Black Box Testing

Introduction

- **Black-box testing** is a method of software testing that examines the functionality of an application (e.g. what the software does) without peering into its internal structures or workings.

- Black box testing attempts to find errors in the external behavior of the code.

BLACK BOX TESTING

Techniques

- Decision table testing
- All-pairs testing
- State transition Analysis
- Equivalence partitioning
- Boundary value analysis
- Cause–effect graph
- Error guessing

Decision table testing

- Decision tables, like flowcharts and if-then-else and switch-case statements, associate conditions with actions to perform

Decision table testing

Printer troubleshooter

		Rules							
Conditions	Printer does not print	Y	Y	Y	Y	N	N	N	N
	A red light is flashing	Y	Y	N	N	Y	Y	N	N
	Printer is unrecognized	Y	N	Y	N	Y	N	Y	N
Actions	Check the power cable			X					
	Check the printer-computer cable	X		X					
	Ensure printer software is installed	X		X		X		X	
	Check/replace ink	X	X			X	X		
	Check for paper jam		X		X				

State transition testing

- State transition testing is used where some aspect of the system can be described in what is called a ‘finite state machine’.
- This simply means that the system can be in a (finite) number of different states, and the transitions from one state to another are determined by the rules of the ‘machine’.
- This is the model on which the system and the tests are based.
- Any system where you get a different output for the same input, depending on what has happened before, is a finite state system.

