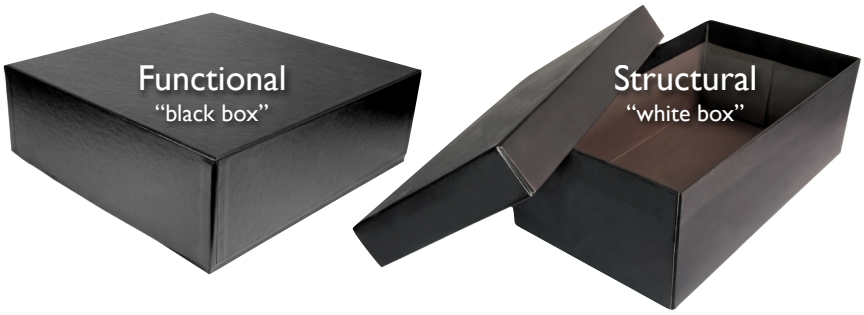
Testing Tactics

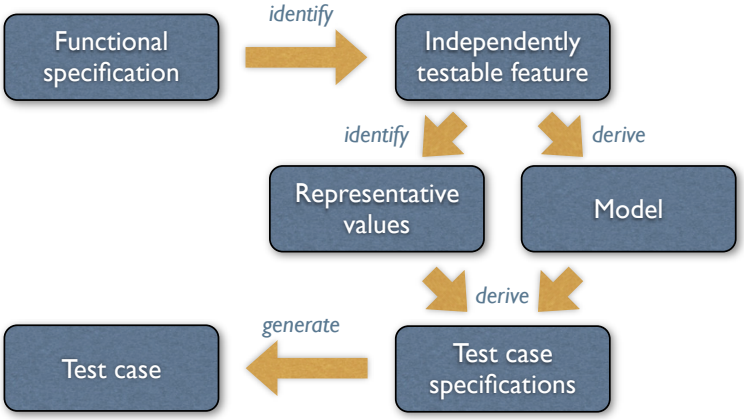


- Tests based on *spec*
- Test covers as much *specified* behavior as possible

- Tests based on *code*
- Test covers as much *implemented* behavior as possible

1

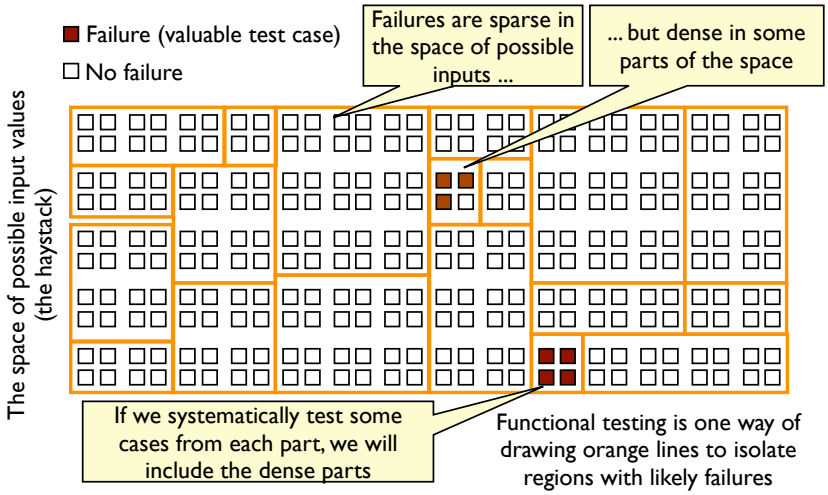
Systematic Functional Testing



2

The main steps of a systematic approach to functional program testing (from Pezze + Young, "Software Testing and Analysis", Chapter 10)

Systematic Partition Testing



3

We can think of all the possible input values to a program as little boxes ... white boxes that the program processes correctly, and colored boxes on which the program fails. Our problem is that there are a lot of boxes ... a huge number, and the colored boxes are just an infinitesimal fraction of the whole set. If we reach in and pull out boxes at random, we

Maintenance: The *Maintenance* function records the history of items undergoing maintenance.

If the product is covered by warranty or maintenance contract, maintenance can be requested either by calling the maintenance toll free number, or through the Web site, or by bringing the item to a designated maintenance station.

If the maintenance is requested by phone or Web site and the customer is a US or EU resident, the item is picked up at the customer site, otherwise, the customer shall ship the item with an express courier.

If the maintenance contract number provided by the customer is not valid, the item follows the procedure for items not covered by warranty.

If the product is not covered by warranty or maintenance contract, maintenance can be requested only by bringing the item to a maintenance station. The maintenance station informs the customer of the estimated costs for repair. Maintenance starts only when the customer accepts the estimate. If the customer does not accept the estimate, the product is returned to the customer.

Small problems can be repaired directly at the maintenance station. If the maintenance station cannot solve the problem, the product is sent to the maintenance regional headquarters (if in US or EU) or to the maintenance main headquarters (otherwise).

If the maintenance regional headquarters cannot solve the problem, the product is sent to the maintenance main headquarters.

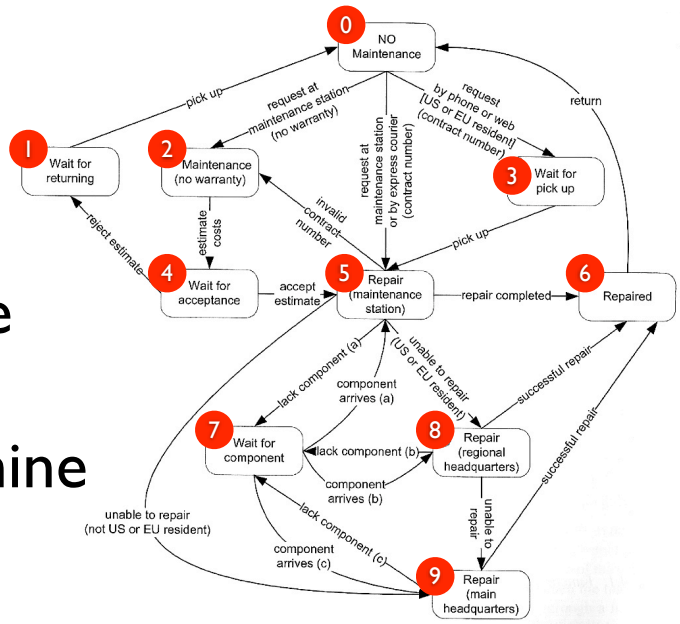
Maintenance is suspended if some components are not available.

Once repaired, the product is returned to the customer.

…based on these (informal) requirements
(from Pezze + Young, "Software Testing and Analysis", Chapter 14)

4

Finite State Machine



As an example, consider these steps modeling a product maintenance process…
(from Pezze + Young, "Software Testing and Analysis", Chapter 14)

5

Decision Tables

	Education		Individual					
Education account	T	T	F	F	F	F	F	F
Current purchase > Threshold 1	–	–	F	F	T	T	–	–
Current purchase > Threshold 2	–	–	–	–	F	F	T	T
Special price < scheduled price	F	T	F	T	–	–	–	–
Special price < Tier 1	–	–	–	–	F	T	–	–
Special price < Tier 2	–	–	–	–	–	–	F	T
Out	Edu discount	Special price	No discount	Special price	Tier 1 discount	Special price	Tier 2 discount	Special Price

A decision table describes under which conditions a specific outcome comes to be. This decision table, for instance, determines the discount for a purchase, depending on specific thresholds for the amount purchased.
(from Pezze + Young, "Software Testing and Analysis", Chapter 14)

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