

# Software Development II

## Unit 5: Blackbox Testing *Testing for Robustness*

---

Markus Roggenbach

March 2018



# What happens with 'unexpected' inputs?

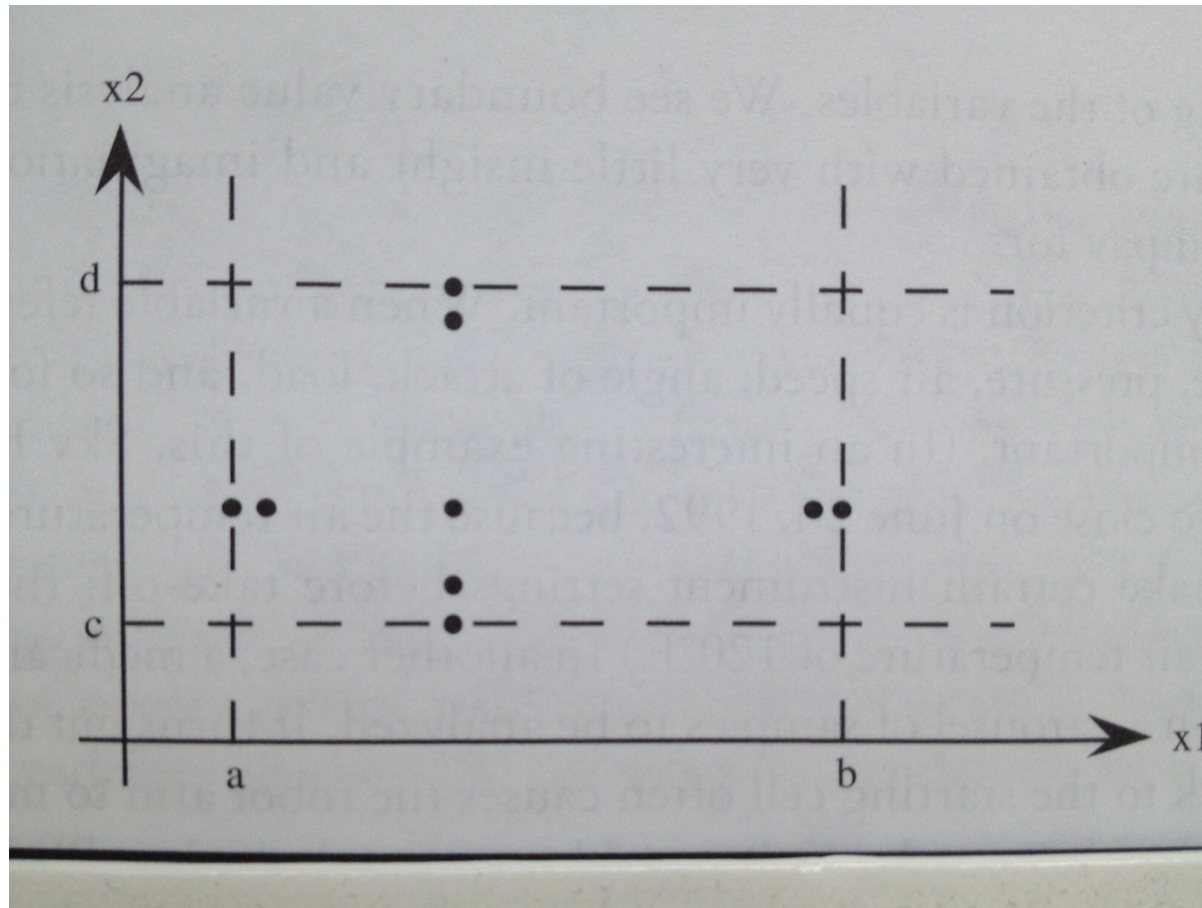
that concerns “robustness”

