

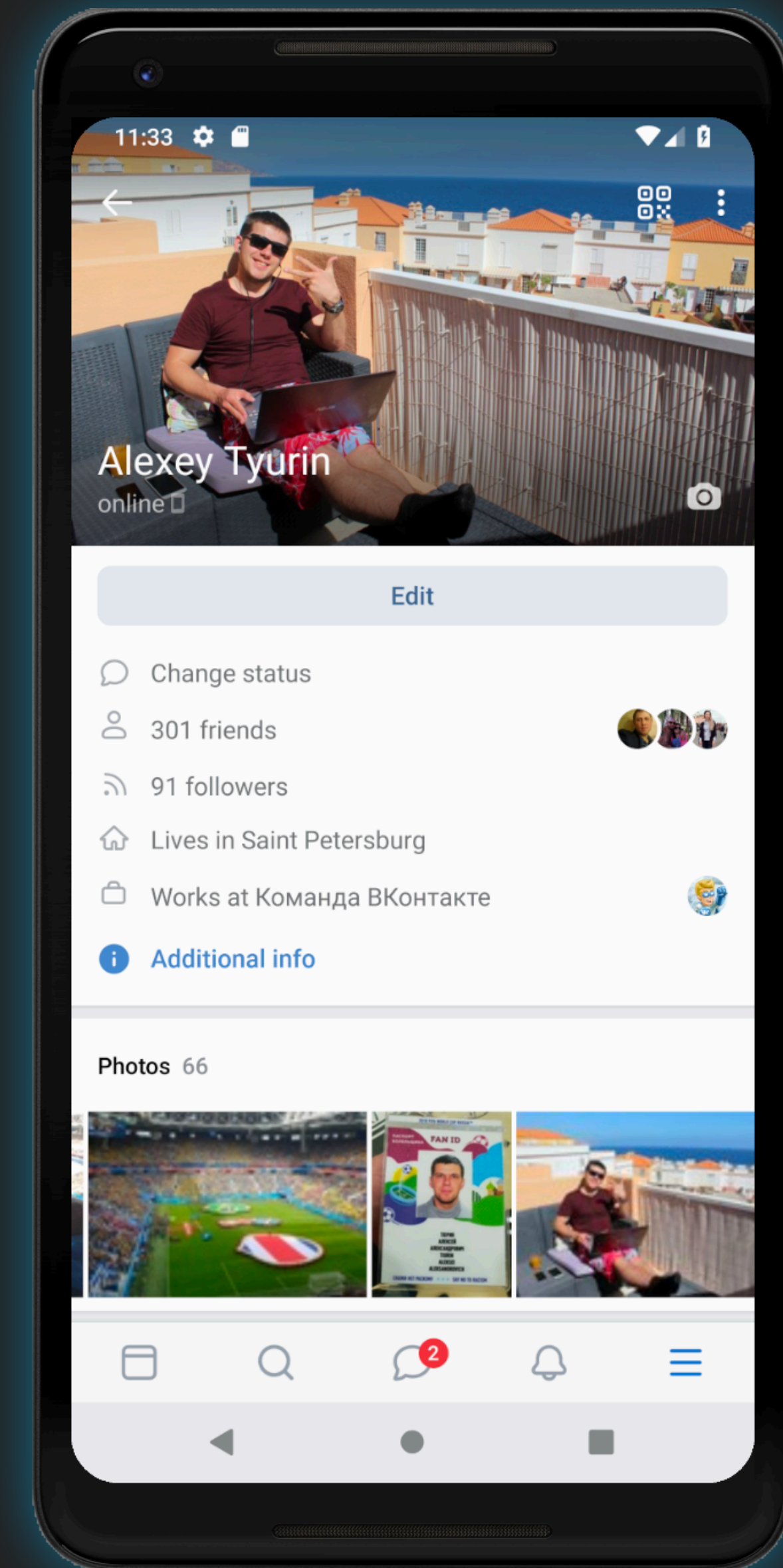
DON'T DO IT IN ANDROID TEST AUTOMATION



ALEKSEI TIURIN, VK

LEAD AUTOMATION ENGINEER AT VK

- vk.com/alex_tiurin
- github.com/alex-tiurin
- linkedin.com/in/aleksei-tiurin





DO YOU REMEMBER ME?

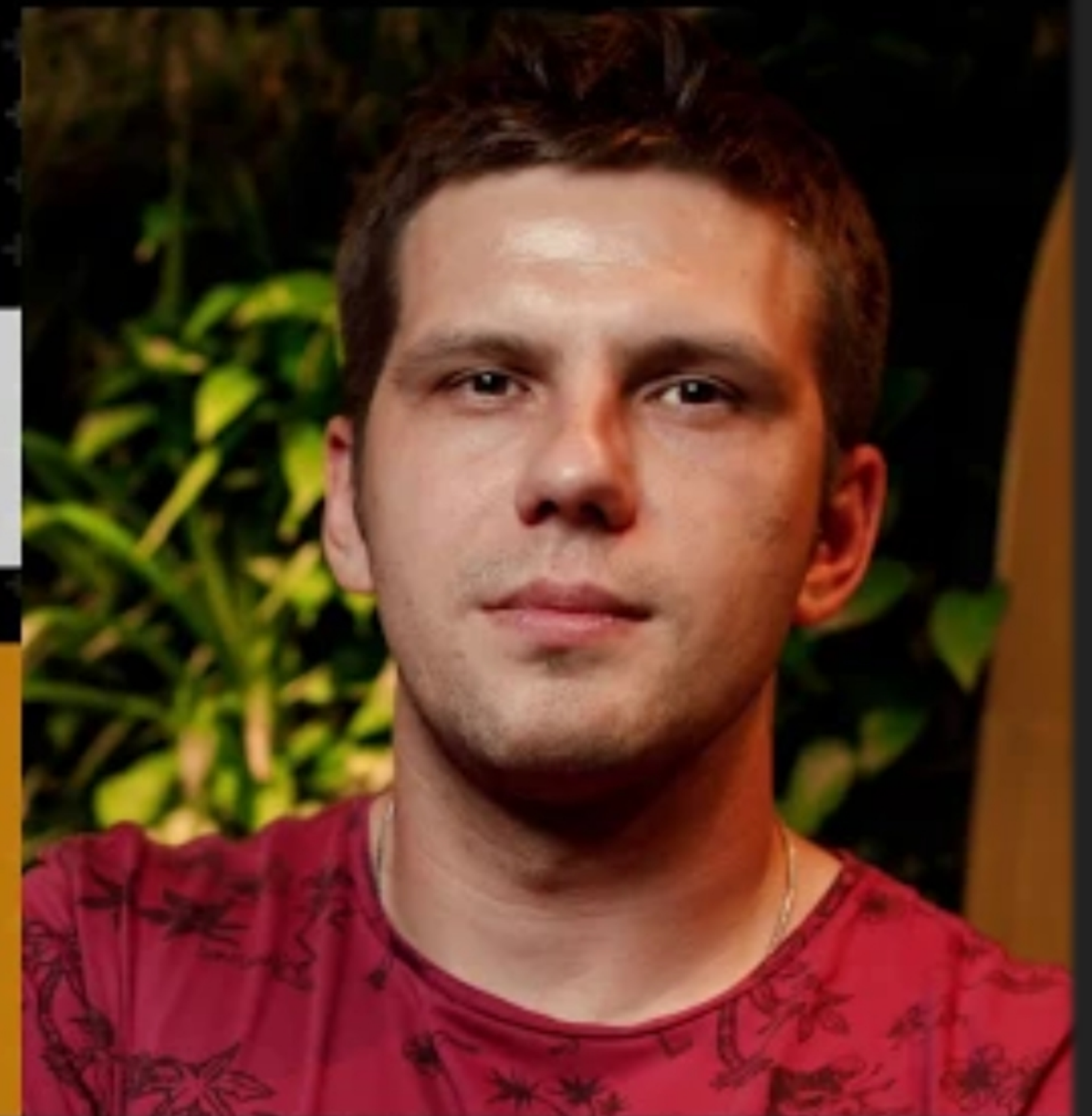
РЕШАЕМ ПРОБЛЕМЫ ESPRESSO АВТОТЕСТОВ ANDROID В РЕАЛЬНОМ МИРЕ



HEISENBUG
2019 MOSCOW

Алексей Тюрин
ВКонтакте

Решаем проблемы
Espresso автотестов
Android в реальном мире



TYPES OF MISTAKES

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- ▶ Test data usage

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- ▶ Test data usage
- ▶ Test flow

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- ▶ Test data usage
- ▶ Test flow
- ▶ Test framework architecture

TYPES OF MISTAKES

- ▶ Test data usage
- ▶ Test flow
- ▶ Test framework architecture
- ▶ Reporting





MARTY-JUNIOR



DOC-SENIOR

MARTY-JUNIOR


```
class SomeTestClass {  
    ...  
}
```



```
class SomeTestClass {  
    companion object {  
        @BeforeClass @JvmStatic  
        fun executeBeforeAllTests(){}  
    }  
    ...  
}
```



```
class SomeTestClass {  
    companion object {  
        @BeforeClass @JvmStatic  
        fun executeBeforeAllTests(){}  
    }  
  
    @Before  
    fun executeBeforeEachTest(){}  
    ...  
}
```



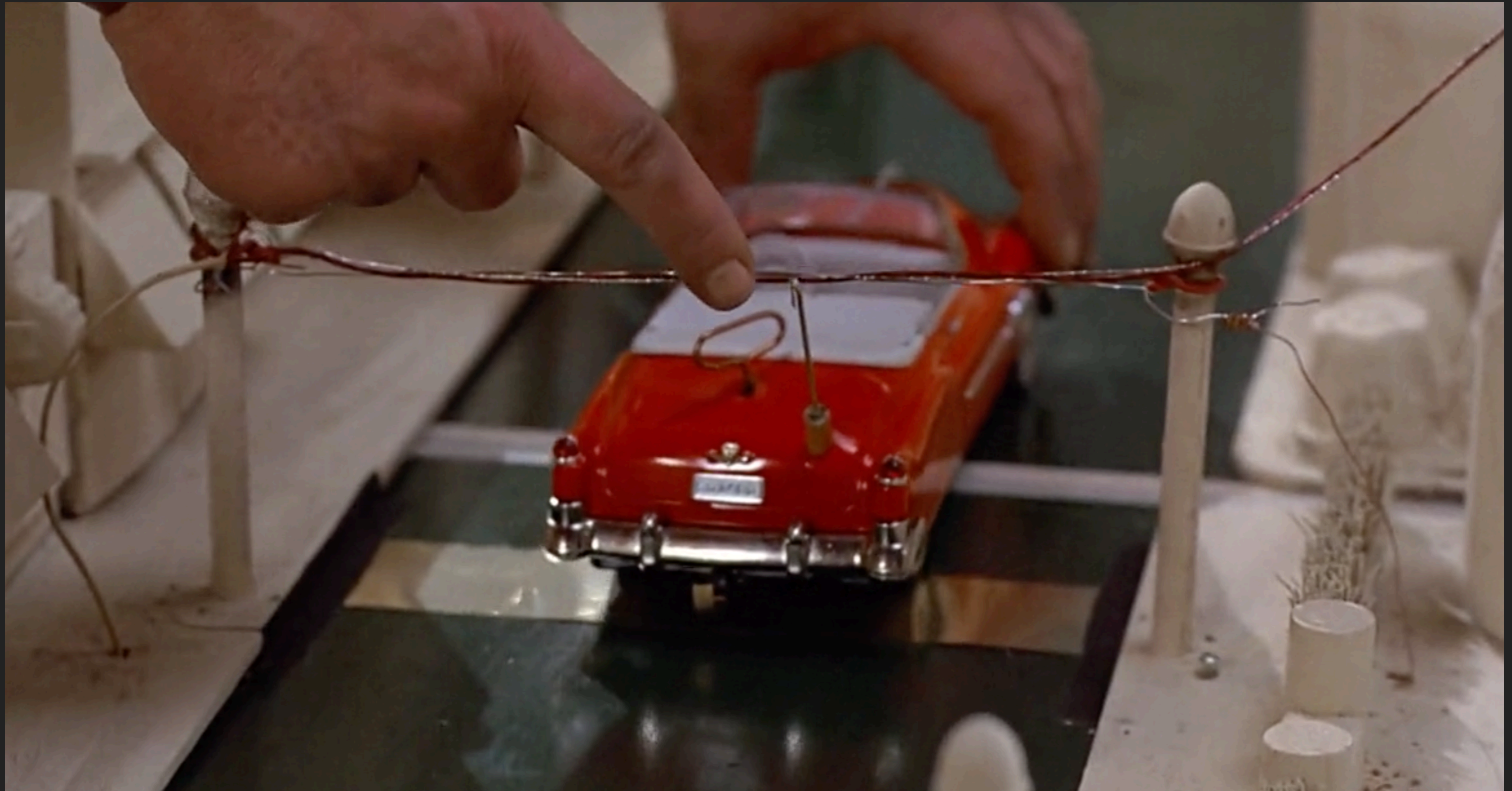
```
class SomeTestClass {  
    companion object {  
        @BeforeClass @JvmStatic  
        fun executeBeforeAllTests(){}  
    }  
  
    @Before  
    fun executeBeforeEachTest(){}  
  
    @Test  
    fun assertSmthTest(){}  
}
```



```
class SomeTestClass {  
    companion object {  
        @BeforeClass @JvmStatic  
        fun executeBeforeAllTests(){}  
    }  
}
```

```
    @get:Rule  
    val activityRule = ActivityTestRule(MainActivity::class.java)
```

```
    @Before  
    fun executeBeforeEachTest(){}  
  
    @Test  
    fun assertSmthTest(){}  
}
```




```
object TestData {  
    val chatId = "..."  
    val documentId = "..."  
}
```



```
object TestData {  
    val chatId = "..."  
    val documentId = "..."  
}  
// Somewhere in user steps  
fun sendDocInChat(user: User){  
    addDocToUser(user, TestData.documentId)  
    sendDoc(TestData.chatId,  
            TestData.documentId)  
}
```



```
object TestData {  
    val chatId = "..."  
    val documentId = "..."  
}  
  
// Somewhere in user steps  
fun sendDocInChat(user: User){  
    addDocToUser(user, TestData.documentId)  
    sendDoc(TestData.chatId,  
            TestData.documentId)  
}  
  
// Somewhere in test class  
@Test fun someTest(){  
    sendDocInChat(user)  
}
```


WHAT'S A PROBLEM

WHAT'S A PROBLEM

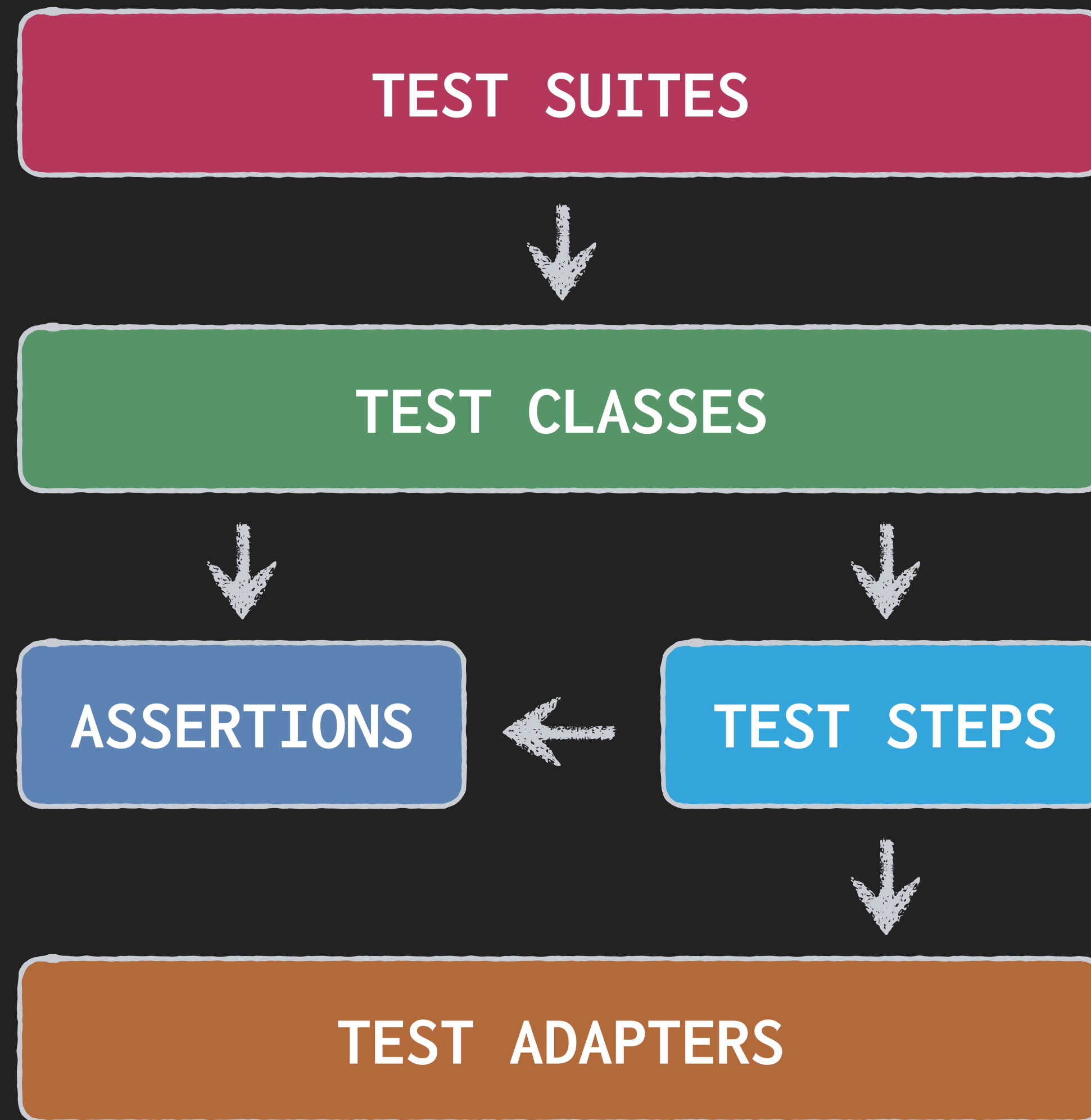
- ▶ Lost a control on test data

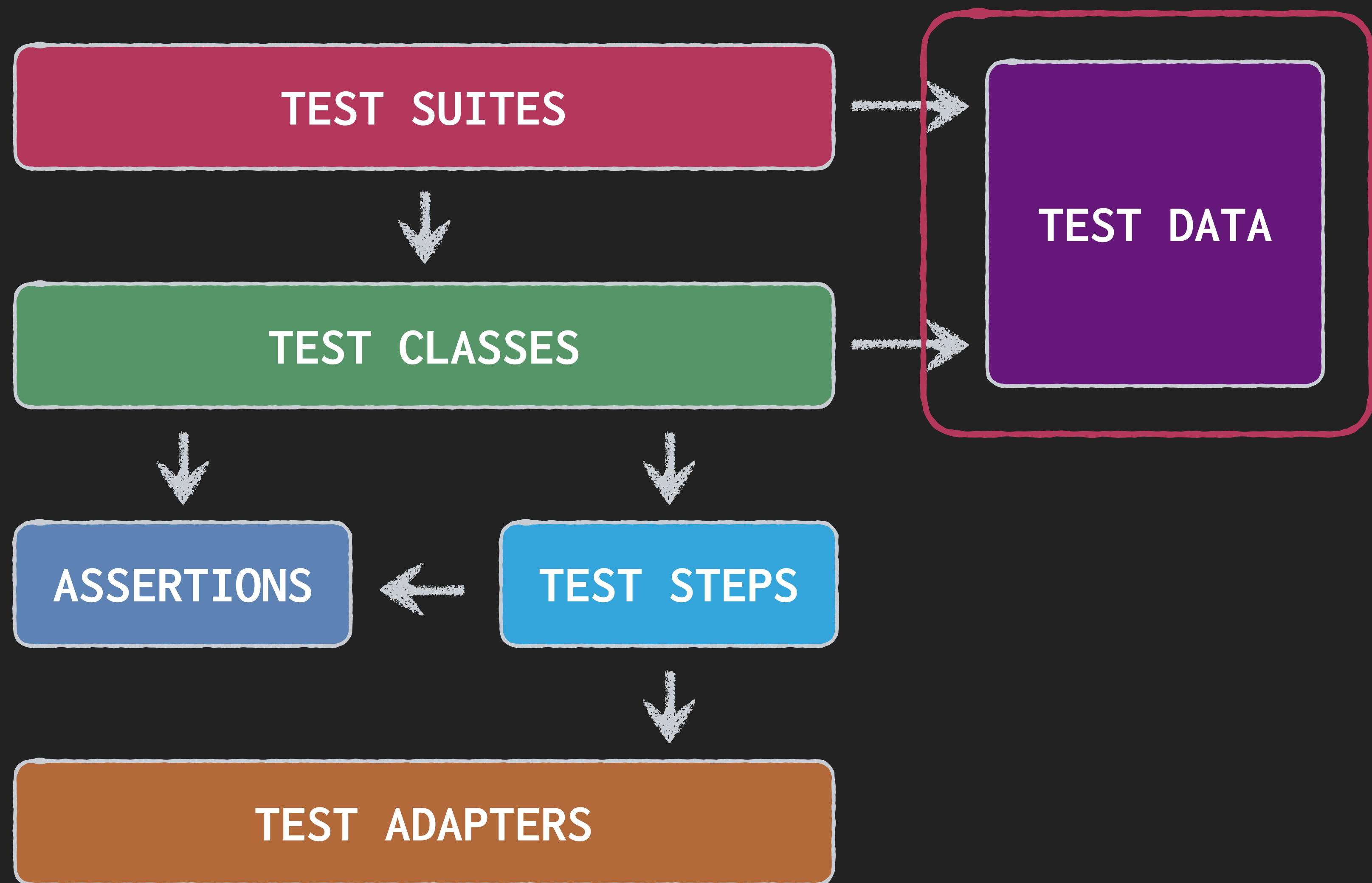
WHAT'S A PROBLEM

- ▶ Lost a control on test data
- ▶ Unexpected test application condition

WHAT'S A PROBLEM

- ▶ Lost a control on test data
- ▶ Unexpected test application condition
- ▶ The same data can be used by several tests at the same time





Д. БУЗДИН – КАК ПОСТРОИТЬ СВОИ ФРЕЙМВОРК ДЛЯ АВТОТЕСТОВ?



HEISENBUG
// 2017 Moscow

Дмитрий Буздин
Riga Dev Days

Как построить
свой фреймворк
для автотестов?

A black and white portrait of Dmitry Buzdin, a man with short dark hair, wearing a headset with a microphone and a lanyard. He is looking slightly to the right. The background of the slide is white with orange 'x' marks and a plus sign in the corners.

SOLUTION

- ▶ Restrict the scope of test data definition to test class / test suite


```
object TestData {  
    val chatId = "..."  
    val documentId = "..."  
}  
// Somewhere in user steps  
fun sendDocInChat(user: User){  
    addDocToUser(user, TestData.documentId)  
    sendDoc(TestData.chatId,  
            TestData.documentId)  
}
```

```
object TestData {  
    val chatId = "..."  
    val documentId = "..."  
}  
// Somewhere in user steps  
fun sendDocInChat(user: User, docId: String, chatId: String){  
    addDocToUser(user, docId)  
    sendDoc(chatId, docId)  
}
```



```
object TestData {  
    val chatId = "..."  
    val documentId = "..."  
}  
// Somewhere in user steps  
fun sendDocInChat(user: User, docId: String, chatId: String){  
    addDocToUser(user, docId)  
    sendDoc(chatId, docId)  
}
```

```
object TestData {  
    val chatId = "..."  
    val documentId = "..."  
}  
  
// Somewhere in user steps  
fun sendDocInChat(user: User, docId: String, chatId: String){  
    addDocToUser(user, docId)  
    sendDoc(chatId, docId)  
}  
  
// Somewhere in test class  
@Test fun someTest(){  
    sendDocInChat(user, documentId, chatId)  
}
```


SOLUTION

- ▶ Restrict the scope of test data definition to test class / test suite

SOLUTION

- ▶ Restrict the scope of test data definition to test class / test suite
- ▶ Store read-only data as project constants


```
object TestData {  
    // editable value, should be calculated somehow  
    val chatId = TestDataManager.createChat()  
    val documentId = "..."  
}  
  
// Somewhere in test class  
@Test fun someTest(){  
    sendDocInChat(user, documentId, chatId)  
}
```

```
object TestData {  
    // editable value, should be calculated somehow  
    val chatId = TestDataManager.createChat()  
    val documentId = TestData.documentId // read-only value  
}  
  
// Somewhere in test class  
@Test fun someTest(){  
    sendDocInChat(user, documentId, chatId)  
}
```


TEST DATA IS DEFINED AFTER ACTIVITY LAUNCH



TEST DATA IS DEFINED AFTER ACTIVITY LAUNCH

```
@get:Rule
```

```
val activityRule =
```

```
    ActivityTestRule(MainActivity::class.java)
```

```
@Before
```

```
fun setUp(){
```

```
    Api.addChatMessage(contact.id, "text")
```

```
}
```


REASON: @BEFORE EXECUTES AFTER ACTIVITY LAUNCHED

```
@get:Rule
```

```
val activityRule =  
    ActivityTestRule(MainActivity::class.java)
```

```
@Before
```

```
fun setUp(){  
    Api.addChatMessage(contact.id, "text")  
}
```

REASON: @BEFORE EXECUTES AFTER ACTIVITY LAUNCHED

@get:Rule

val activityRule =

ActivityTestRule(MainActivity::class.java)

ActivityLaunched

@Before

fun setUp(){

Api.addChatMessage(contact.id, "text")

}

REASON: @BEFORE EXECUTES AFTER ACTIVITY LAUNCHED

```
@get:Rule  
val activityRule =  
    ActivityTestRule(MainActivity::class.java)
```

```
@Before  
fun setUp(){  
    Api.addChatMessage(contact.id, "text")  
}
```

ActivityLaunched



@Before

REASON: @BEFORE EXECUTES AFTER ACTIVITY LAUNCHED

@get:Rule

```
val activityRule =  
    ActivityTestRule(MainActivity::class.java)
```

@Before

```
fun setUp(){  
    Api.addChatMessage(contact.id, "text")  
}
```

ActivityLaunched



@Before



@Test

REASON: @BEFORE EXECUTES AFTER ACTIVITY LAUNCHED

```
@get:Rule
```

```
val activityRule =
```

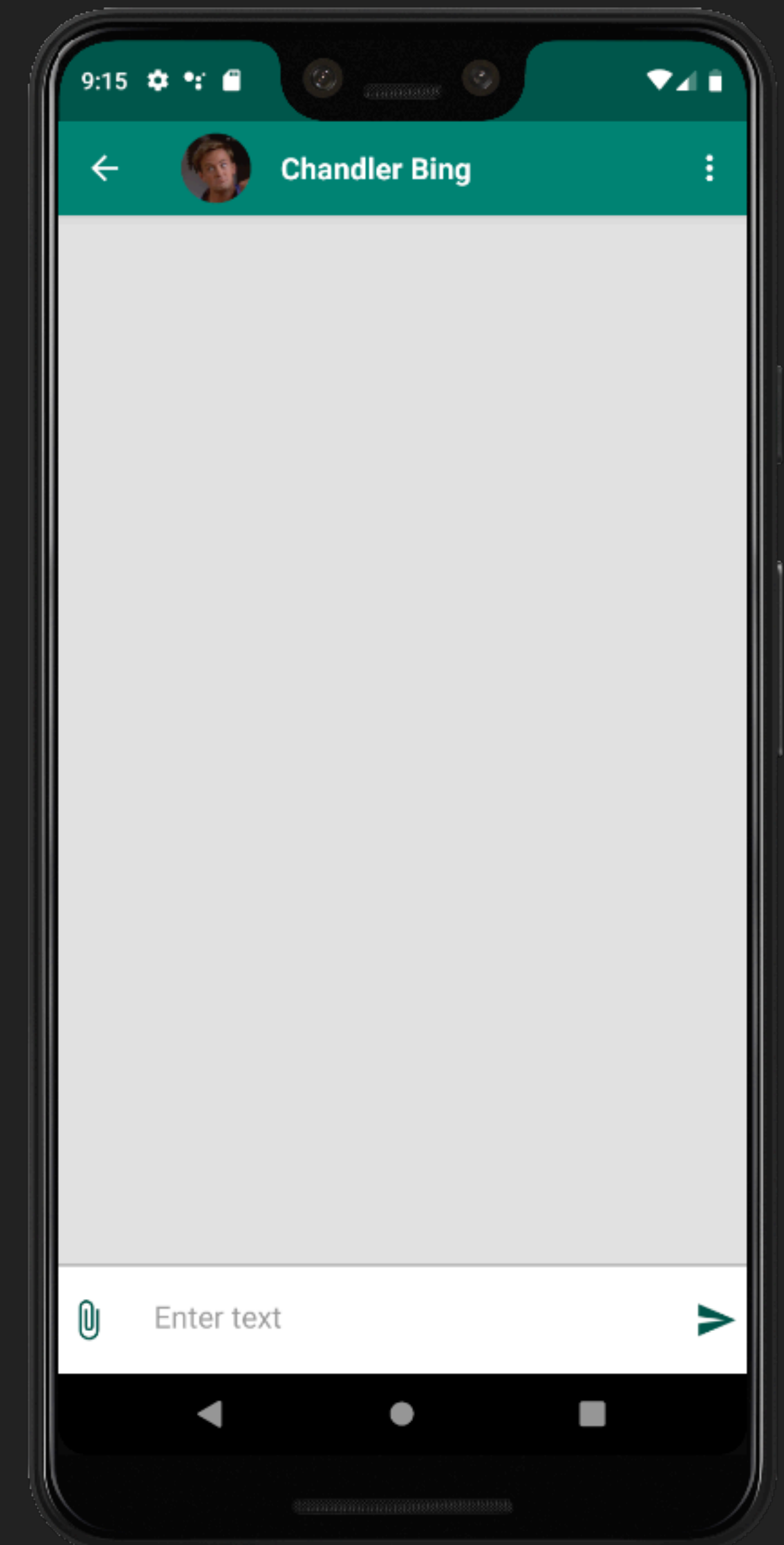
```
    ActivityTestRule(MainActivity::class.java)
```

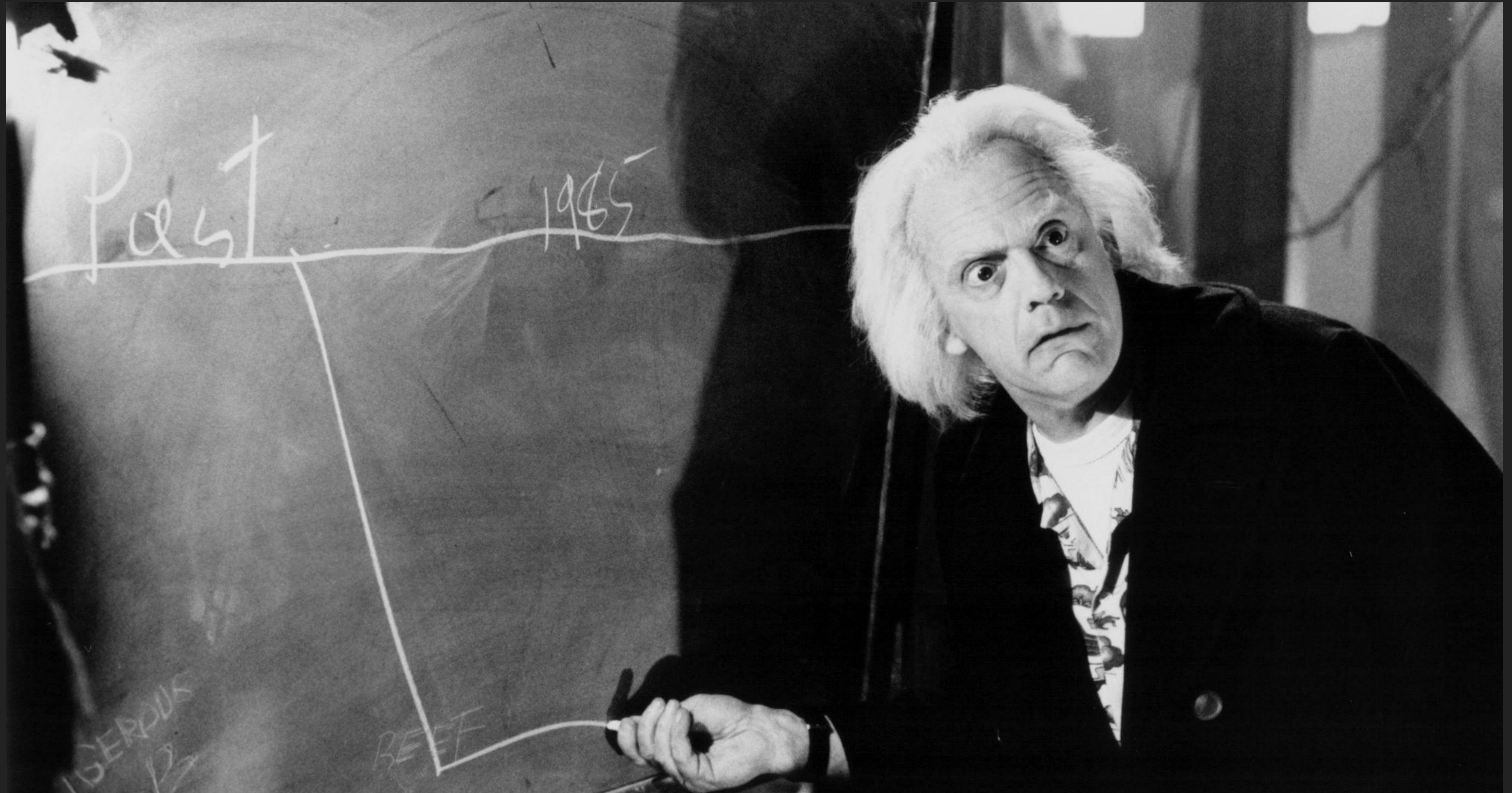
```
@Before
```

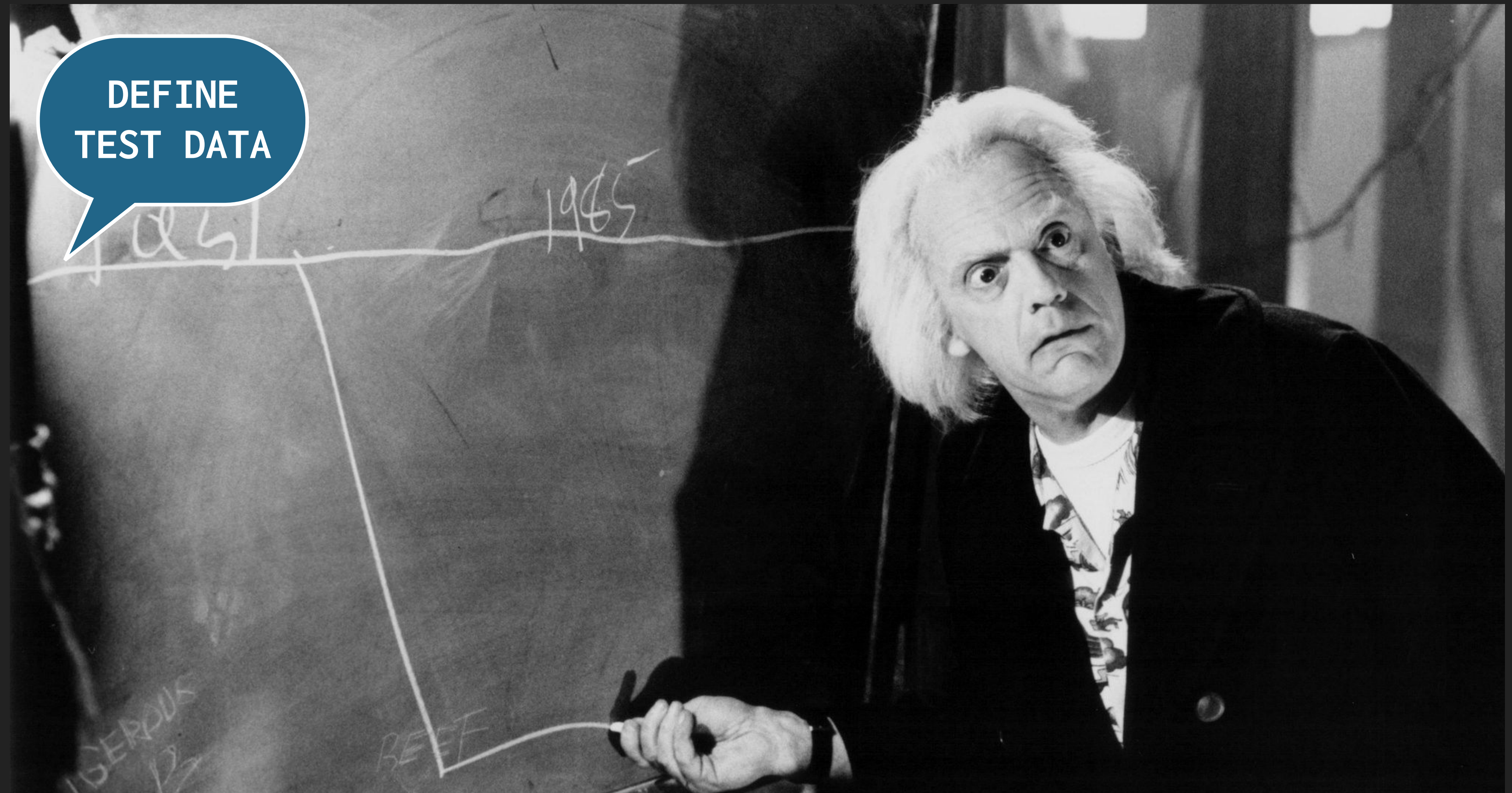
```
fun setUp(){
```

```
    Api.addChatMessage(contact.id, "text")
```

```
}
```

