Software Testing

Dynamic Testing

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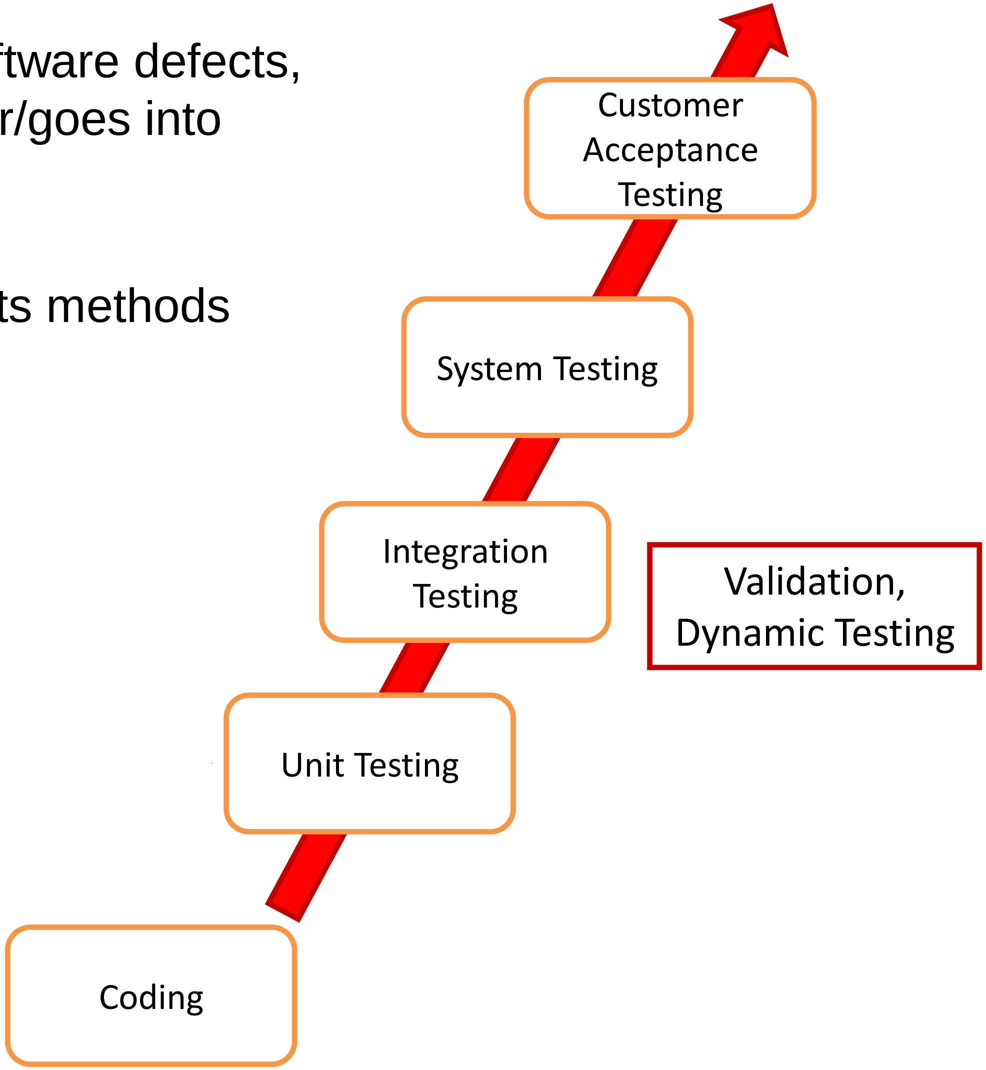
Dynamic Testing

Dynamic Testing

Aims to discover and eliminate software defects, before the software is handed over/goes into production

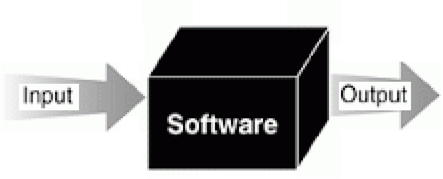
Dynamic Testing has 3 types of Tests methods

- Black Box Testing methods
- White Box Testing methods
- Gray Box Testing methods



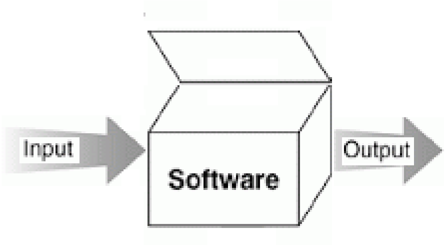
Dynamic Testing

Test Types



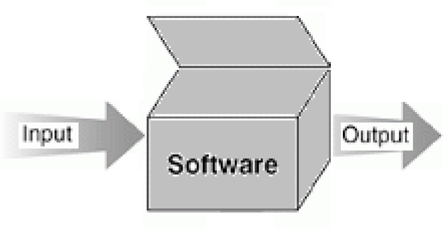
Black Box Testing

- No programming knowledge required
- Based on requirements and/or specifications (testing functionality)



White Box Testing

- Programming knowledge is required
- Based on detailed designs/requirements (testing on code)