State diagram

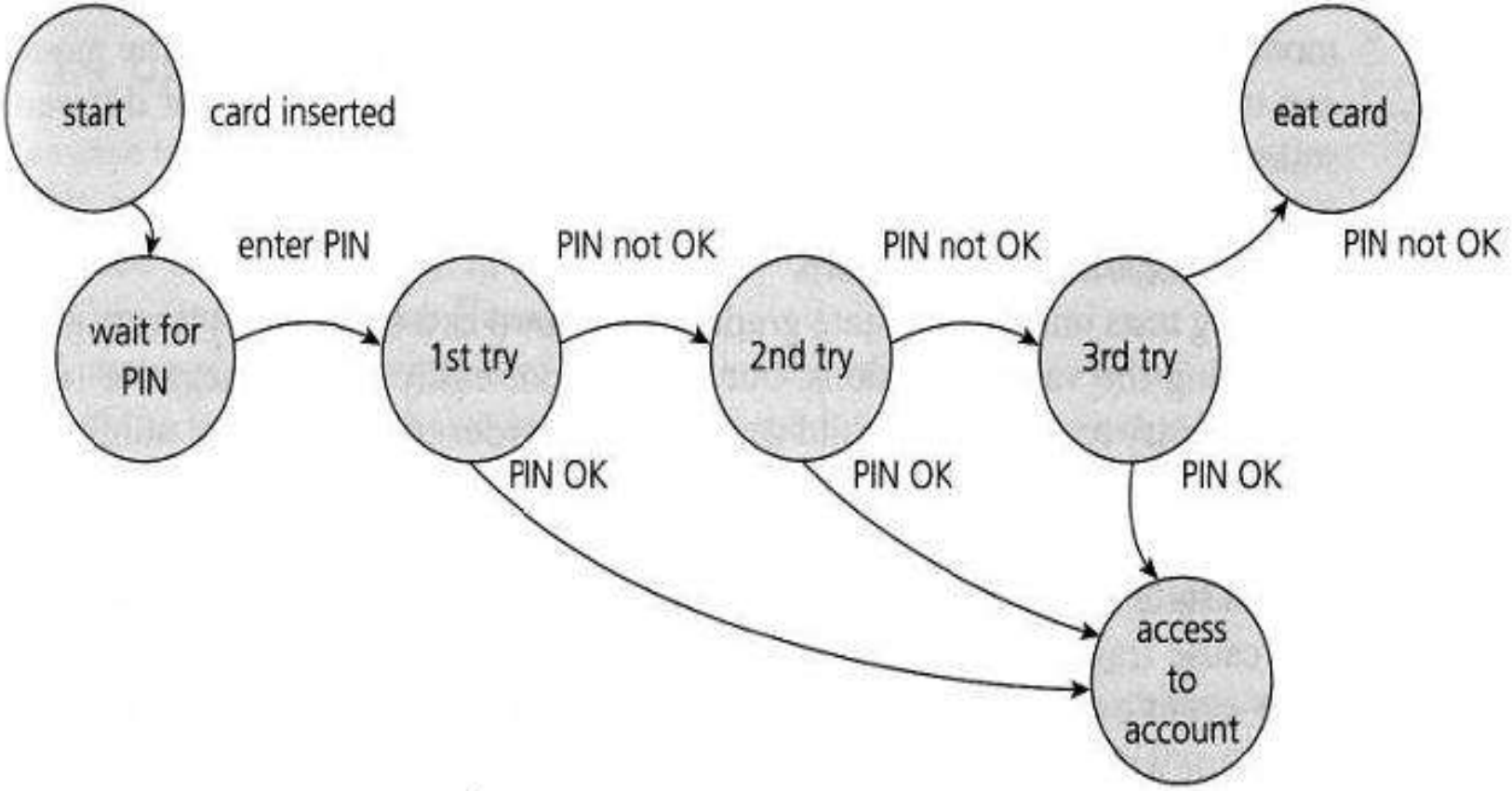


FIGURE 4.2 State diagram for PIN entry

Equivalence partitioning

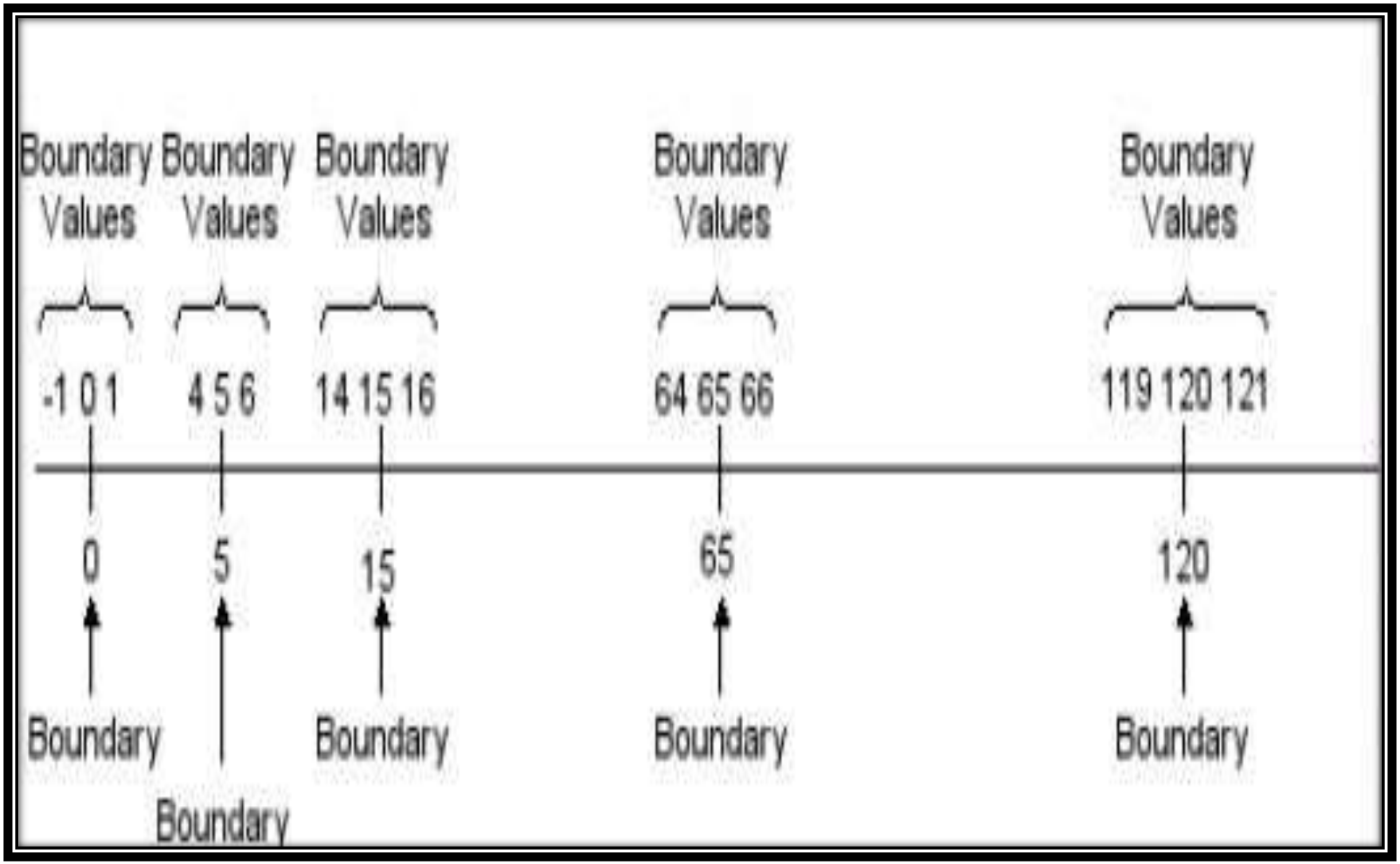
- It is a software testing technique that divides the input data of a software unit into partitions of equivalent data from which test cases can be derived.