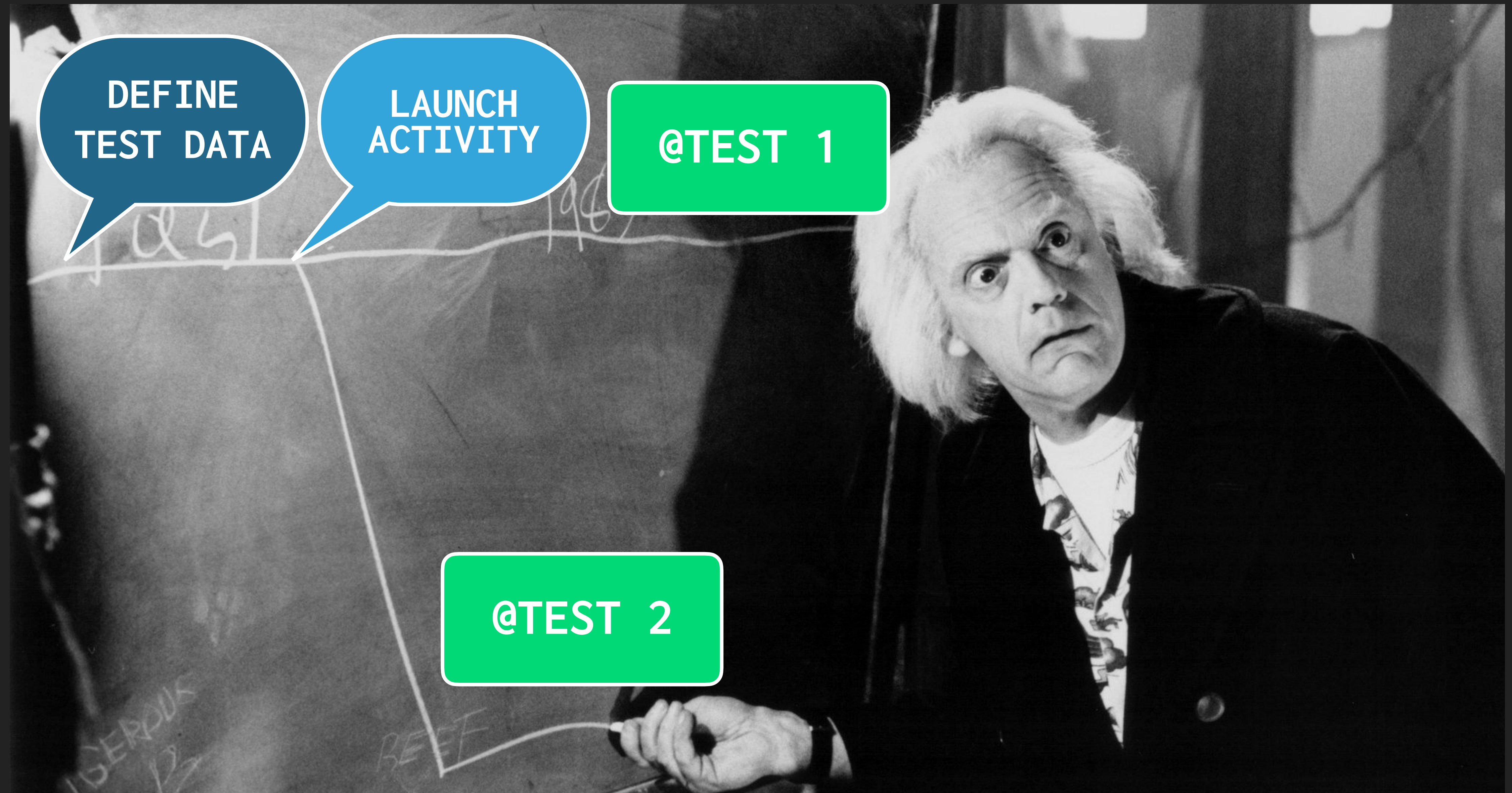












SOLUTION #1: SET UP DATA IN @BEFORECLASS

@BeforeClass

```
@get:Rule
val activityRule =
    ActivityTestRule(MainActivity::class.java)
companion object {
    @BeforeClass @JvmStatic
    fun setUpTestData(){
        Api.addChatMessage(contact.id, "text")
    }
}
```

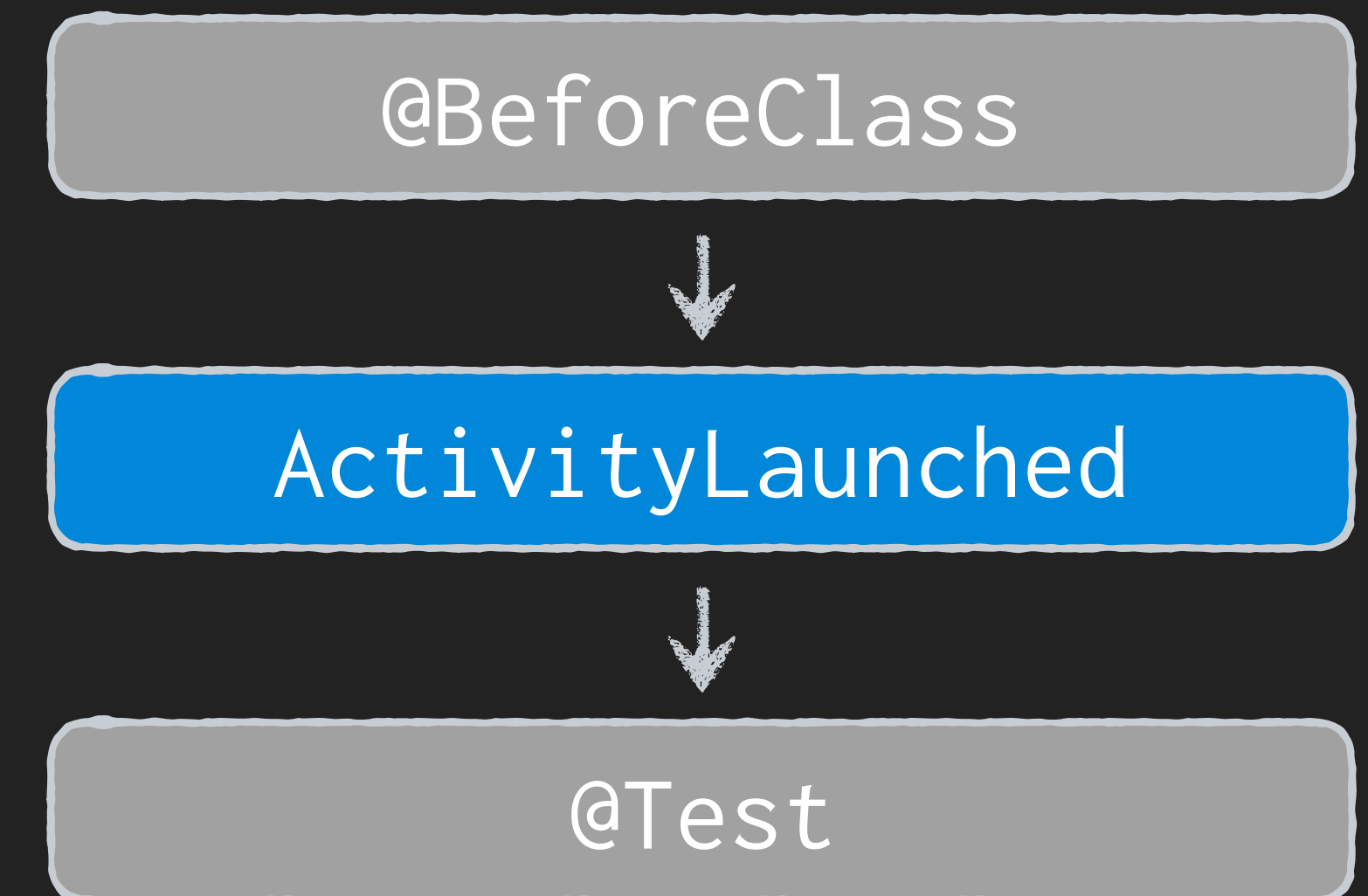
SOLUTION #1: SET UP DATA IN @BEFORECLASS

@BeforeClass

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@get:Rule
val activityRule =
    ActivityTestRule(MainActivity::class.java)
companion object {
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    fun setUpTestData(){
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    }
}
```

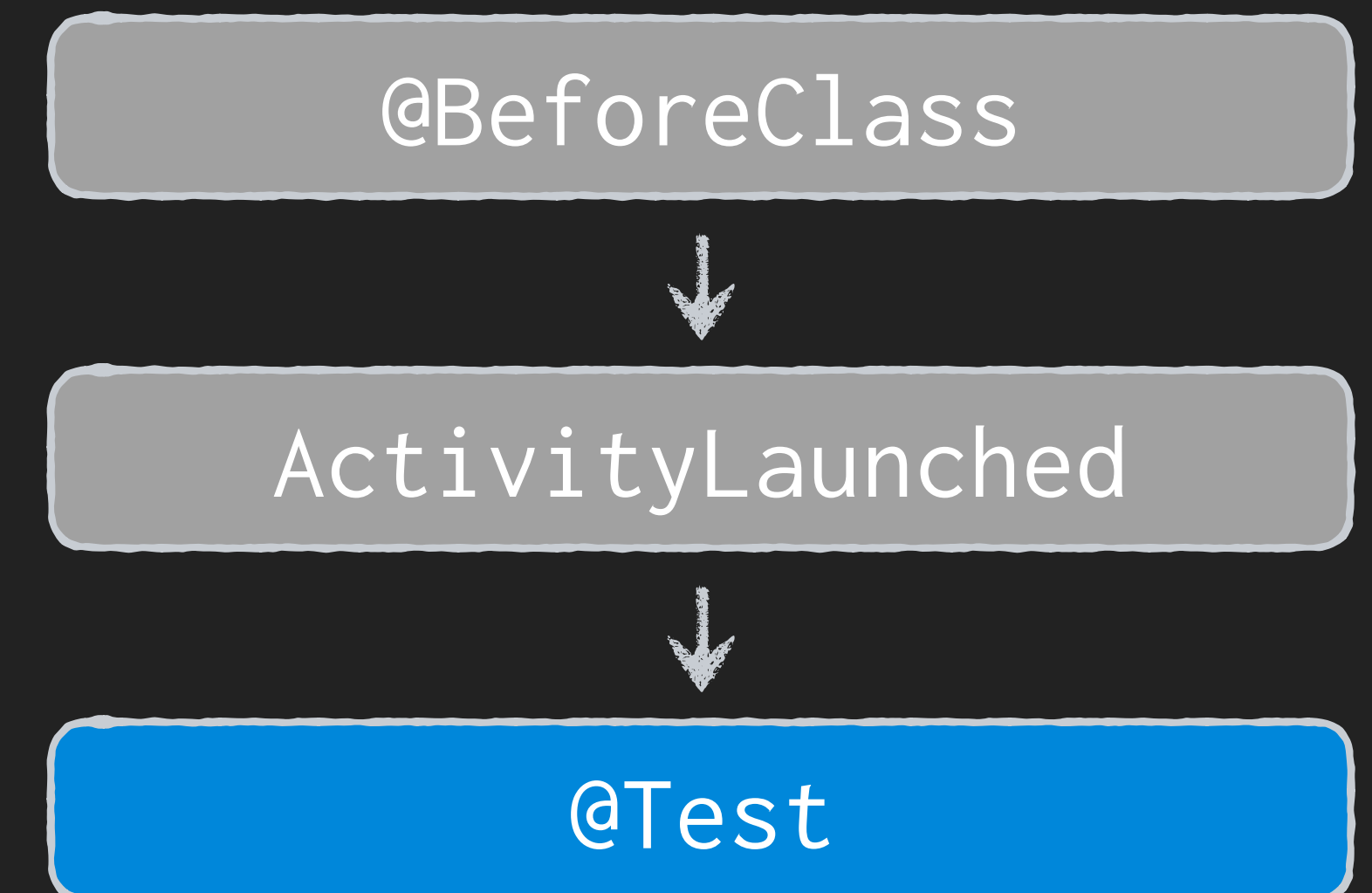

SOLUTION #1: SET UP DATA IN @BEFORECLASS

```
@get:Rule
val activityRule =
    ActivityTestRule(MainActivity::class.java)
companion object {
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```



SOLUTION #1: SET UP DATA IN @BEFORECLASS

```
@get:Rule
val activityRule =
    ActivityTestRule(MainActivity::class.java)
companion object {
    @BeforeClass @JvmStatic
    fun setUpTestData(){
        Api.addChatMessage(contact.id, "text")
    }
}
```



SOLUTION #2: LAUNCH ACTIVITY = FALSE

```
@get:Rule
val activityRule =
    ActivityTestRule(MainActivity::class.java,
        initialTouchMode = false,
        launchActivity = false)

@Before
fun setUp(){
    Api.addChatMessage(contact.id, "text")
    activityRule.launchActivity(Intent())
}
```

SOLUTION #2: LAUNCH ACTIVITY = FALSE

```
@get:Rule
val activityRule =
    ActivityTestRule(MainActivity::class.java,
        initialTouchMode = false,
        launchActivity = false)

@Before
fun setUp(){
    Api.addChatMessage(contact.id, "text")
    activityRule.launchActivity(Intent())
}
```


SOLUTION #2: LAUNCH ACTIVITY = FALSE

@BeforeClass

```
@get:Rule
val activityRule =
    ActivityTestRule(MainActivity::class.java,
        initialTouchMode = false,
        launchActivity = false)

@Before
fun setUp(){
    Api.addChatMessage(contact.id, "text")
    activityRule.launchActivity(Intent())
}
```

SOLUTION #2: LAUNCH ACTIVITY = FALSE

```
@get:Rule
val activityRule =
    ActivityTestRule(MainActivity::class.java,
        initialTouchMode = false,
        launchActivity = false)
```

```
@Before
fun setUp(){
    Api.addChatMessage(contact.id, "text")
    activityRule.launchActivity(Intent())
}
```

@BeforeClass



@Before

SOLUTION #2: LAUNCH ACTIVITY = FALSE

```
@get:Rule
val activityRule =
    ActivityTestRule(MainActivity::class.java,
        initialTouchMode = false,
        launchActivity = false)

@Before
fun setUp(){
    Api.addChatMessage(contact.id, "text")
    activityRule.launchActivity(Intent())
}
```

@BeforeClass



@Before

SOLUTION #2: LAUNCH ACTIVITY = FALSE

```
@get:Rule
```

```
val activityRule =
```

```
    ActivityTestRule(MainActivity::class.java,  
        initialTouchMode = false,  
        launchActivity = false)
```

```
@Before
```

```
fun setUp(){
```

```
    Api.addChatMessage(contact.id, "text")  
    activityRule.launchActivity(Intent())
```

```
}
```

@BeforeClass



@Before

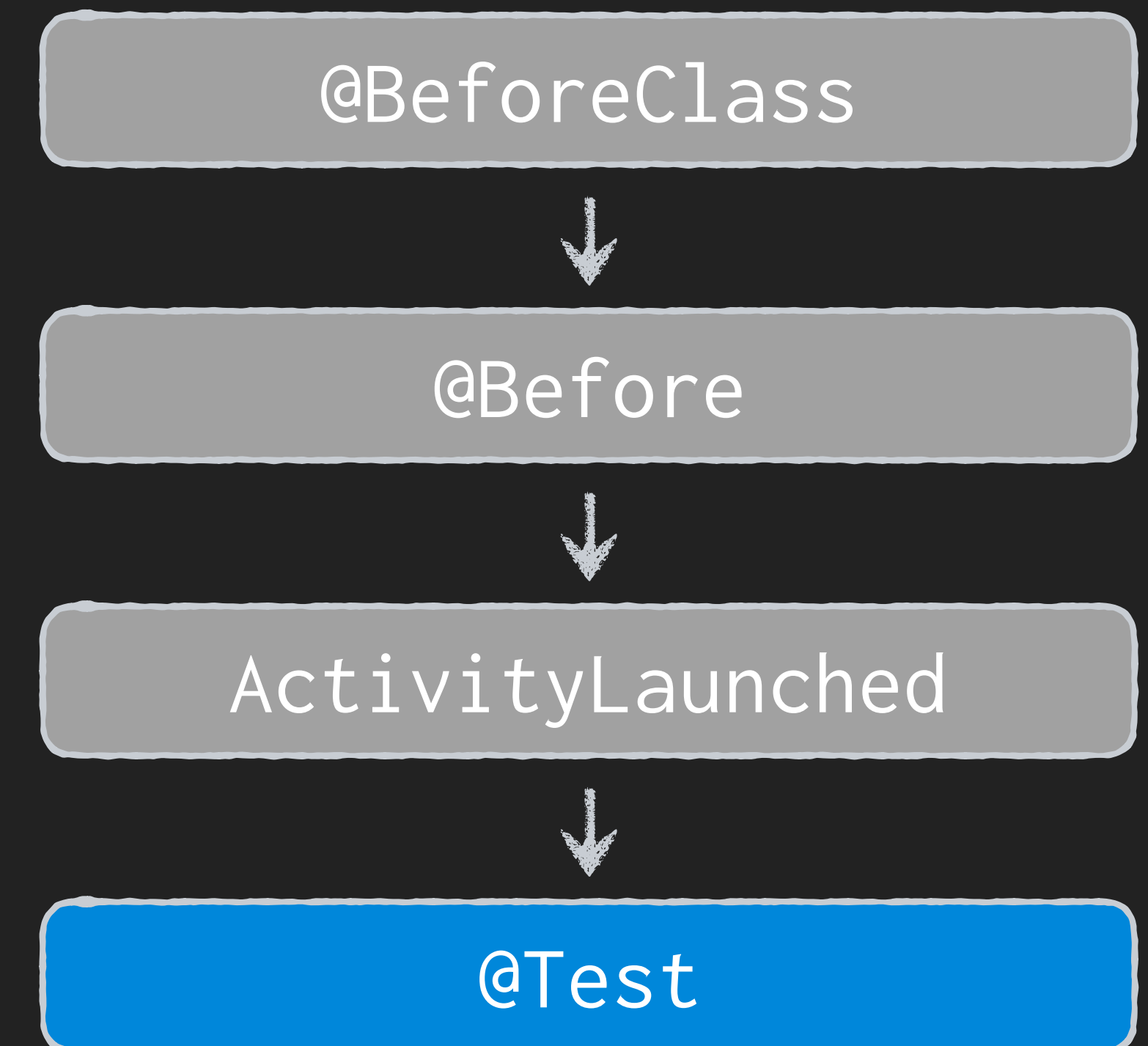


ActivityLaunched

SOLUTION #2: LAUNCH ACTIVITY = FALSE

```
@get:Rule
val activityRule =
    ActivityTestRule(MainActivity::class.java,
        initialTouchMode = false,
        launchActivity = false)

@Before
fun setUp(){
    Api.addChatMessage(contact.id, "text")
    activityRule.launchActivity(Intent())
}
```



SOLUTION #3: CUSTOM SETUP RULE

```
class SetUpTearDownRule : TestWatcher() {  
    val setUps = mutableListOf<Condition>()  
    val tearDowns = mutableListOf<Condition>()  
}
```


SOLUTION #3: CUSTOM SETUP RULE

```
class SetUpTearDownRule : TestWatcher() {  
    val setUps = mutableListOf<Condition>()  
    val tearDowns = mutableListOf<Condition>()  
}
```

SOLUTION #3: CUSTOM SETUP RULE

```
class SetUpTearDownRule : TestWatcher() {  
    val setUps = mutableListOf<Condition>()  
    val tearDowns = mutableListOf<Condition>()  
}
```


SOLUTION #3: CUSTOM SETUP RULE

```
class SetUpTearDownRule : TestWatcher() {  
    private val setUps = mutableListOf<Condition>()  
    inner class Condition(  
        val counter: Int,  
        val key: String,  
        val actions: () -> Unit  
    )  
}
```

SOLUTION #3: CUSTOM SETUP RULE

```
class SomeTestClass {  
    @get:Rule  
    val setupRule = SetupTearDownRule()  
        .addSetUp {  
            Api.addChatMessage(contact.id, "text")  
        }  
    ...  
}
```


SOLUTION #3: CUSTOM SETUP RULE

```
class SomeTestClass {  
    @get:Rule  
    val setupRule = SetUpTearDownRule()  
        .addSetup {  
            Api.addChatMessage(contact.id, "text")  
        }  
    ...  
}
```

SOLUTION #3: CUSTOM SETUP RULE

@BeforeClass

```
class SomeTestClass {  
    @get:Rule  
    val setupRule = SetUpTearDownRule()  
        .addSetUp {  
            Api.addChatMessage(contact.id, "text")  
        }  
    @get:Rule  
    val activityRule =  
        ActivityTestRule(MainActivity::class.java)  
    ...  
}
```


SOLUTION #3: CUSTOM SETUP RULE

```
class SomeTestClass {  
    @get:Rule  
    val setupRule = SetupTearDownRule()  
        .addSetUp {  
            Api.addChatMessage(contact.id, "text")  
        }  
    @get:Rule  
    val activityRule =  
        ActivityTestRule(MainActivity::class.java)  
    ...  
}
```

@BeforeClass



SetUps.actions

SOLUTION #3: CUSTOM SETUP RULE

```
class SomeTestClass {  
    @get:Rule  
    val setupRule = SetupTearDownRule()  
        .addSetUp {  
            Api.addChatMessage(contact.id, "text")  
        }  
  
    @get:Rule  
    val activityRule =  
        ActivityTestRule(MainActivity::class.java)  
  
    ...  
}
```

@BeforeClass



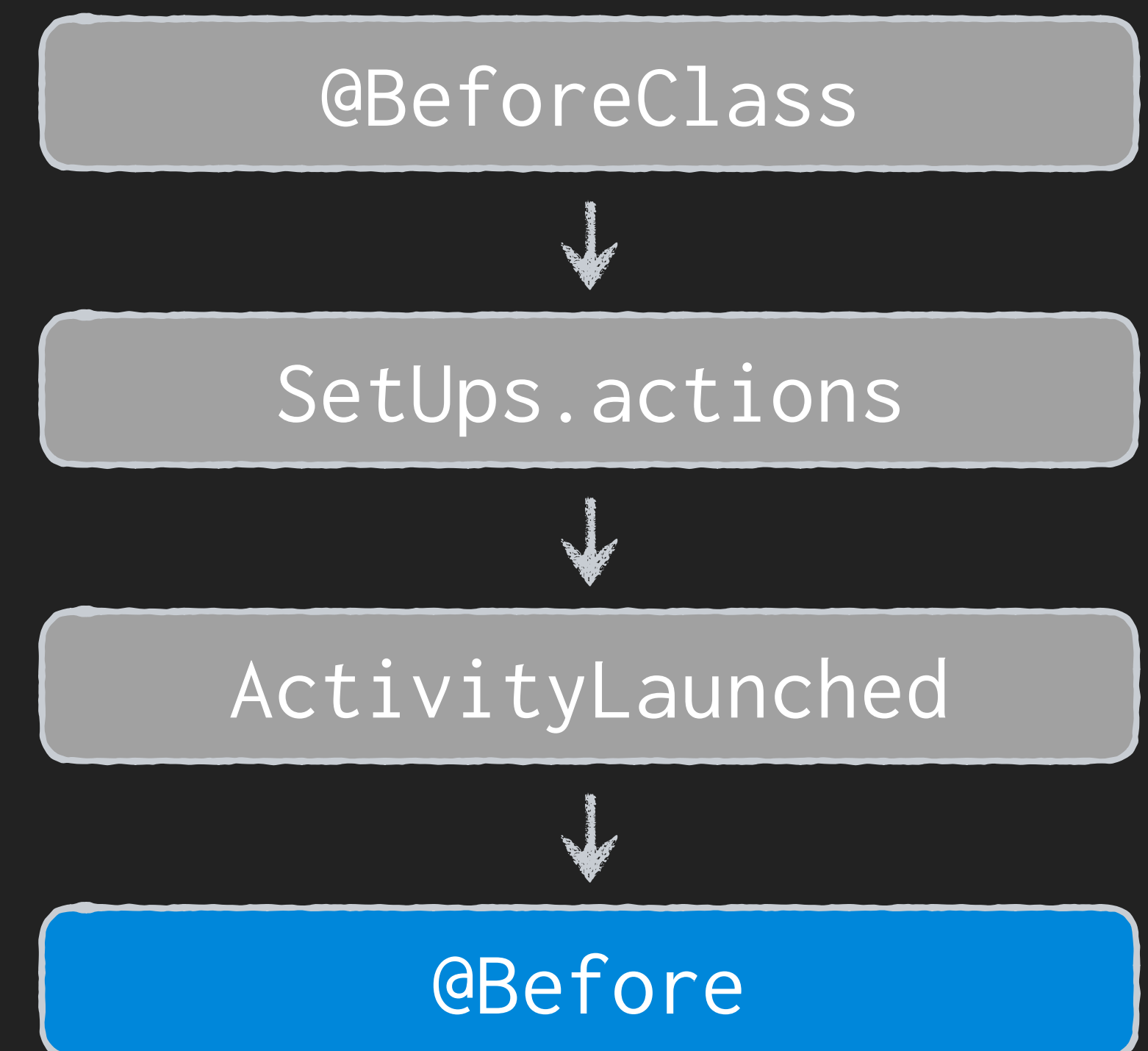
SetUps.actions



ActivityLaunched

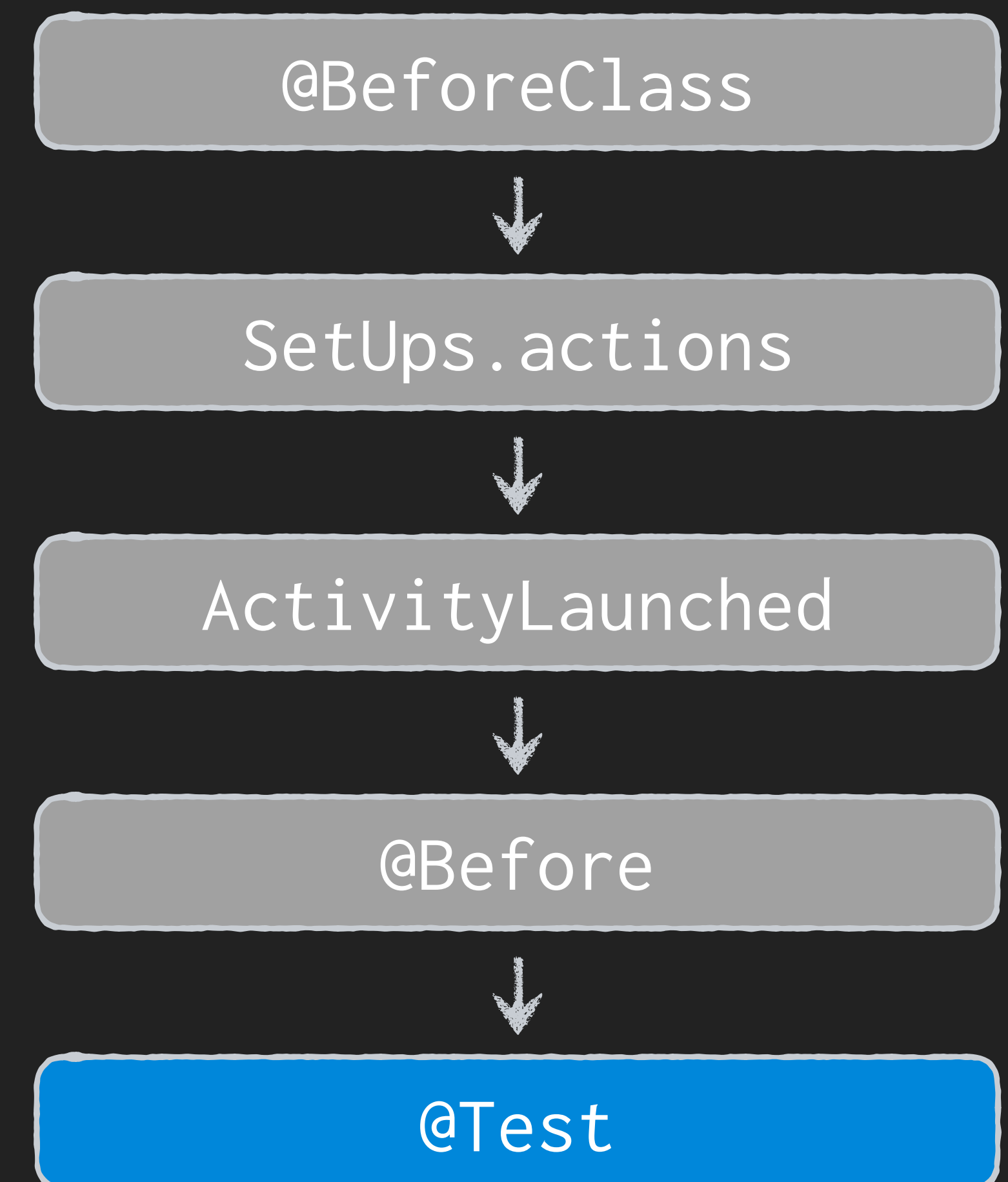
SOLUTION #3: CUSTOM SETUP RULE

```
class SomeTestClass {  
    @get:Rule  
    val setupRule = SetupTearDownRule()  
        .addSetUp {  
            Api.addChatMessage(contact.id, "text")  
        }  
  
    @get:Rule  
    val activityRule =  
        ActivityTestRule(MainActivity::class.java)  
  
    ...  
}
```



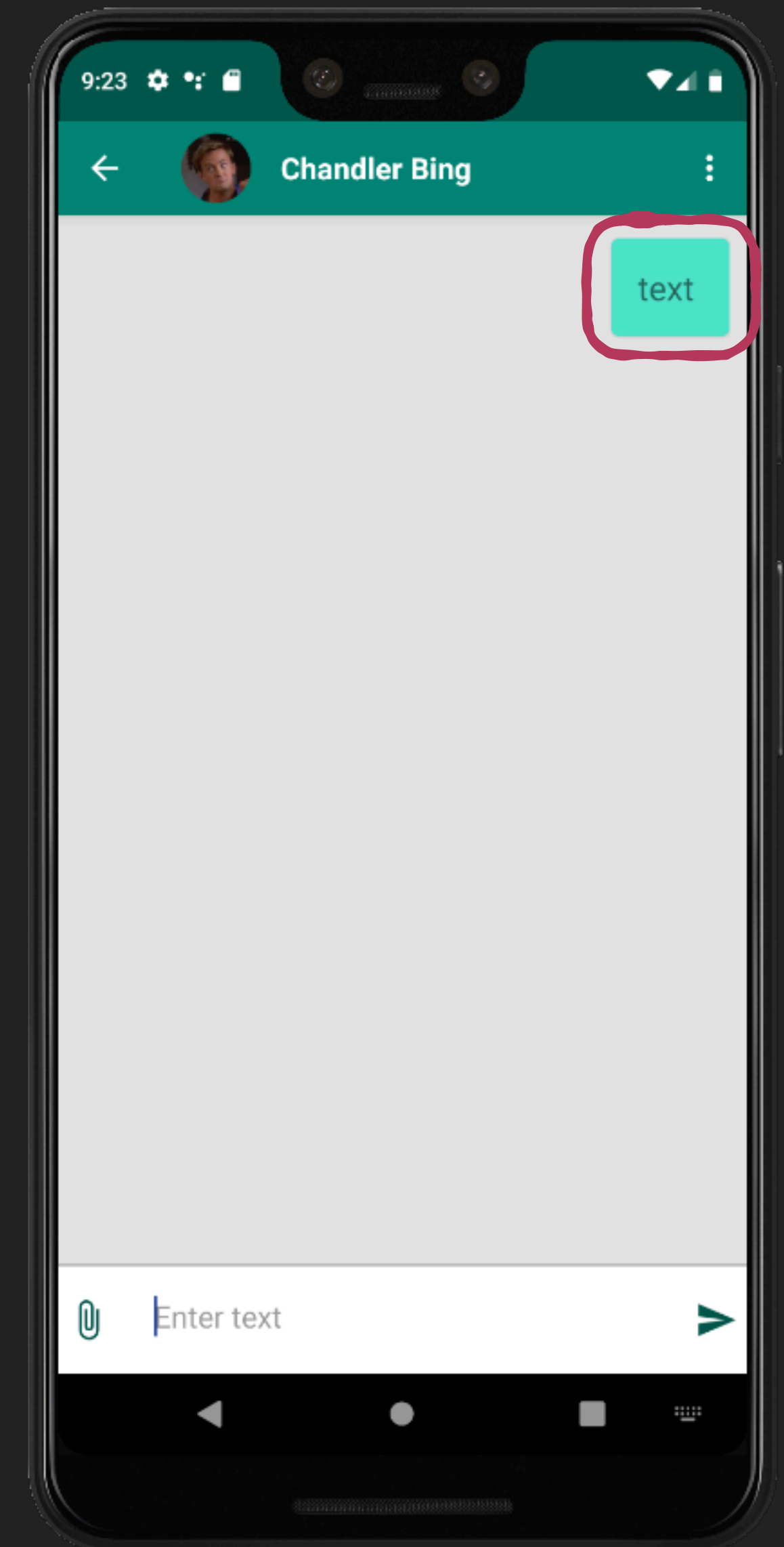
SOLUTION #3: CUSTOM SETUP RULE

```
class SomeTestClass {  
    @get:Rule  
    val setupRule = SetupTearDownRule()  
        .addSetUp {  
            Api.addChatMessage(contact.id, "text")  
        }  
    @get:Rule  
    val activityRule =  
        ActivityTestRule(MainActivity::class.java)  
    ...  
}
```



SOLUTION #3: CUSTOM SETUP RULE

```
class SomeTestClass {  
    @get:Rule  
    val setupRule = SetupTearDownRule()  
        .addSetUp {  
            Api.addChatMessage(contact.id, "text")  
        }  
    @get:Rule  
    val activityRule =  
        ActivityTestRule(MainActivity::class.java)  
    ...  
}
```



**SOLUTION #3
DOESN'T WORK
WTF?**



SOLUTION #3 DOESN'T WORK ALWAYS! WHY?

```
class SomeTestClass {  
    @get:Rule  
    val setupRule = SetUpTearDownRule()  
        .addSetUp {  
            Api.addChatMessage(contact.id, "text")  
        }  
    @get:Rule  
    val activityRule =  
        ActivityTestRule(MainActivity::class.java)  
    ...  
}
```



SOLUTION #3 DOESN'T WORK ALWAYS! WHY?

```
class SomeTestClass {  
    @get:Rule  
    val setupRule = SetUpTearDownRule()  
        .addSetUp {  
            Api.addChatMessage(contact.id, "text")  
        }  
  
    @get:Rule  
    val activityRule =  
        ActivityTestRule(MainActivity::class.java)  
  
    ...  
}
```



ORDER RULES WITH RULECHAIN

```
@get:Rule
```

```
val setupRule = SetUpTearDownRule().addSetUp{...}
```

```
@get:Rule
```

```
val activityRule = ActivityTestRule(MainActivity::class.java)
```

```
@get:Rule
```

```
val ruleChain = RuleChain.outerRule(setupRule)  
                    .around(activityRule)
```


ORDER RULES WITH RULECHAIN

```
@get:Rule
```

```
val setupRule = SetUpTearDownRule().addSetUp{...}
```

```
@get:Rule
```

```
val activityRule = ActivityTestRule(MainActivity::class.java)
```

```
@get:Rule
```

```
val ruleChain = RuleChain.outerRule(setupRule)  
                    .around(activityRule)
```

ORDER RULES WITH RULECHAIN

```
val setupRule = SetUpTearDownRule().addSetUp{...}
val activityRule = ActivityTestRule(MainActivity::class.java)

@get:Rule
val ruleChain = RuleChain.outerRule(setupRule)
                    .around(activityRule)
```


**MARTY, ARE YOU REALLY
TELLING ME YOUR PLAN
IS BASED ON
“BACK TO THE FUTURE”?**



**MARTY, ARE YOU REALLY
TELLING ME YOUR PLAN
IS BASED ON
“RULE CHAIN” IN 2020?**



ORDER RULES WITH RULECHAIN

```
val setupRule = SetUpTearDownRule().addSetUp{...}  
val activityRule = ActivityTestRule(MainActivity::class.java)  
  
@get:Rule  
val ruleChain = RuleChain.outerRule(setupRule)  
                    .around(activityRule)
```


REPLACE RULE CHAIN WITH RULE SEQUENCE

```
val setupRule = SetUpTearDownRule().addSetUp{...}  
val activityRule = ActivityTestRule(MainActivity::class.java)
```

```
@get:Rule  
val ruleChain = RuleChain.outerRule(setupRule)  
    .around(activityRule)
```

```
@get:Rule  
val ruleSequence = RuleSequence(setupRule, activityRule)
```

ADVANCES OF RULE SEQUENCE

- ▶ Friendly interface

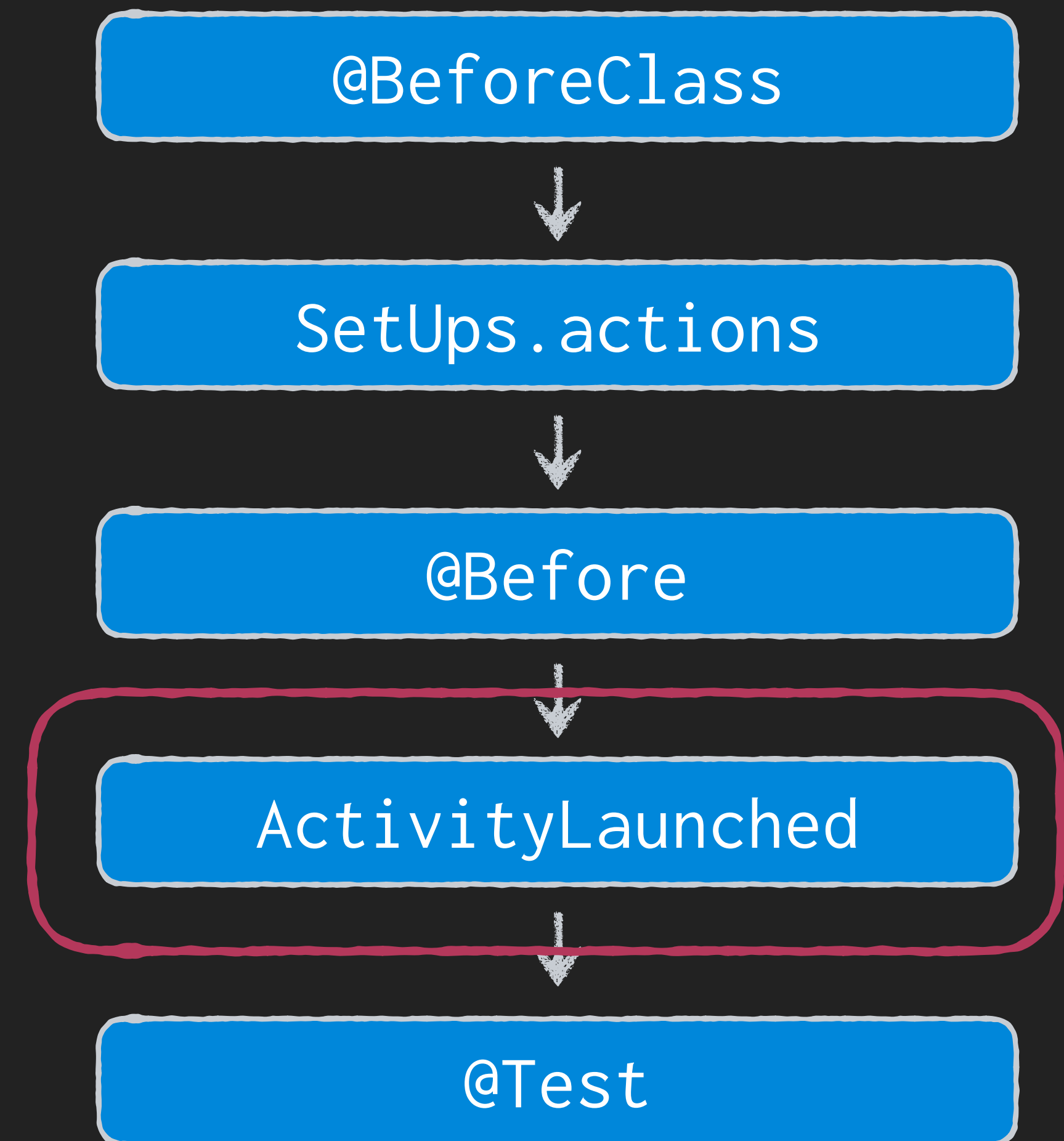
ADVANCES OF RULE SEQUENCE

- ▶ Friendly interface
- ▶ Better work with test classes inheritance

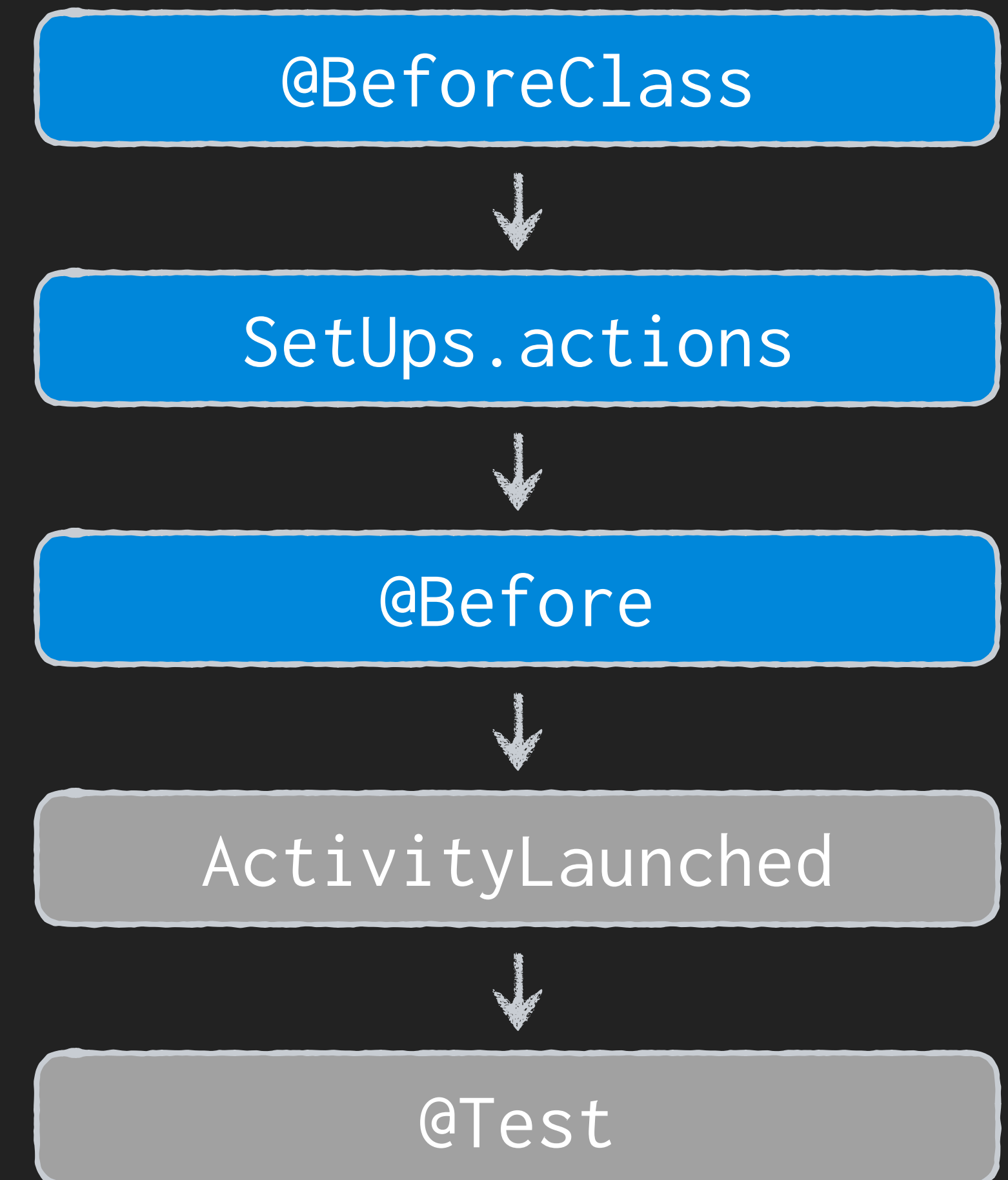
ADVANCES OF RULE SEQUENCE

- ▶ Friendly interface
- ▶ Better work with test classes inheritance
- ▶ Three lists of prioritised rules (add, addFirst, addLast)