Gray Box Testing

- Methods can be used for Black Box testing

and

- Methods can be used for White Box Testing

White Box Method - Test Code

How: Write Test code (use of testing frameworks)

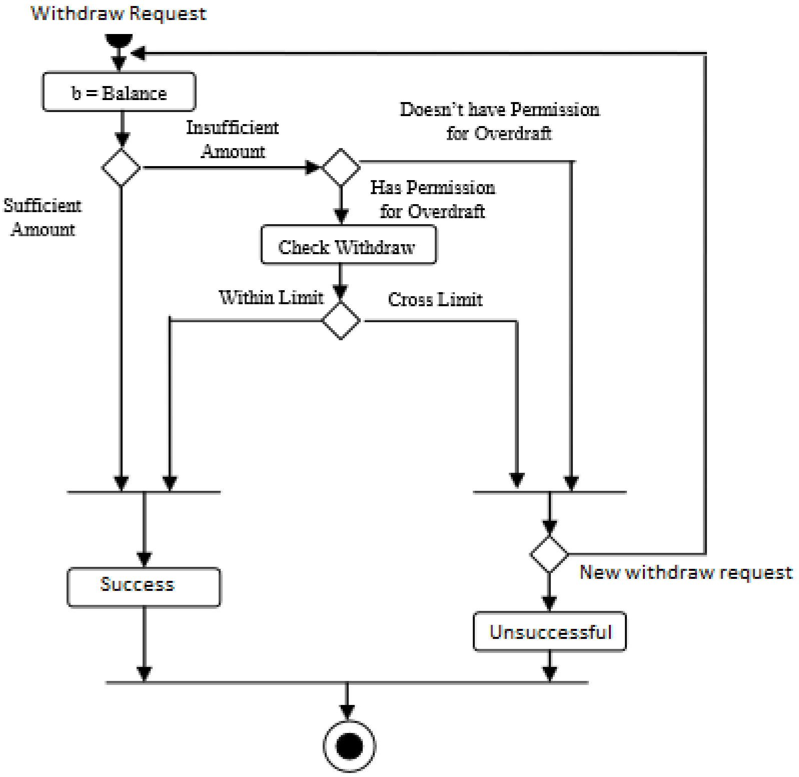
```
public class Calc
{
    …

    public int add(int a, int b)
    {
        return a + b;
    }
}
```

```
public class CalcTest
{
    [Test]
    public void TestAddMethod()
    {
        Calc calc = new Calc();
        int a = 10;
        int b = 20;
        int expected = 30;

        Assert.assertNotNull(calc);

        int actual = calc.add(a, b);

        Assert.assertEquals(expected, actual);
     }
}
```

Black Box Method

Control-Flow Testing/Path-Testing

Execution of the Scenarios is Black Box Testing



Conditions for accounts withdraw method are:

Pre Condition:

1) Account does have some minimum balance.
2) Amount entered should be a valid amount.

Post Condition

1) Withdraw successful.
2) Withdraw unsuccessful.

Main Scenario

1) The user invokes the withdraw method.
2) The user enter amount to be drawn.
3) The user successfully withdraw from the ATM.

Alternate course of action

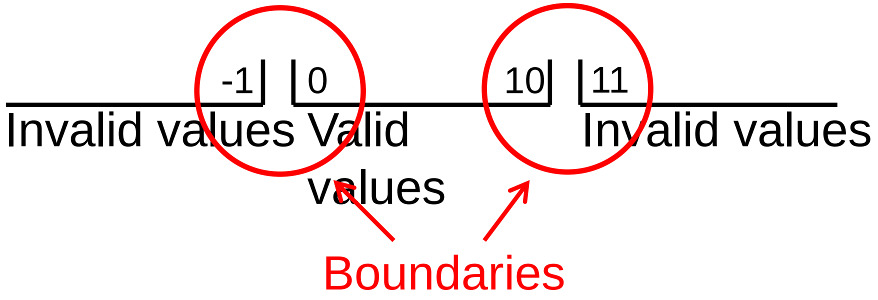
The user can not withdraw the enter amount. The system notifies the user.

Grey Box Method – Boundary Testing

or Boundary Value Analysis (BVA)

How:

1. Identify the valid/invalid input ranges
2. Test boundaries of ranges (min, max, just inside/outside boundaries)

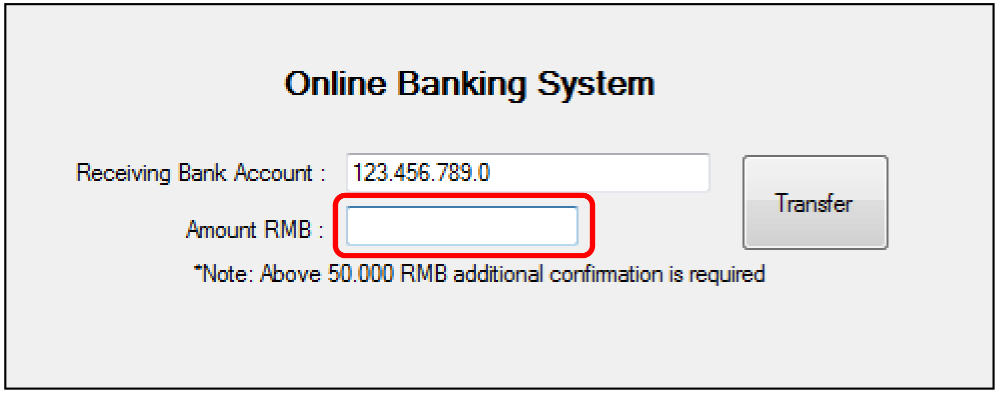


-1 0 10 11

Invalid values Valid values Invalid values

Boundaries

Example:



