ISO/IEC/IEEE 29119-4:2015

SOFTWARE AND SYSTEMS ENGINEERING - SOFTWARE TESTING - PART 4: TEST TECHNIQUES

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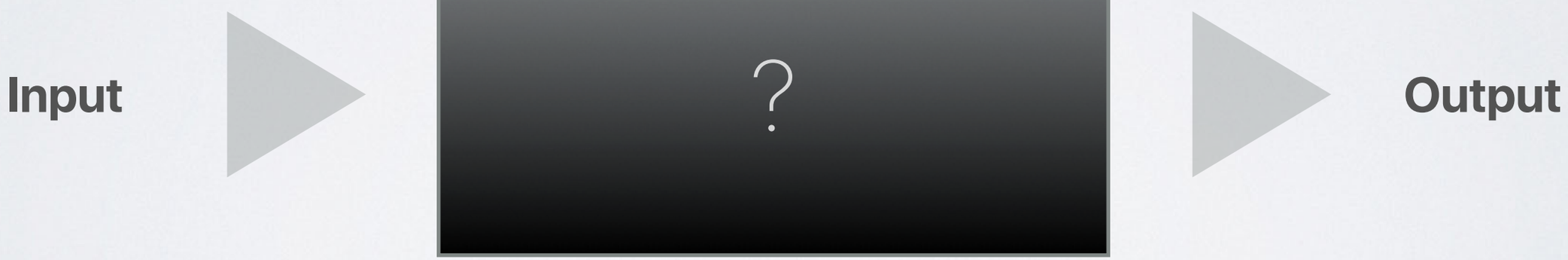
SPECIFICATION-BASED TESTING TECHNIQUES

Also known as **Black Box** techniques.

The internal structure (e.g. source code) is not visible or available.



SYNTAX TESTING

This technique makes use of the **possible input formats** of a given *test item*.

Tries both **valid and invalid** inputs, to test the **resilience** of the *test item*.

Example of *test coverage items*:

- whenever there are **multiple input options**, exploit that and add a *test case* for every option;
- whenever there is a **required amount** of letters of numbers, add a case with less and another with more;
- whenever a **limited amount of characters** is allowed, add a case with unexpected symbols.

DECISION TABLE TESTING

This technique is useful for **documentation and visualization**.

Table with **conditions** and and logically corresponding **actions**:

		Test case 1	Test case 2	Test case 3
Conditions	Color	Red	Blue	Green
	Size	Small	Small	Big
	Type	Car	Bike	Car
Actions	Parking	✓	✓	-

STRUCTURE-BASED TESTING TECHNIQUES

Also known as **White Box** techniques.

They are used to test the **internal structure** of the test item.

Measure test coverage

Design additional tests in order to increase the coverage

$$\text{Coverage} = \frac{\text{N° of coverage items covered}}{\text{Total number of coverage items}} * 100\%$$

DECISION TESTING

This technique aims to **cover each decision outcome** in the test item.

Decisions are points in the test item where two or more **possible outcomes may be taken**.

Examples:

- simple selections;
- decide when to exit loops;
- case statements.

Compared to some other techniques, Decision Testing allows for **better coverage** as it requires more checks.

DATA FLOW TESTING

Data Flow Testing is a testing technique that **focuses on the variables and their values** used within the test item.

The objective is to **reveal the coding errors and mistakes**, which can result in improper implementation.

Categories are assigned to each variable occurrence:

- **Definitions** – variable occurrences where a variable is given a new value;
- **Uses** – occurrence where the variable is not given a new value:
  - **P-uses** – the variable is used to determine the outcome of a condition;
  - **C-uses** – all other occurrences.

This testing technique is used to **identify any of the following issues**:

- variables that are declared but never used;
- variables that are used but never declared.

EXPERIENCE-BASED TESTING TECHNIQUES

Using **past experience** to validate software quality.

This type of testing is required when there is:

- limited knowledge of the software product;
- inadequate specification;
- restricted amount of time to perform testing.

ERROR GUESSING

Drafting a **checklist of defects** that may exist in the test item.

Using different inputs, **verify if the defects exist** in the test item.

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DÚVIDAS?