SOLUTIONS

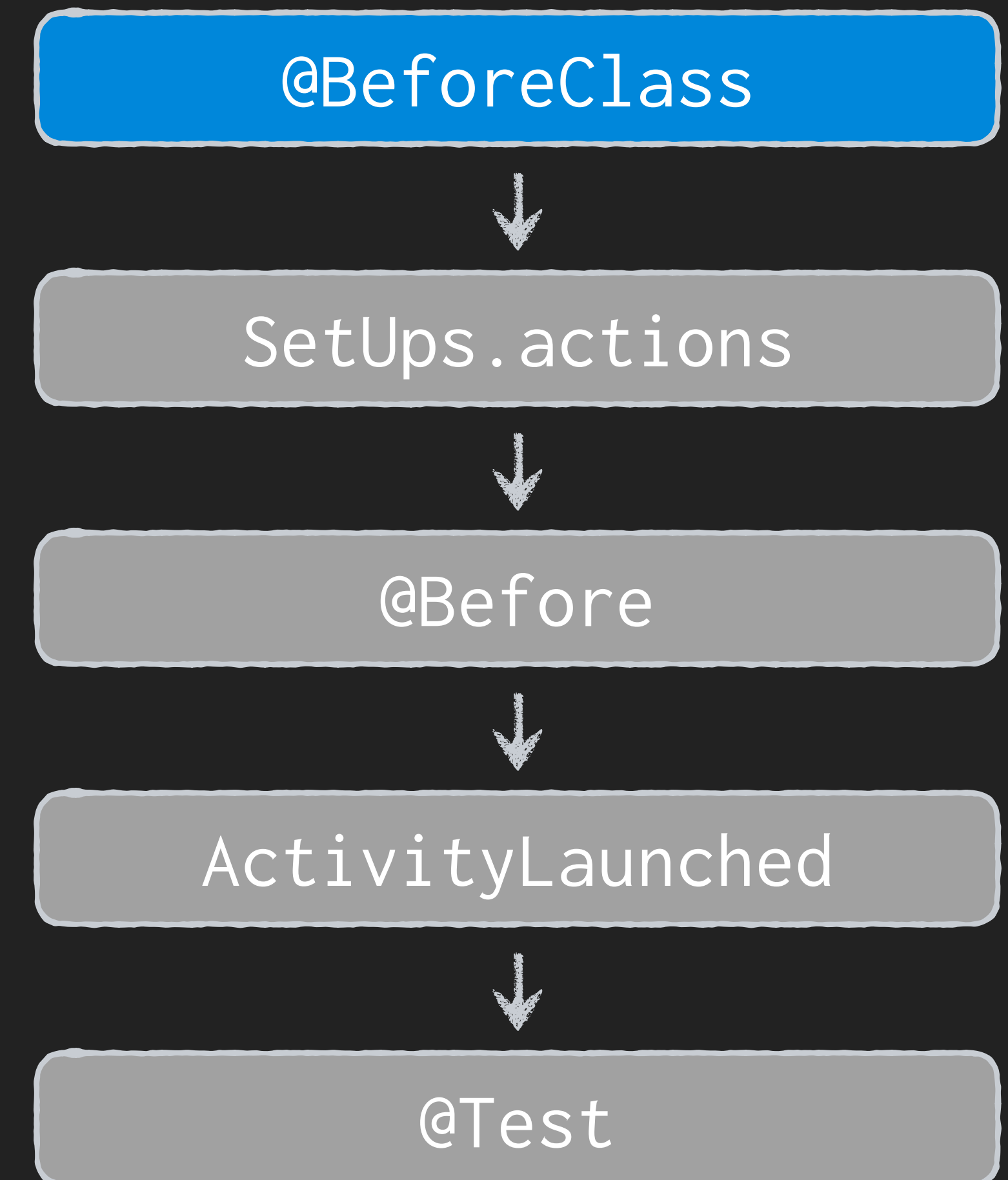


SOLUTIONS



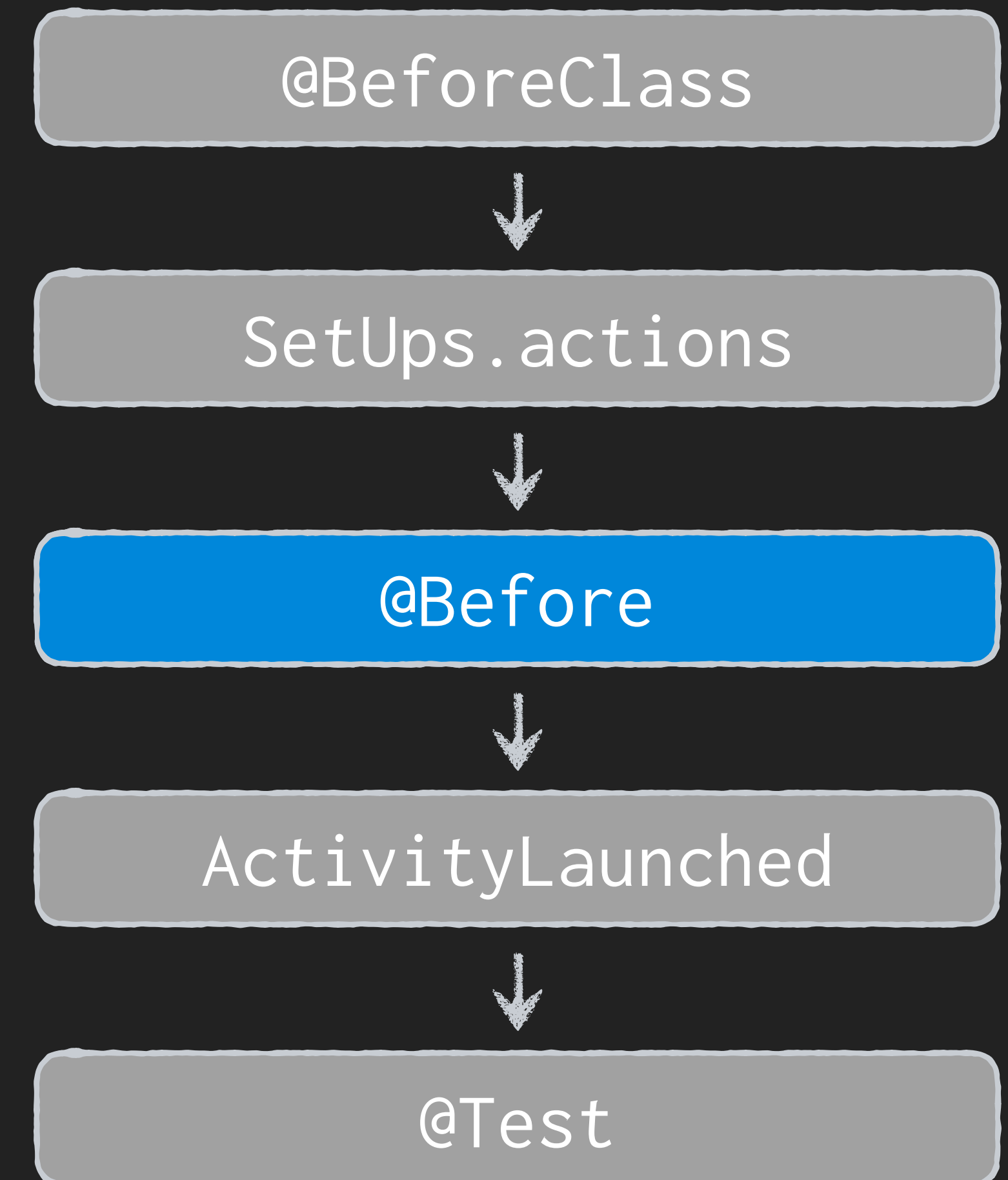
SOLUTIONS

- ▶ Set up test data in @BeforeClass



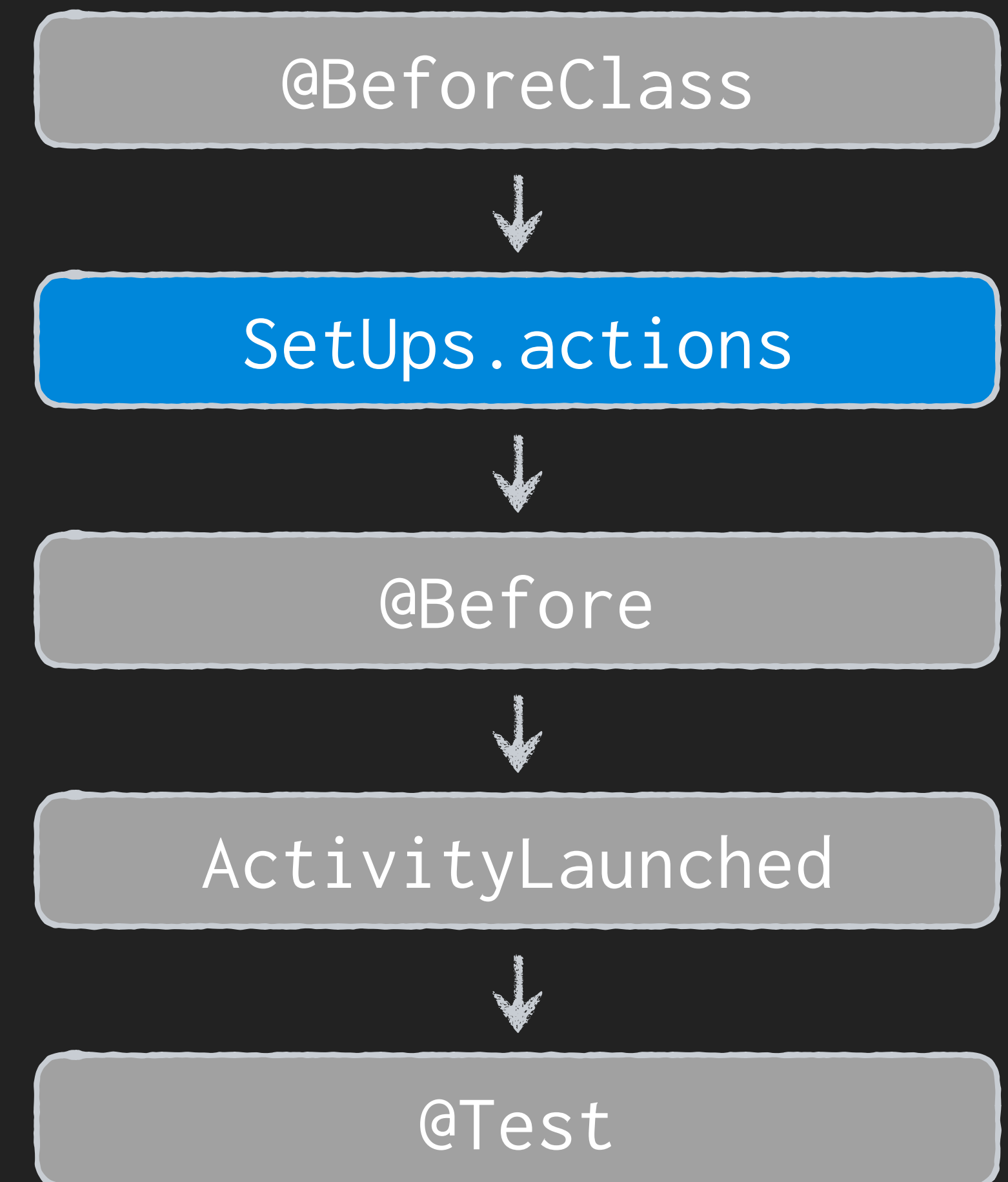
SOLUTIONS

- ▶ Set up test data in @BeforeClass
- ▶ LaunchActivity = false. Set up in @Before



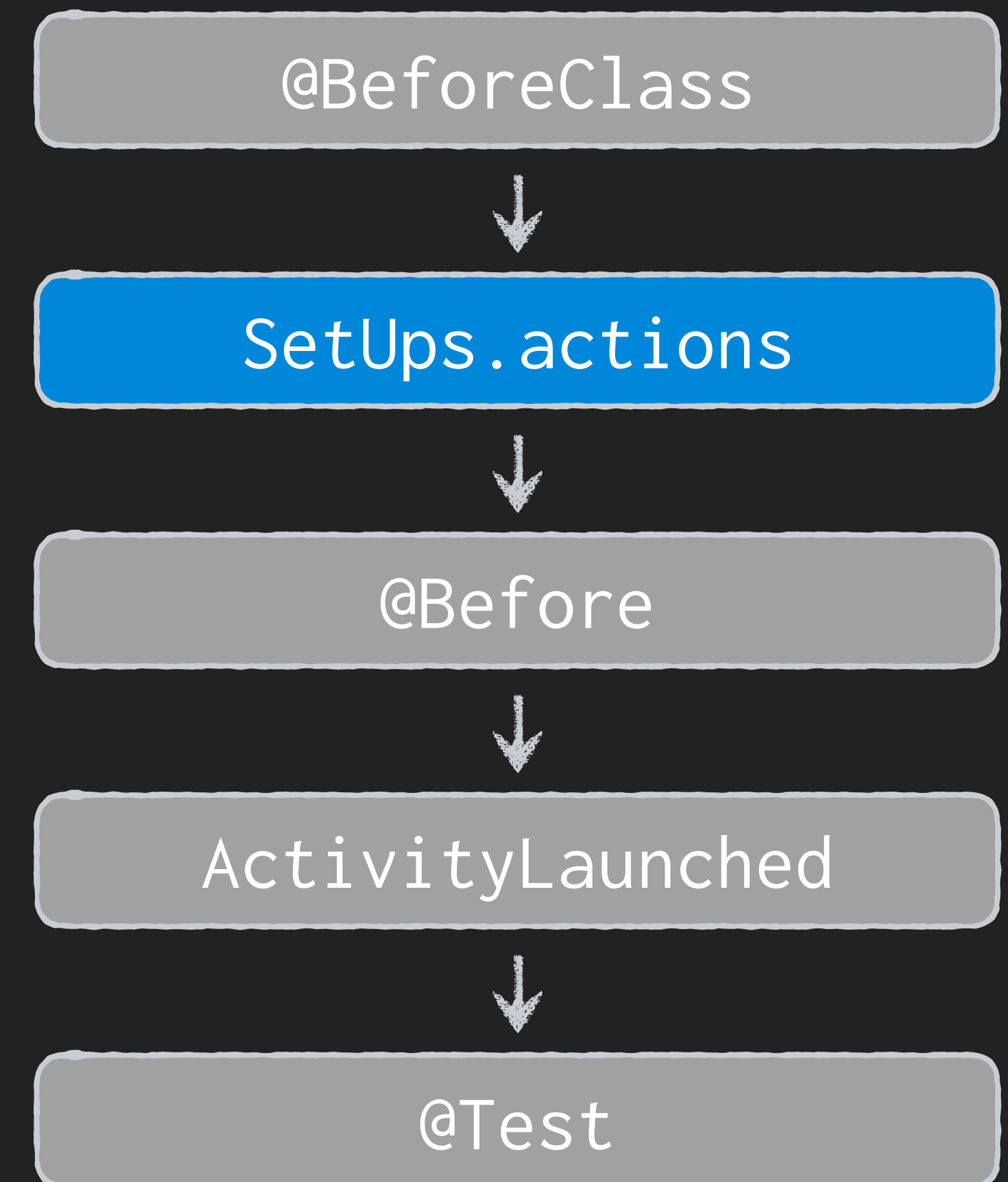
SOLUTIONS

- ▶ Set up test data in @BeforeClass
- ▶ LaunchActivity = false. Set up in @Before
- ▶ Custom SetUpRule + RuleSequence



SOLUTIONS

- ▶ Set up test data in @BeforeClass
- ▶ LaunchActivity = false. Set up in @Before
- ▶ Custom SetUpRule + RuleSequence (best way)



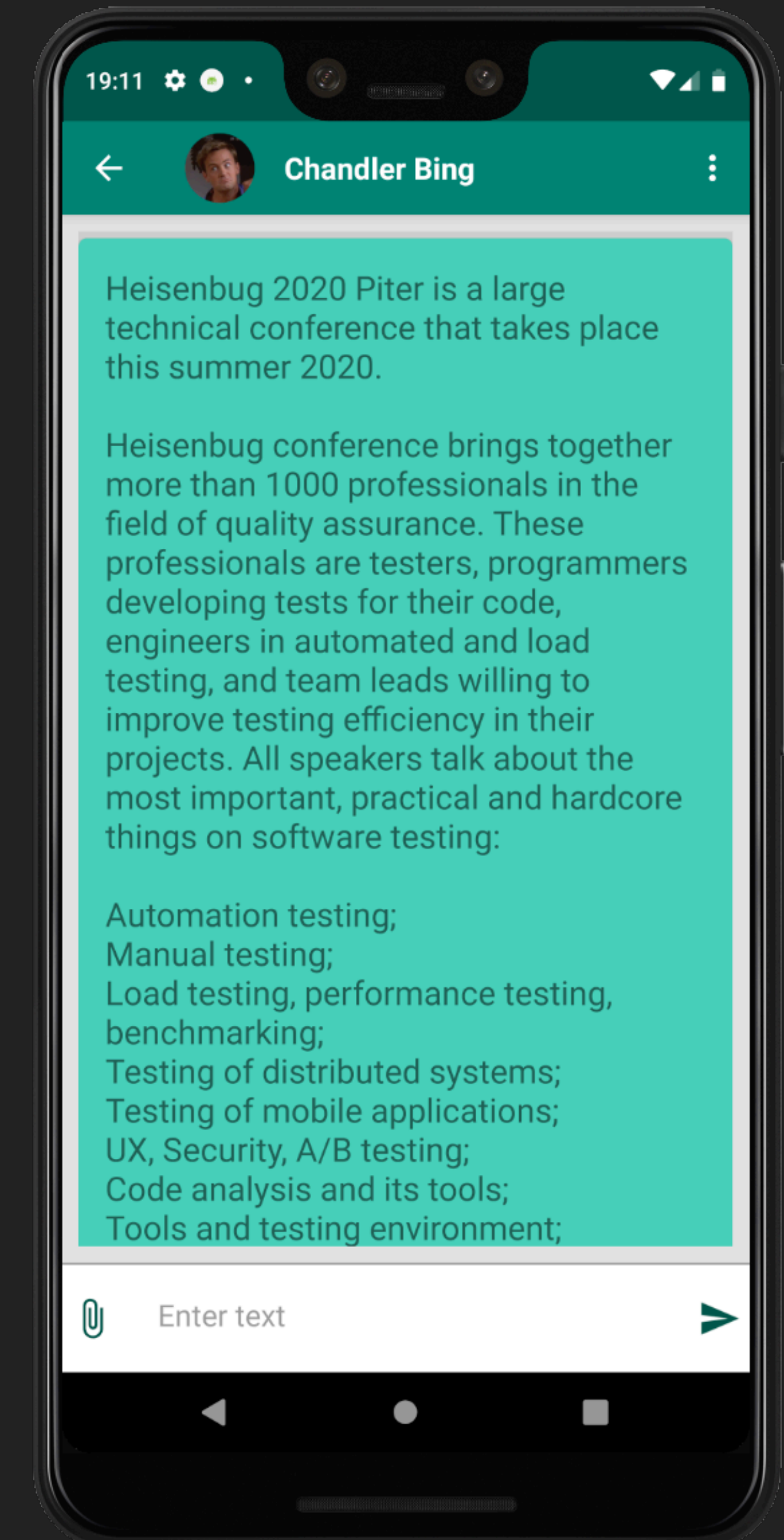
TEST DATA IS DEFINED IN @BEFORECLASS OR @BEFORE METHOD FOR ALL @TEST




```
class SomeTestClass {  
    companion object {  
        @BeforeClass @JvmStatic  
        fun setUpTestData(){  
            Api.clearChatMessages(contact.id)  
            Api.addChatMessage(contact.id, longMessage)  
            Api.addChatMessage(contact.id, simpleMessage)  
            Api.addChatMessage(contact.id, specialCharsMessage)  
        }  
    }  
}
```

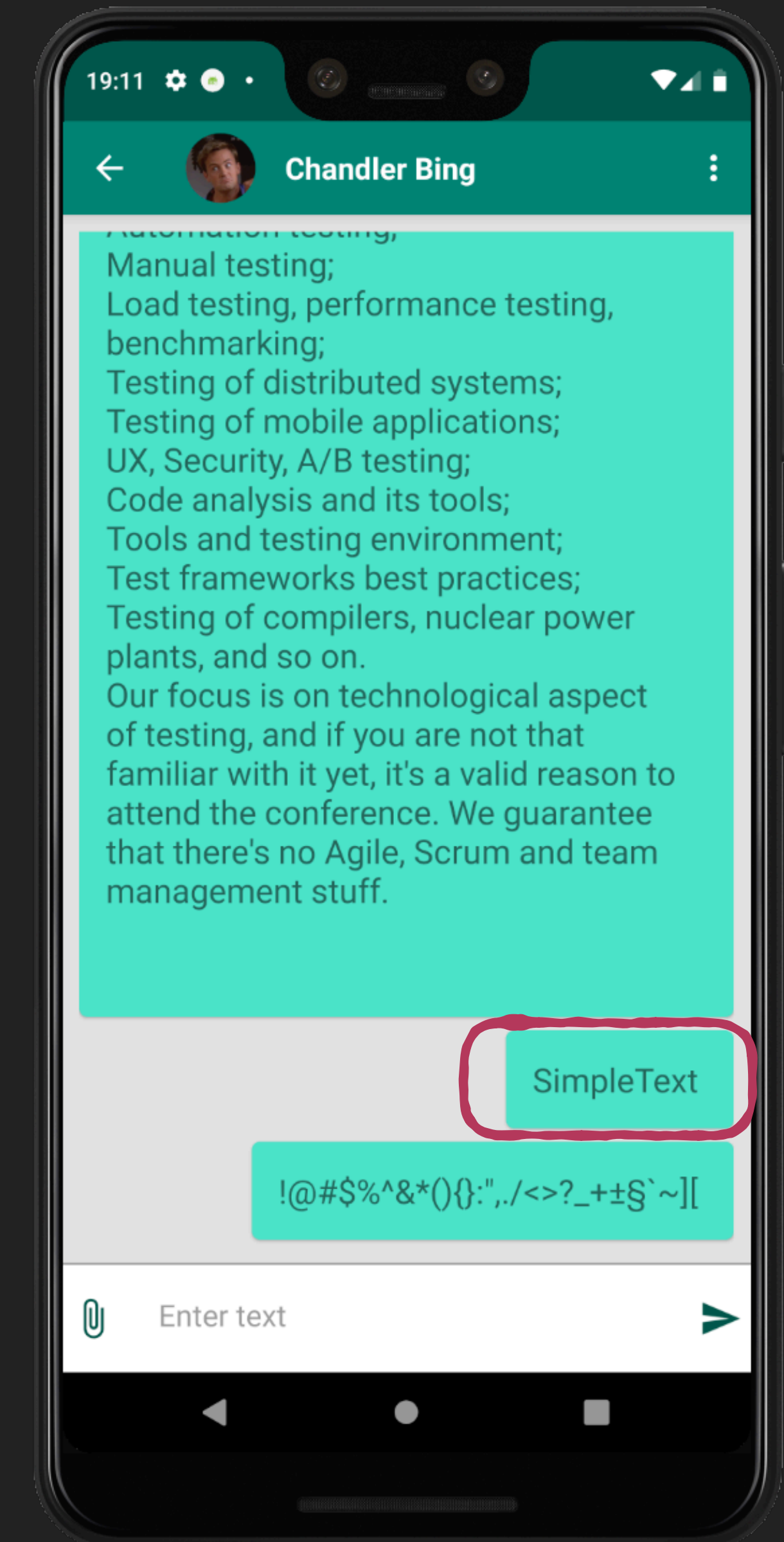
```
class SomeTestClass {  
    @Before  
    fun setUpTestData(){  
        Api.clearChatMessages(contact.id)  
        Api.addChatMessage(contact.id, longMessage)  
        Api.addChatMessage(contact.id, simpleMessage)  
        Api.addChatMessage(contact.id, specialCharsMessage)  
    }  
}
```

```
@Test
fun assertSimpleMessage() {
    ChatPage(contact)
        .assertMessageDisplayed(simpleMessage.text)
}
```



@Test

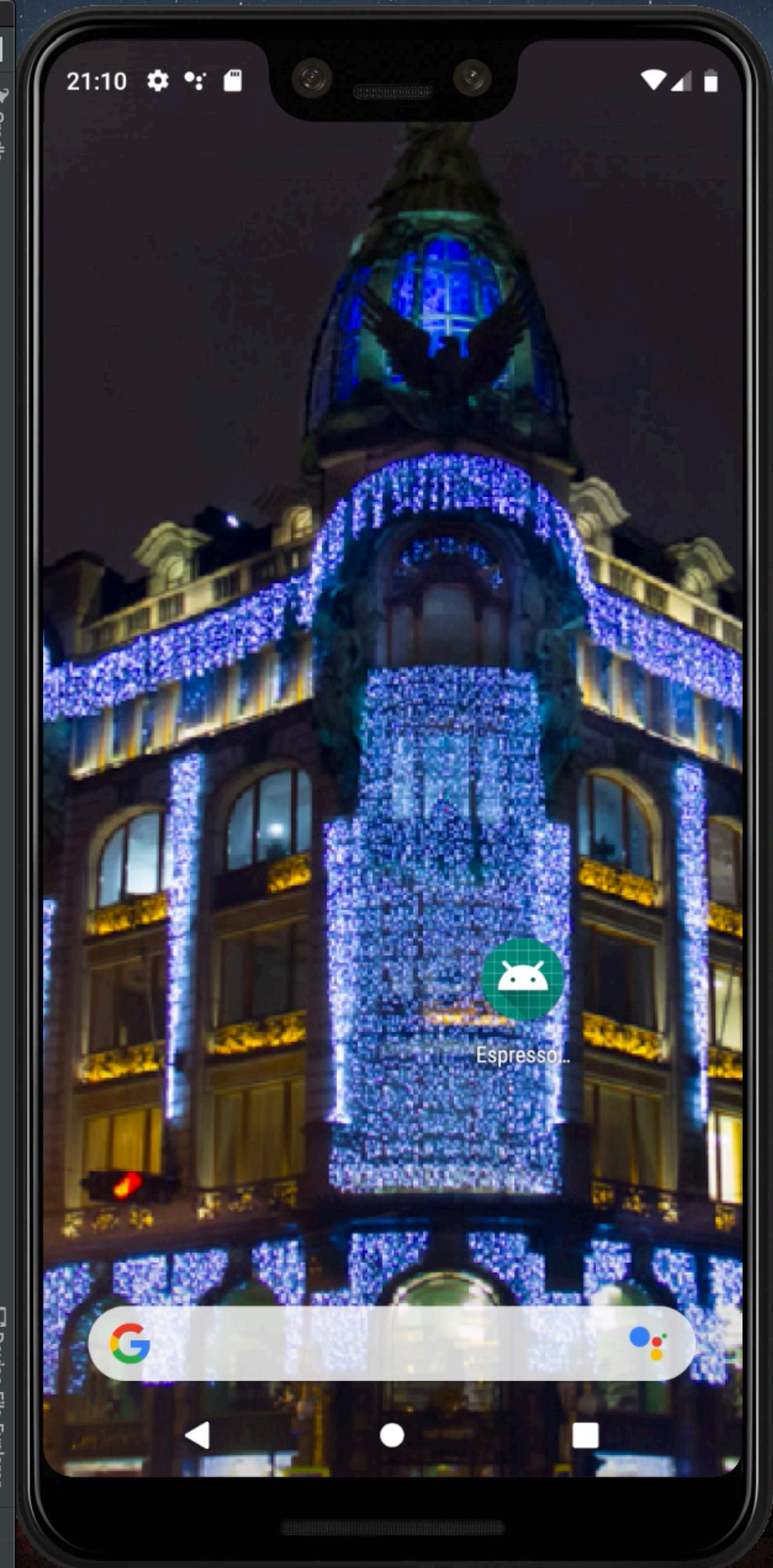
```
fun assertSimpleMessage() {  
    ChatPage(contact)  
        .assertMessageDisplayed(simpleMessage.text)  
}
```



BAD WAY DEMO




```
EspressoGuide [~/devep/EspressoGuide] - .../app/src/androidTest/java/com/atiurin/essroguide/tests/BadDataPreparationTest.kt [app]
java > com > atiurin > essroguide > tests > BadDataPreparationTest assertLongMessage() (1) Pixel 3 XL API 28 Git: ✓ ✓ ⌂ 🔍
BadDataPreparationTest.kt ChatPageTest.kt
17
18 ▶ class BadDataPreparationTest : BaseTest() {
19     companion object {
20         private val contact: Contact = ContactsRepository.getContact(id: 2)
21         private val simpleMessage = Message(CURRENT_USER.id, contact.id, text: "SimpleText")
22         private val specialCharsMessage = Message(CURRENT_USER.id, contact.id, text: "!@#$$%^&*(){}")
23         private val longMessage = Message(CURRENT_USER.id, contact.id, InstrumentationRegistry.getInstrumentation().getRandomAlphaNumeric(100))
24         @BeforeClass
25         @JvmStatic
26         fun prepareData() {
27             MessageRepository.clearChatMessages(contact.id)
28             MessageRepository.addChatMessage(contact.id, longMessage)
29             MessageRepository.addChatMessage(contact.id, simpleMessage)
30             MessageRepository.addChatMessage(contact.id, specialCharsMessage)
31         }
32     }
33     private val activityTestRule: ActivityTestRule<ChatActivity!> = ActivityTestRule(ChatActivity::class)
34
35     @Before
36     fun prepareConditions(){
37         AccountManager(InstrumentationRegistry.getInstrumentation().targetContext).login(
38             CURRENT_USER.login,
39             CURRENT_USER.password
40         )
41         val intent: Intent = Intent().putExtra(INTENT_CONTACT_ID_EXTRA_NAME, contact.id)
42         activityTestRule.launchActivity(intent)
43     }
44 }
BadDataPreparationTest
4: Run 5: Debug TODO 9: Version Control Profiler 6: Logcat Build Terminal Multi-OS Engine 94 Event Log
Emulator: Warning: Failed to get QCocoaScreen for NSObject(0x0) ((null):0, (null)) (41 minutes ago) 44:5 LF UTF-8 4 spaces Git: master 🔍
```



SOLUTION: CUSTOM SETUP RULE + @SETUP & @TEARDOWN ANNOTATIONS

```
class SomeTestClass {  
    val setupRule = SetupTearDownRule()  
        .addSetup { Api.clearChatMessages(contact.id) }  
        .addSetup("ADD_SIMPLE") { Api.addChatMessage(contact.id, simpleMessage) }  
        .addSetup("ADD_LONG") { Api.addChatMessage(contact.id, longMessage) }  
}
```

SOLUTION: CUSTOM SETUP RULE + @SETUP & @TEARDOWN ANNOTATIONS

```
class SomeTestClass {  
    val setupRule = SetUpTearDownRule()  
    .addSetup { Api.clearChatMessages(contact.id) }  
    .addSetup("ADD_SIMPLE") { Api.addChatMessage(contact.id, simpleMessage) }  
    .addSetup("ADD_LONG") { Api.addChatMessage(contact.id, longMessage) }  
}
```

SOLUTION: CUSTOM SETUP RULE + @SETUP & @TEARDOWN ANNOTATIONS

```
class SomeTestClass {  
    val setupRule = SetUpTearDownRule()  
        .addSetup { Api.clearChatMessages(contact.id) }  
        .addSetup("ADD_SIMPLE") { Api.addChatMessage(contact.id, simpleMessage) }  
        .addSetup("ADD_LONG") { Api.addChatMessage(contact.id, longMessage) }  
}
```


SOLUTION: CUSTOM SETUP RULE + @SETUP & @TEARDOWN ANNOTATIONS

```
class SomeTestClass {  
    val setupRule = SetUpTearDownRule()  
        .addSetup { Api.clearChatMessages(contact.id) }  
        .addSetup("ADD_SIMPLE") { Api.addChatMessage(contact.id, simpleMessage) }  
        .addSetup("ADD_LONG") { Api.addChatMessage(contact.id, longMessage) }  
}
```

SOLUTION: CUSTOM SETUP RULE + @SETUP & @TEARDOWN ANNOTATIONS

```
class SomeTestClass {  
    val setupRule = SetUpTearDownRule()  
        .addSetUp { Api.clearChatMessages(contact.id) }  
        .addSetUp("ADD_SIMPLE") { Api.addChatMessage(contact.id, simpleMessage) }  
        .addSetUp("ADD_LONG") { Api.addChatMessage(contact.id, longMessage) }  
}
```

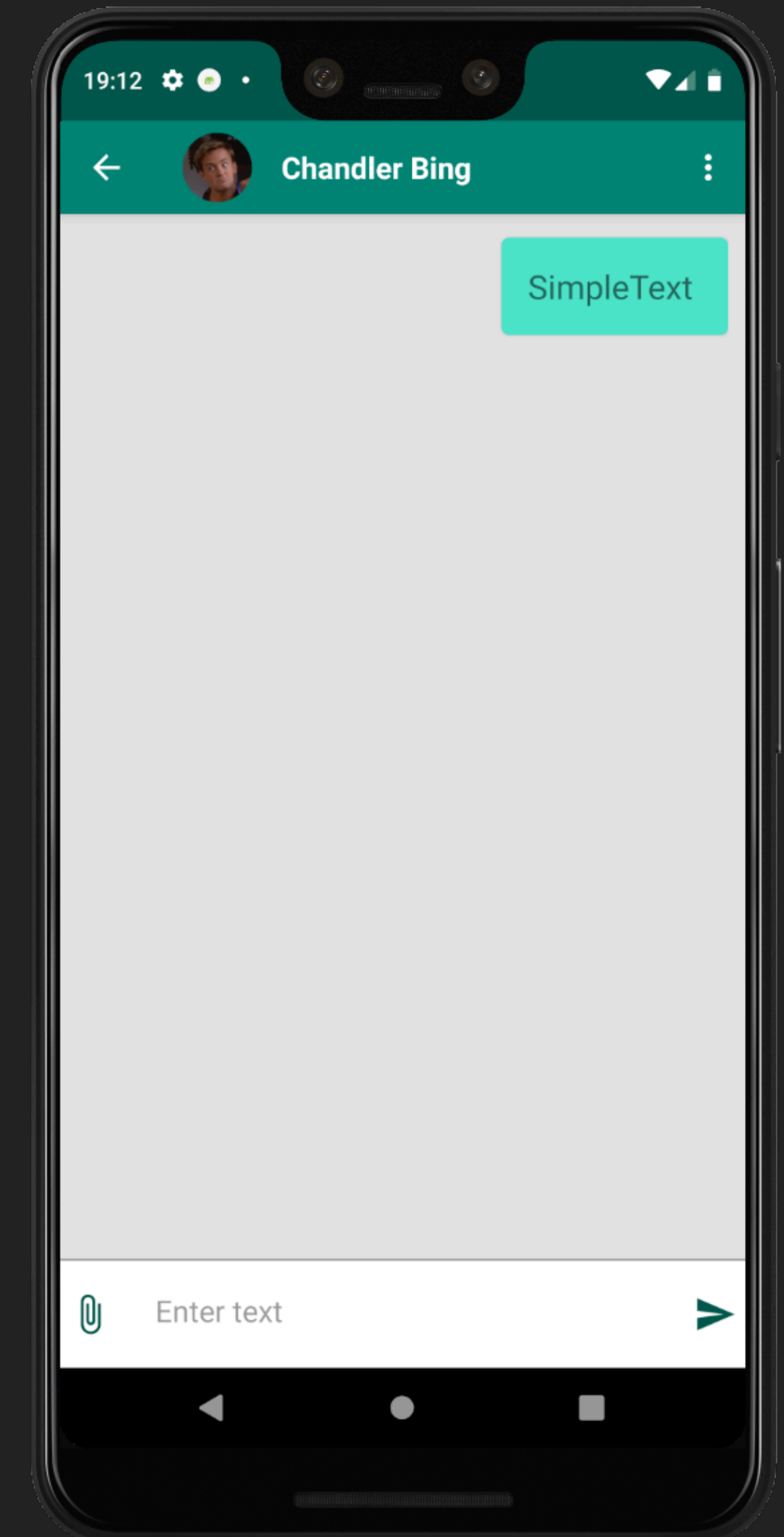
SOLUTION: CUSTOM SETUP RULE + @SETUP & @TEARDOWN ANNOTATIONS

```
class SomeTestClass {  
    val setupRule = SetUpTearDownRule()  
        .addSetup { Api.clearChatMessages(contact.id) }  
        .addSetup("ADD_SIMPLE") { Api.addChatMessage(contact.id, simpleMessage) }  
        .addSetup("ADD_LONG") { Api.addChatMessage(contact.id, longMessage) }  
}
```