Online Banking System

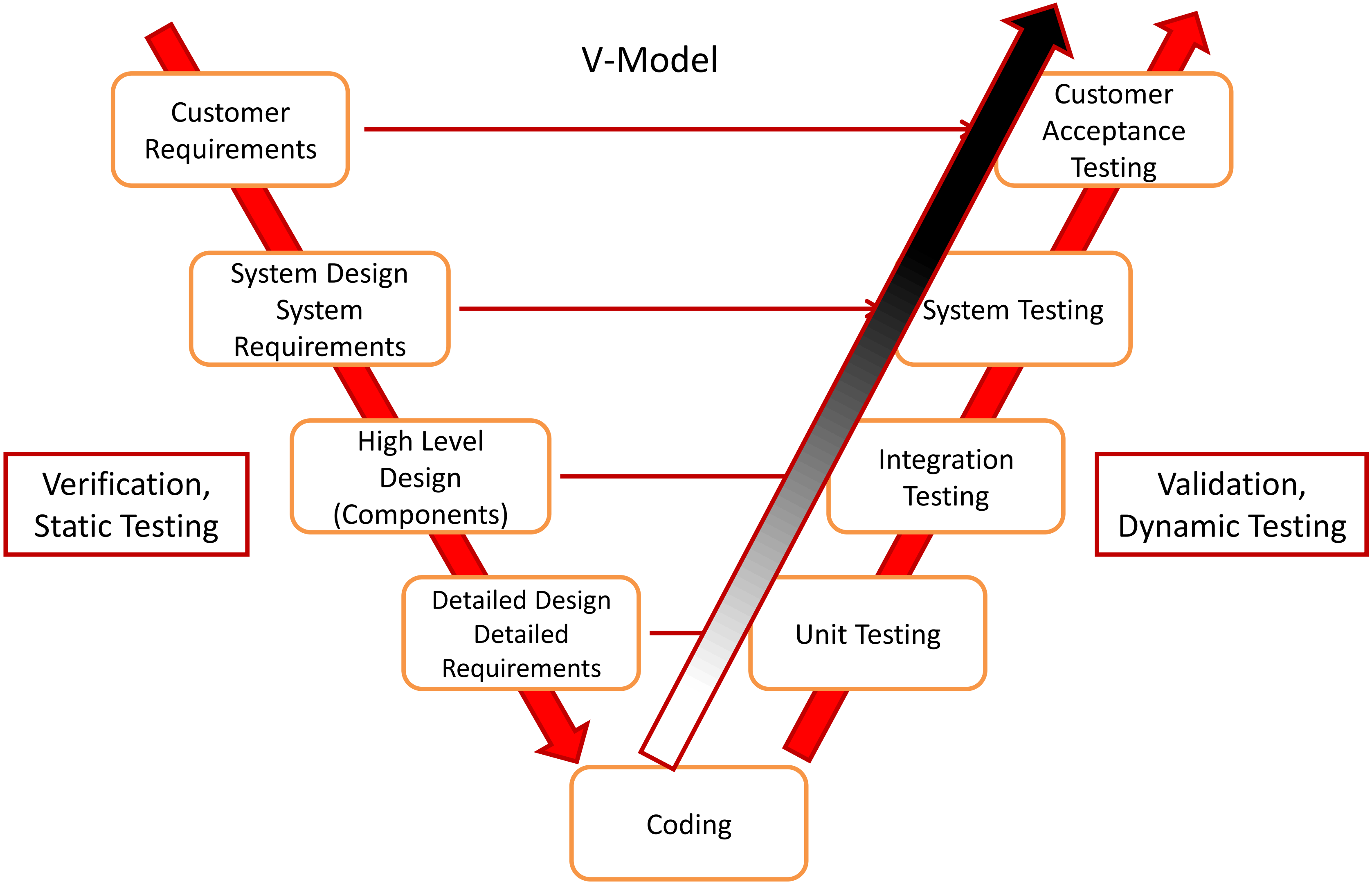
Receiving Bank Account : 123.456.789.0

Amount RMB :

*Note: Above 50.000 RMB additional confirmation is required

What values would you test ? -1, 0, 1, 50.000, 50.001

Test Levels


V-Model

Customer Requirements

System Design System Requirements

High Level Design (Components)

Detailed Design Detailed Requirements

Coding

Unit Testing

Integration Testing

System Testing

Customer Acceptance Testing

Verification, Static Testing

Validation, Dynamic Testing

Questions?