partitions.

Boundary Value Analysis (BVA) example 2

A store in city offers different discounts depending on the purchase amount.

If purchase is in the range of $0.00 up to $50.00 - no discounts

Purchase over $50.01 and up to $200.00 - 5% discount

Purchase of $200.01 and up to $500.00 - 10% discounts

Purchase of $500.01 and up to $max - 15% discounts.

Now to test this we can identify 4 valid equivalence partitions and 2 invalid partition as shown below.

Invalid Partition	Valid Partition(No Discounts)	Valid Partition(5%)	Valid Partition(10%)	Valid Partition(15%)	Invalid Partition
-$0.01	$0.00-$50.00	$50.01-$200	$200.01-$500	$500.01-$max	$max+$0.01

Now let us see the Boundary values for this scenario

Boundary Value Analysis (BVA) example 2 cont.

Test Condition	Valid partitions	Invalid partitions	Valid boundaries	Invalid boundaries
Purchase amount	$0.00-$50.00 $50.01-$200 $200.01-$500 $500.01-$max	<$0.00 >$max	$0.00 $50 $50.01 $200 $200.01 $500 $500.01 $max	-$0.01 $max+0.01
Discount percentage	No discounts 5% 10% 15%	• Any other value • Non-integer • No interest calculated	N/A	N/A

Why do both EP and BVA?

Testing only boundaries does not give much confidence as we are testing just extreme values of partitions

It is important to test some values in between the partitions

It is recommended that partitions should be tested separately from boundary values

If you want to be more thorough then start with valid partition testing then invalid partitions, then valid boundaries and finally invalid boundaries

Conclusion

Specification-based or Black-box Techniques

- Equivalence Partitioning
- Boundary Value Analysis

Why to do both EP and BVA?

THANK YOU!!!