Equivalence partitioning

- Calculator example
  - It's impossible to test all the cases of adding two numbers together.
  - **Equivalence partitioning** provides a systematic means for selecting the values that matter and ignoring the ones that don't.

- When looking for equivalence partitions, think about ways to group:
  - similar inputs
  - similar outputs
  - and similar operation of the software.
    - What is the difference between 1+999999.. and 1+13?

Boundary value analysis



Error guessing

- In software testing, **error guessing** is a test method in which test cases used to find bugs in programs are established based on experience in prior testing.
- The scope of test cases usually rely on the software tester involved, who uses past experience and intuition to determine what situations commonly cause software failure, or may cause errors to appear.
- Typical errors include divide by zero, null pointers, or invalid parameters.

Types of Black Box Testing

Usability Testing

- Easy To Use - Application should have user friendly interface. Customers should be able to access application easily.

- Look And Feel - Application should maintain consistency in terms of fonts, colors.

- Quick Interface - Application should provide quick navigation. Application must have most frequently pages appearing as link at top. Whatever client looking for, should be able to get that information quickly and easily.

Types of Black Box Testing

Security Testing

- Application should be secure.
- Private or sensitive information should not be leaked out.
- Application should maintain trust of customers by giving them sense that their information is in safe hands.

Types of Black Box Testing

Performance Testing

- Verifying the performance of the application under customer expected.
- Application should not crash when undergoes customer expected load.

Types of Black Box Testing

- **Load Testing :** Checking the performance under customer expected load.
- **Stress Testing :** Checking the performance above customer expected load by continuously increasing stress(number of users).

Types of Black Box Testing

Functionality Testing

- Executing the application for verifying its functionality.
- For Example : To check the login functionality of gmail.com, Enter Valid Credentials and then checking if able to login or not.

Types of Functionality Testing

1. Functional Testing :

It is also known as positive testing. Entering valid username and valid password and checking if able to login or not.

2. Error Handling

It is also known as negative testing. Entering invalid credentials and checking if able to login or not and checking for user friendly error message on screen.

Types of Functionality Testing

3. Compatibility Testing

- It is also known as Software Compatibility.
- Application is verified for compatibility with 3 things:
- **Browser Compatibility**: Application should work perfectly client's browsers.
- **Database Compatibility**: Application should be compatible with client's database(SQL SERVER, MYSQL etcetera).
- **Operating System Compatibility :** Application should be compatible with client's Operating System.

Types of Functionality Testing

4. Installation Testing

- Application should be easy to install.
- If some setting to be made prior to installation, those should be mentioned in installation manual.

5. Intersystem Testing

- Application should be able to work with other systems.
- For example : Mobile Phones. Airtel customer should be able to call Reliance Customer. System should be able to intertalk with each other.

Types of Functionality Testing

6. Sanitation Testing

- Application is verified for extra features which its providing.
- For example: Forgot password functionality in Login page.

7. Parallel Testing

- It is known as Competition Testing.
- Application should be delivered at right time and keeping market requirements in mind.

Types of Functionality Testing

8. Configuration Testing

- It is also known as Hardware Compatibility. Application should work perfectly with customer expected platform (Client's mouse, keyboard).

9. Input Domain Testing

- Verifying the application by passing multiple sets of data.

10. Recovery Testing

- Application should have auto recovery features.
- It should be able to recover on its own if gets crashed or shut down. Windows exemplifies this.

Difference between Black Box and White Box

BLACK BOX	WHITE BOX
The Internal Workings of an application are not required to be known	Tester has full knowledge of the Internal workings of the application
Also known as closed box testing, data driven testing and functional testing	Also known as clear box testing, structural testing or code based testing
Performed by end users .	Normally done by testers and developers
Testing is based on external expectations - Internal behavior of the application is unknown	Internal workings are fully known and the tester can design test data accordingly
This can only be done by trial and error method	Data domains and Internal boundaries can be better tested

THANK YOU