SOLUTION: CUSTOM SETUP RULE + @SETUP & @TEARDOWN ANNOTATIONS

```
class SomeTestClass {  
    val setupRule = SetUpTearDownRule()  
        .addSetUp { Api.clearChatMessages(contact.id) }  
        .addSetUp("ADD_SIMPLE") { Api.addChatMessage(contact.id, simpleMessage) }  
        .addSetUp("ADD_LONG") { Api.addChatMessage(contact.id, longMessage) }  
  
    @Setup("ADD_SIMPLE")  
    @Test  
    fun assertSimpleMessage() {  
        ChatPage(contact).assertMessageDisplayed(simpleMessage.text)  
    }  
}
```

```
@SetUp("ADD_SIMPLE")
@Test
fun assertSimpleMessage() {
    ChatPage(contact)
        .assertMessageDisplayed(simpleMessage.text)
}
```



SOLUTION: CUSTOM SETUP RULE + @SETUP & @TEARDOWN ANNOTATIONS

```
class SomeTestClass {  
    ...  
    .addSetUp("ADD_SIMPLE") { Api.addChatMessage(contact.id, simpleMessage) }  
    .addSetUp("ADD_LONG") { Api.addChatMessage(contact.id, longMessage) }  
  
    @SetUp("ADD_SIMPLE")  
    @Test  
    fun assertBothMessagesDisplayed() {}  
}
```


SOLUTION: CUSTOM SETUP RULE + @SETUP & @TEARDOWN ANNOTATIONS

```
class SomeTestClass {  
    ...  
    .addSetUp("ADD_SIMPLE") { Api.addChatMessage(contact.id, simpleMessage) }  
    .addSetUp("ADD_LONG") { Api.addChatMessage(contact.id, longMessage) }  
  
    @SetUp("ADD_SIMPLE", "ADD_LONG")  
    @Test  
    fun assertBothMessagesDisplayed() {}  
}
```

SOLUTION: CUSTOM SETUP RULE + @SETUP & @TEARDOWN ANNOTATIONS

```
class SomeTestClass {  
    ...  
    .addSetUp("ADD_SIMPLE") { Api.addChatMessage(contact.id, simpleMessage) }  
    .addSetUp("ADD_LONG") { Api.addChatMessage(contact.id, longMessage) }  
  
    @SetUp("ADD_SIMPLE", "ADD_LONG")  
    @Test  
    fun assertBothMessagesDisplayed() {  
        ChatPage(contact)  
        .assertMessageDisplayed(simpleMessage.text)  
        .assertMessageDisplayed(longMessage.text)  
    }  
}
```

GOOD WAY DEMO



EspressoGuide [- .../app/src/androidTest/java/com/atiurin/esspressoguide/tests/ChatPageTest.kt [app]]

BadDataPreparationTest.kt x ChatPageTest.kt x

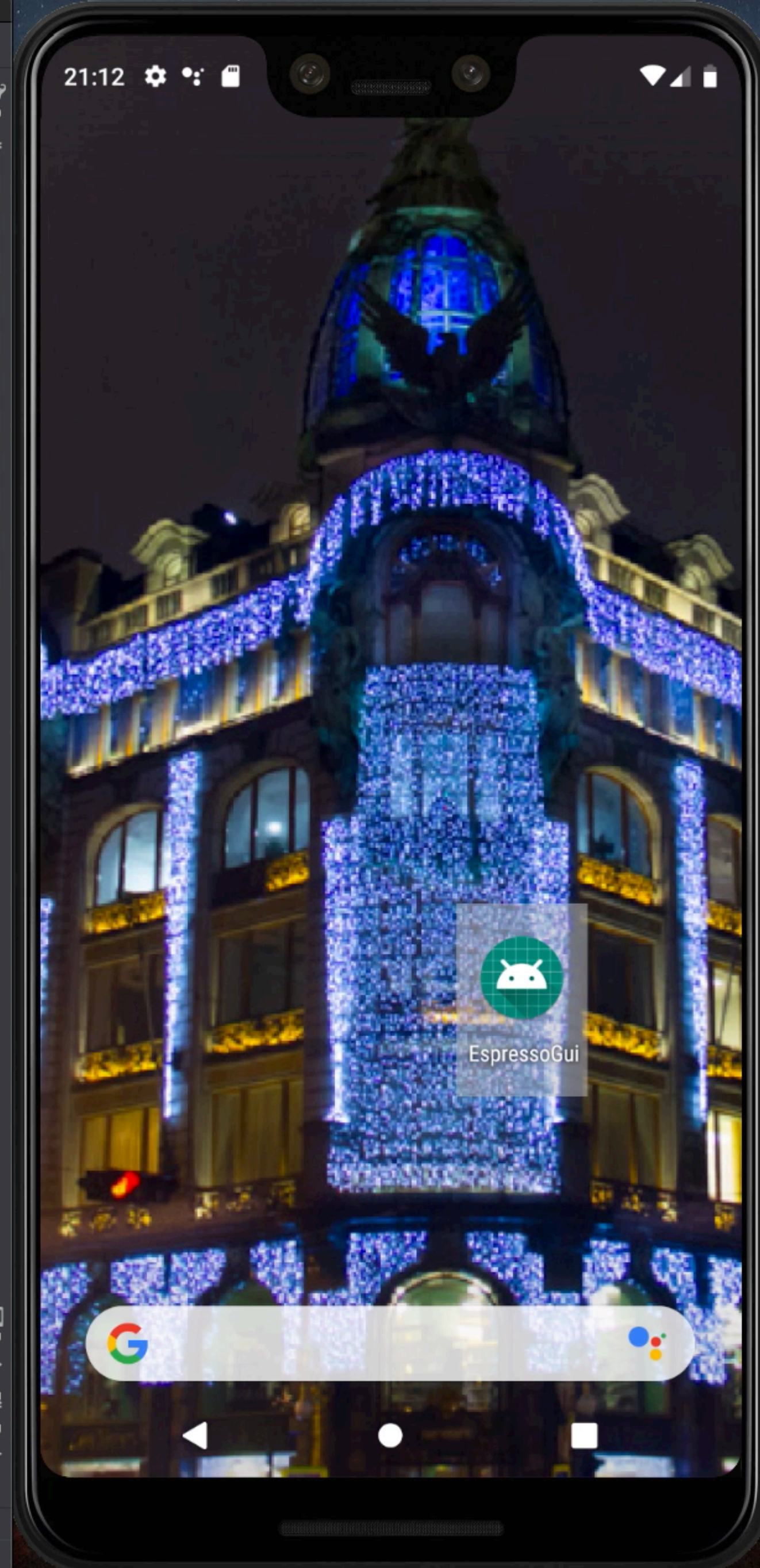
```
1 package com.atiurin.esspressoguide.tests
2
3 import ...
4
21 class ChatPageTest : BaseTest() {
22     companion object {...}
27     private val contact: Contact = ContactsRepository.getContact(id: 2)
28     private val simpleMessage = Message(CURRENT_USER.id, contact.id, text: "SimpleText")
29     private val specialCharsMessage = Message(CURRENT_USER.id, contact.id, text: "!@#\$%^&*(){}:~\"'./<>?_+±$`~] [")
30     private val longMessage = Message(CURRENT_USER.id, contact.id, InstrumentationRegistry.getInstrumentation().context.assets
31
32     private val activityTestRule: ActivityTestRule<ChatActivity!> = ActivityTestRule(ChatActivity::class.java, initialTouchMode: false,
33     private val setUpTearDownRule: SetupTearDownRule = SetupTearDownRule()
34         .addSetup { MessageRepository.clearChatMessages(contact.id) }
35         .addSetup(ADD_SIMPLE_MESSAGE) {
36             MessageRepository.addChatMessage(contact.id, simpleMessage)
37         }
38         .addSetup(ADD_SPECIAL_CHARS_MESSAGE) {
39             MessageRepository.addChatMessage(contact.id, specialCharsMessage)
40         }
41         .addSetup(ADD_LONG_MESSAGE) {
42             MessageRepository.addChatMessage(contact.id, longMessage)
43         }
44         .addSetup {
45             AccountManager(InstrumentationRegistry.getInstrumentation().targetContext).login(
46                 CURRENT_USER.login,
47                 CURRENT_USER.password
48             )
49             val intent: Intent = Intent().putExtra(INTENT_CONTACT_ID_EXTRA_NAME, contact.id)
50             activityTestRule.launchActivity(intent)
51         }
52
53     init {
54         ruleSequence.add(setUpTearDownRule, activityTestRule)
55     }
56 }
```

ChatPageTest

4: Run 5: Debug 9: Version Control Profiler 6: Logcat Build Terminal Multi-OS Engine

Tests passed: 3 (a minute ago)

21:34 LF UTF-8 4 spaces Git: master



TEST DATA IS RELATED WITH BUILD.SERIAL

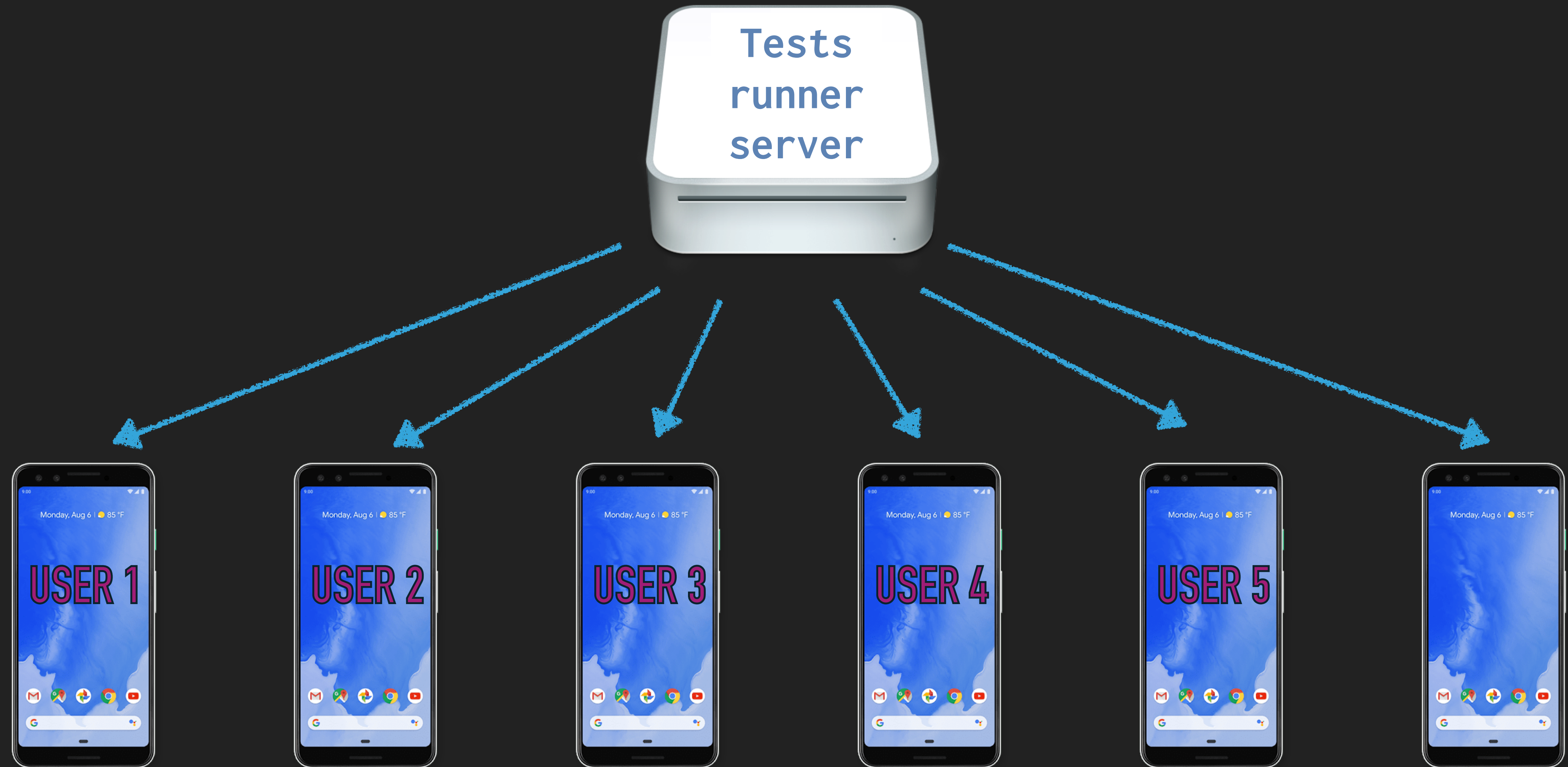


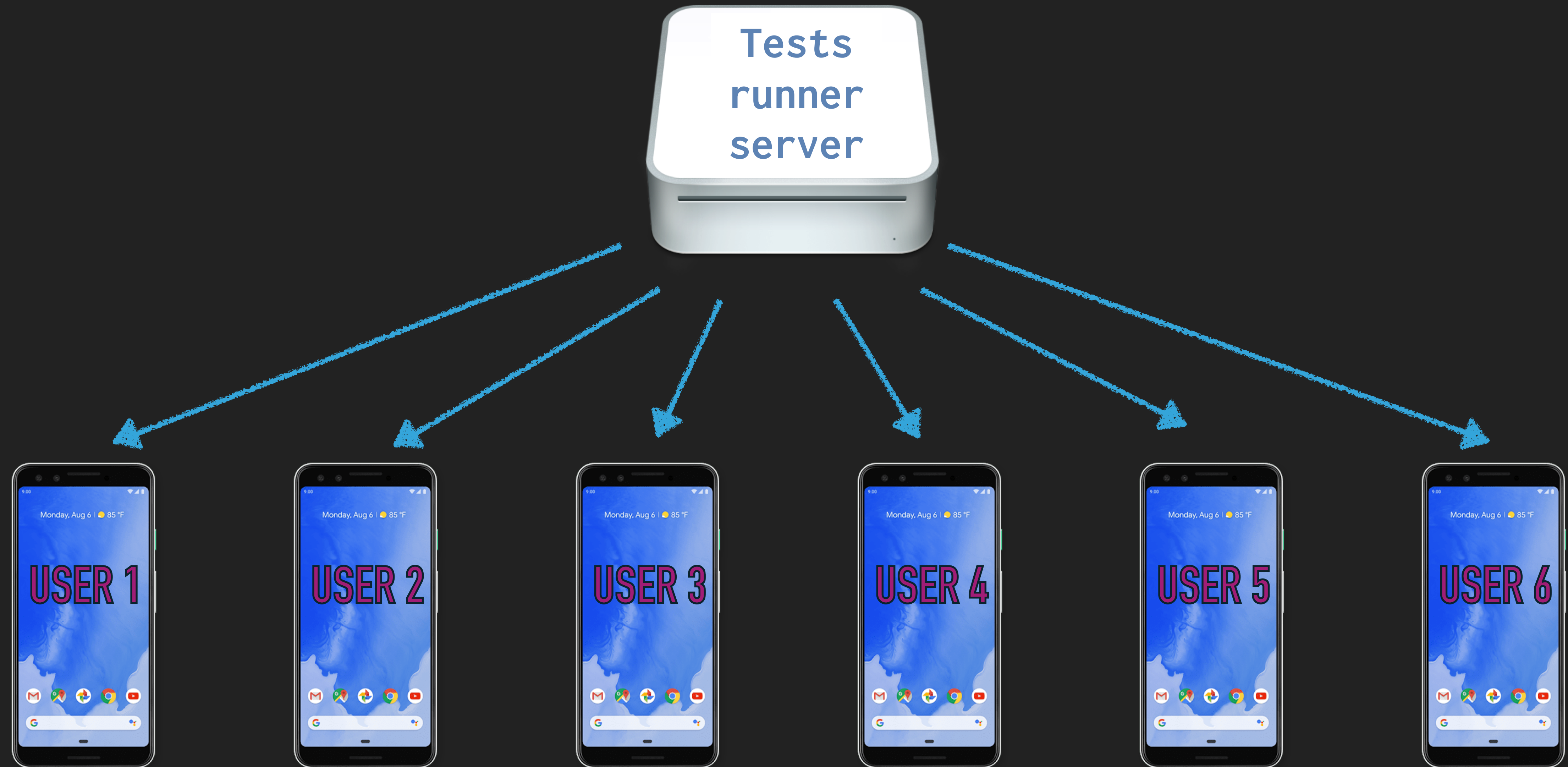
```
class SomeTestClass {  
    ...  
    val user = TestData.getUser(Build.Serial)  
}
```

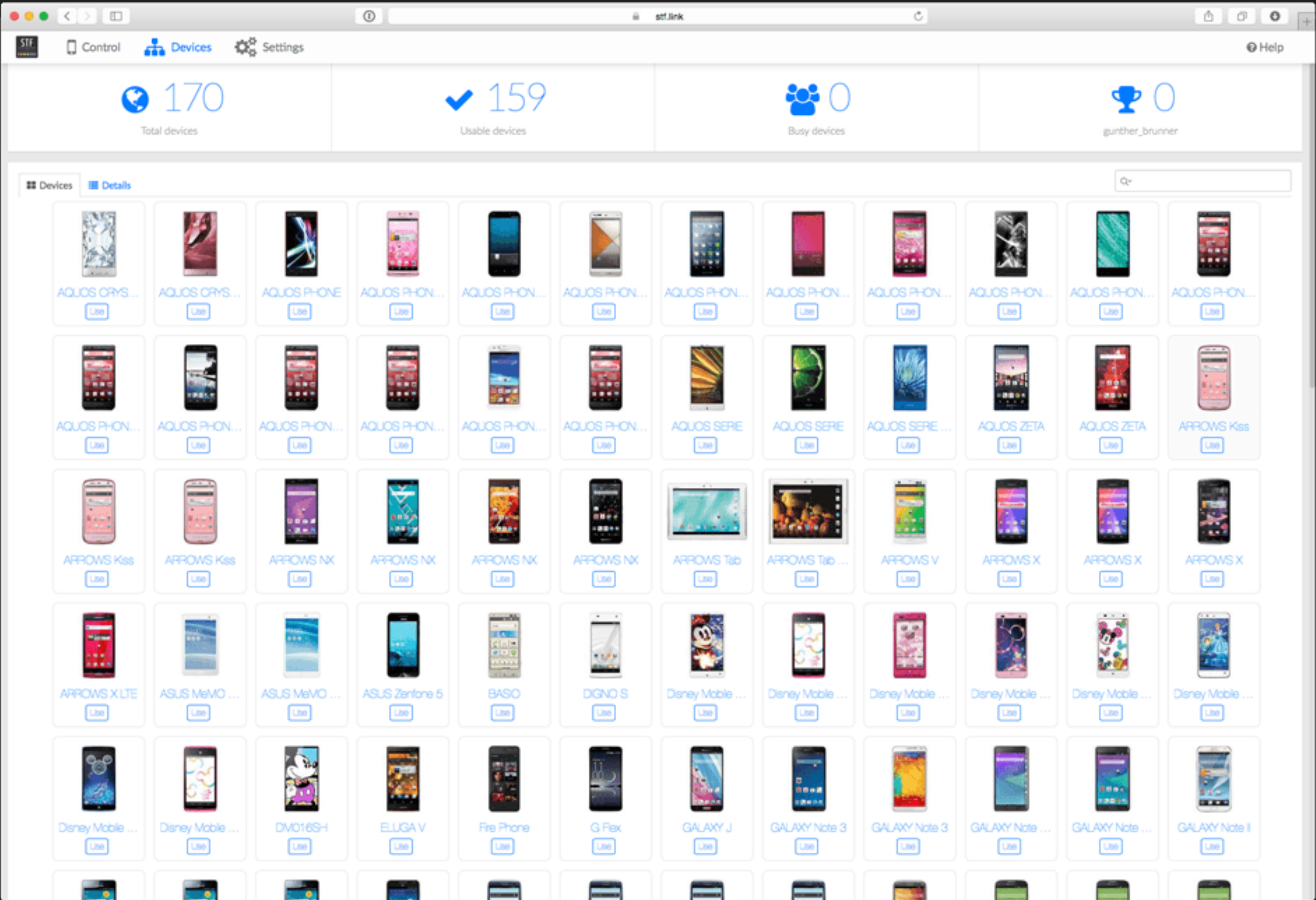










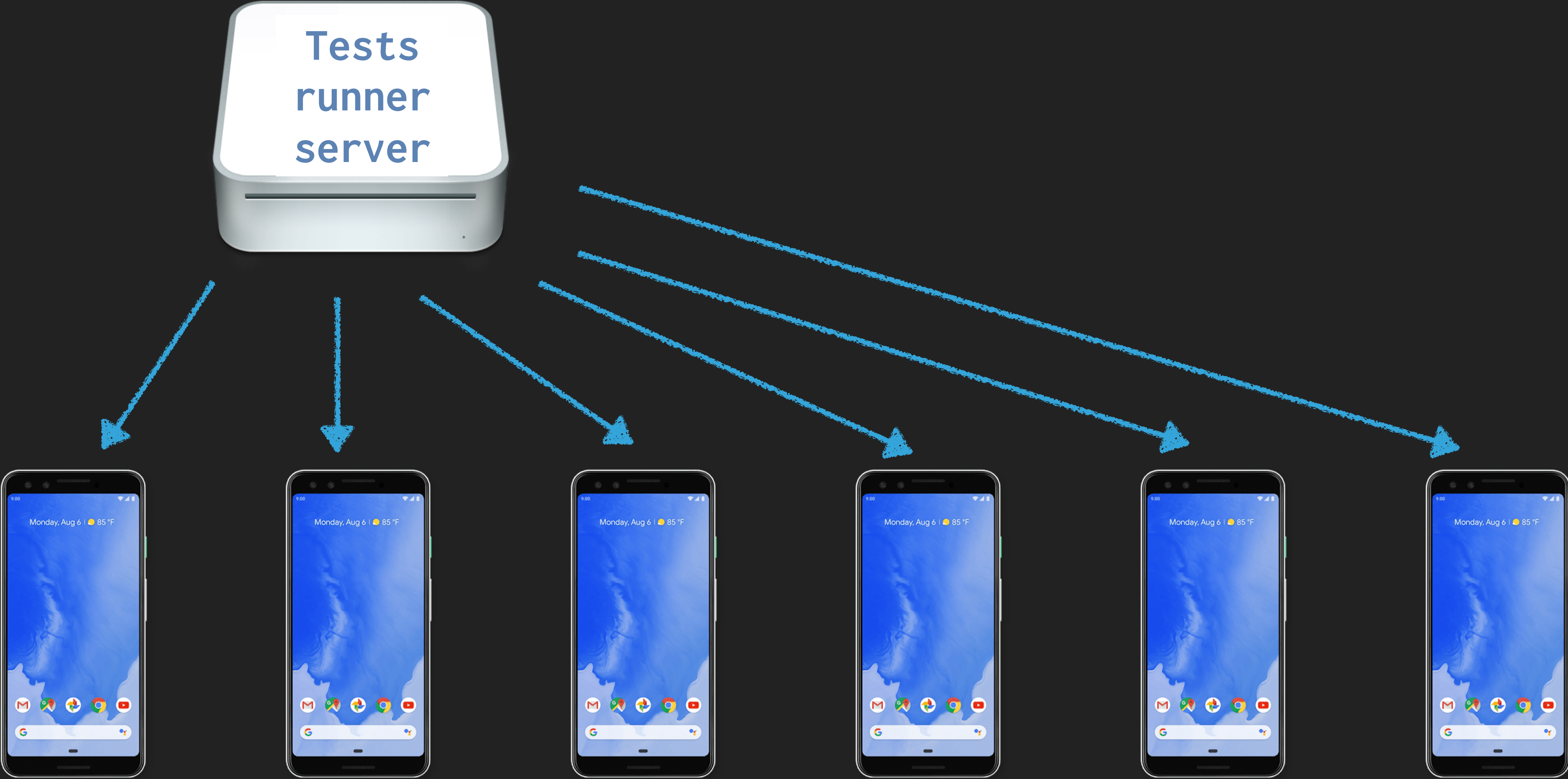
IF WE WANNA ADD OR CHANGE A DEVICE

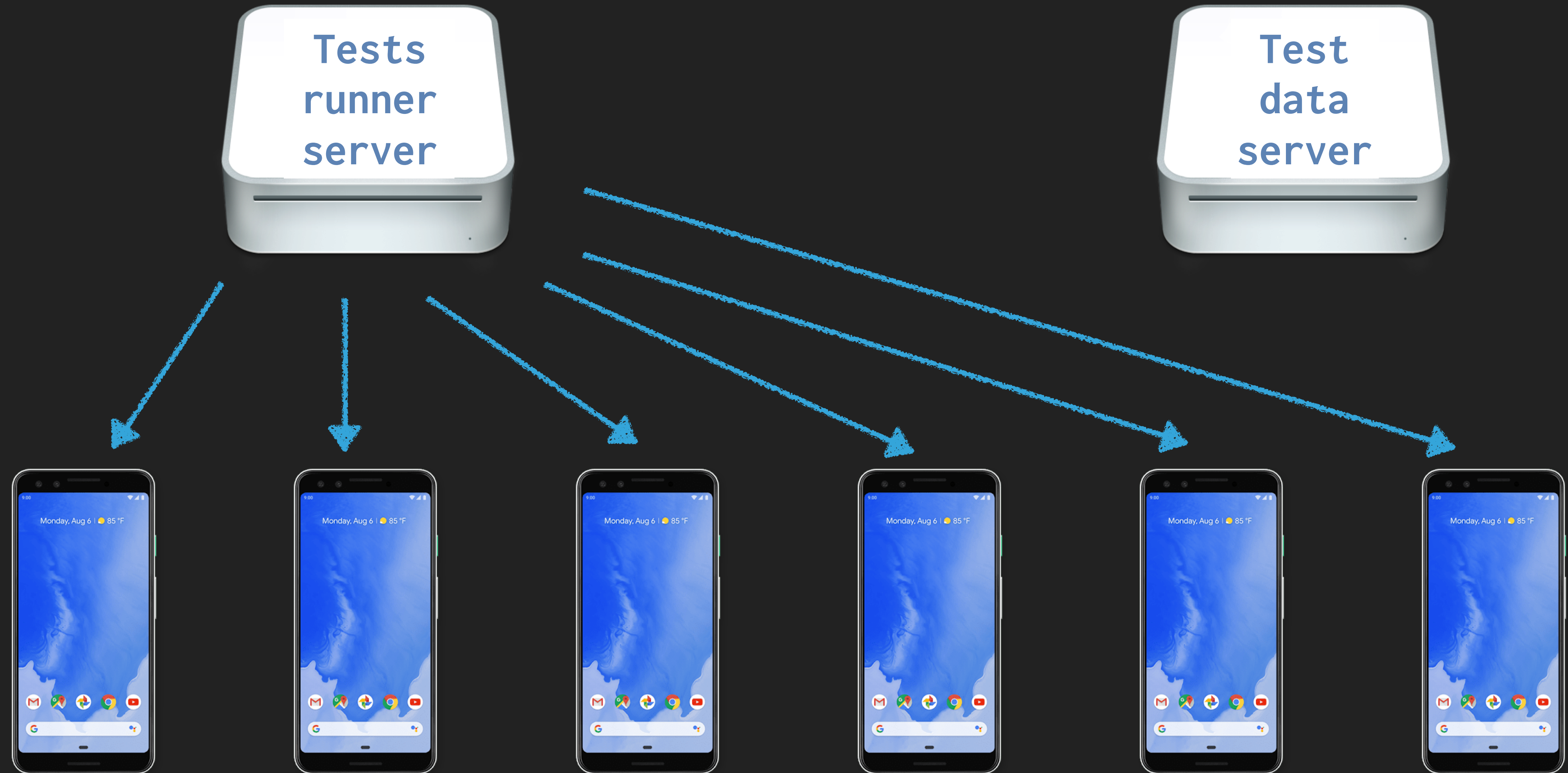
IF WE WANNA ADD OR CHANGE A DEVICE

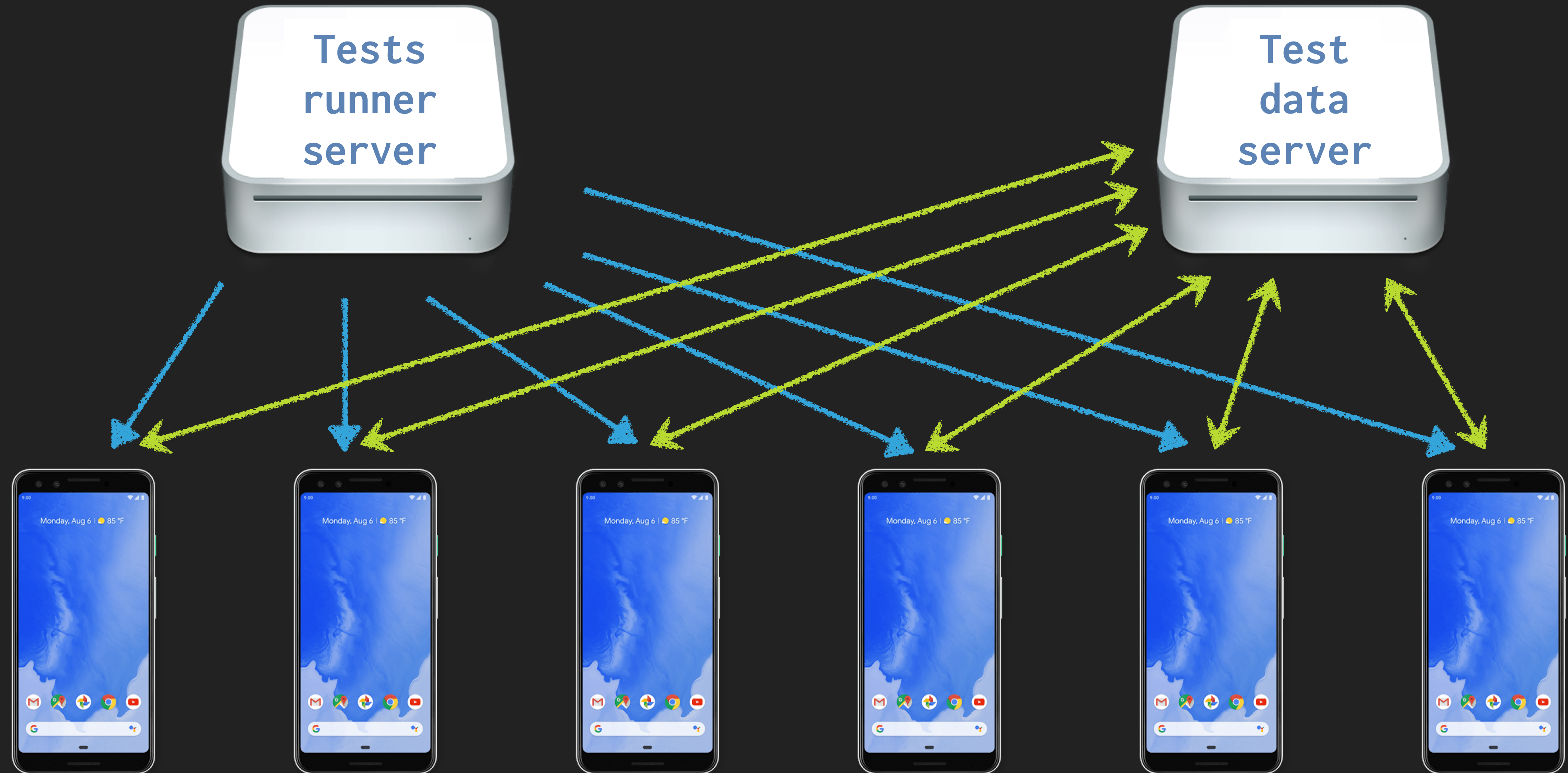
- ▶ Support changing in test code

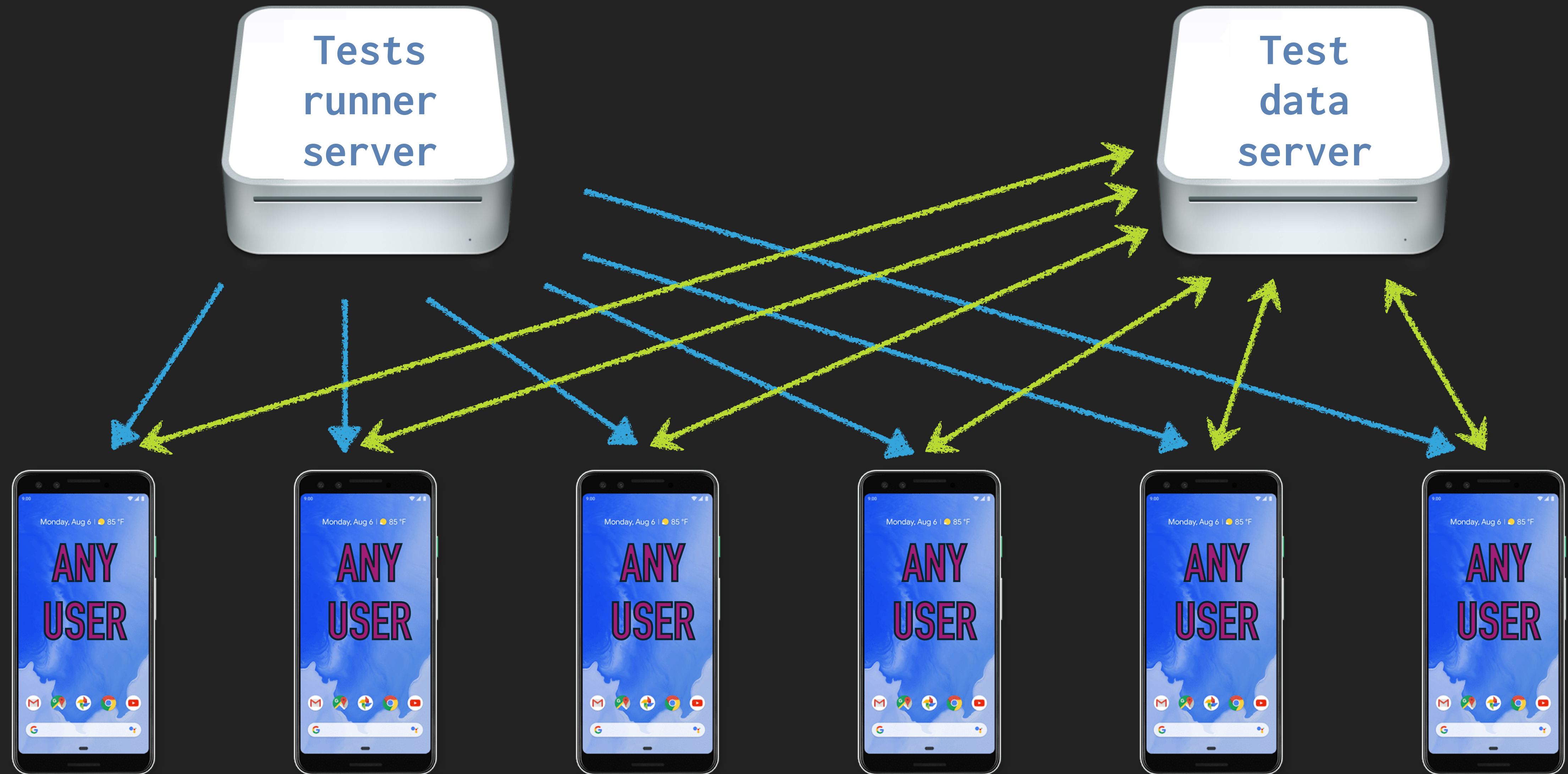
IF WE WANNA ADD OR CHANGE A DEVICE

- ▶ Support changing in test code
- ▶ Configure test user to default test conditions











**Test
data
server**

- ▶ Pool of test users and any other required objects



- ▶ Pool of test users and any other required objects
- ▶ Data management via rest api



- ▶ Pool of test users and any other required objects
- ▶ Data management via rest api
- ▶ Guarantee of test data uniqueness for separate test



- ▶ Kotlin
- ▶ Spring Boot (<https://spring.io/projects/spring-boot>)
- ▶ JetBrains Exposed (<https://github.com/JetBrains/Exposed>)



SOLUTION: TEST DATA SERVER

SOLUTION: TEST DATA SERVER

- ▶ No need to support devices

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- ▶ No need to support devices
- ▶ Single point to control all test data

SOLUTION: TEST DATA SERVER

- ▶ No need to support devices
- ▶ Single point to control all test data
- ▶ Multiple test runs at the same time (CI tasks)

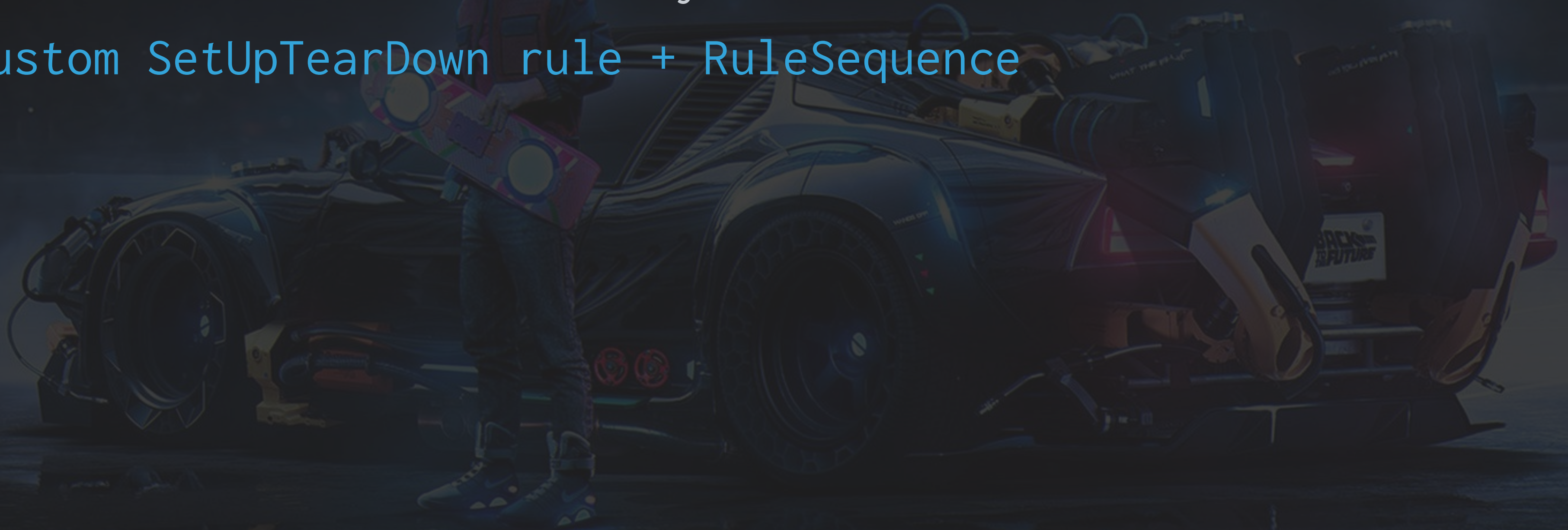
SOLUTION: TEST DATA SERVER

- ▶ No need to support devices
- ▶ Single point to control all test data
- ▶ Multiple test runs at the same time (CI tasks)
- ▶ It could be used by other test frameworks (iOS, Web, api tests)

