Classification Tree Method

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Agenda

- Objective
- Application of the Method
- Classification of values
- Equivalance partitioning
- Repeated Equivalence Partitioning

Objective

- Classification Tree Method - CTM
- Generating error-sensitive, low redundancy set of test case specifications.
- High probability to detect a fault in the test object.
- This method is applicable for both White box and black box kind of testing.
- The input for this method is functional specification of the test object
- CTM incorporates several well-known approaches for test case specification, e.g. equivalent partitioning, and boundary value analysis

Application of the method

- Understand the functional specification
- Identify the test releavent aspects of the system
- An aspect is considered relevant if the user wants to use different values for this aspect during testing.

Example - CTM

- Consider systems that measures distances in a range of some meters, e.g. the distance to a wall in a room.
- In this kind of system, a radar or sonar is used to send a signal and measure the time taken to recieve the reflected signal.
- In sonar system temperature of the room will influence the calculation, for differenct temperature values testing will be odne
- Temperature is a test releavent object.
- But for radar systems temperature is not a test relavent aspect.

Classification of values

- Each test relevant aspect may take different set of values
- The values are divided into classes according to the equivalence partitioning method.
- Values assisgned to same class are said to be Equivalent for the test - behaviour of the test object will be same for all the values of that class.

Example- Equivalance class partitioning

An ice warning indication in the dashboard of a car shall be tested. This ice warning indication depends on the temperature reported by a temperature sensor at the outside of the car. This sensor can report temperatures from -60 C to +80 C. At temperatures above 3 C the ice warning shall be off, at lower temperatures it shall be on.

- Temperature - test relevant aspect
- consider both valid and invalid values
- Here invalid values are due to the short circuit or an interruption of the cable.
- Two classes for valid
  1. Temperature values which makes display on
  2. Temperature values which makes display off
- Two classes for invalid
  1. Temperatures that are too high (higher than 80 C)
  2. Temperatures that are too low (lower than -60 C)

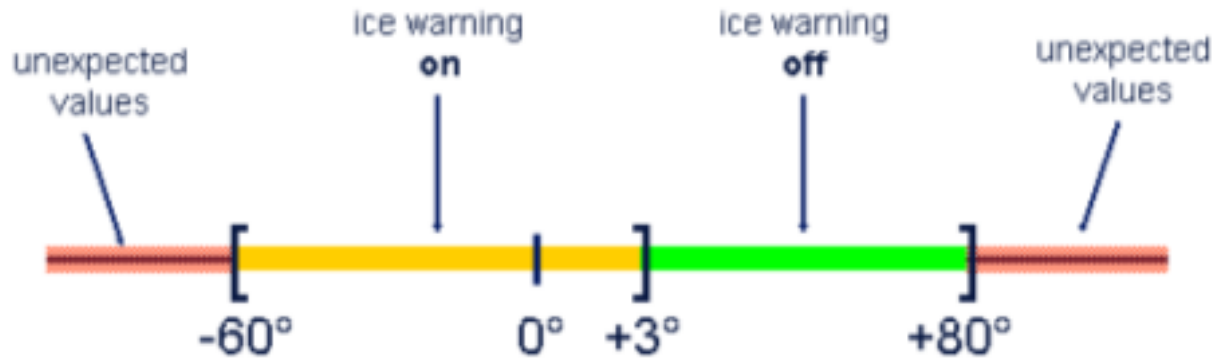

Figure : Equivalance Class partitioning

Repeated Equivalence Partitioning

- An equivalence class can be sub-divided according to additional aspects.
- It reduces complexity, each class is considered individually and sub-divided if it is needed.
- In the above example no consideration is for sign of the temperature
- To avoid this consequence, divide the class further according to the sign of the temperature.

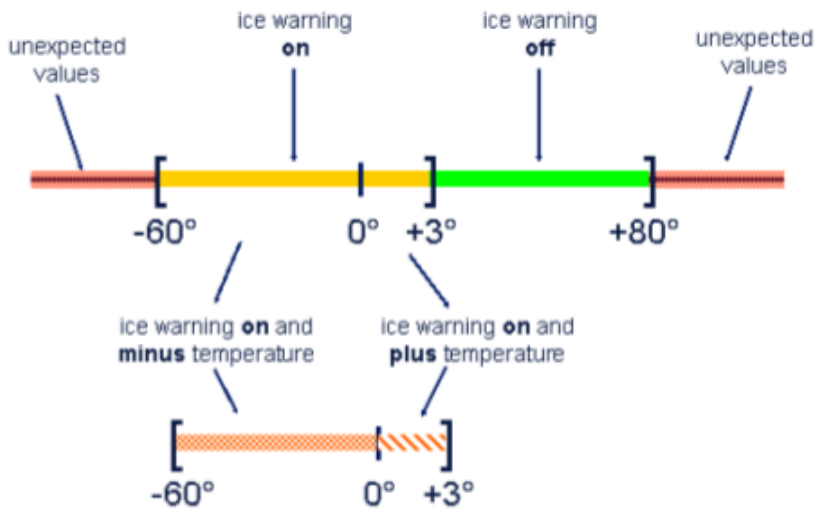

Figure : Repeated Equivalence Partitioning

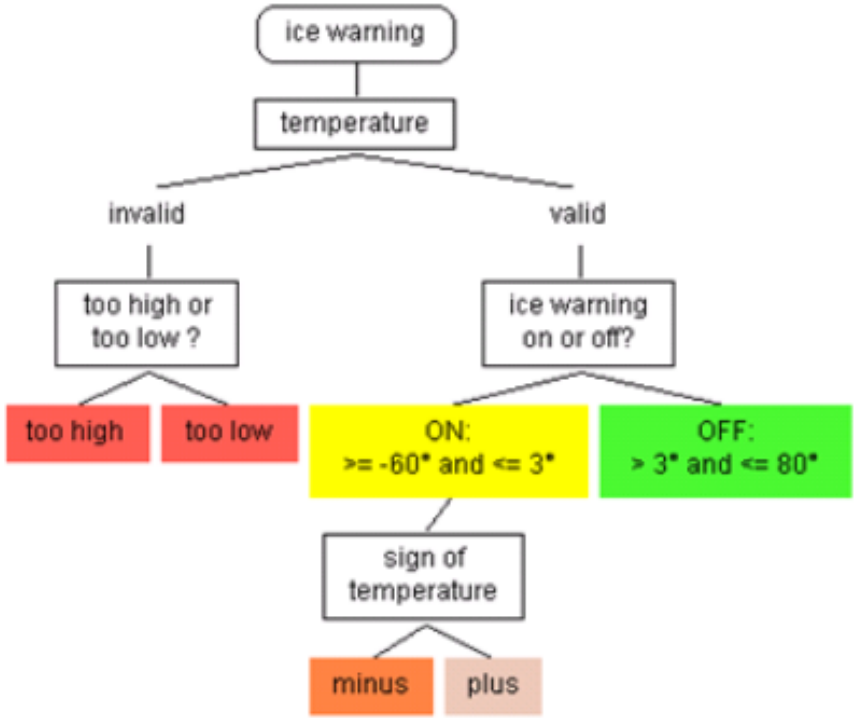

Figure : CTM - Ice warning display

References I

[1] Frank Buechner *"TestCaseDesignUsingTheClassificationTreeMethod "*

Thank you