There are versions of testing for robustness for

- Boundary Value Analysis (BVA)
- Equivalence class testing

# Testing for Robustness – Extending BVA

# Recap: BVA – illustration with 2 inputs



# Robustness Testing

*Forces attention on exception handling.*

add

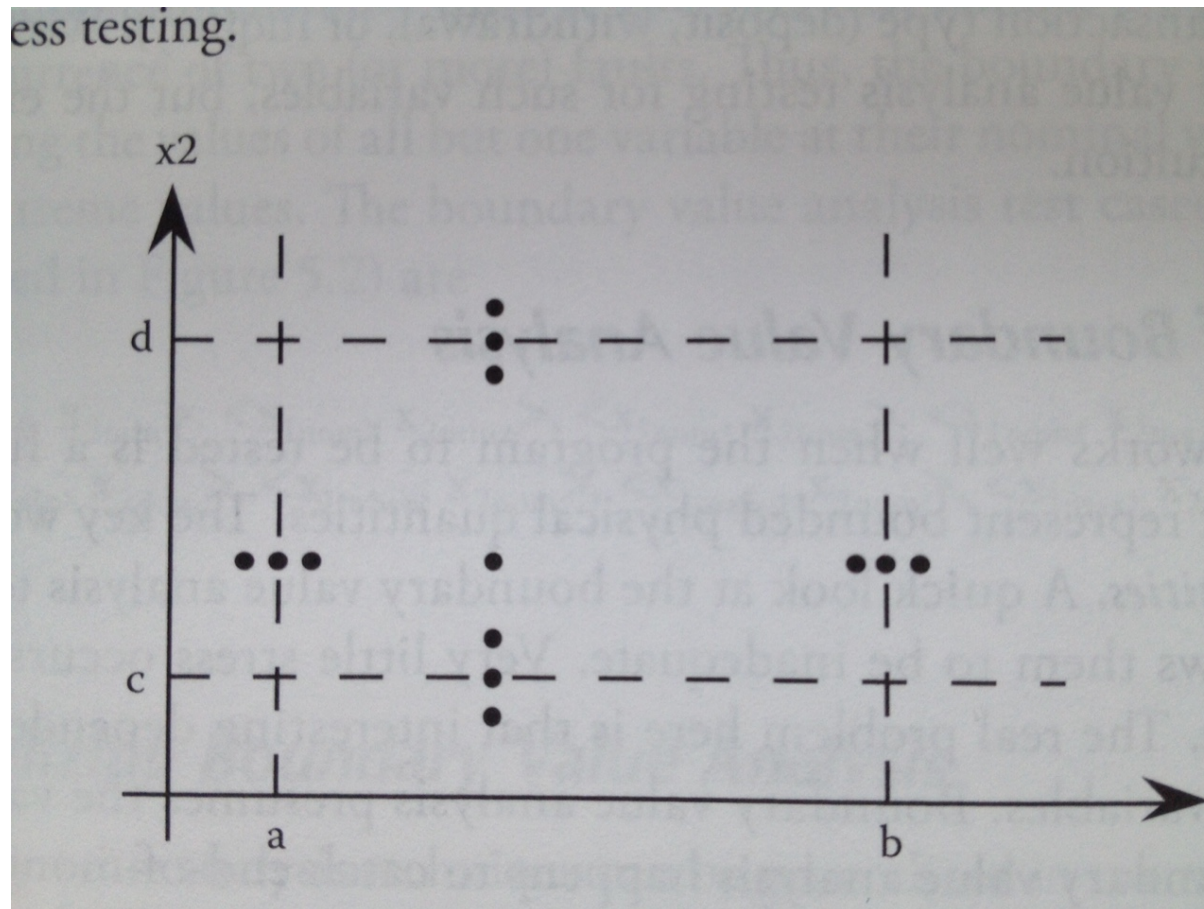
- value slightly larger than maximum – “ $max+$ ”
- value slightly smaller than minimum – “ $min-$ ”

and generate test cases as for BVA.

What happens if a physical quantity exceeds its maximum?