- ▶ Test data is used everywhere:
 - > Strict data definition to test suite or test case
 - > Store read-only data as constants

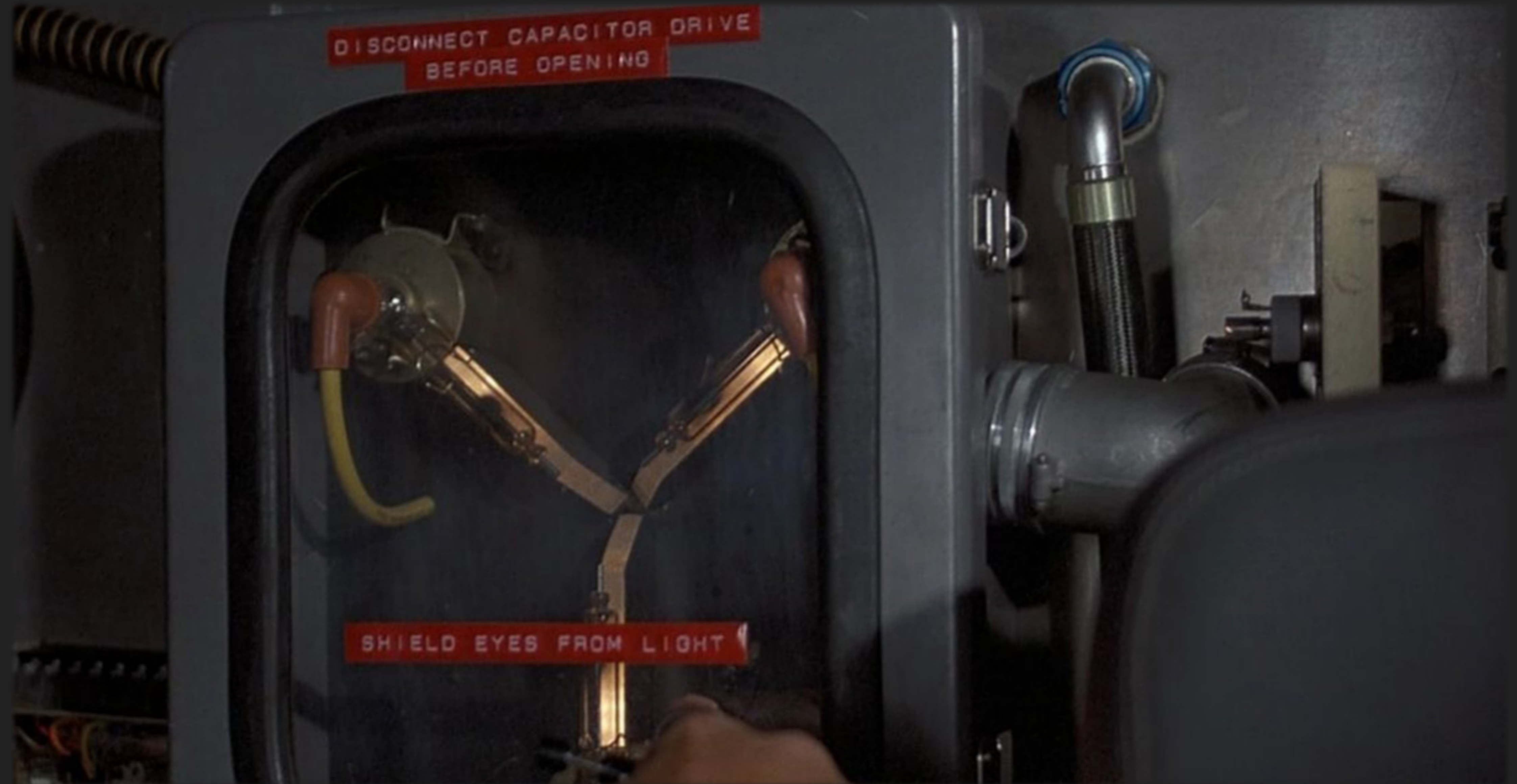


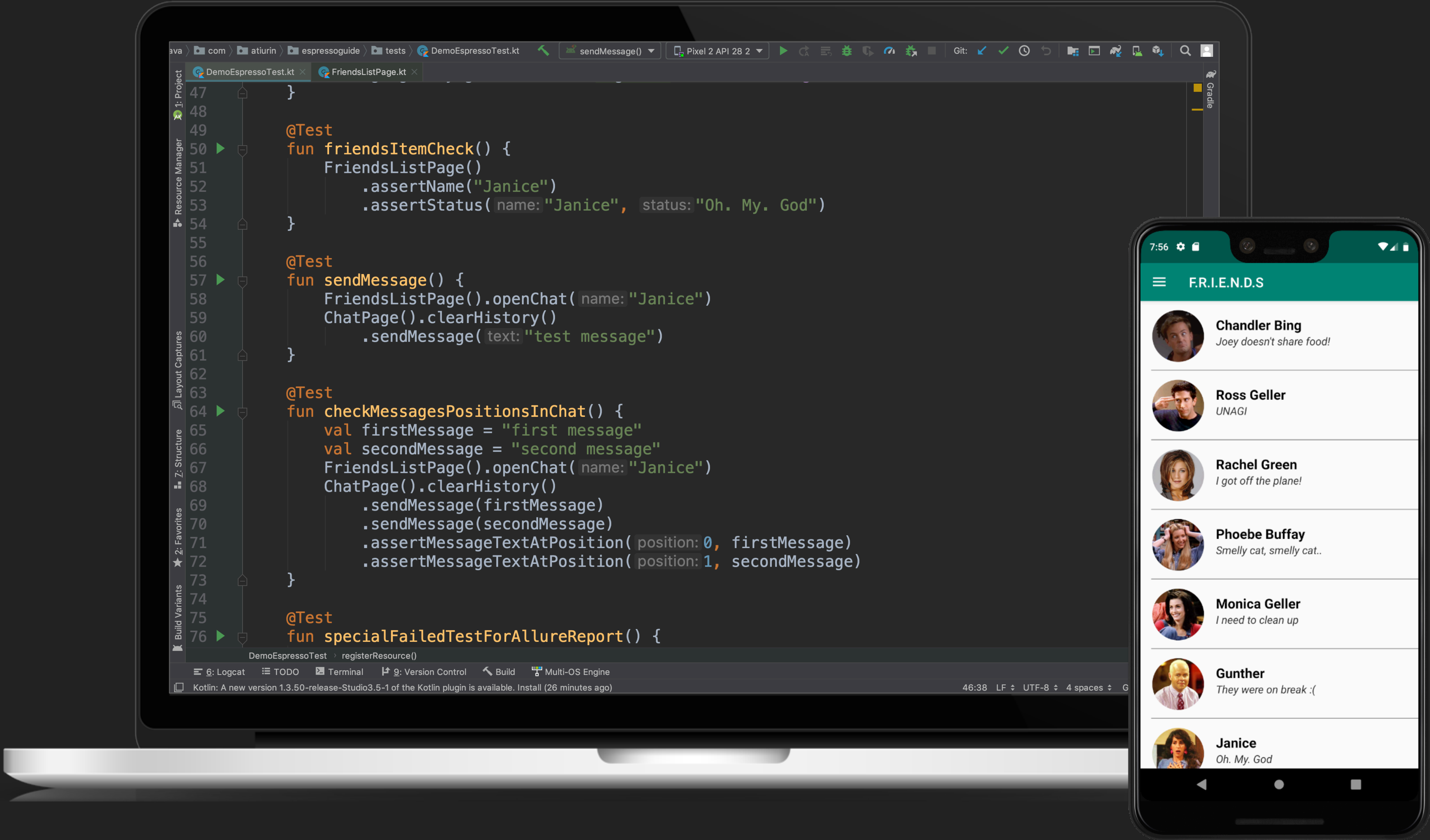
- ▶ Test data is used everywhere:
 - > Strict data definition to test suite or test case
 - > Store read-only data as constants
- ▶ Test data is defined after activity launch
 - > Use custom SetUpTearDown rule + RuleSequence

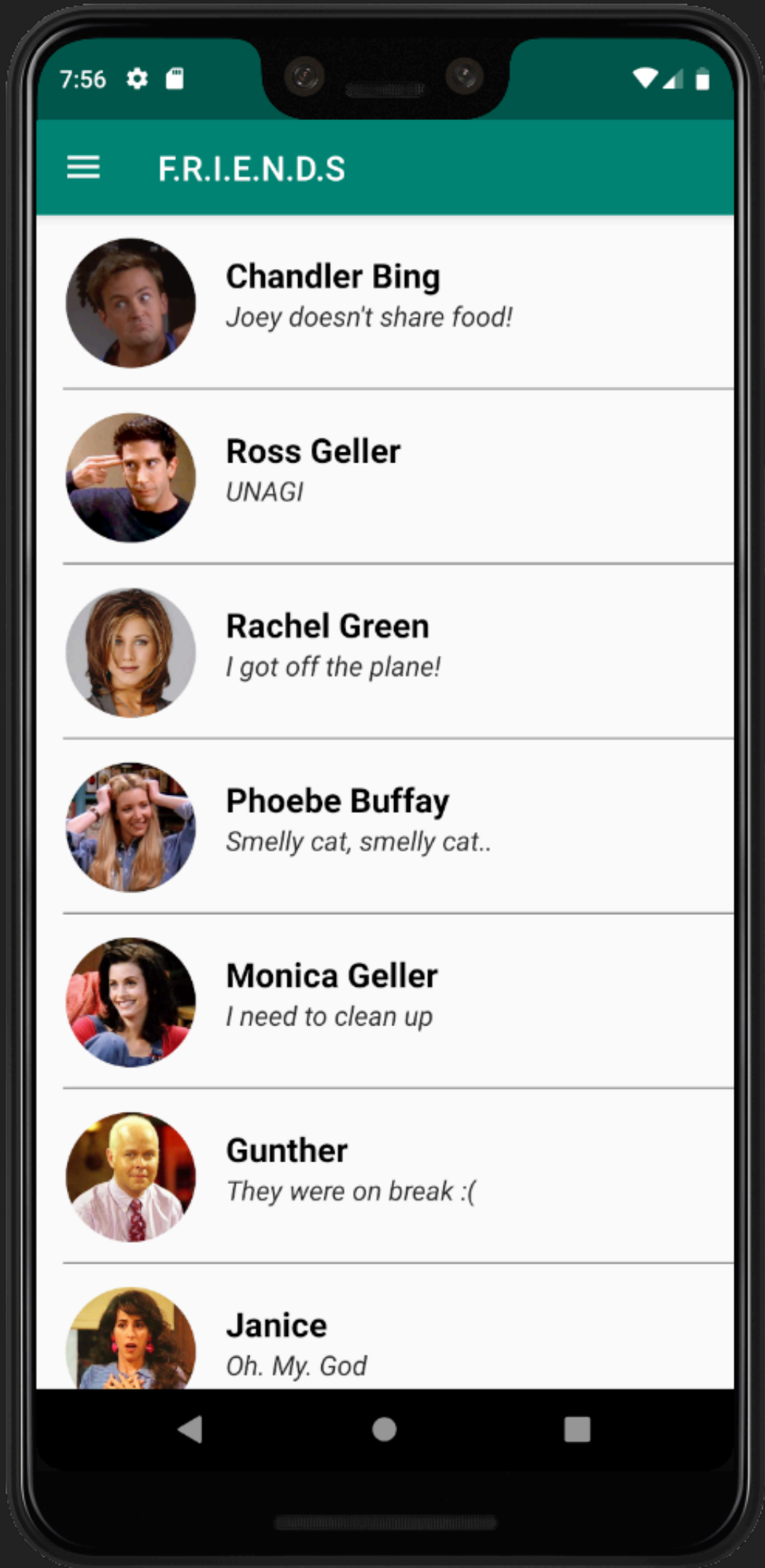


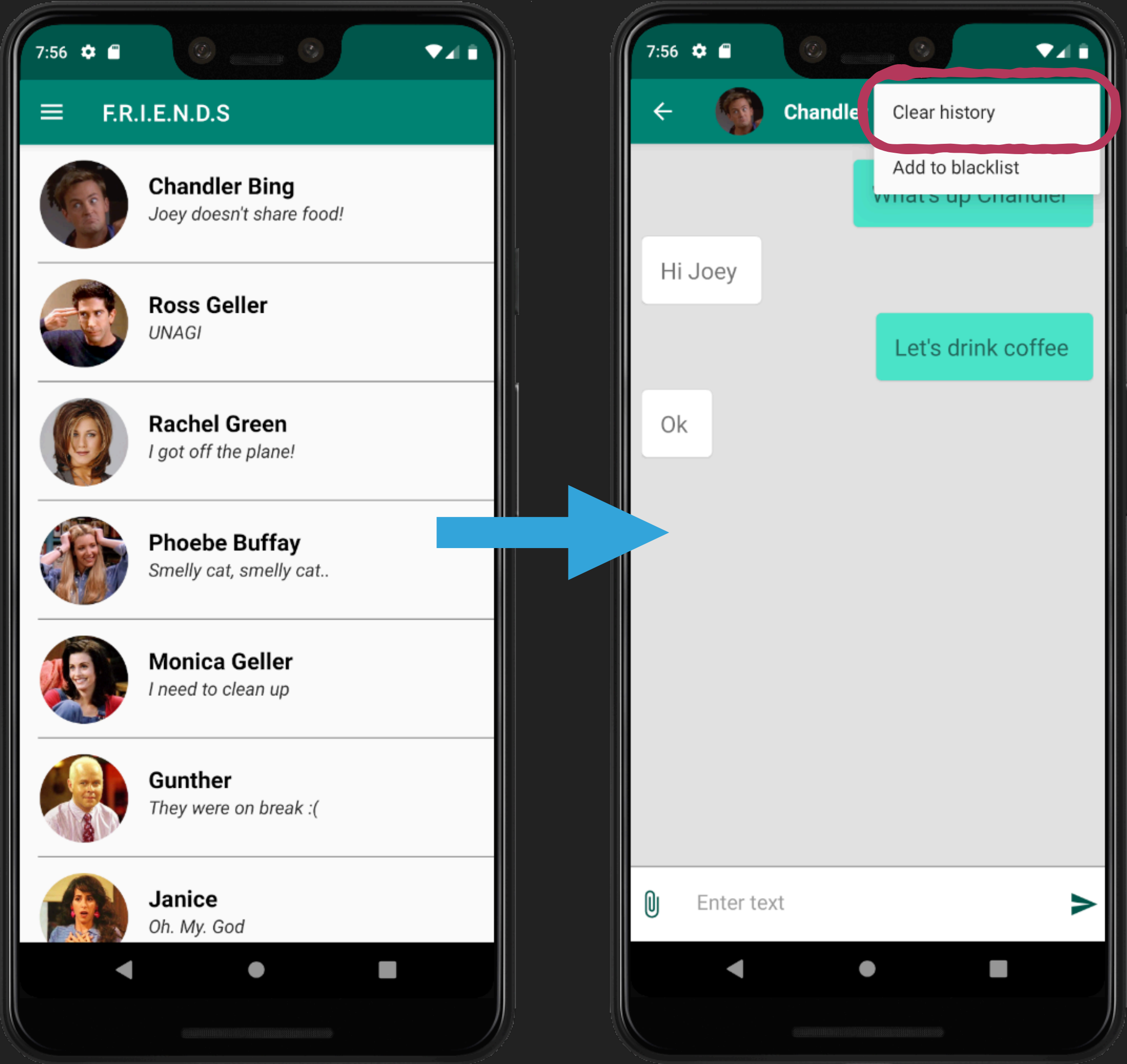
- ▶ Test data is used everywhere:
 - > Strict data definition to test suite or test case
 - > Store read-only data as constants
- ▶ Test data is defined after activity launch
 - > Use custom `SetUpTearDown` rule + `RuleSequence`
- ▶ Test data is defined in `@BeforeClass` or `@Before` method for all `@Test` methods
 - > Use `SetUpTearDown` rule + `SetUp` and `TearDown` annotations

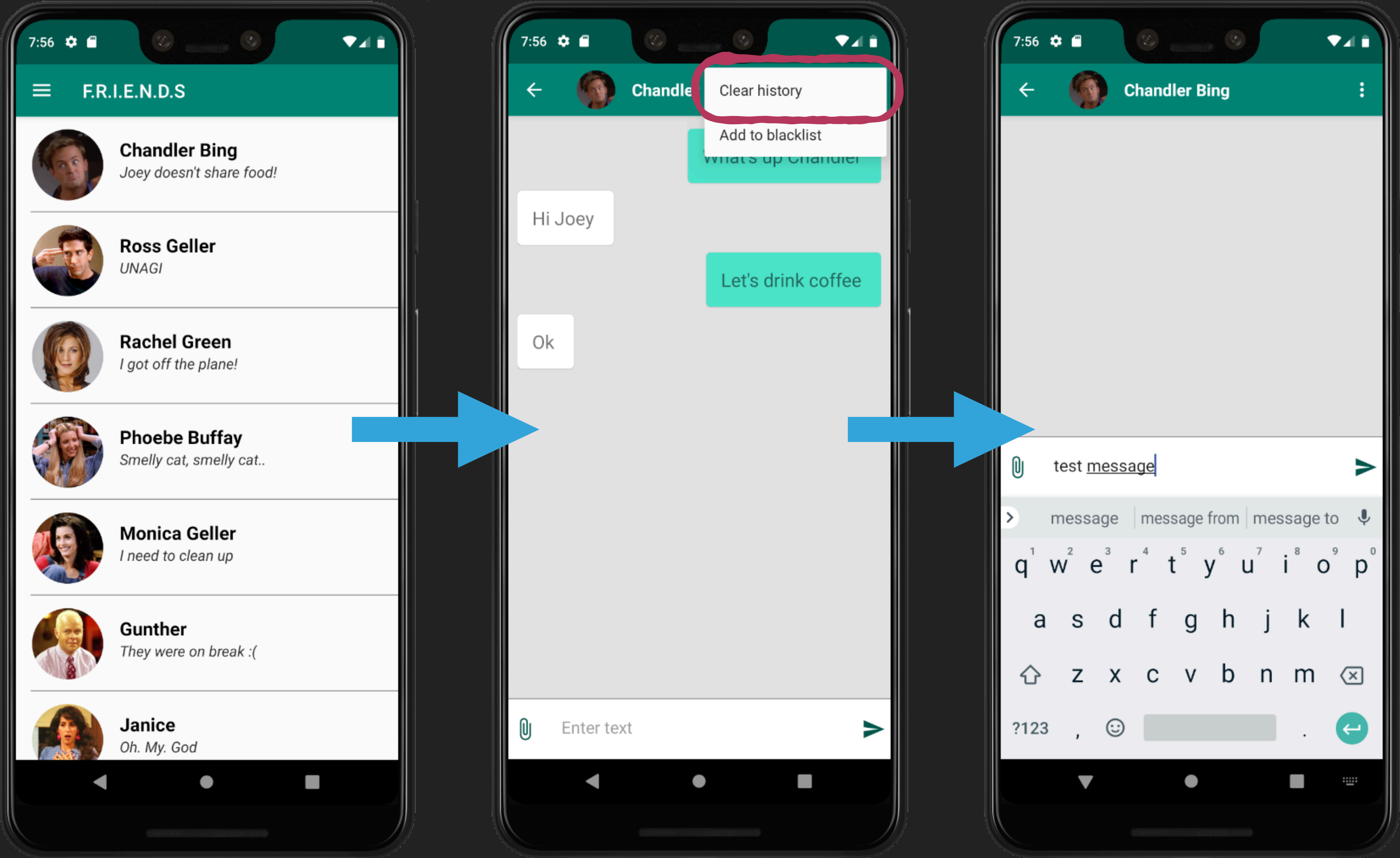
- ▶ Test data is used everywhere:
 - > Strict data definition to test suite or test case
 - > Store read-only data as constants
- ▶ Test data is defined after activity launch
 - > Use custom `SetUpTearDown` rule + `RuleSequence`
- ▶ Test data is defined in `@BeforeClass` or `@Before` method for all `@Test` methods
 - > Use `SetUpTearDown` rule + `SetUp` and `TearDown` annotations
- ▶ Test user is related with device `Build.Serial`
 - > Use `TestData` server

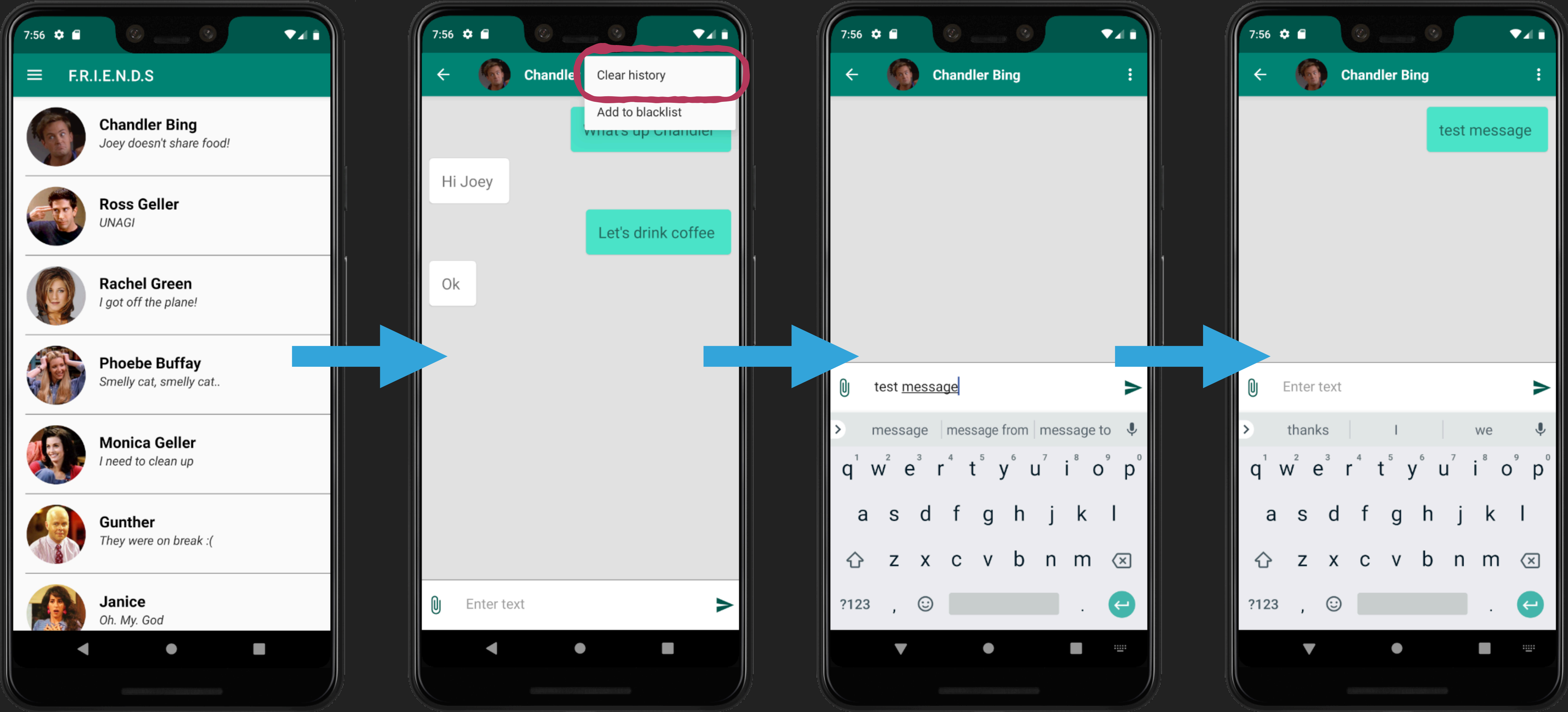




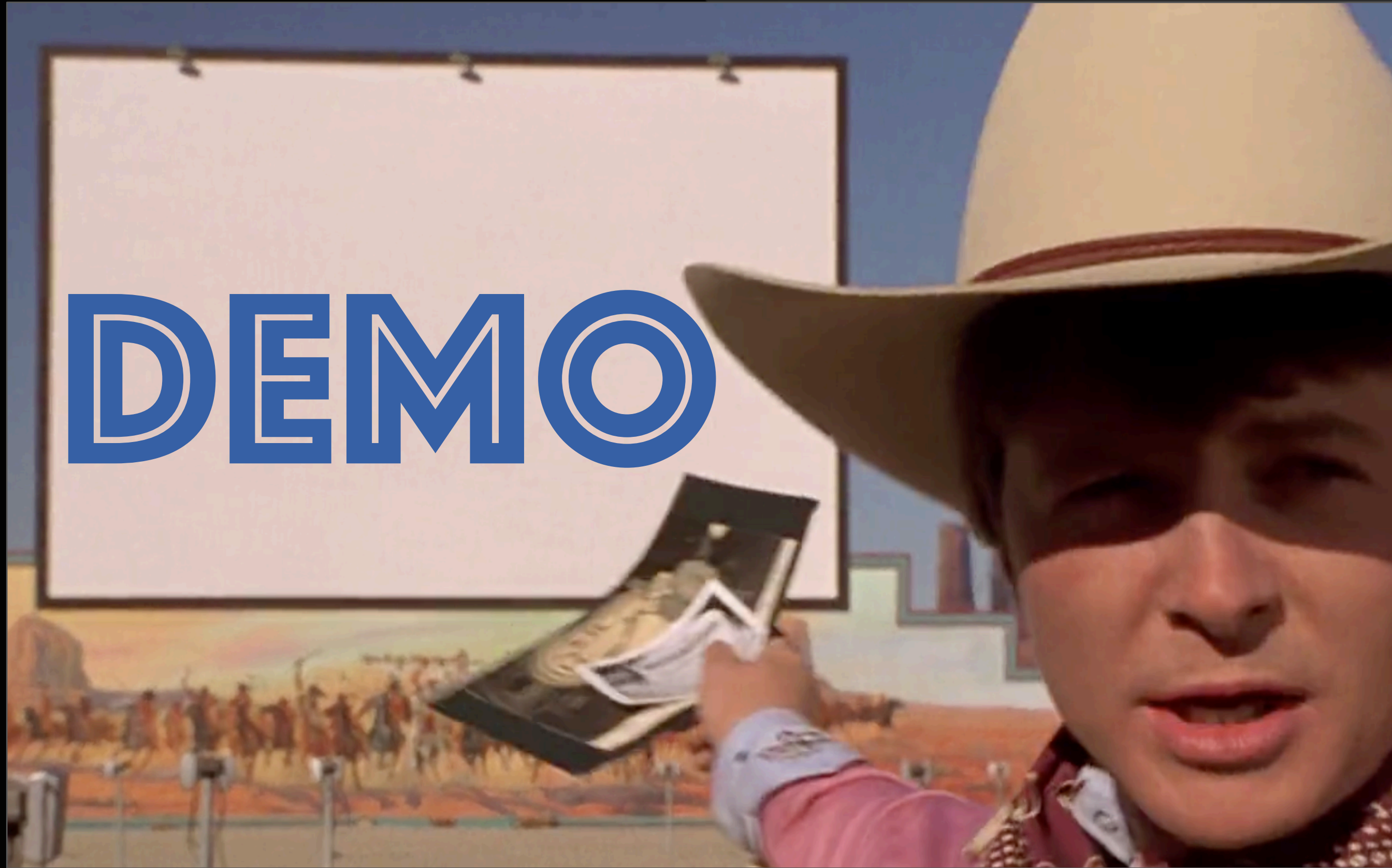








DEMO




```
EspressoGuide [~/develop/EspressoGuide] - .../app/src/androidTest/java/com/atiurin/espressoguide/tests/DemoEspressoTest.kt [app]
com > atiurin > espressoguide > tests > DemoEspressoTest
sendMessageWithLink() Pixel 3 XL API 28 Git:
DemoEspressoTest.kt MainActivity.kt ContactsPresenter.kt ChatPageTest.kt ChatPage.kt BaseTest.kt ScreenshotLifecycleListener.kt AbstractLifecycleListener.kt LifecycleListener.kt
9 companion object {
0     @BeforeClass
1     @JvmStatic
2     fun switchOffFailureHandler() {...}
6 }
7
8 lateinit var chatPage: ChatPage
9 private val contact: Contact = ContactsRepositoty.getContact( name: "Chandler Bing")
0
1 init {
2     ruleSequence
3         .add(SetupTearDownRule()
4             .addSetup {...})
2         .addLast(CustomActivityTestRule(MainActivity::class.java))
3     }
4
5 @Test
6 fun friendsItemCheck() {...}
2
3 @Test
4 fun sendMessage() {
5     FriendsListPage().openChat(contact)
6     ChatPage(contact).clearHistory()
7         .sendMessage(text: "test message")
8 }
9
0 @Test
1 fun sendMessage2() {
2     ...
3 }
4
5 DemoEspressoTest > sendMessage()
Run TODO Version Control Profiler Logcat Build Terminal Multi-OS Engine
2 Event Log
Tests passed: 1 (8 minutes ago) 57:54 LF UTF-8 4 spaces Git: master
```



COOL TEST

```
@Test
fun goodTest(){
    FriendsListPage().openChat("Ross Geller")
    ChatPage().clearHistory()
        .sendMessage("test message")
}
```


IS IT A GOOD IDEA?

@Test

```
fun sendMessageWithLink(){  
    FriendsListPage().openChat("Ross Geller")  
    ChatPage().clearHistory()  
        .sendMessage("message with link vk.com")  
}
```

ACTUALLY IT ISN'T A GOOD IDEA!

@Test

```
fun sendMessageWithLink(){  
    FriendsListPage().openChat("Ross Geller")  
    ChatPage().clearHistory()  
        .sendMessage("message with link vk.com")  
}
```

LONG TEST SCENARIO



LONG TEST SCENARIO

- ▶ It's a flaky way



LONG TEST SCENARIO

- ▶ It's a flaky way
- ▶ It takes a lot of time



LONG TEST SCENARIO

- ▶ It's a flaky way
- ▶ It takes a lot of time
- ▶ Code duplication





SOLUTION: SHORT TEST

@Test

```
fun sendMessageWithLink(){  
    FriendsListPage().openChat("Ross Geller")  
    ChatPage().clearHistory()  
        .sendMessage("message with link vk.com")  
}
```


SOLUTION: SHORT TEST

@Test

```
fun sendMessageWithLink(){  
    FriendsListPage().openChat("Ross Geller")  
    ChatPage().clearHistory()  
    ChatPage().sendMessage("message with link vk.com")  
}
```


SOLUTION: SHORT TEST

```
class ChatTest {  
    @Test  
    fun sendMessageWithLink() {  
        ChatPage().sendMessage("message with link vk.com")  
    }  
}
```

```
class ChatTest {  
    @get:Rule  
    val activityRule = ActivityTestRule(MainActivity::class.java, false, false)  
}
```

```
class ChatTest {  
    @get:Rule  
    val activityRule = ActivityTestRule(MainActivity::class.java, false, false)  
}
```



```
class ChatTest {  
    @get:Rule  
    val activityRule = ActivityTestRule(ChatActivity::class.java, false, false)  
}
```

```
class ChatTest {
    @get:Rule
    val activityRule = ActivityTestRule(ChatActivity::class.java, false, false)
    @Before
    fun prepareData() {
        MessageRepository.clearChatMessages(contact.id)
        val intent = Intent()
        intent.putExtra("INTENT_CONTACT_ID_EXTRA_NAME", contact.id)
        activityRule.launchActivity(intent)
    }
}
```

```
class ChatTest {  
    @get:Rule  
    val activityRule = ActivityTestRule(ChatActivity::class.java, false, false)  
    @Before  
    fun prepareData() {  
        MessageRepository.clearChatMessages(contact.id)  
        val intent = Intent()  
        intent.putExtra("INTENT_CONTACT_ID_EXTRA_NAME", contact.id)  
        activityRule.launchActivity(intent)  
    }  
}
```



```
class ChatTest {  
    @get:Rule  
    val activityRule = ActivityTestRule(ChatActivity::class.java, false, false)  
    @Before  
    fun prepareData() {  
        MessageRepository.clearChatMessages(contact.id)  
        val intent = Intent()  
        intent.putExtra("INTENT_CONTACT_ID_EXTRA_NAME", contact.id)  
        activityRule.launchActivity(intent)  
    }  
}
```

```
class ChatTest {  
    @get:Rule  
    val activityRule = ActivityTestRule(ChatActivity::class.java, false, false)  
    @Before  
    fun prepareData() {  
        MessageRepository.clearChatMessages(contact.id)  
        val intent = Intent()  
        intent.putExtra("INTENT_CONTACT_ID_EXTRA_NAME", contact.id)  
        activityRule.launchActivity(intent)  
    }  
}
```

```
class ChatTest {  
    @get:Rule  
    val activityRule = ActivityTestRule(ChatActivity::class.java, false, false)  
    @Before  
    fun prepareData() {  
        MessageRepository.clearChatMessages(contact.id)  
        val intent = Intent()  
        intent.putExtra("INTENT_CONTACT_ID_EXTRA_NAME", contact.id)  
        activityRule.launchActivity(intent)  
    }  
}
```



```
class ChatTest {  
    @get:Rule  
    val activityRule = ActivityTestRule(ChatActivity::class.java, false, false)  
    @Before  
    fun prepareData() {  
        MessageRepository.clearChatMessages(contact.id)  
        val intent = Intent()  
        intent.putExtra("INTENT_CONTACT_ID_EXTRA_NAME", contact.id)  
        activityRule.launchActivity(intent)  
    }  
    @Test  
    fun sendMessageWithLink() {  
        ChatPage().sendMessage("message with link vk.com")  
    }  
}
```

```
class ChatTest {  
    @get:Rule  
    val activityRule = ActivityTestRule(ChatActivity::class.java, false, false)  
    @Before  
    fun prepareData() {  
        MessageRepository.clearChatMessages(contact.id)  
        val intent = Intent()  
        intent.putExtra("INTENT_CONTACT_ID_EXTRA_NAME", contact.id)  
        activityRule.launchActivity(intent)  
    }  
    @Test  
    fun sendMessageWithLink() {...}  
}
```

```
class ChatTest {
    @get:Rule
    val activityRule = ActivityTestRule(ChatActivity::class.java, false, false)

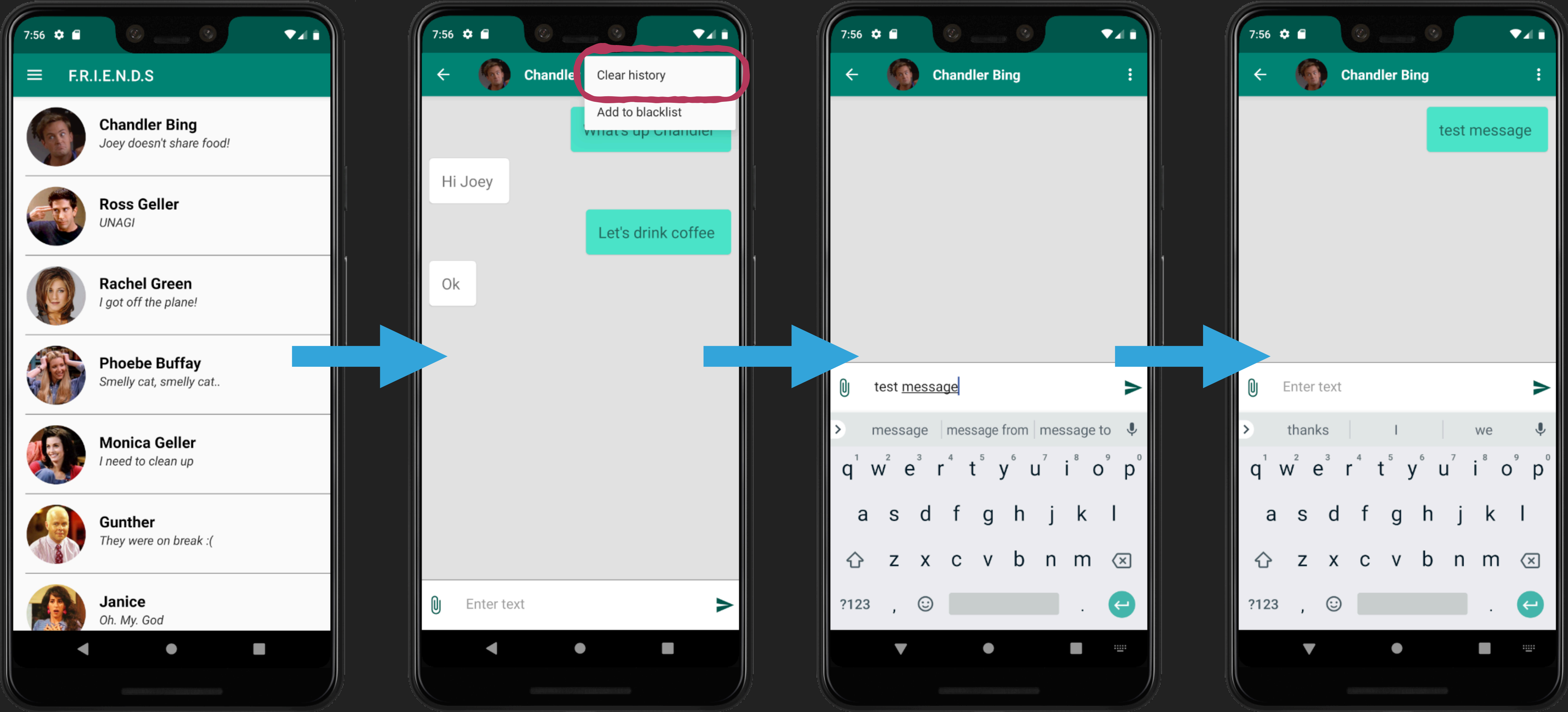
    val setupRule = SetupTearDownRule()
        .addSetUp {
            MessageRepository.clearChatMessages(contact.id)
            val intent = Intent()
            intent.putExtra("INTENT_CONTACT_ID_EXTRA_NAME", contact.id)
            activityRule.launchActivity(intent)
        }

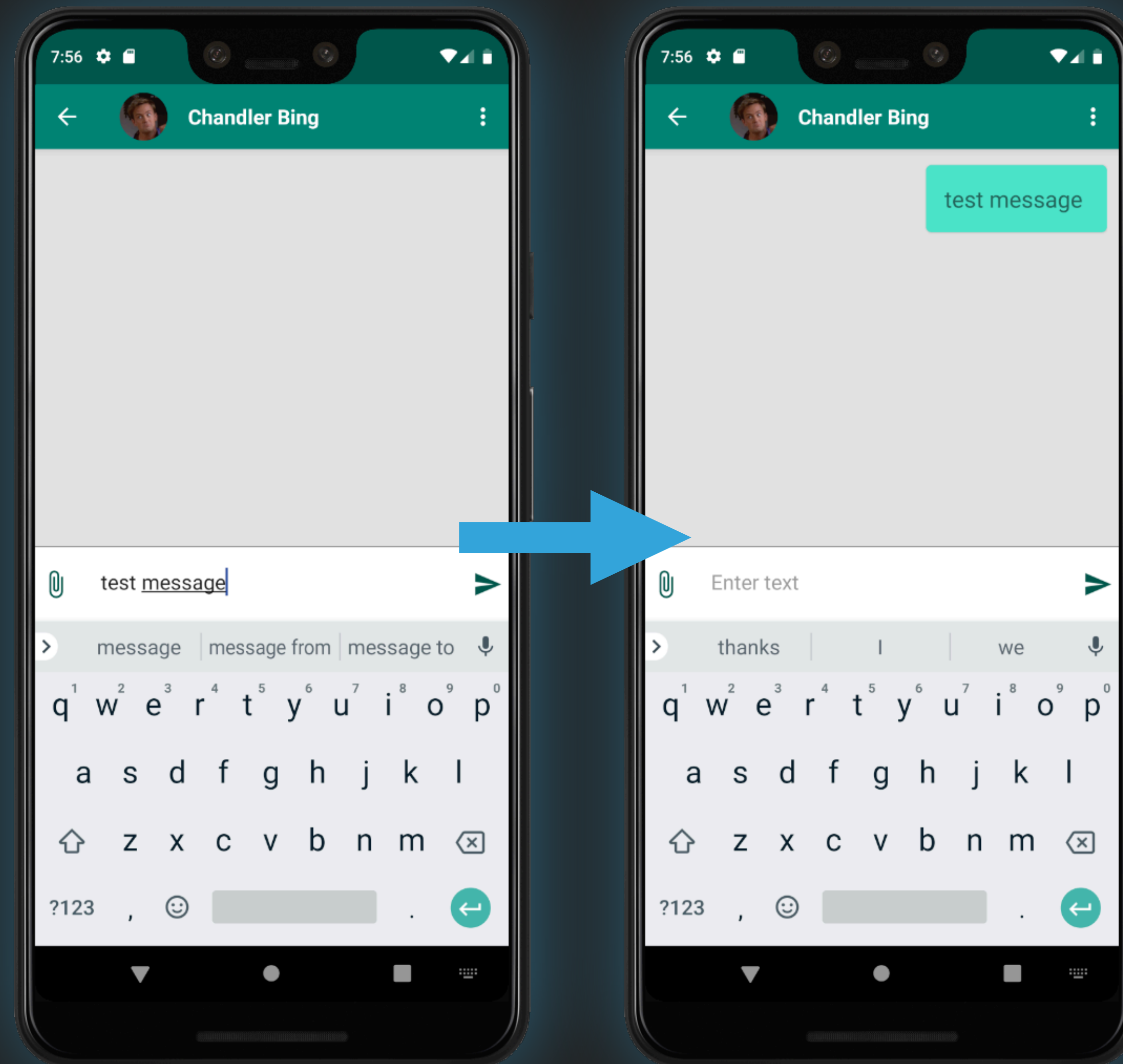
    @Test
    fun sendMessageWithLink() {...}
}
```



