BLACK BOX TESTING

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- BLACK BOX TESTING INVOLVES LOOKING AT THE SPECIFICATIONS AND DOES NOT REQUIRE EXAMINING THE CODE OF A PROGRAM.

- BLACK BOX TESTING IS DONE FROM THE CUSTOMER'S VIEWPOINT.

- BLACK BOX TESTING IS DONE WITHOUT THE KNOWLEDGE OF THE INTERNALS OF THE SYSTEM UNDER TEST.

BLACK BOX TESTING

Functionality	What you need to know to use
Features of a lock	It is made of metal, has a hole provision to lock, has a facility to insert the key, and the keyhole ability to turn clockwise or anticlockwise.
Features of a key	It is made of metal and created to fit into a particular lock's keyhole.
Actions performed	Key inserted and turned clockwise to lock Key inserted and turned anticlockwise to unlock
States	Locked Unlocked
Inputs	Key turned clockwise or anticlockwise
Expected outcome	Locking Unlocking

WHY BLACK BOX TESTING

- BLACK BOX TESTING IS DONE <u>BASED ON REQUIREMENTS</u>.

- BLACK BOX TESTING ADDRESSES <u>THE STATED REQUIREMENTS AS WELL AS IMPLIED REQUIREMENTS.</u>

- BLACK BOX TESTING ENCOMPASSES THE <u>END USER PERSPECTIVES</u>.

- BLACK BOX TESTING HANDLES <u>VALID AND INVALID INPUTS</u>.

BLACK BOX TESTING TECHNIQUES

- REQUIREMENTS BASED TESTING

- POSITIVE AND NEGATIVE TESTING

- BOUNDARY VALUE ANALYSIS

- DECISION TABLES

- EQUIVALENCE PARTITIONING

- STATE BASED TESTING

- COMPATIBILITY TESTING

- USER DOCUMENTATION TESTING

- DOMAIN TESTING

BOUNDARY VALUE ANALYSIS

- A method useful for arriving at tests that are effective in catching defects that happen at boundaries

- BVA believes and extends the concept that the density of defect is more towards the boundaries.

BOUNDARY VALUE ANALYSIS

- Consider a billing system that offers discounts to customers.

- The concept of volume discounts when we buy goods —buy one packet of chips for $1.59 but three for $4.

- It becomes economical for the buyer to buy in bulk.

- From the seller's point of view also, it is economical to sell in bulk.

BOUNDARY VALUE ANALYSIS

Number of units bought	Price per unit
First ten units (that is, from 1 to 10 units)	$5.00
Next ten units (that is, from units 11 to 20 units)	$4.75
Next ten units (that is, from units 21 to 30 units)	$4.50
More than 30 units	$4.00

From the above table, If we buy 5 units, we pay 5*5 = $25.

If we buy 11 units, we pay 5*10 = $50 for the first ten units and $4.75 for the eleventh item.

Similarly, if we buy 15 units, we will pay 10*5 + 5*4.75 = $73.75.

BOUNDARY VALUE ANALYSIS

- Generally it has been found that most defects in situations such as this happen around the boundaries

- For example, when buying 9, 10, 11, 19, 20, 21, 29, 30, 31, and similar number of items.

BOUNDARY VALUE ANALYSIS

- The reasons for this phenomenon is not entirely clear, some possible reasons are as follows.

  - Programmers' tentativeness in using <u>the right comparison operator</u>, for example, whether to use the < = operator or < operator when trying to make comparisons.
  - Confusion caused by the availability of <u>multiple ways to implement loops and condition checking.</u>
  - The requirements themselves may <u>not be clearly understood.</u>

EQUIVALENCE PARTITIONING

- It involves identifying a small set of representative input values that produce as many different output conditions as possible.

- This reduces the number of permutations and combinations of input, output values used for testing, thereby increasing the coverage and reducing the effort involved in testing.

