



**HAVE YOU EVER FAILED
BECAUSE YOUR TESTS
DIDN'T PASS ?**

FLAKY TESTS

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CONTENTS

- What is this and Why should I bother?
- Types of Flaky Tests
- Common Sources of Flaky Tests
- Identification and Response
- AI and Flaky Tests
- Tips

THE SCHRÖDINGER CAT OF TESTS

A test case that passes or fails even when you don't change the source code of the program under test or the test suite itself



IS IT A BIG THREAT?

Continuous Integration and Development would be heavily affected if there is flakiness in your tests

IMAGINE FAILING BECAUSE OF FLAKY TESTS

In the podcast Gregory Kapfhammer gives
an example about a problem when evaluating some work

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ORDER DEPENDENT

NON-ORDER DEPENDENT

ORDER DEPENDENT

- Running tests in a different order produces them to fail in a flaky fashion

1



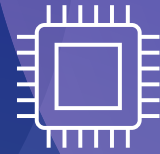
2



3

NON-ORDER DEPENDENT

- Test fail or pass for reasons not related to order
- Timing and time zones
- CPU, memory and file system issues

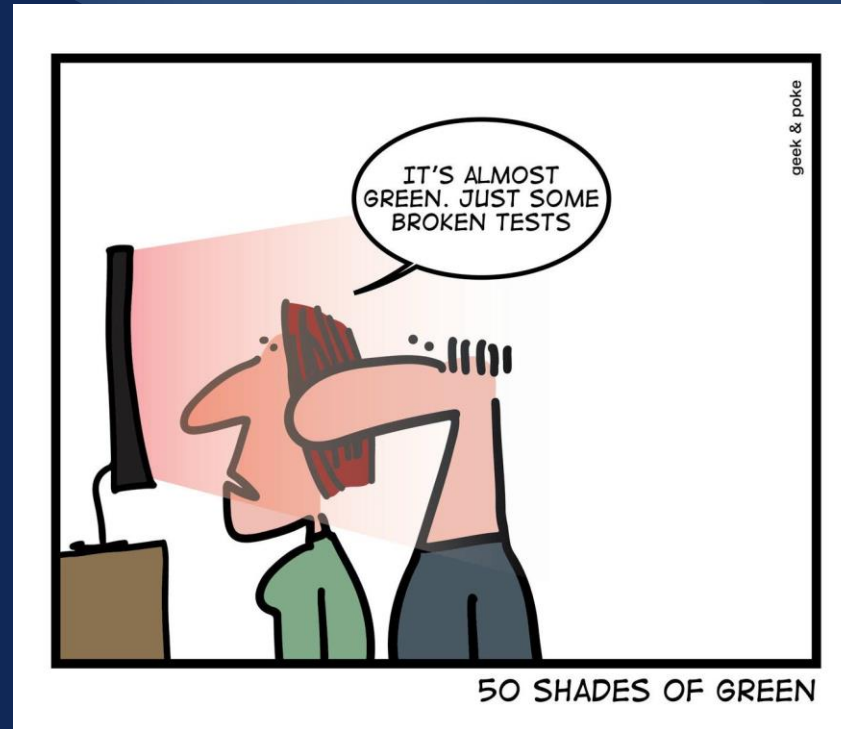


CONTENTS

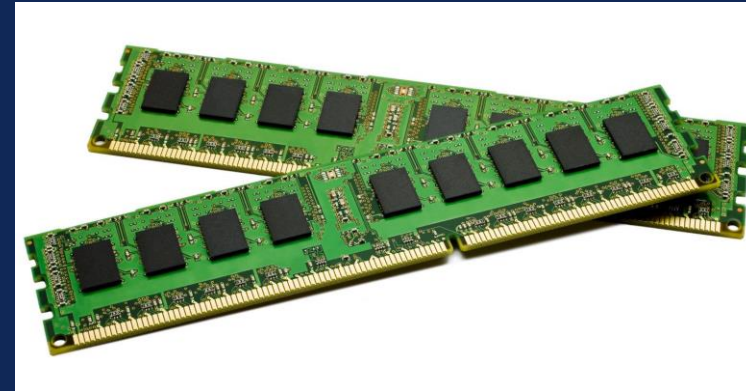
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COMMON SOURCES