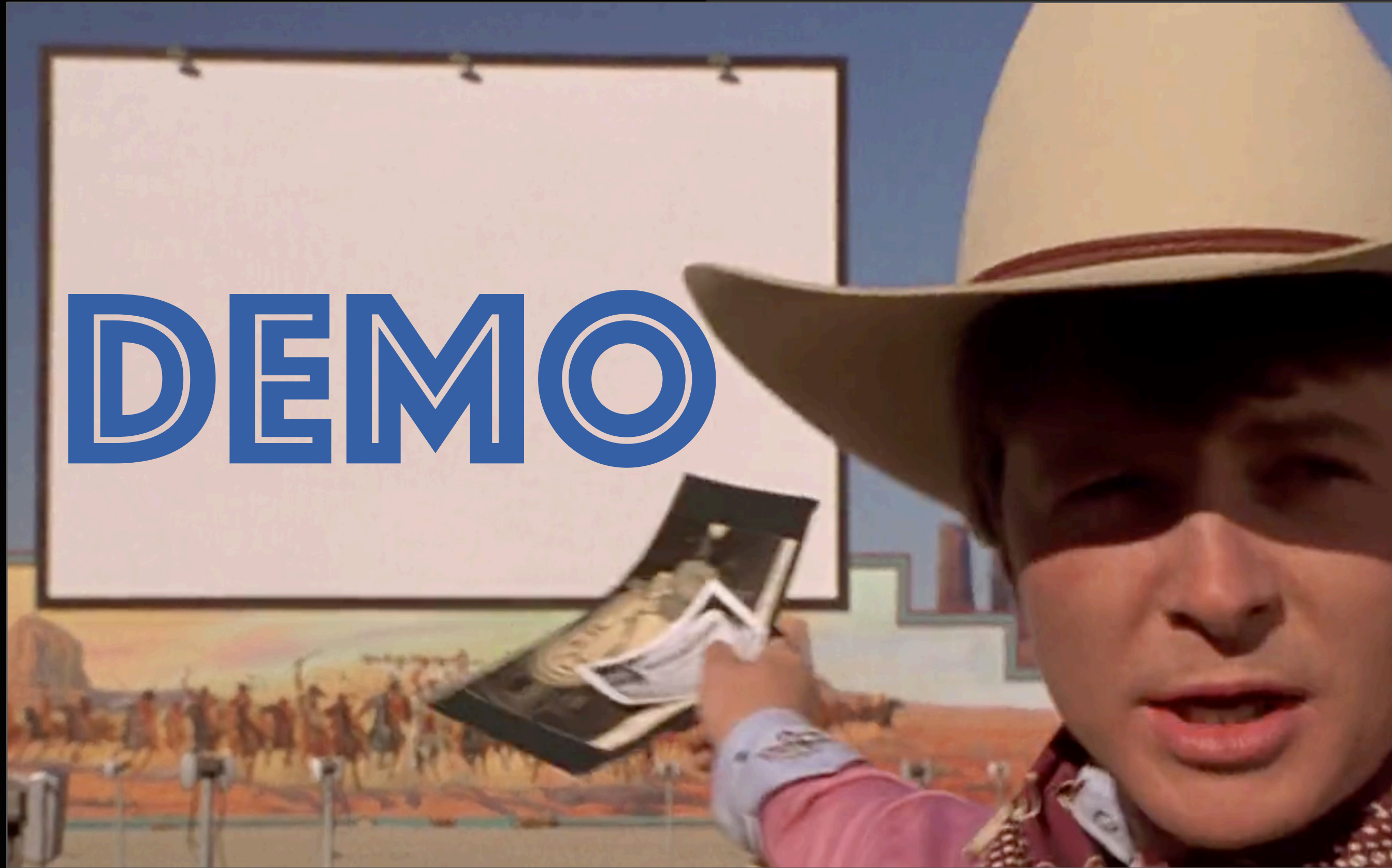
```
class ChatTest {  
    @get:Rule  
    val activityRule = ActivityTestRule(ChatActivity::class.java, false, false)  
  
    val setupRule = SetupTearDownRule()  
        .addSetUp {  
            MessageRepository.clearChatMessages(contact.id)  
            val intent = Intent()  
            intent.putExtra("INTENT_CONTACT_ID_EXTRA_NAME", contact.id)  
            activityRule.launchActivity(intent)  
        }  
    @Test  
    fun sendMessageWithLink() {...}  
}
```

```
class ChatTest {  
    val activityRule = ActivityTestRule(ChatActivity::class.java, false, false)  
    val setupRule = SetupTearDownRule()  
        .addSetup {  
            MessageRepository.clearChatMessages(contact.id)  
            val intent = Intent()  
            intent.putExtra("INTENT_CONTACT_ID_EXTRA_NAME", contact.id)  
            activityRule.launchActivity(intent)  
        }  
  
    @get:Rule  
    val ruleSequence = RuleSequence(setupRule, activityRule)  
  
    @Test  
    fun sendMessageWithLink() {...}  
}
```





DEMO




```

private val specialCharsMessage = Message(CURRENT_USER.id, contact.id, text: "!@#\$%^&*(){}: \", . / < > ? _ + = %")

private val activityTestRule: CustomActivityTestRule<ChatActivity> = CustomActivityTestRule(ChatActivity::class)
private val setUpTearDownRule: SetupTearDownRule = SetupTearDownRule()

    .addSetup {
        MessageRepository.clearChatMessages(contact.id)
    }
    .addSetup(ADD_SIMPLE_MESSAGE) {
        MessageRepository.addChatMessage(contact.id, simpleMessage)
    }
    .addSetup(ADD_SPECIAL_CHARS_MESSAGE) {
        MessageRepository.addChatMessage(contact.id, specialCharsMessage)
    }
    .addSetup {
        AccountManager(InstrumentationRegistry.getInstrumentation().targetContext).login(
            CURRENT_USER.login,
            CURRENT_USER.password
        )
        val intent: Intent = Intent().putExtra(INTENT_CONTACT_ID_EXTRA_NAME, contact.id)
        activityTestRule.launchActivity(intent)
    }

init {
    ruleSequence.add(setUpTearDownRule, activityTestRule)
}

@Test
fun sendMessageWithLink(){
    val message = "message with link vk.com"
}

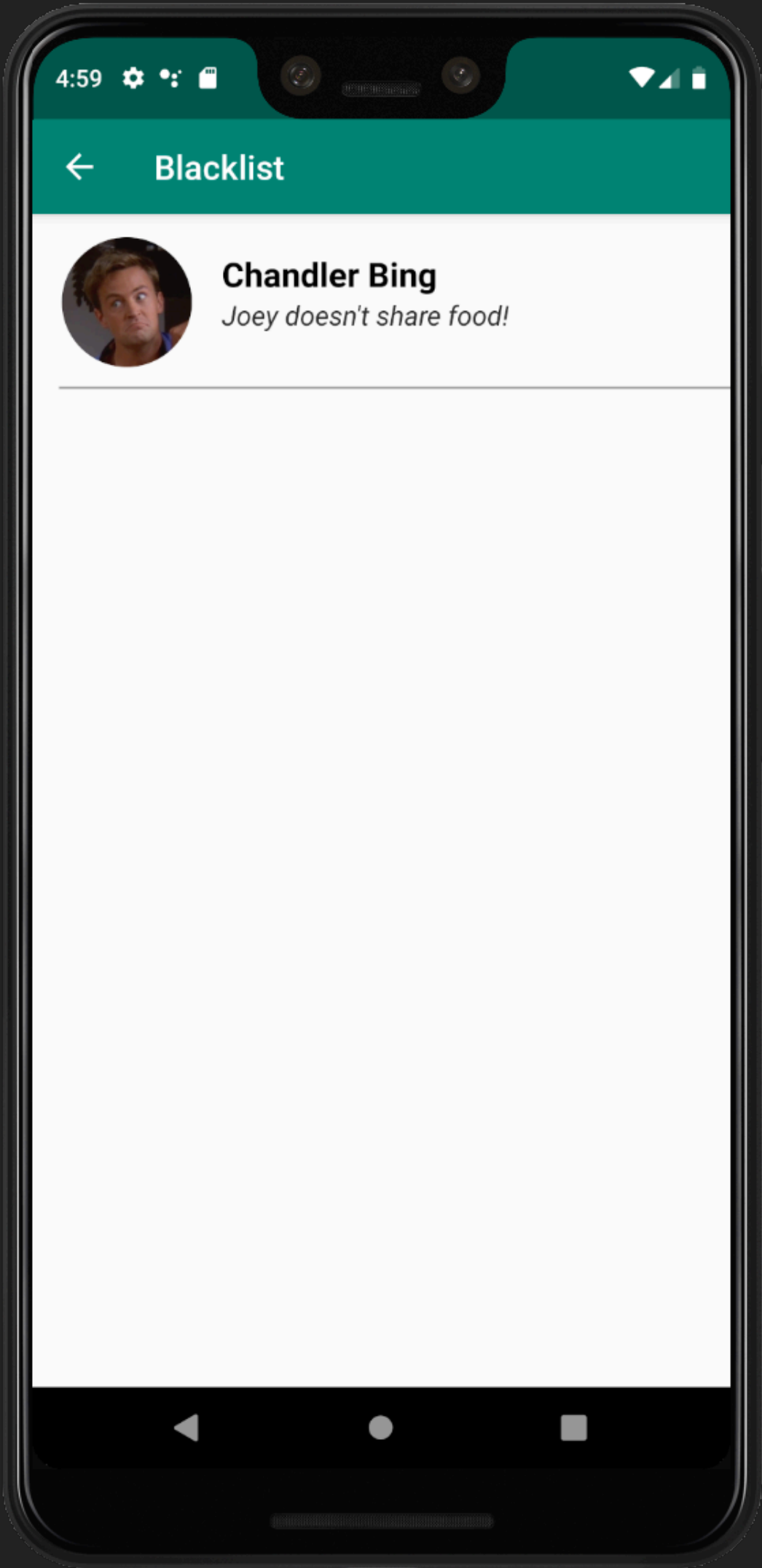
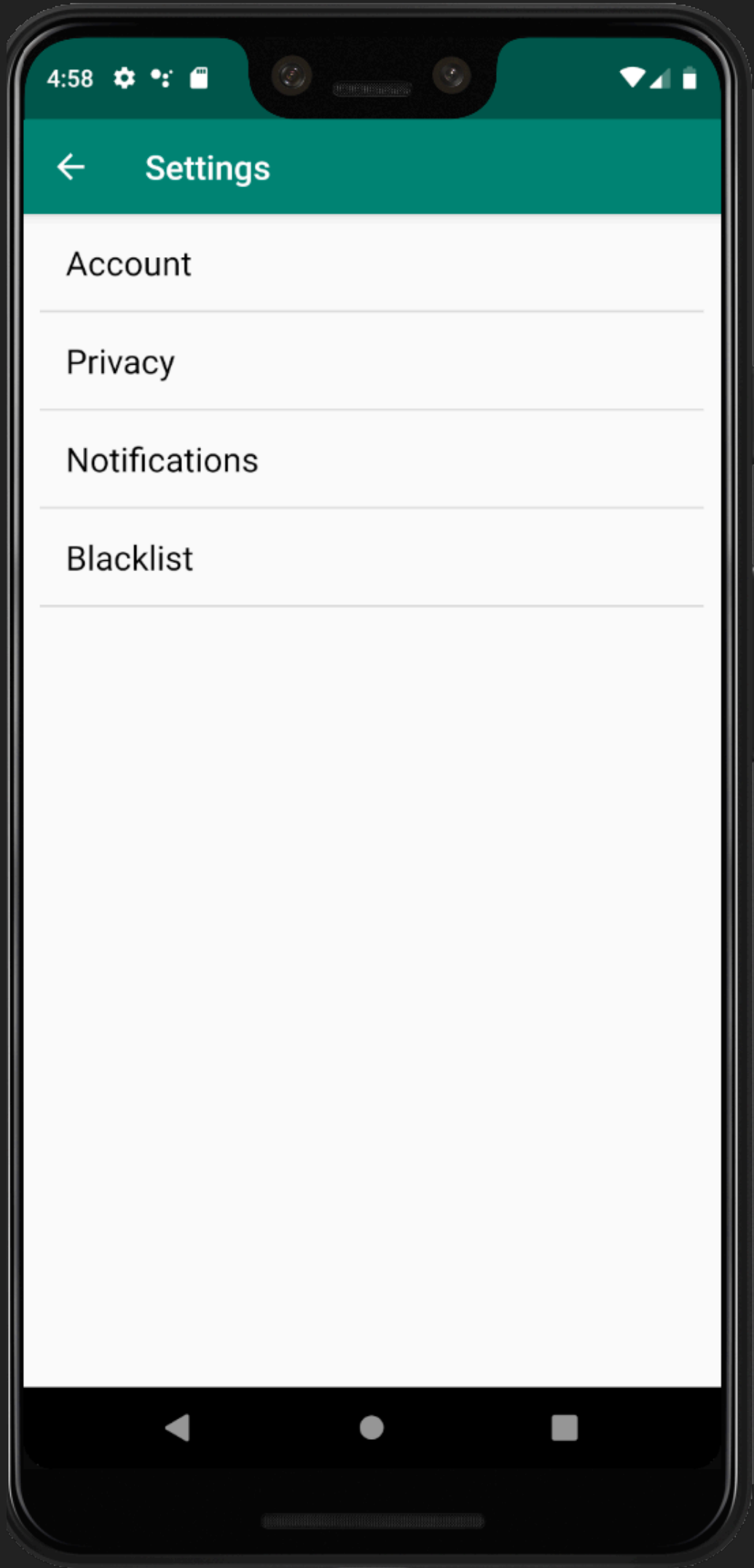
```

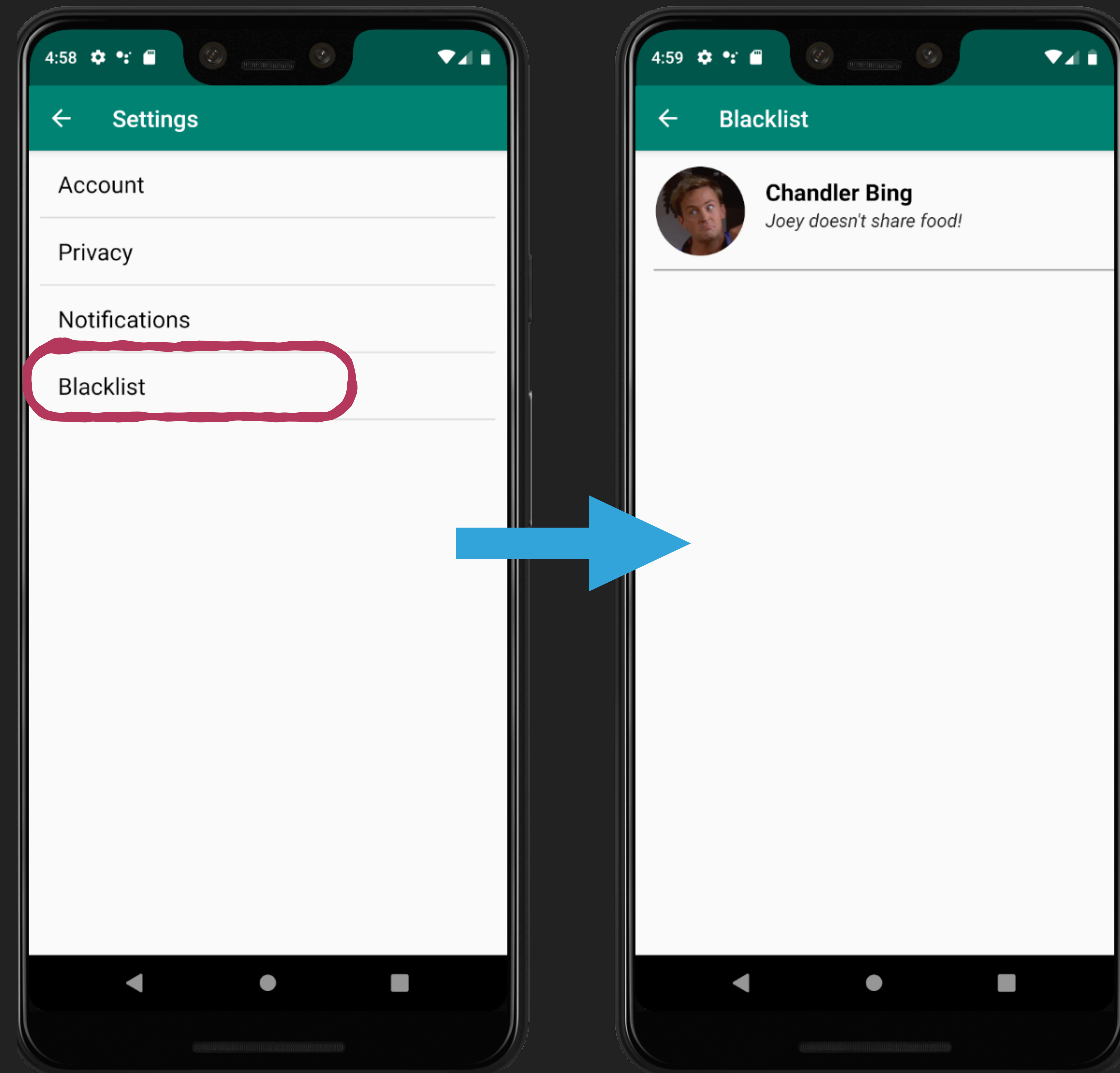

SOLUTION: SHORT TEST

```
class ChatTest {  
    @Test  
    fun sendMessageWithLink() {  
        ChatPage().sendMessage("message with link vk.com")  
    }  
}
```

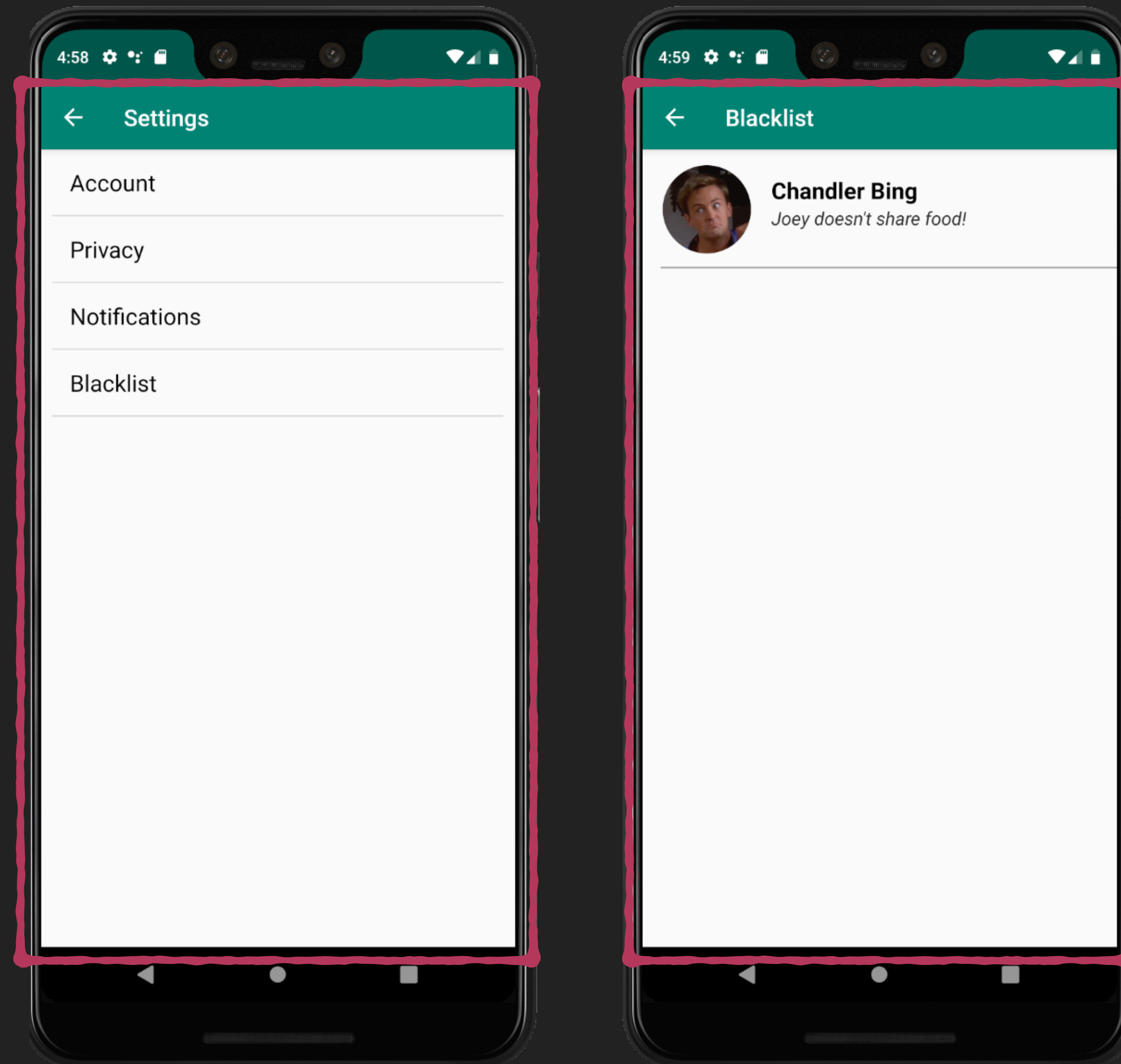
WHAT CAN I DO WITH FRAGMENTS?





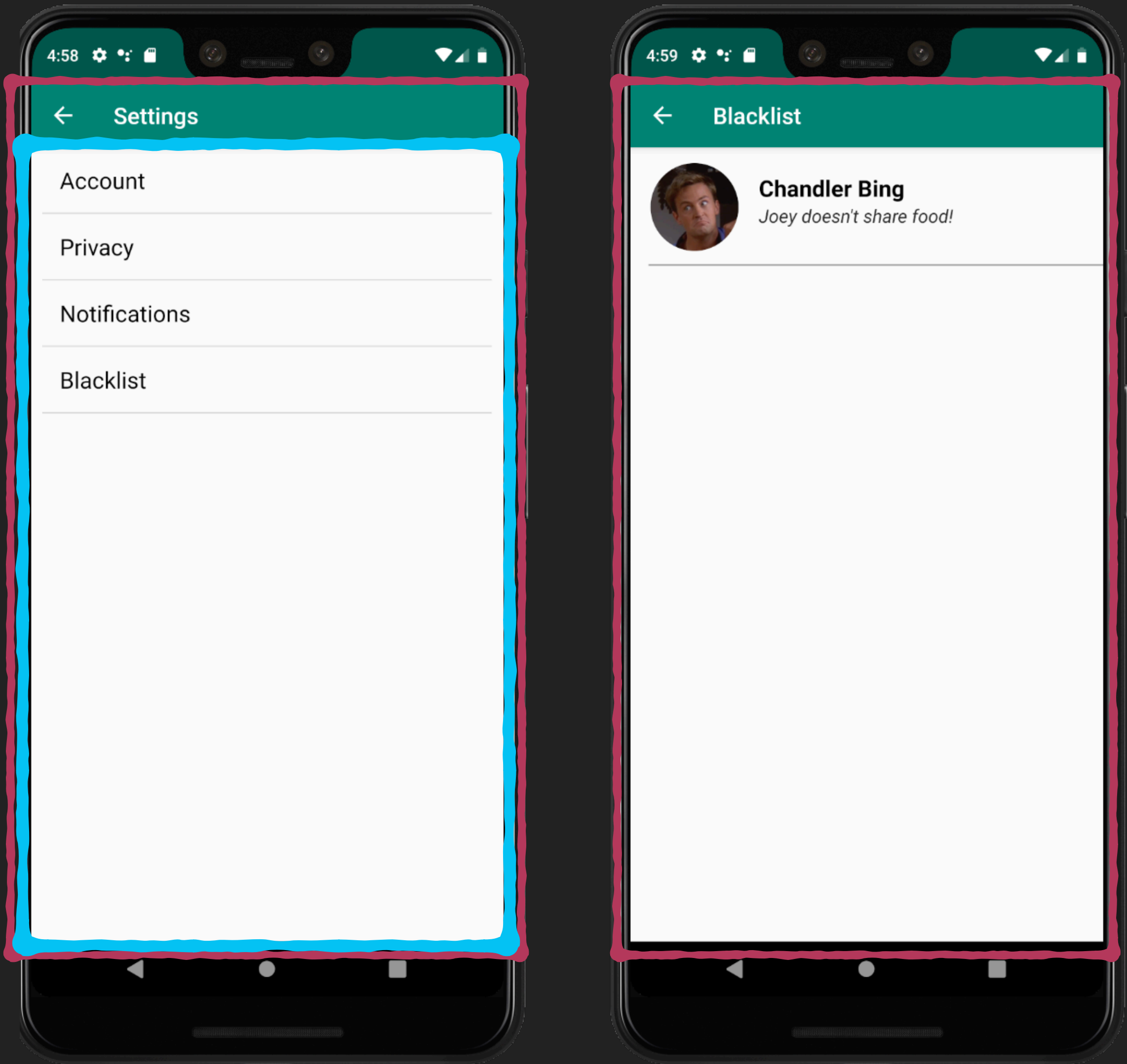


SettingsActivity



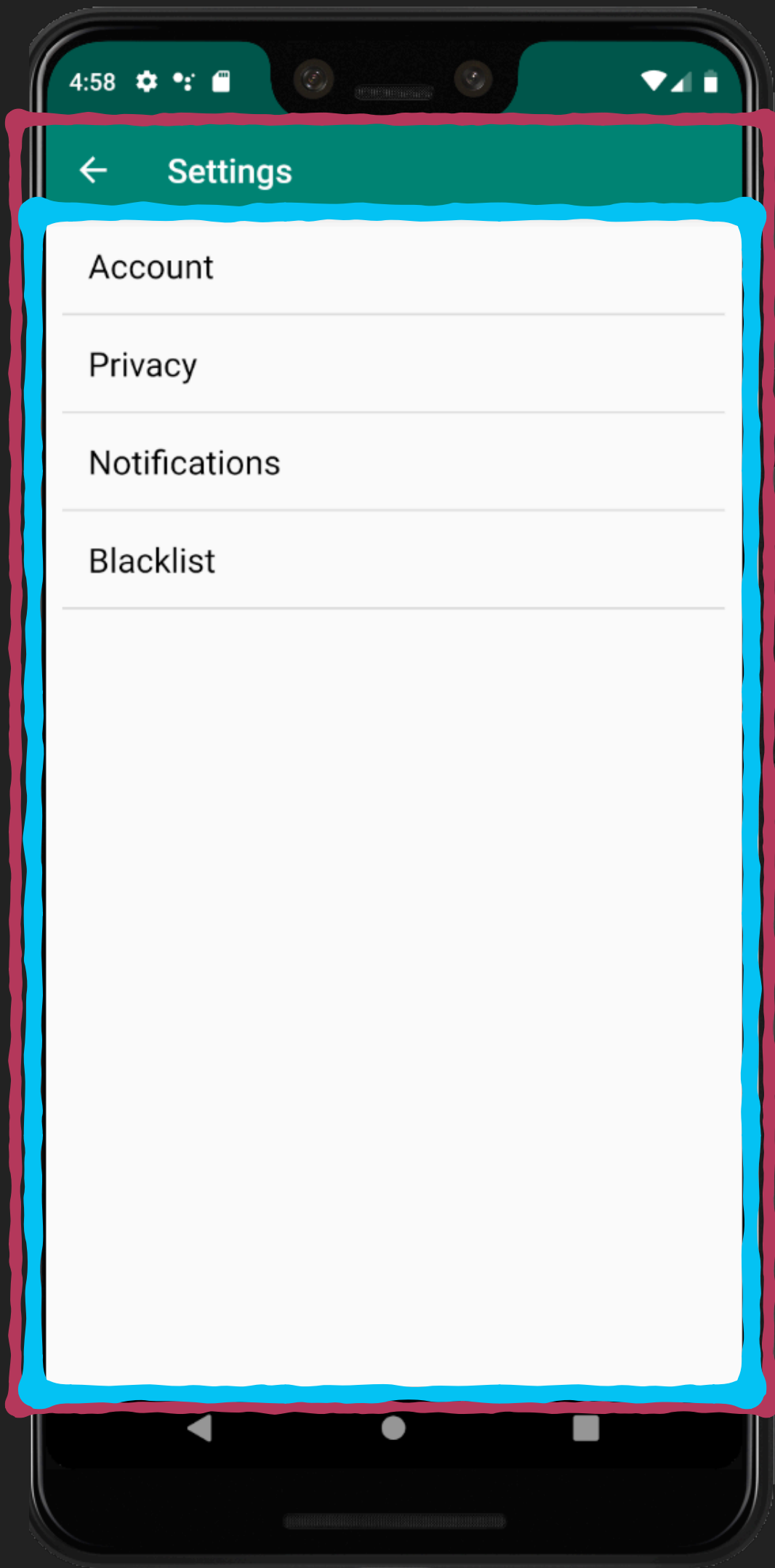
SettingsActivity

SettingsListFragment

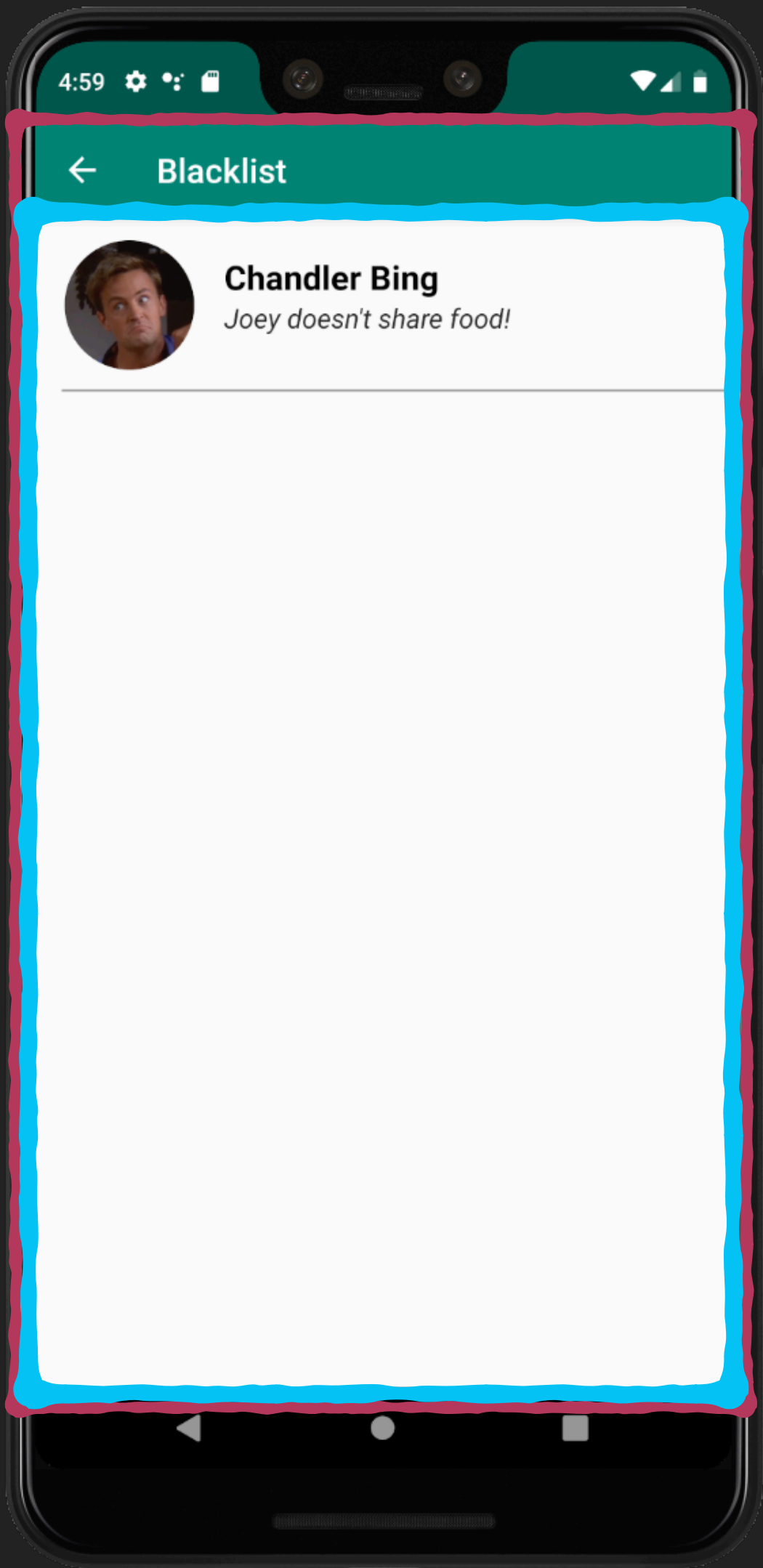


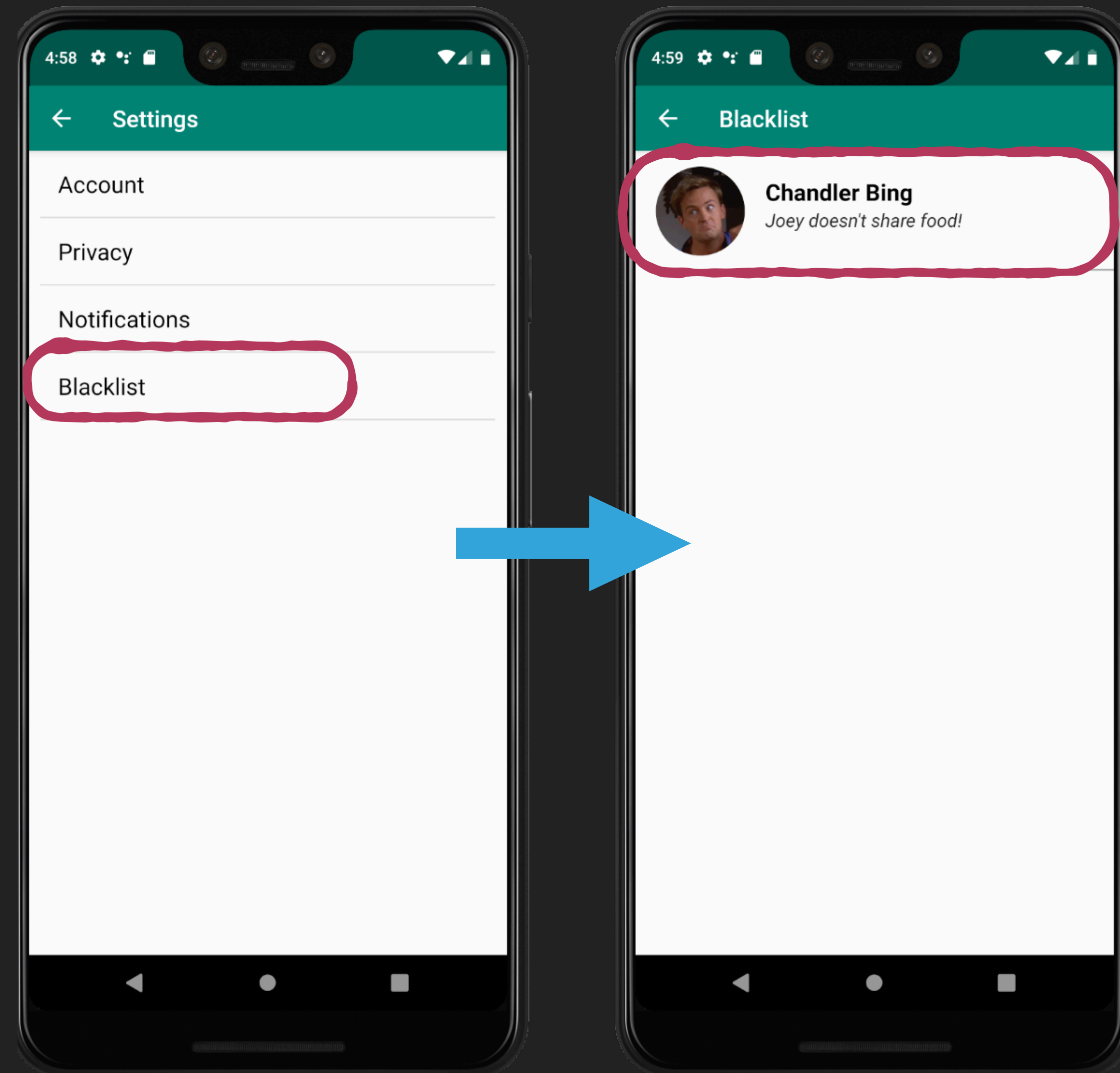
SettingsActivity

SettingsListFragment



BlacklistFragment





```
class BlacklistTests {  
    ...  
    @get:Rule  
    val ruleSequence = RuleSequence(setupRule, activityRule)  
}
```