EQUIVALENCE PARTITIONING

1 – 100				
1 – 20	21 – 40	41 – 60	61 – 80	81 - 100
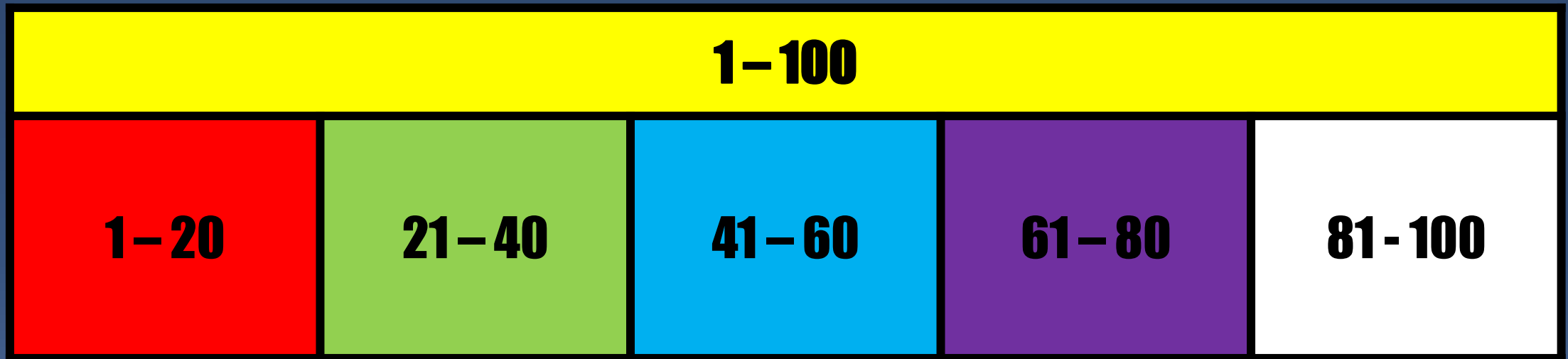
EQUIVALENCE PARTITIONING TECHNIQUE

- Testing by this technique involves

  1. Identifying all partitions for the complete set of input, output values for a product.
  2. Picking up one member value from each partition for testing to maximize complete coverage.

EQUIVALENCE PARTITIONING TECHNIQUE

- Consider the example of an insurance company that has the following premium rates based on the age group.
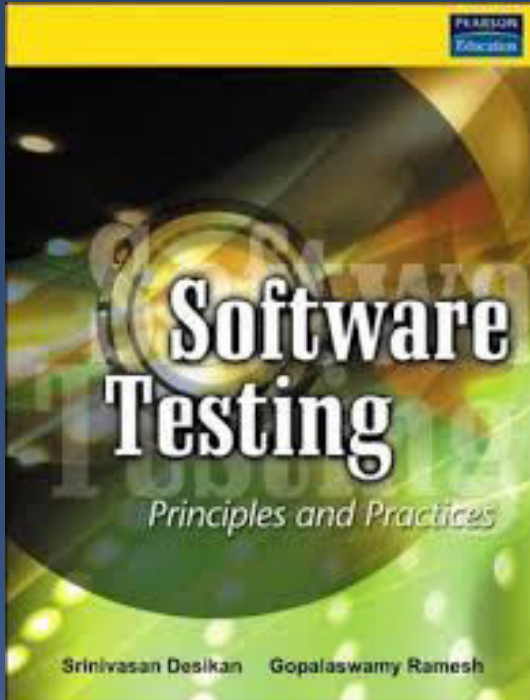
Age group	Additional premium
Under 35	$1.65
35-59	$2.87
60+	$6.00

- A life insurance company has base premium of $0.50 for all ages.

- Based on the age group, an additional monthly premium has to be paid that is as listed in the table below.

- For example, a person aged 34, has to pay a premium=base premium + additional premium=$0.50 + $1.65=$2.15.

EQUIVALENCE PARTITIONING TECHNIQUE

- Based on the equivalence partitioning technique, the equivalence partitions that are based on age are given below:
  - Below 35 years of age (valid input)
  - Between 35 and 59 years of age (valid input)
  - Above 60 years of age (valid input)
  - Negative age (invalid input)
  - Age as 0 (invalid input)
  - Age as any three-digit number (valid input)

REFERENCES

Software Testing
Principles and Practices
Srinivasan Desikan   Gopalaswamy Ramesh

Guru99

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edureka!

Software Testing Help

https://www.softwaretestinghelp.com/what-is-boundary-value-analysis-and-equivalence-partitioning/