- load capacity of an elevator
- date, e.g. May 32
- temperature

# Robustness Testing – illustration with 2 inputs



# Testing for Robustness – Extending Equivalence Class Testing

# Recap: Equivalence class testing with two inputs

**F:**

**Input:**  $x$  and  $y$

**Output:** . . .

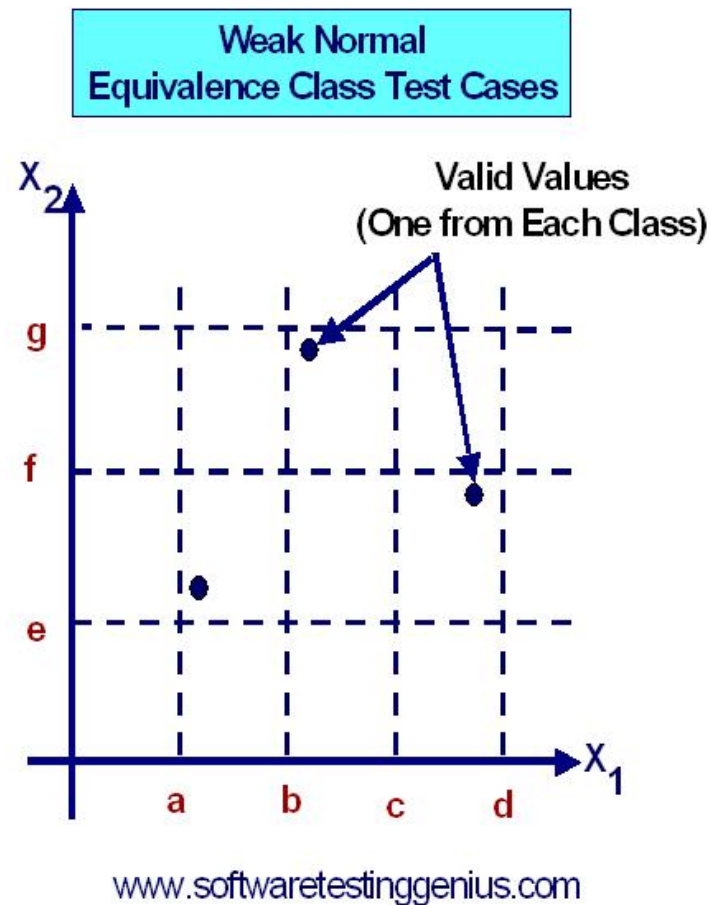
Assume that

- $[a, b), [b, c], (c, d]$  is a useful partition for  $x$ .
- $[e, f), [f, g]$  is a useful partition for  $y$ .

with  $a \leq b \leq c \leq d$  and  $e \leq f \leq g$ .



# Choice of representatives for Equivalence Class Testing

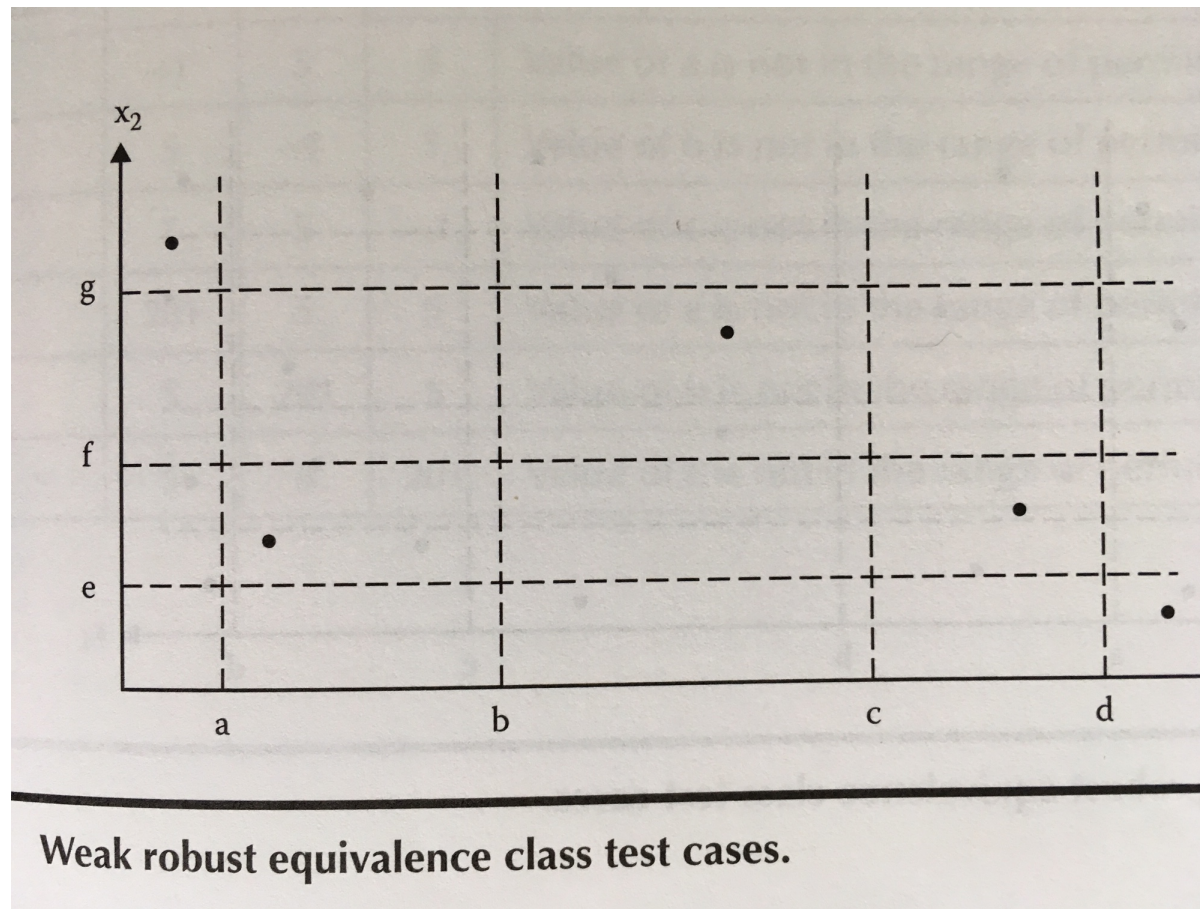


# Adding robustness to Equivalence Class Testing

Equivalence Class testing – classes only for the valid inputs

Robust Equivalence Class testing – classes for valid inputs & invalid inputs

# Choice of Representatives for Robust Equivalence Class Testing, 1st version



# Choice of Representatives for Robust Equivalence Class Testing, improved version