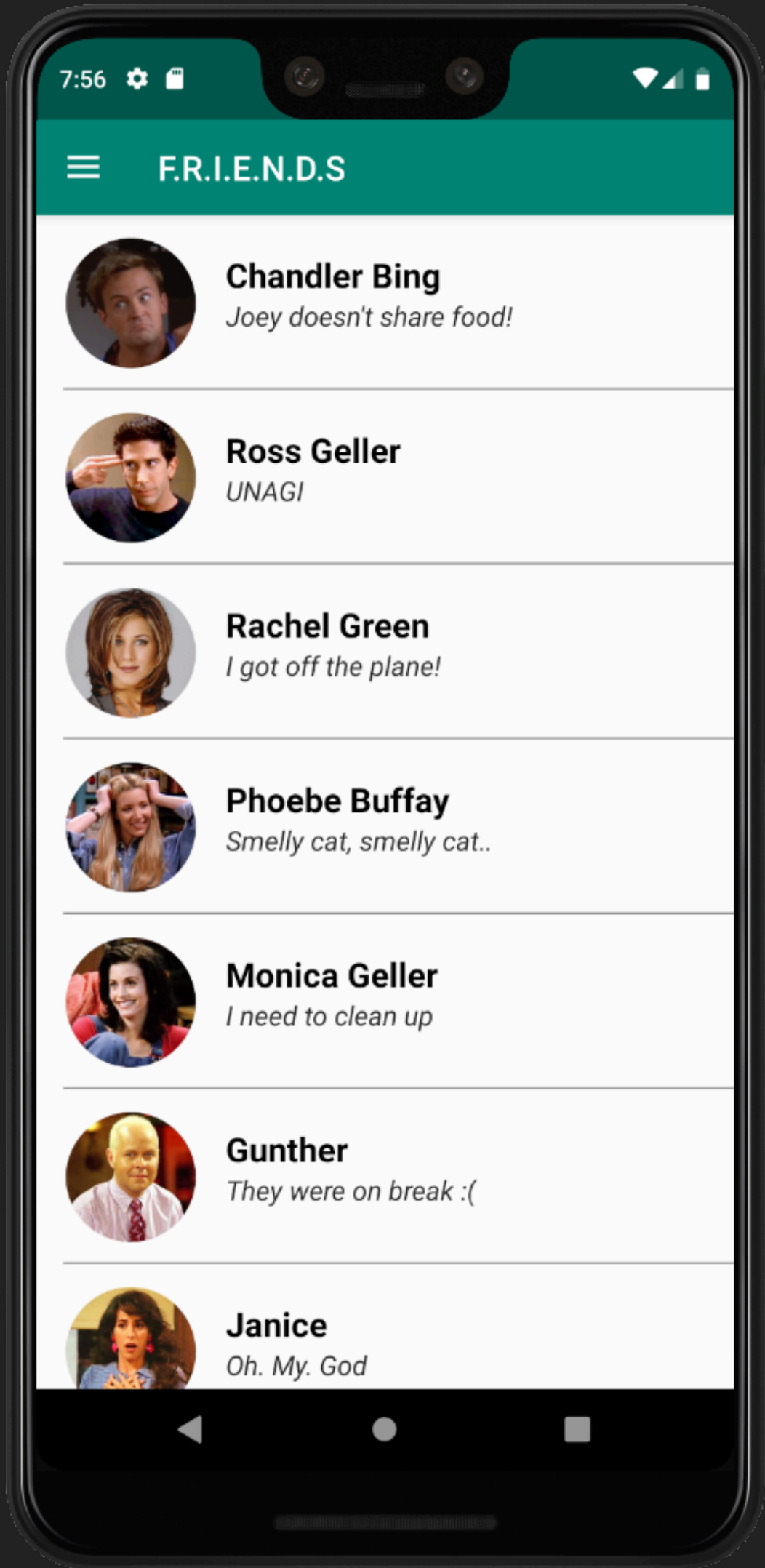
```
class BlacklistTests {  
    ...  
    @get:Rule  
    val ruleSequence = RuleSequence(setupRule, activityRule)  
    @Before  
    fun openFragment(){  
        activityRule.runOnUiThread {  
            SettingsFragmentNavigator.go(BlacklistFragment::class.java)  
        }  
    }  
}
```

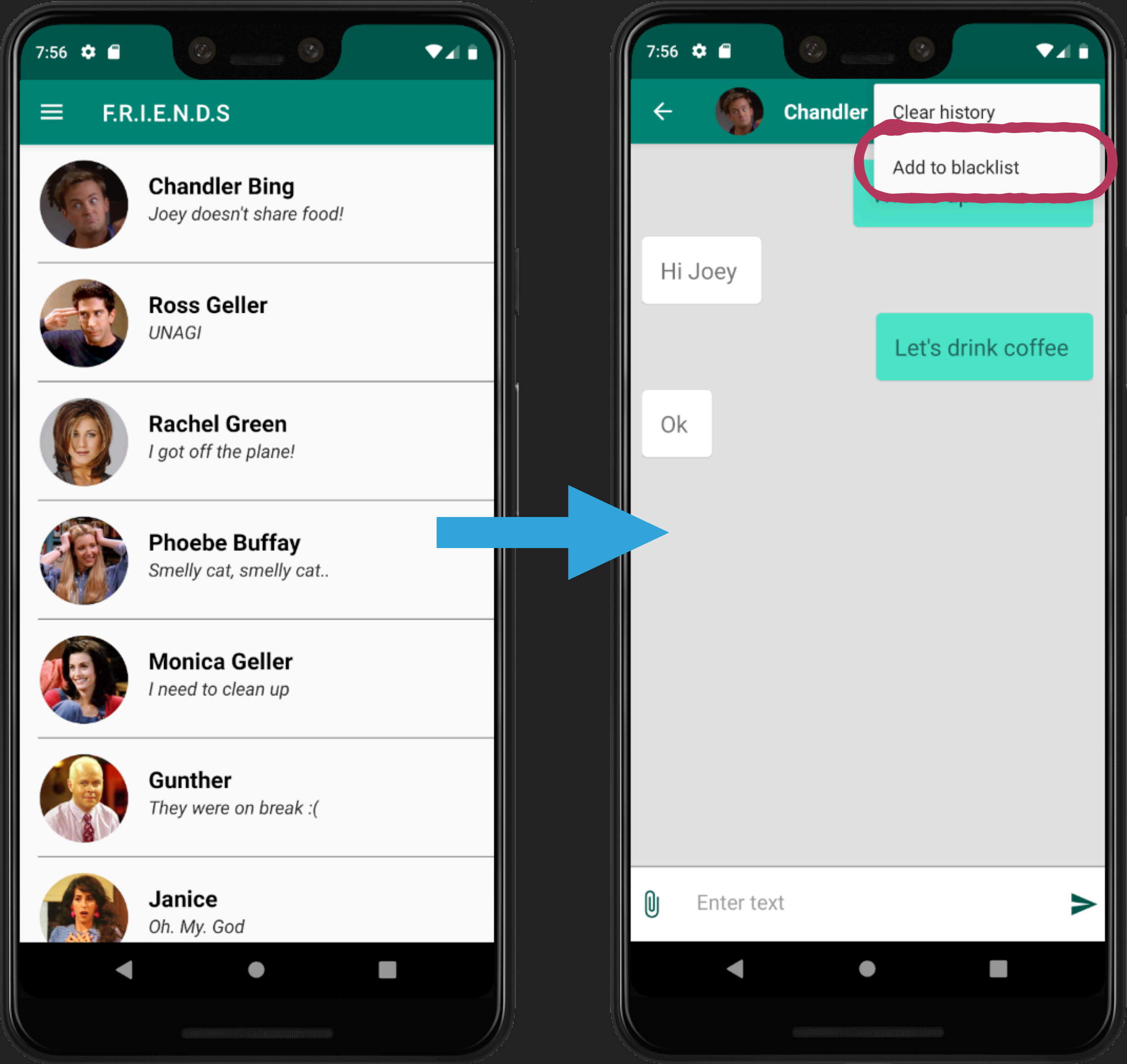
```
class BlacklistTests {  
    ...  
    @get:Rule  
    val ruleSequence = RuleSequence(setupRule, activityRule)  
    @Before  
    fun openFragment(){  
        activityRule.runOnUiThread {  
            SettingsFragmentNavigator.go(BlacklistFragment::class.java)  
        }  
    }  
}
```

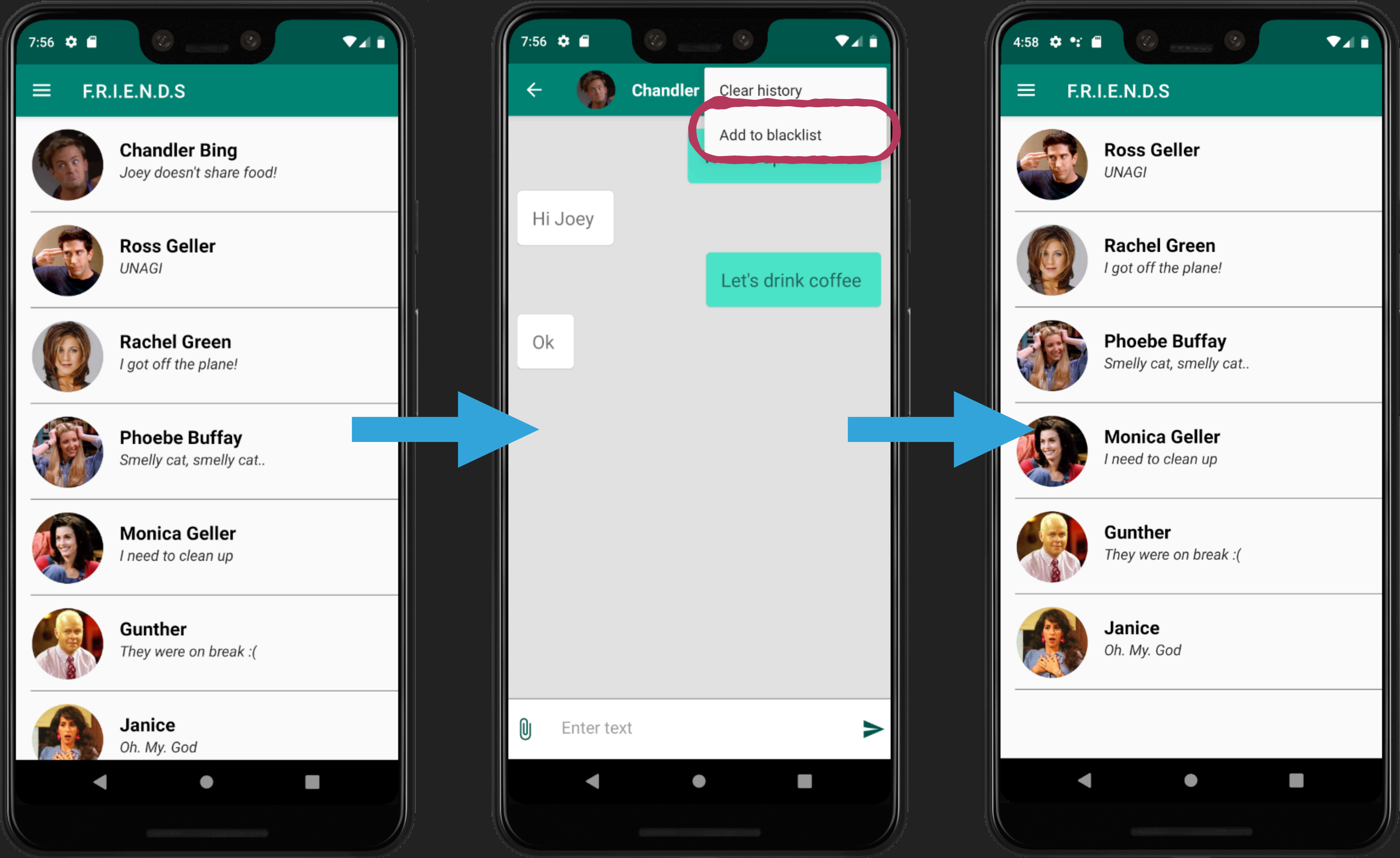
```
class BlacklistTests {  
    ...  
    @get:Rule  
    val ruleSequence = RuleSequence(setupRule, activityRule)  
    @Before  
    fun openFragment(){  
        activityRule.runOnUiThread {  
            SettingsFragmentNavigator.go(BlacklistFragment::class.java)  
        }  
    }  
}
```

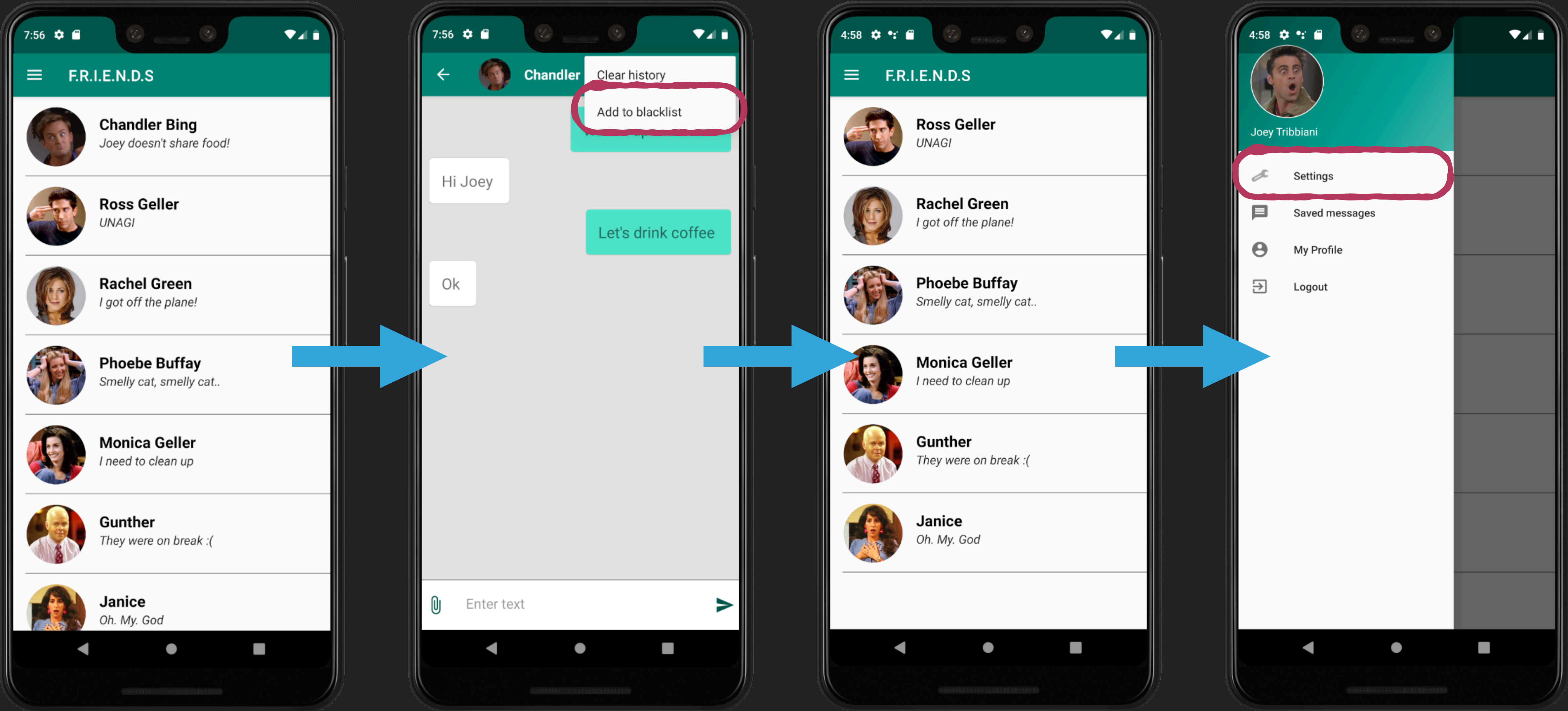


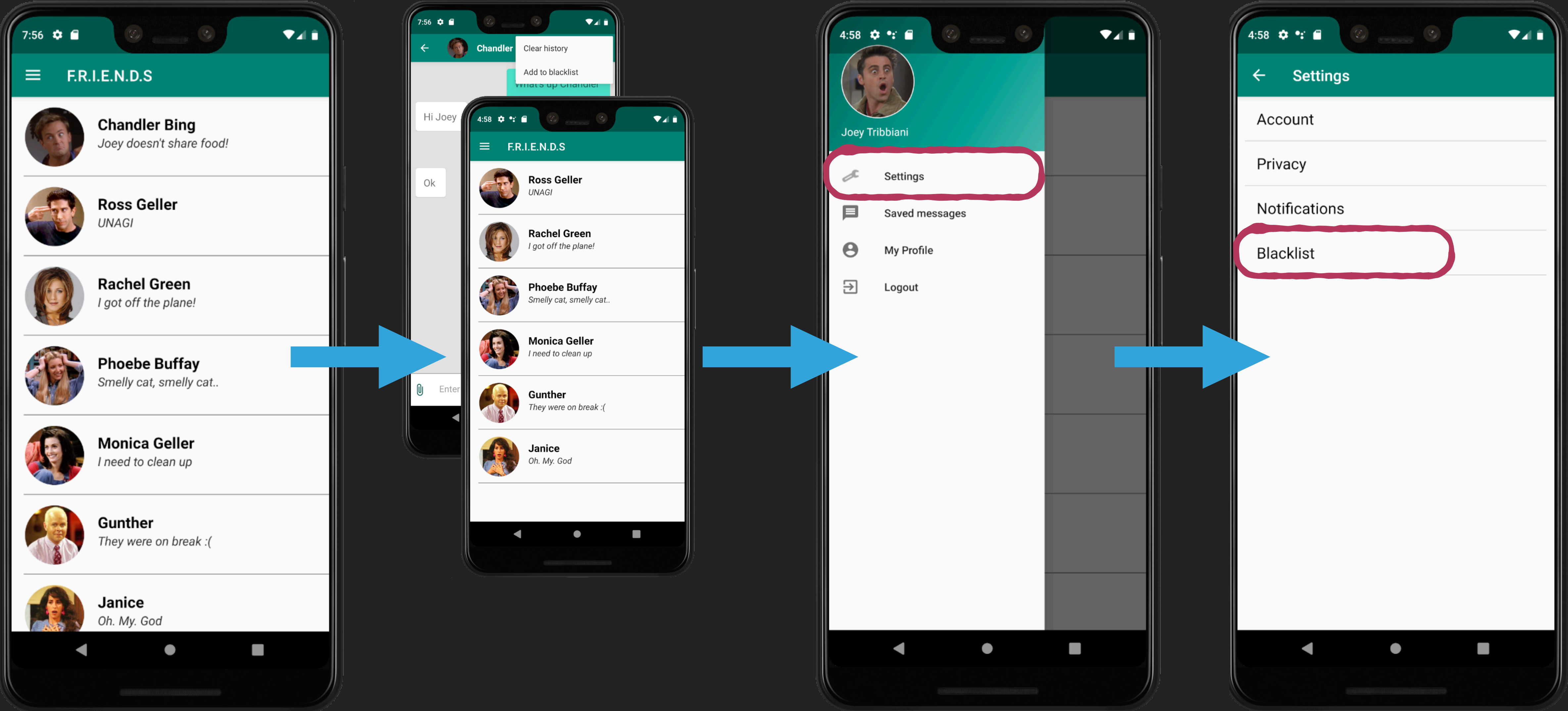
```
class BlacklistTests {  
    ...  
    @get:Rule  
    val ruleSequence = RuleSequence(setupRule, activityRule)  
        .addLast(SetupTearDownRule().addSetUp {  
            activityRule.runOnUiThread {  
                SettingsFragmentNavigator.go(BlacklistFragment::class.java)  
            }  
        })  
}
```

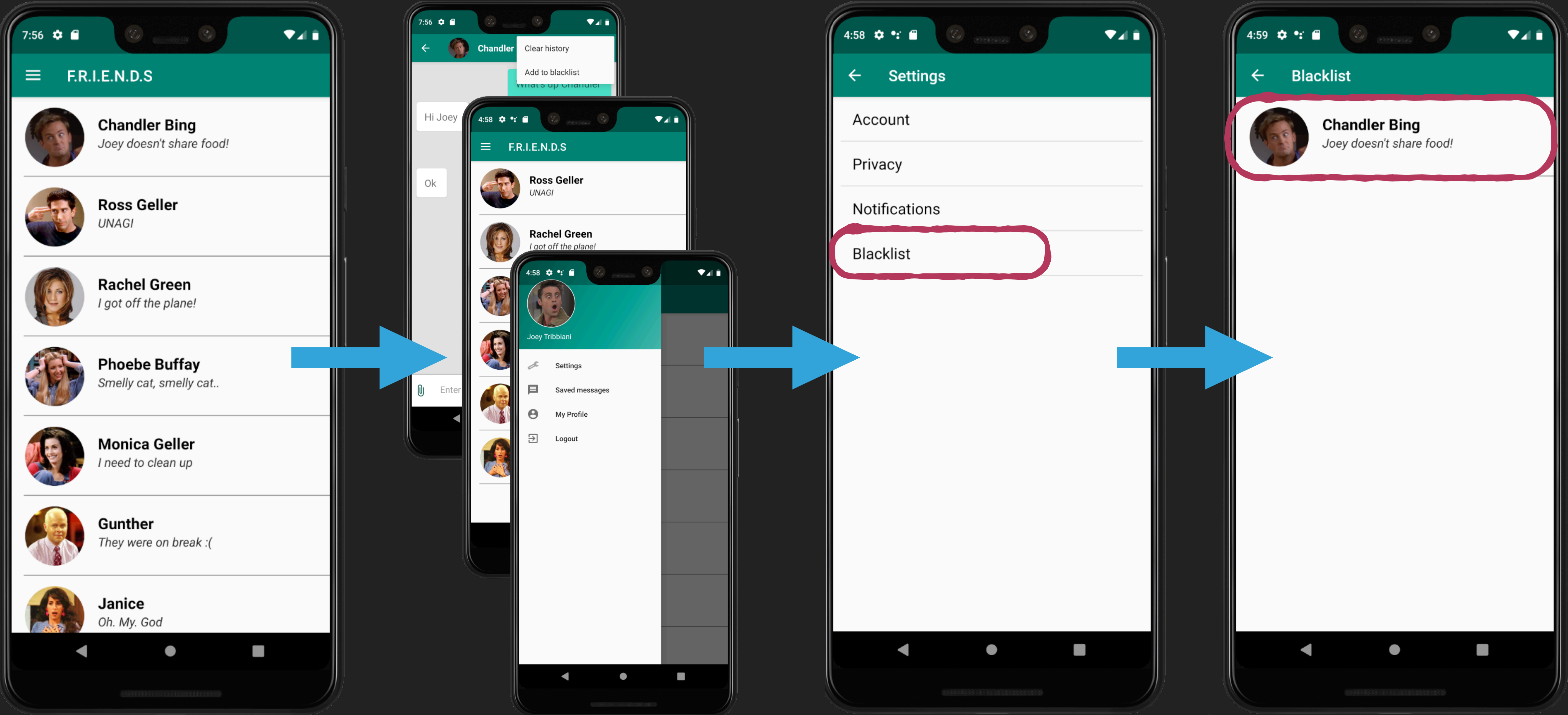


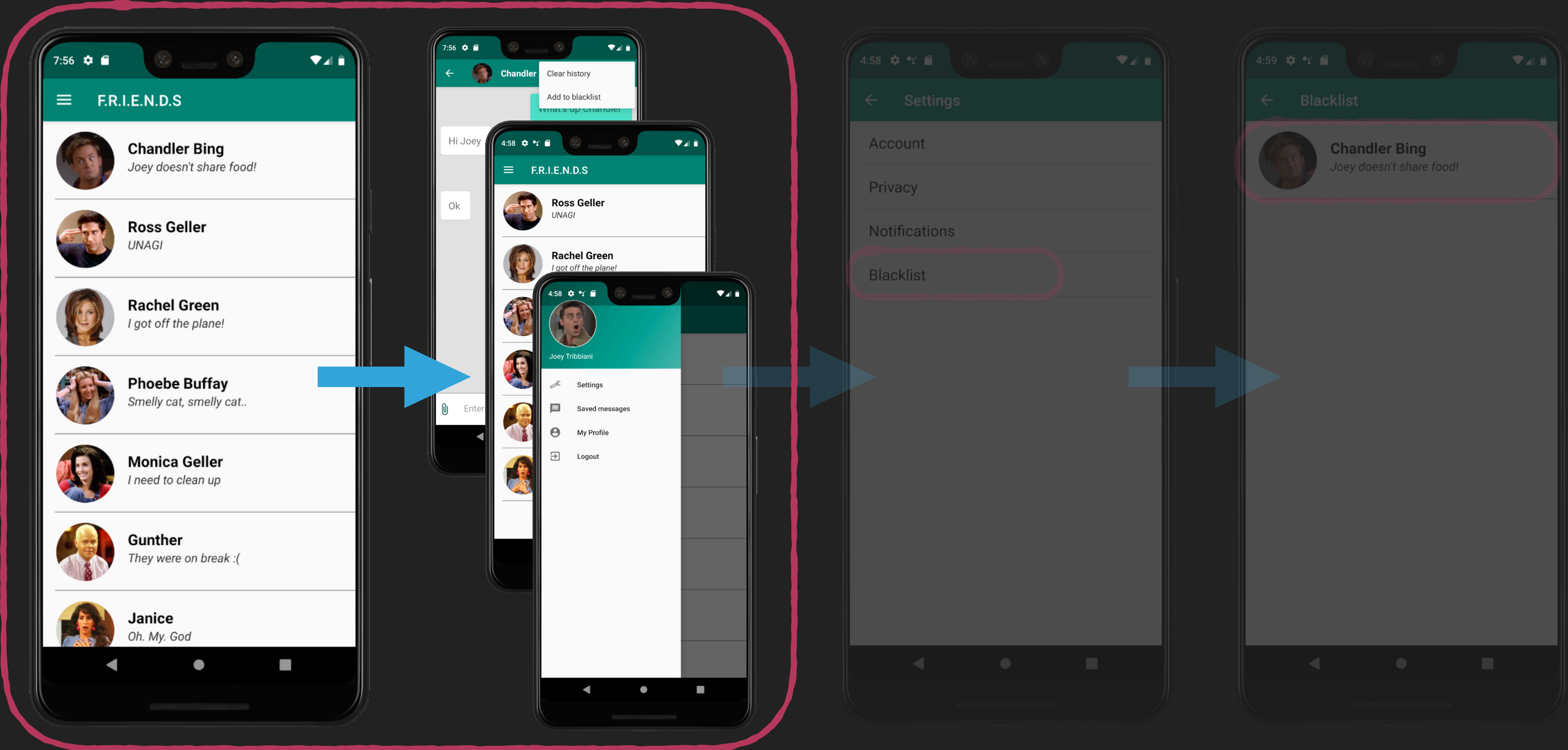










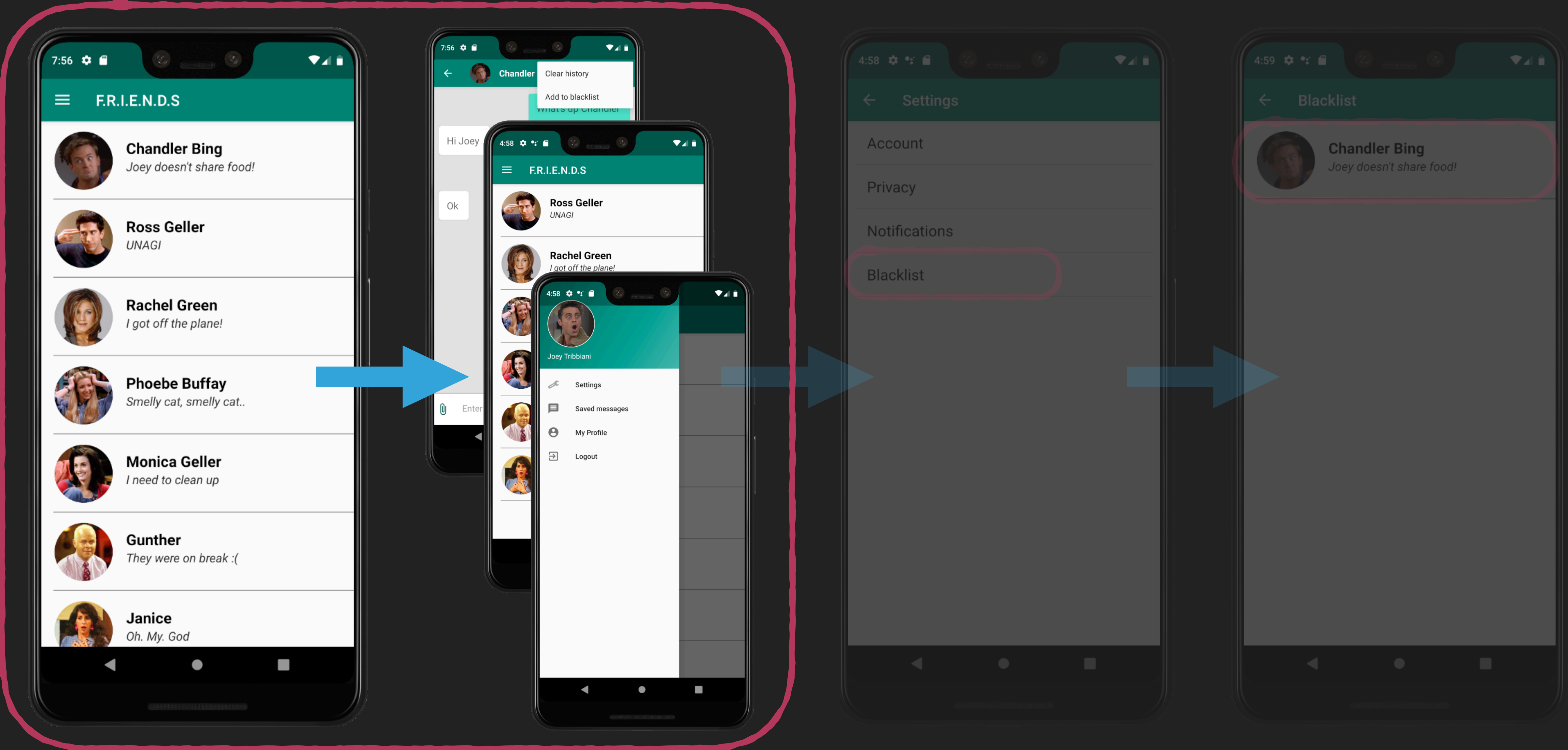


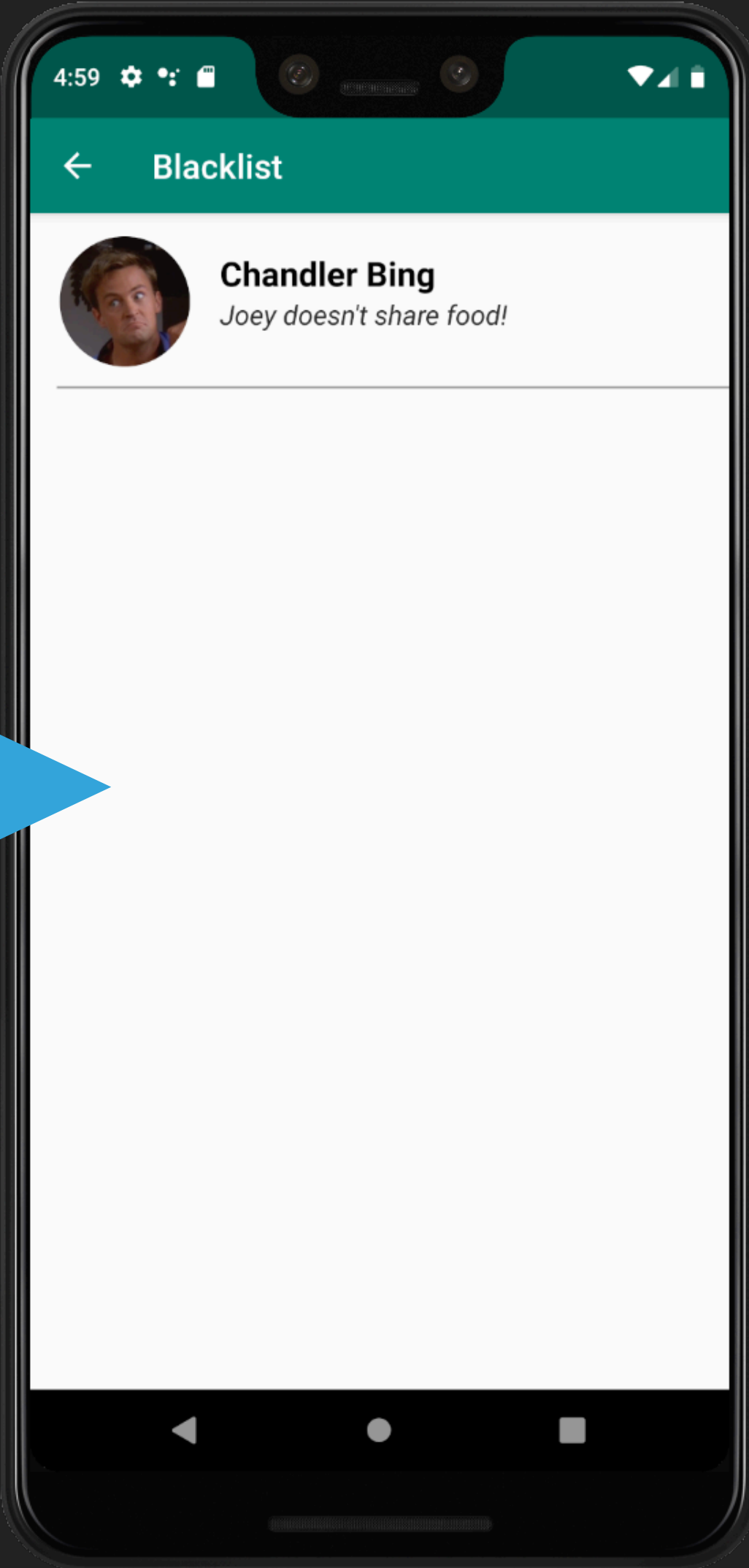
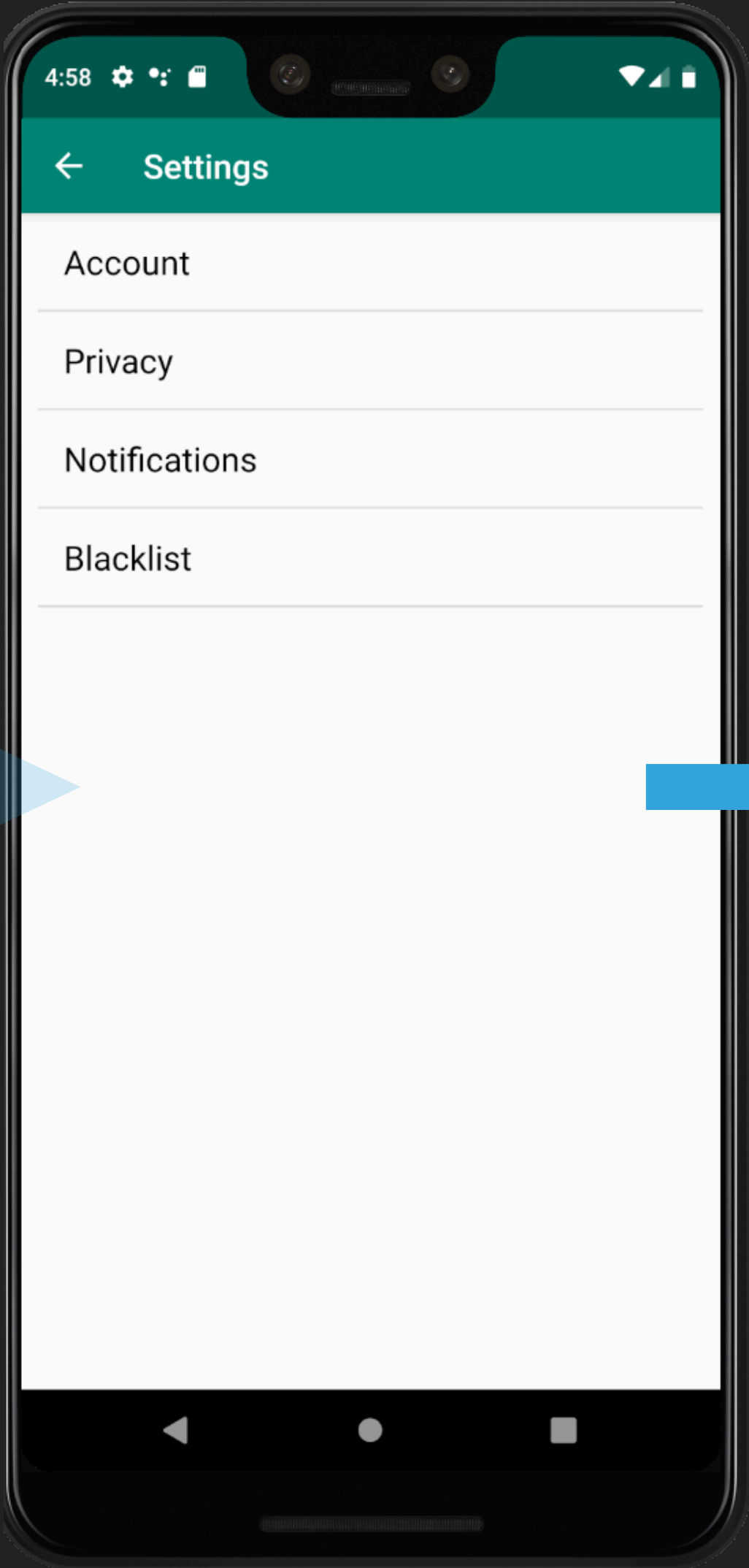
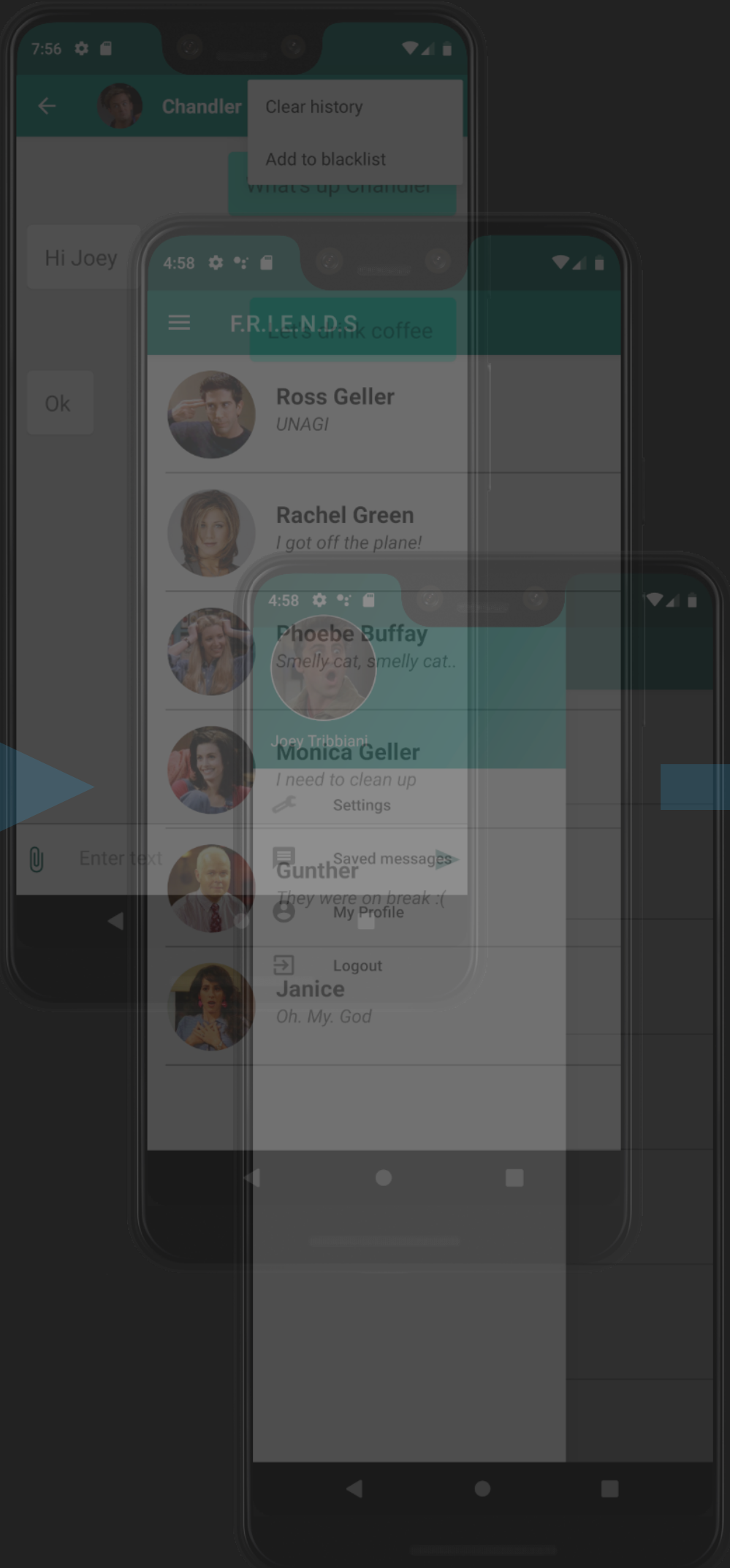
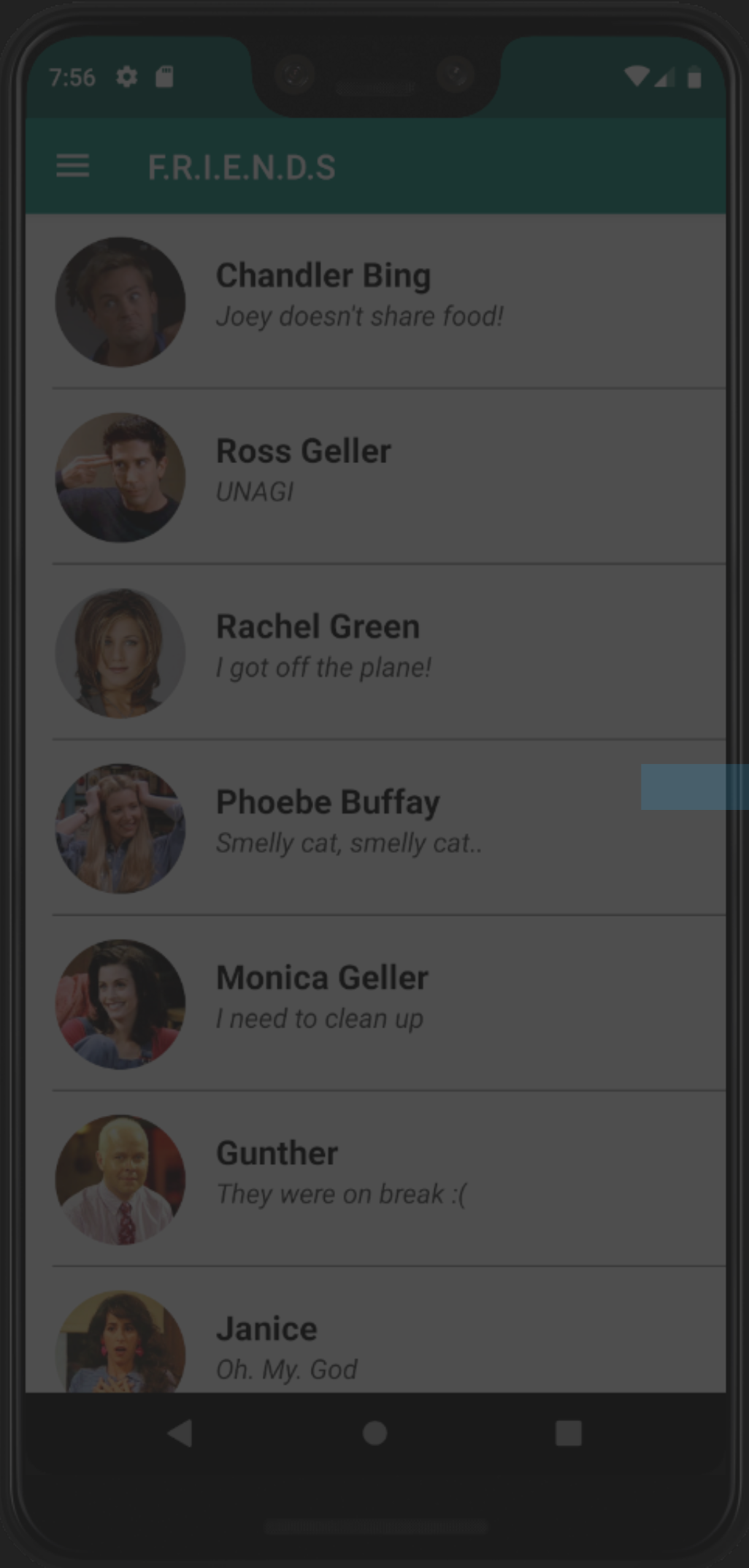
```
class BlacklistTests {  
    val activityRule = ActivityTestRule(SettingsActivity::class.java)  
    val setUpTearDownRule = SetUpTearDownRule()  
        .addSetUp {  
            ContactsRepository.clearBlacklist()  
            ContactsRepository.addToBlacklist(contact.id)  
        }  
    @get:Rule  
    val ruleSequence = RuleSequence(setupRule, activityRule)  
}
```



```
class BlacklistTests {  
    val activityRule = ActivityTestRule(SettingsActivity::class.java)  
    val setUpTearDownRule = SetUpTearDownRule()  
        .addSetUp {  
            ContactsRepositoty.clearBlacklist()  
            ContactsRepositoty.addToBlacklist(contact.id)  
        }  
    @get:Rule  
    val ruleSequence = RuleSequence(setupRule, activityRule)  
}
```

```
class BlacklistTests {  
    val activityRule = ActivityTestRule(SettingsActivity::class.java)  
    val setUpTearDownRule = SetUpTearDownRule()  
        .addSetUp {  
            ContactsRepository.clearBlacklist()  
            ContactsRepository.addToBlacklist(contact.id)  
        }  
    @get:Rule  
    val ruleSequence = RuleSequence(setupRule, activityRule)  
}
```