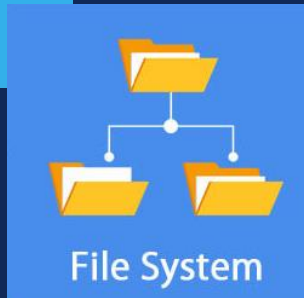
The origin of flakiness



PHYSICAL



SOFTWARE



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DETECTING FLAKY TESTS

- Rerunning in isolation and increasing the number of test to ran along it
- Tools for Java and Python to rerun and add markers



Test History							Builds to show: 50		
Test status	Duration	Build Info			Changes	Started	Agent		
OK	< 1ms	... Build	master	#63	Tests passed: 42, ignored: 1	No changes	19 Aug 19 22:40	Main Agent	
Failure	2ms	... Build	master	#62	Tests failed: 3 (1 new), passed: 39, ignored: 1	No changes	19 Aug 19 22:40	Main Agent	
OK	< 1ms	... Build	master	#61	Tests failed: 2 (1 new), passed: 40, ignored: 1	No changes	19 Aug 19 22:39	Main Agent	
Failure	< 1ms	... Build	master	#60	Tests failed: 2 (1 new), passed: 40, ignored: 1	No changes	19 Aug 19 22:38	Main Agent	
OK	< 1ms	... Build	master	#59	Tests failed: 1, passed: 41, ignored: 1	No changes	19 Aug 19 22:38	Main Agent	
Failure	1ms	... Build	master	#58	Tests failed: 2 (2 new), passed: 40, ignored: 1	No changes	19 Aug 19 22:37	Main Agent	
OK	< 1ms	... Build	master	#57	Tests failed: 1 (1 new), passed: 41, ignored: 1	No changes	19 Aug 19 22:36	Main Agent	
OK	1ms	... Build	master	#56	Tests failed: 1, passed: 41, ignored: 1	No changes	19 Aug 19 22:36	Main Agent	
Failure	1ms	... Build	master	#55	Tests failed: 3 (1 new), passed: 39, ignored: 1	No changes	19 Aug 19 22:35	Main Agent	

WHAT TO DO ONCE DETECTED

- Investigate interaction of test with execution environment (CPU, memory usage, file system)
- Datadog
- Stop running it in Continuous Integration
- Mocking



