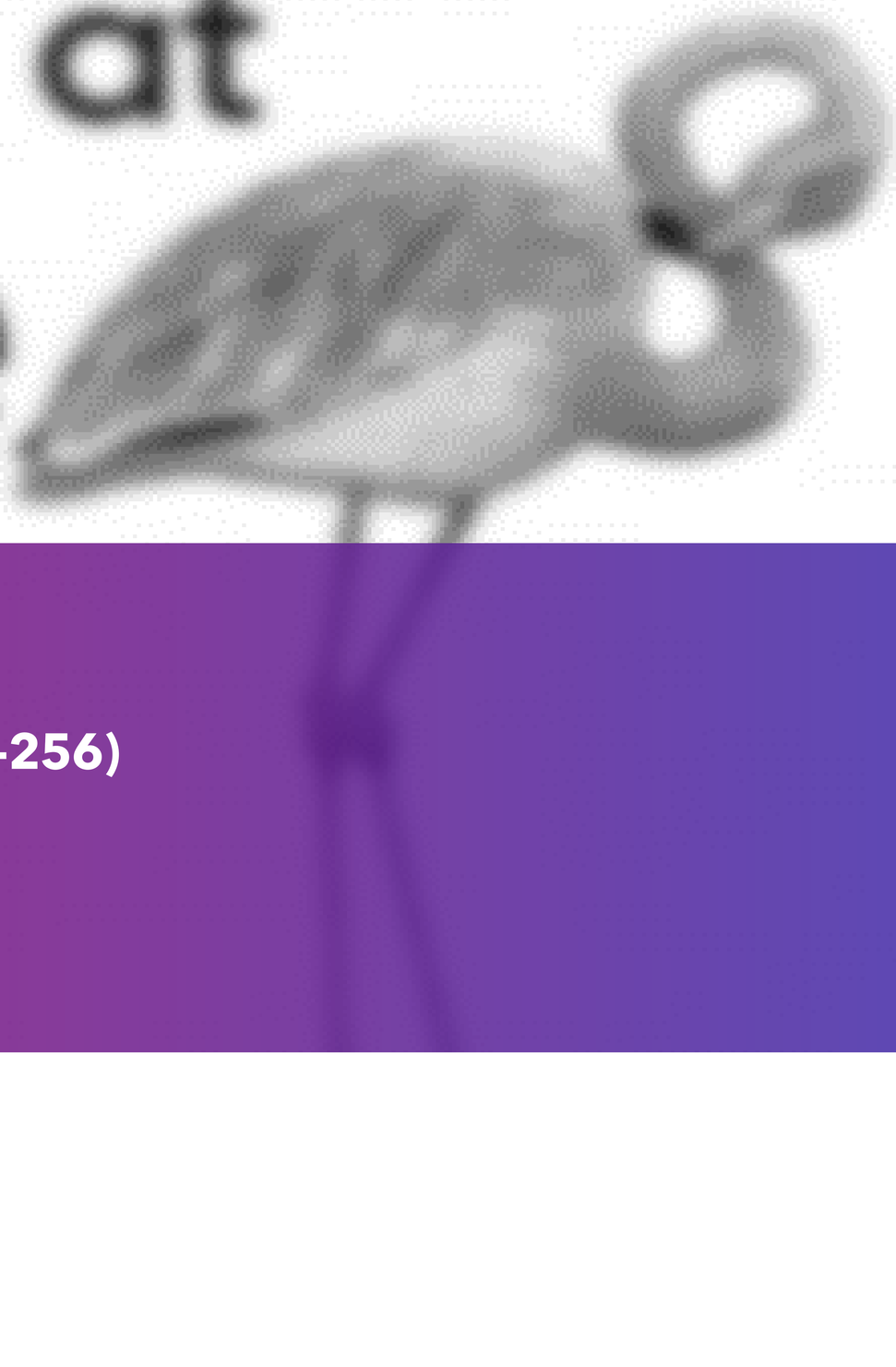
Software Engineering at Google



Unit Testing (p231-256)

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Introduction

- What is unit testing?
  - *Tests of relatively narrow scope, such as a single class or method*
- Unit tests' properties
  1. *Small in size*
  2. *Easy to write*
  3. *High test coverage*
  4. *Obvious failure reason*
  5. *Documentation and examples*
- Role of unit testing

Importance of maintability

- Short story ;)
- Brittle tests

Prevent brittle tests

- Why is it bad?

Strive for unchanging test

- Kinds of Changes
  - Pure refactoring
  - New features
  - Bug fixes
  - Behavior changes

Test via public APIs

- Advantages?
- What are public APIs? And definition of unit

Test state, not interactions

- Interaction test vs. state test
- What can go wrong with interaction tests?

Writing clear tests

- Why do tests fail?
- Engineer's job
- Test calrit
- The problem with unclear tests
- What happens to unclear tests

Make complete and concise tests

- Definition
- Helper methods
- Dry principle

Test behaviors, not methods

- The problem with method testing
- Given, when, then
- behavior testing is more clear than method testing

Structure tests based on behavior

how does it help? gives 3 levels to read the test

```java
@Test
public void transferFundsShouldMoveMoneyBetweenAccounts() {
  // Given two accounts with initial balances of $150 and $20
  Account account1 = newAccountWithBalance(usd(150));
  Account account2 = newAccountWithBalance(usd(20));

  // When transferring $100 from the first to the second account
  bank.transferFunds(account1, account2, usd(100));

  // Then the new account balances should reflect the transfer
  assertThat(account1.getBalance()).isEqualTo(usd(50));
  assertThat(account2.getBalance()).isEqualTo(usd(120));
}
```

Name tests after behavior

- Why test's name is important?
- What should the name contain?
- Examples:
  multiplyingTwoPositiveNumbersShouldReturnAPositiveNumber

Don't put logic in tests

- clear tests
- logic is complex: operator, loops, codition

Write clear failure messages

- What should a failure message do?
- What should a failure message contain?

DAMP, not DRY

- what is DRY? Pros and cons
- what is DAMP? (Descriptive and Meaningful phrases)

Shared setup

- Setup methods

Defining test infrastructures

- what is test infrastructures
- test infrastructure is code is difficult to change
- well-known third-party libraries

Conclusion

Thank you for your time