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MACHINE LEARNING

SUPERVISED



UNSUPERVISED

SUPERVISED

Probabilistic

Static

Dynamic

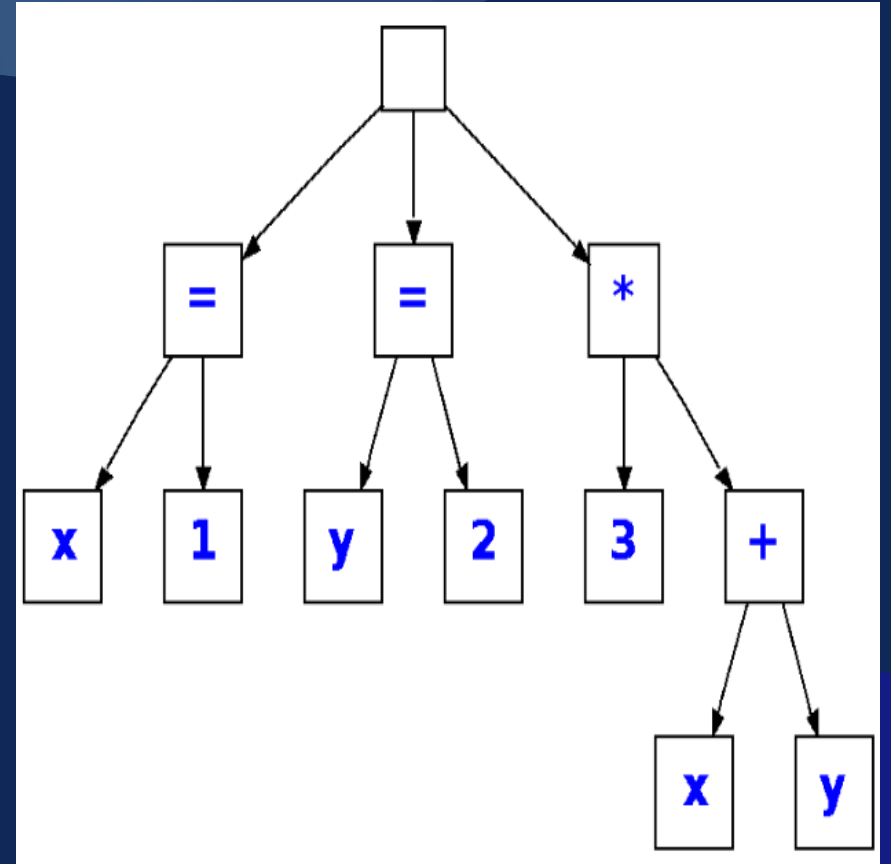


SUPERVISED

Probabilistic

Static

Dynamic

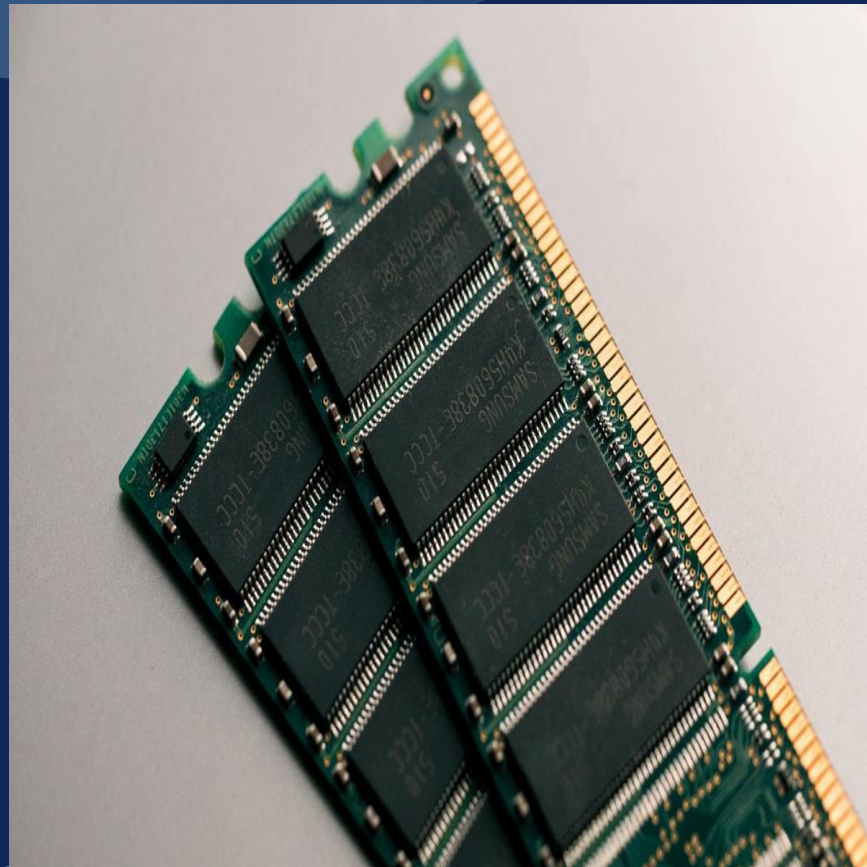


SUPERVISED

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**ARE YOU GOING TO BE
PRONE TO INTRODUCING
FLAKINESS?**

Probably.

MAJOR TIP

Run your test **RANDOMLY**



ABOUT WRITING TEST CASES

Keep it simple

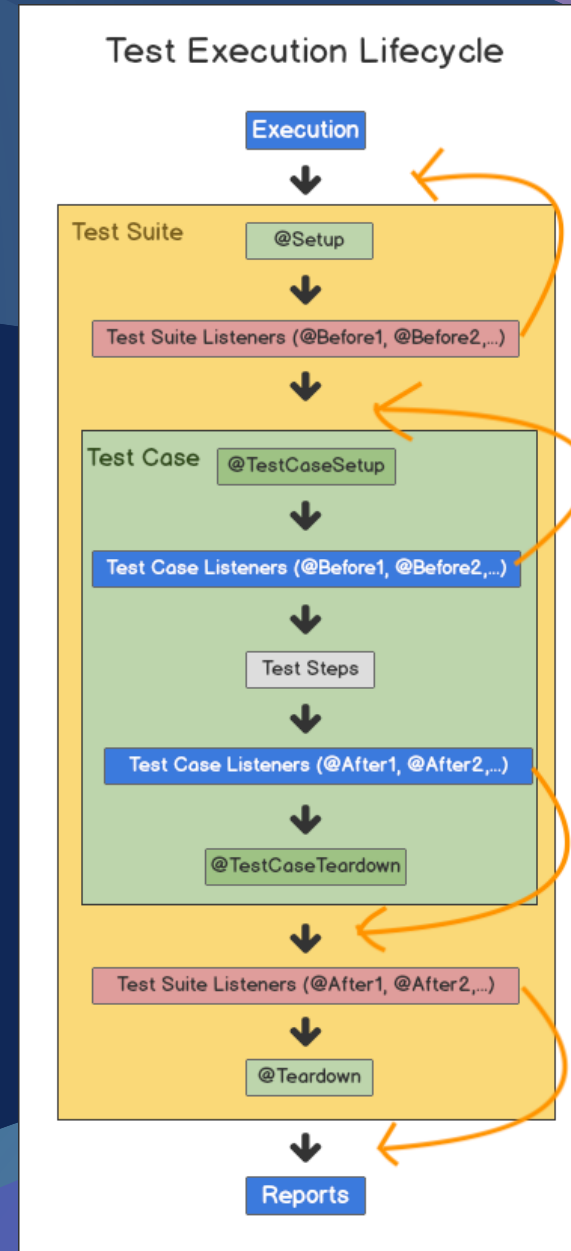
Avoid conditionals and loops

Avoid **TOO** many asserts

```
WebDriver driver;
// To run the script on IE browser set the path
//System.setProperty("webdriver.chrome.driver", ".\\driver\\chromedriver.exe");
System.setProperty("webdriver.ie.driver", ".\\driver\\IEDriverServer.exe");
// driver=new ChromeDriver();
// Initialize the driver instance with IE browser
DesiredCapabilities ieCapabilities = DesiredCapabilities.internetExplorer();
ieCapabilities.setCapability("nativeevents", false);
ieCapabilities.setCapability("unexpectedAlertBehaviour", "accept");
ieCapabilities.setCapability("ignoreProtectedModeSettings", true);
ieCapabilities.setCapability("disable-popup-blocking", true);
ieCapabilities.setCapability("enablePersistentHover", true);
ieCapabilities.setCapability("ignoreZoomSetting", true);
driver=new InternetExplorerDriver(ieCapabilities);
// Initialize the driver instance with IE browser
driver.manage().window().maximize();
driver.manage().timeouts().implicitlyWait(10, TimeUnit.SECONDS);
// Open the WebPage
driver.get("https://accounts.google.com/signin");
// Enter the correct gmail id
driver.findElement(By.xpath("//input[@type='email']")).sendKeys("cgmailid");

driver.findElement(By.xpath("//span[contains(text(),'Next')]")).click();
// Enter the wrong Password
driver.findElement(By.xpath("//input[@name='password']")).sendKeys("password");
driver.findElement(By.xpath("//span[contains(text(),'Next')]")).click();
String error_message=driver.findElement(By.xpath("//div[@jsname='B34E7']/span")).getText();
System.out.println(error_message);
if(error_message.contains("Wrong password")) {
    System.out.println("Unable to login, Please enter the correct Password");
}
```

SETUP AND TEARDOWN



ABOUT VMS AND CONTAINERS

New VM or
Container each
Time

More than one
Docker file.