DEMO

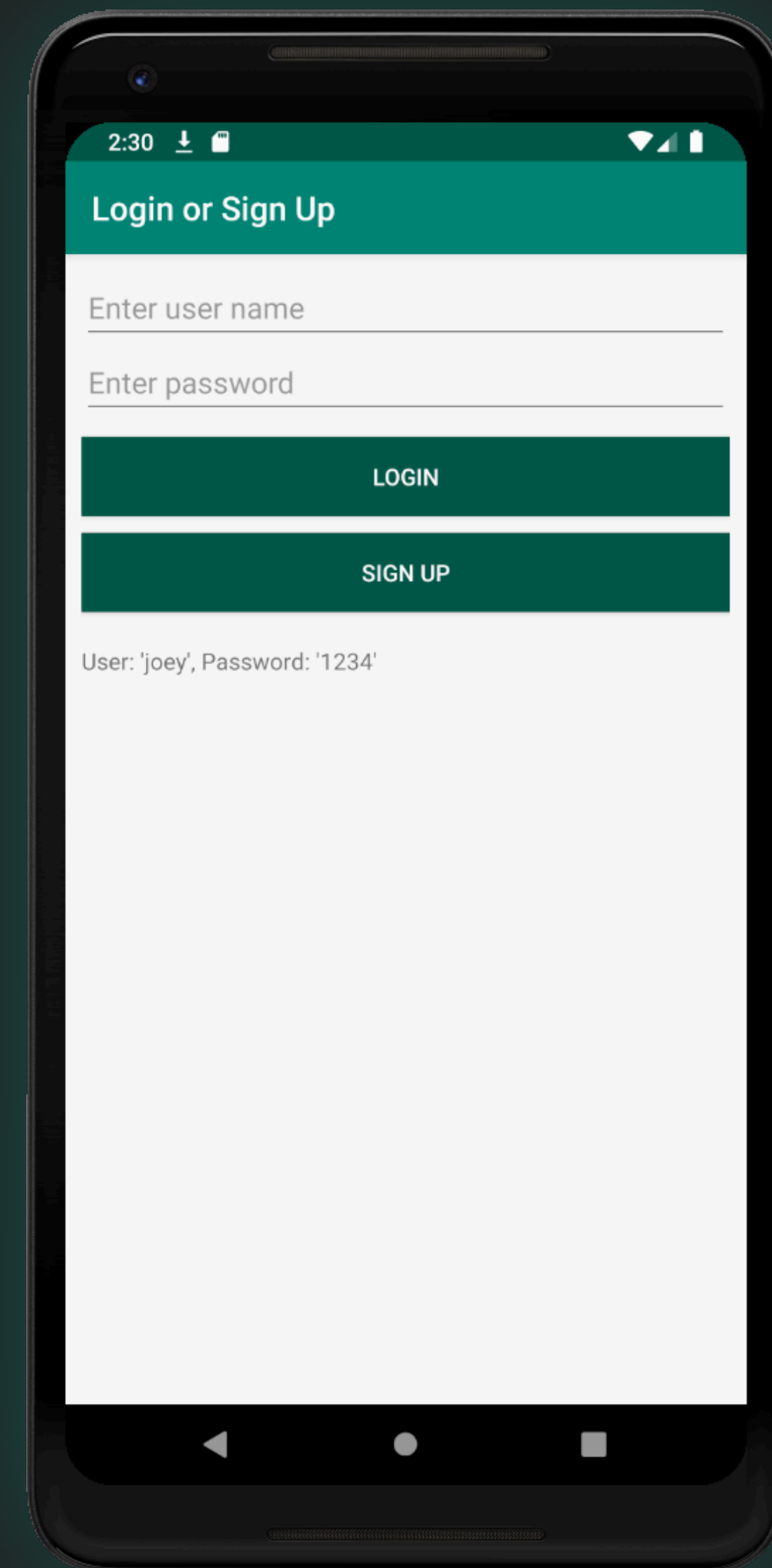



```
EspressoGuide [~/dev/espressoGuide] - .../app/src/androidTest/java/com/atiurin/espressoguide/tests/BlacklistTests.kt [app]
est > java > com > atiurin > espressoguide > tests > BlacklistTests testItemDisplayed...() Pixel 3 XL API 28
BlacklistTests.kt BlacklistPage.kt DemoEspressoTest.kt ChatPageTest.kt ChatPage.kt SetUpTearDownDemoTest.kt BaseTest.kt ScreenshotLifecycleListener.kt AbstractLifecycleListener.kt
6 .add(setUpTearDownRule, activityRule)
7 .addLast(SetupTearDownRule().addSetup {
8     activityRule.runOnUiThread {
9         SettingsFragmentNavigator.go(BlacklistFragment::class.java)
10    }
11 })
12
13 }
14
15 @Before
16 fun openFragment(){
17     activityRule.runOnUiThread {
18         SettingsFragmentNavigator.go(BlacklistFragment::class.java)
19     }
20 }
21
22 @DisplayName(value="when contact in blacklist then it displayed in blacklist")
23 @SetUp(CLEAR_BLACKLIST, ADD_CONTACT_TO_BLACKLIST)
24 @Test
25 fun testItemDisplayedInBlacklist() {
26     BlacklistPage().assertContactDisplayed(contact.name)
27 }
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SOLUTION: USE INTERNAL NAVIGATION MECHANISM

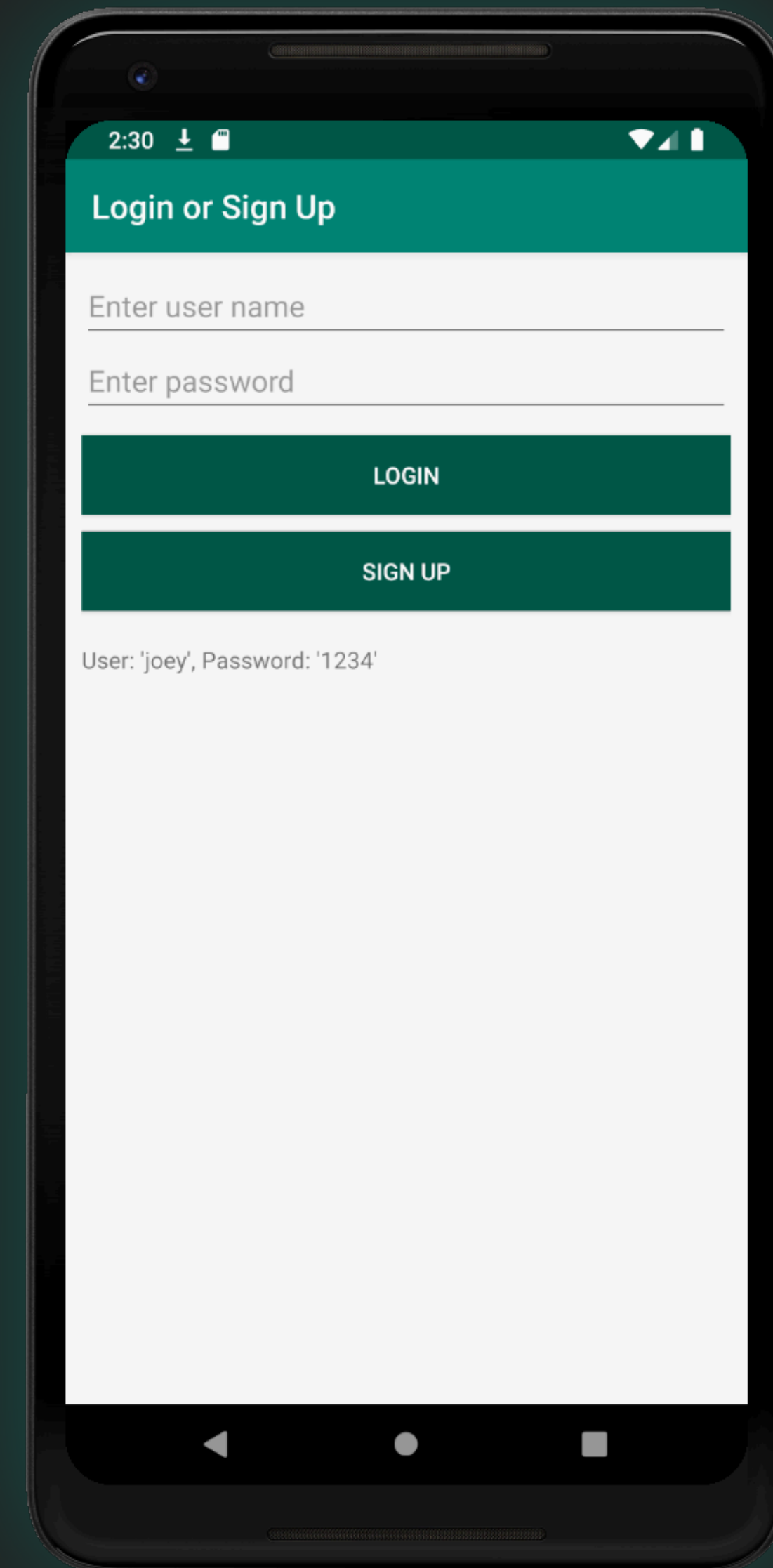
```
activityRule.runOnUiThread {  
    SettingsFragmentManager.go(BlacklistFragment::class.java)  
}
```

WHAT CAN I DO WITH LOGIN PROBLEM?



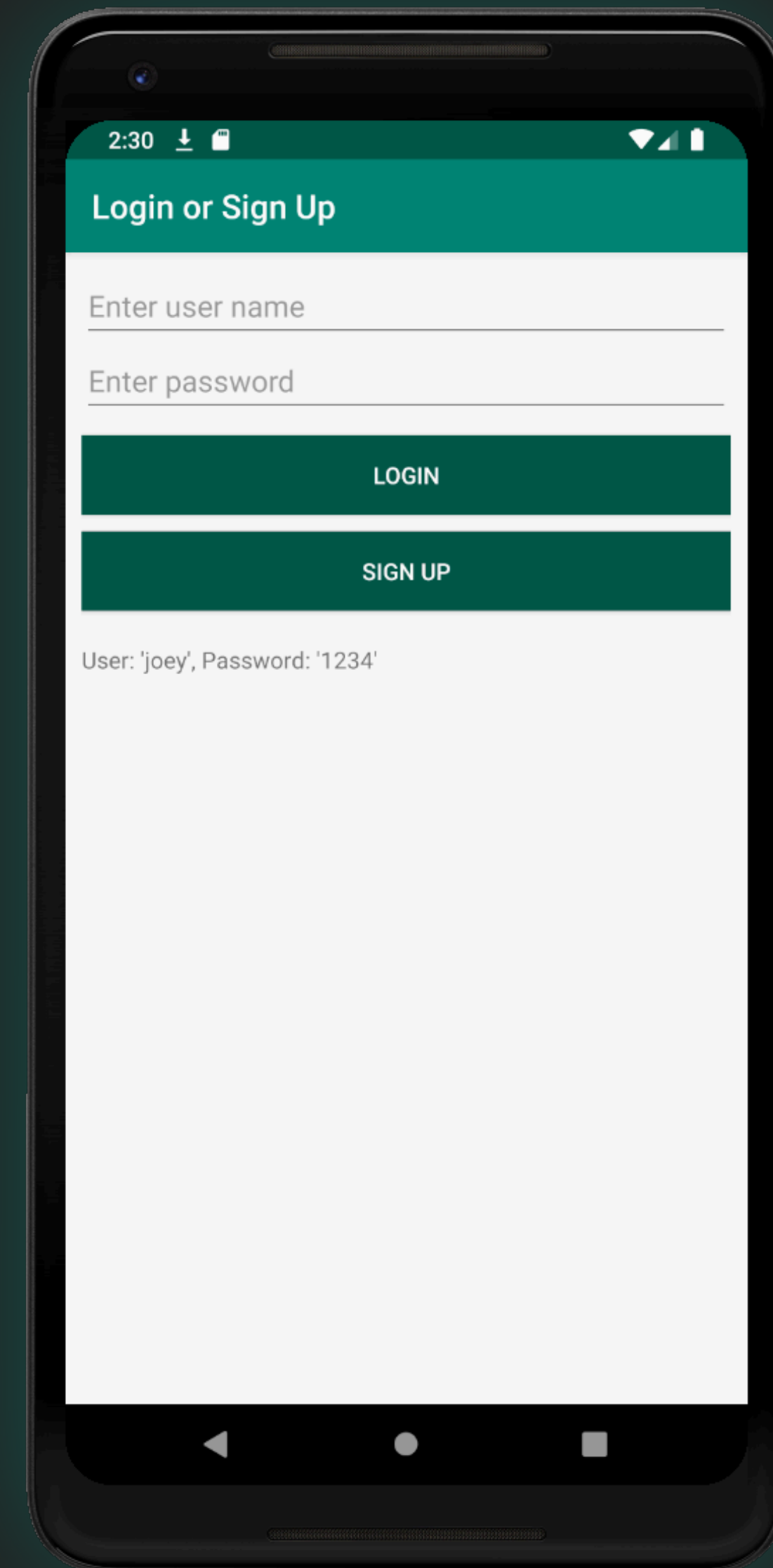
WHAT CAN I DO WITH LOGIN PROBLEM?

- ▶ Use authorisation via UI

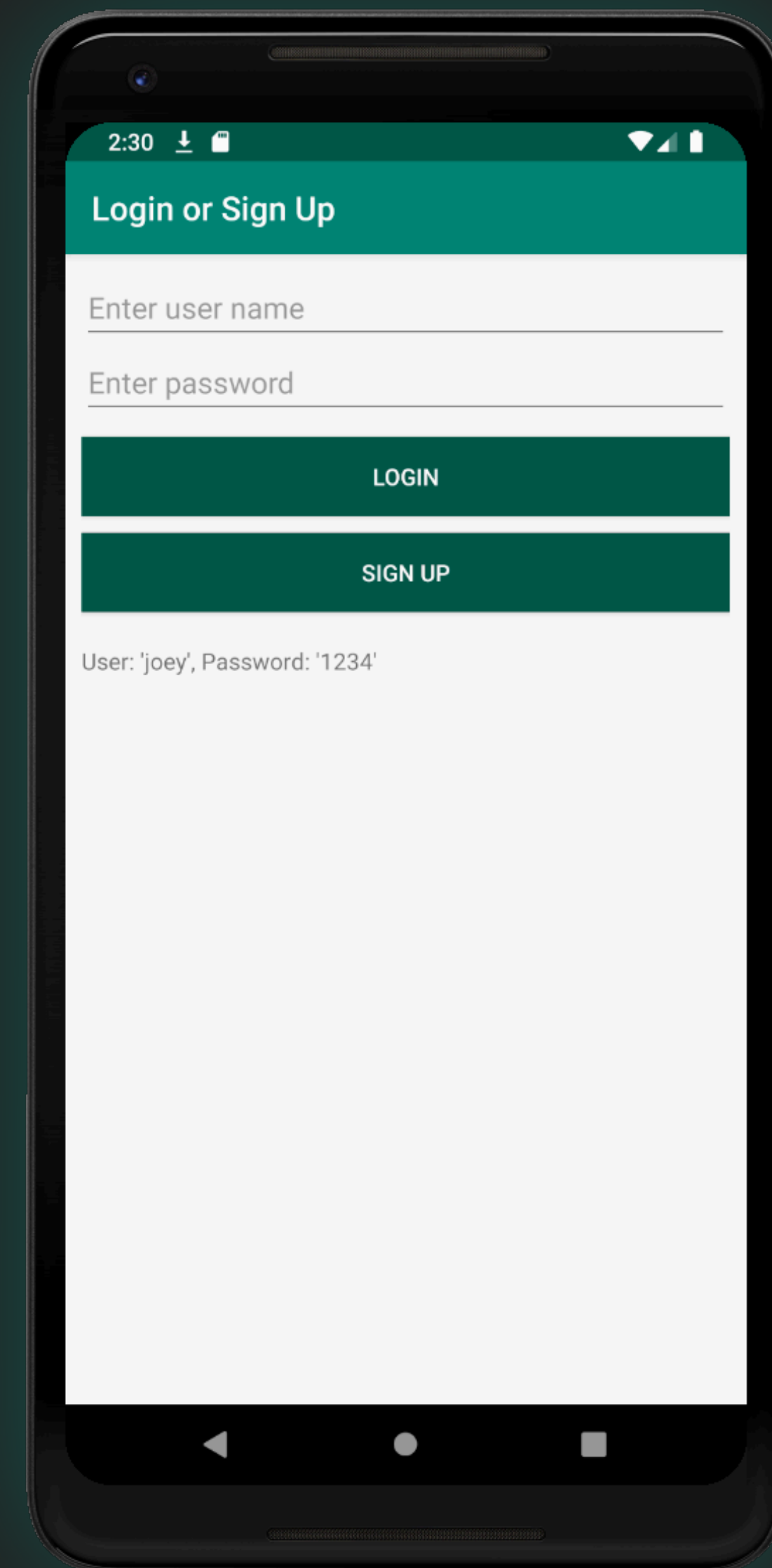


WHAT CAN I DO WITH LOGIN PROBLEM?

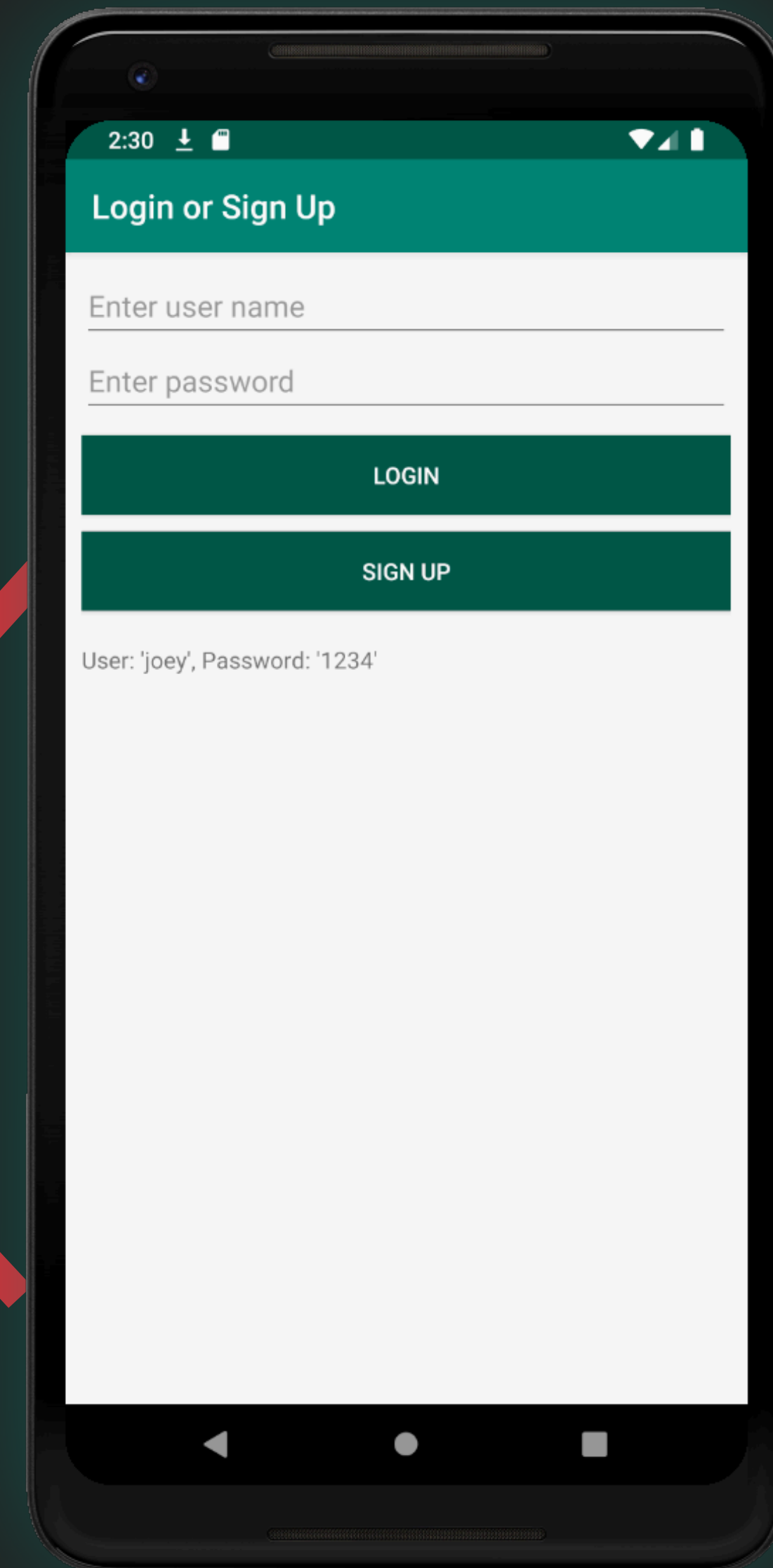
- ▶ Use authorisation via UI
- ▶ Use internal authorisation mechanism



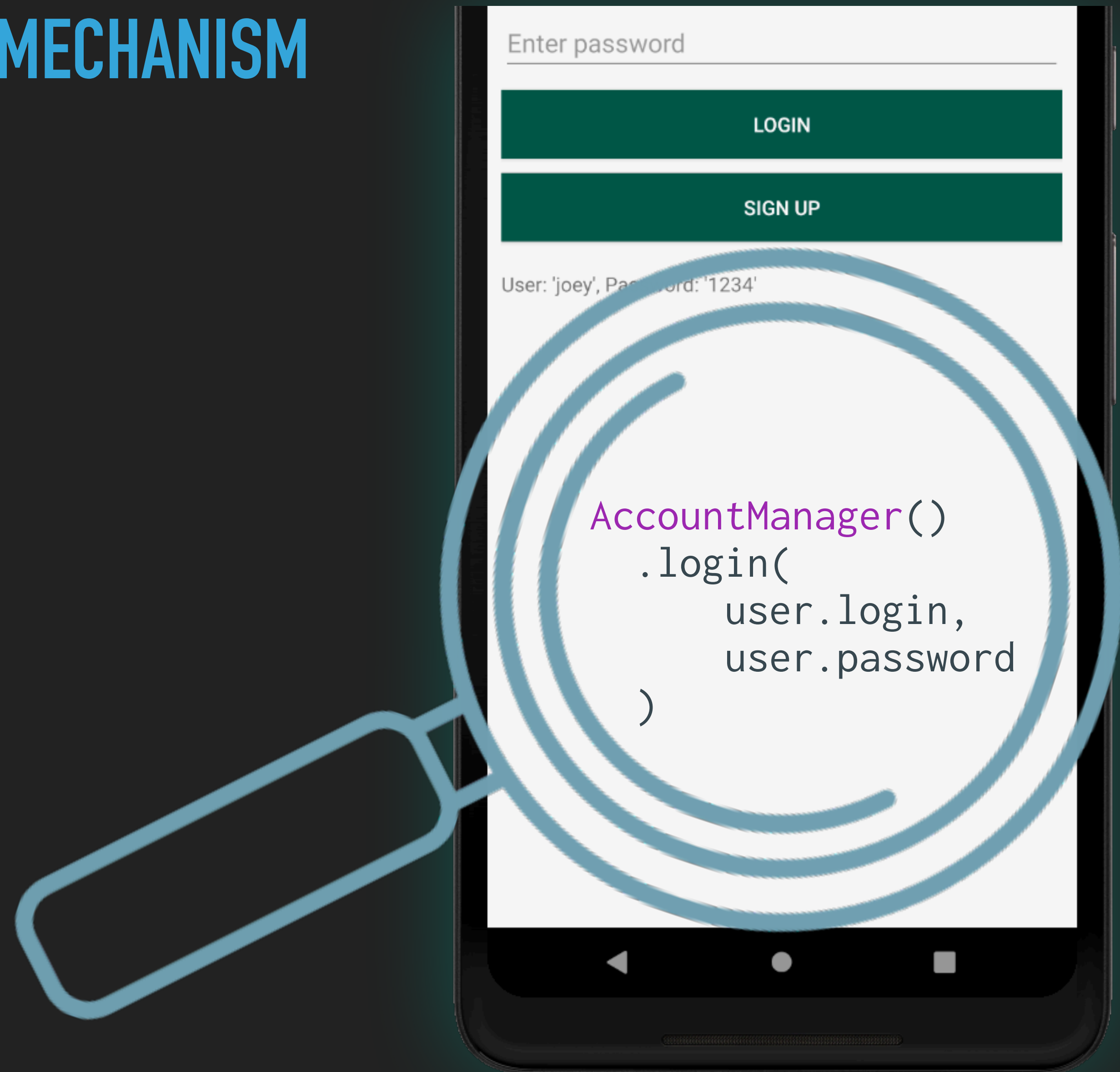
USE AUTHORISATION VIA UI



USE AUTHORISATION VIA UI



USE INTERNAL AUTHORISATION MECHANISM



```
class ChatTest {  
    ...  
    val setupRule = SetUpTearDownRule()  
        .addSetUp {  
            MessageRepository.clearChatMessages(contact.id)  
            val intent = Intent()  
            intent.putExtra("INTENT_CONTACT_ID_EXTRA_NAME", contact.id)  
            activityRule.launchActivity(intent)  
        }  
    @Test  
    fun sendMessageWithLink() {... }  
}
```

```
class ChatTest {  
    ...  
    val setupRule = SetupTearDownRule()  
        .addSetup {  
            MessageRepository.clearChatMessages(contact.id)  
            ...  
        }  
    @Test  
    fun sendMessageWithLink() {... }  
}
```



```
class ChatTest {  
    ...  
    val setupRule = SetupTearDownRule()  
        .addSetup {  
            AccountManager(targetContext).login(user.login, user.password)  
            MessageRepository.clearChatMessages(contact.id)  
            ...  
        }  
    @Test  
    fun sendMessageWithLink() {... }  
}
```

SOLUTION: USE INTERNAL AUTHORISATION MECHANISM

```
AccountManager(targetContext).login(user.login, user.password)
```

I HAD THE LONGEST TEST EVER BUT NOW ...



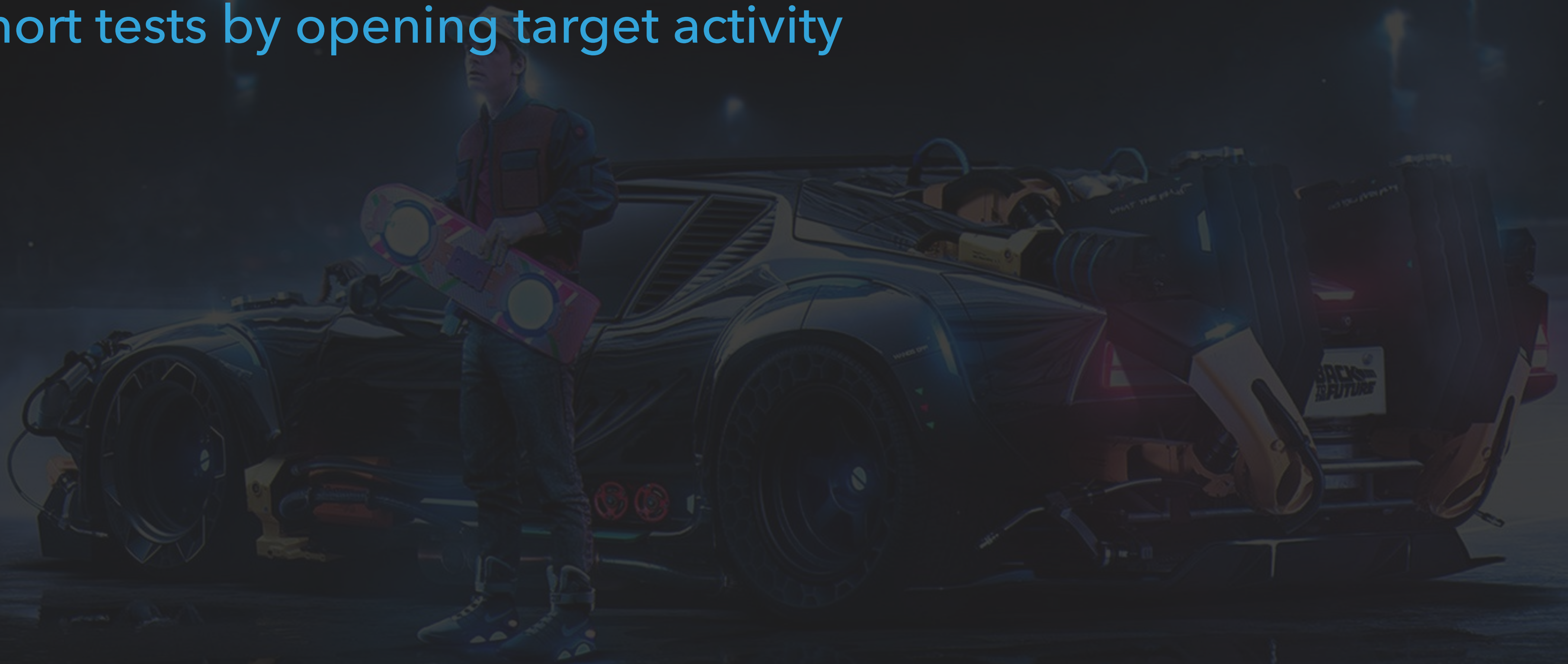
I HAD THE LONGEST TEST EVER BUT NOW ...

- ▶ Long test scenario



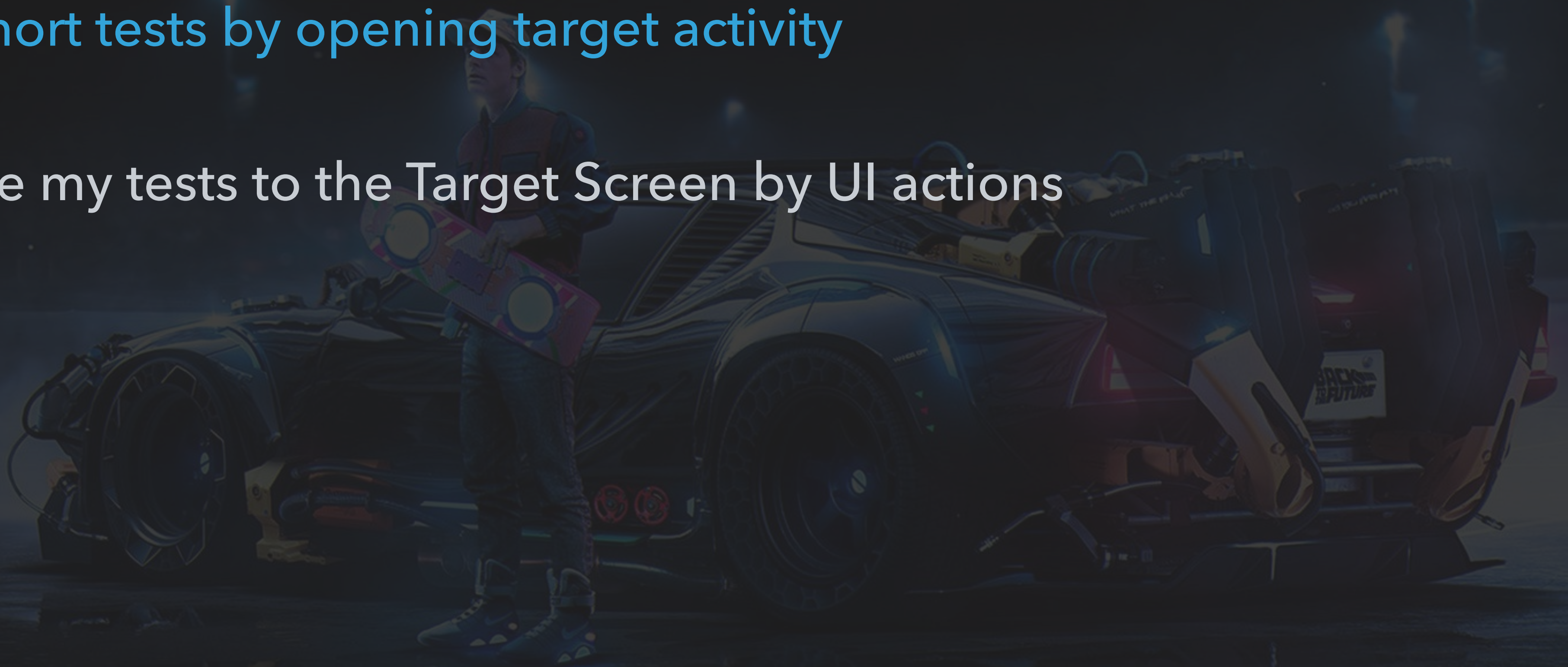
I HAD THE LONGEST TEST EVER BUT NOW ...

- ▶ Long test scenario
 - > Use short tests by opening target activity



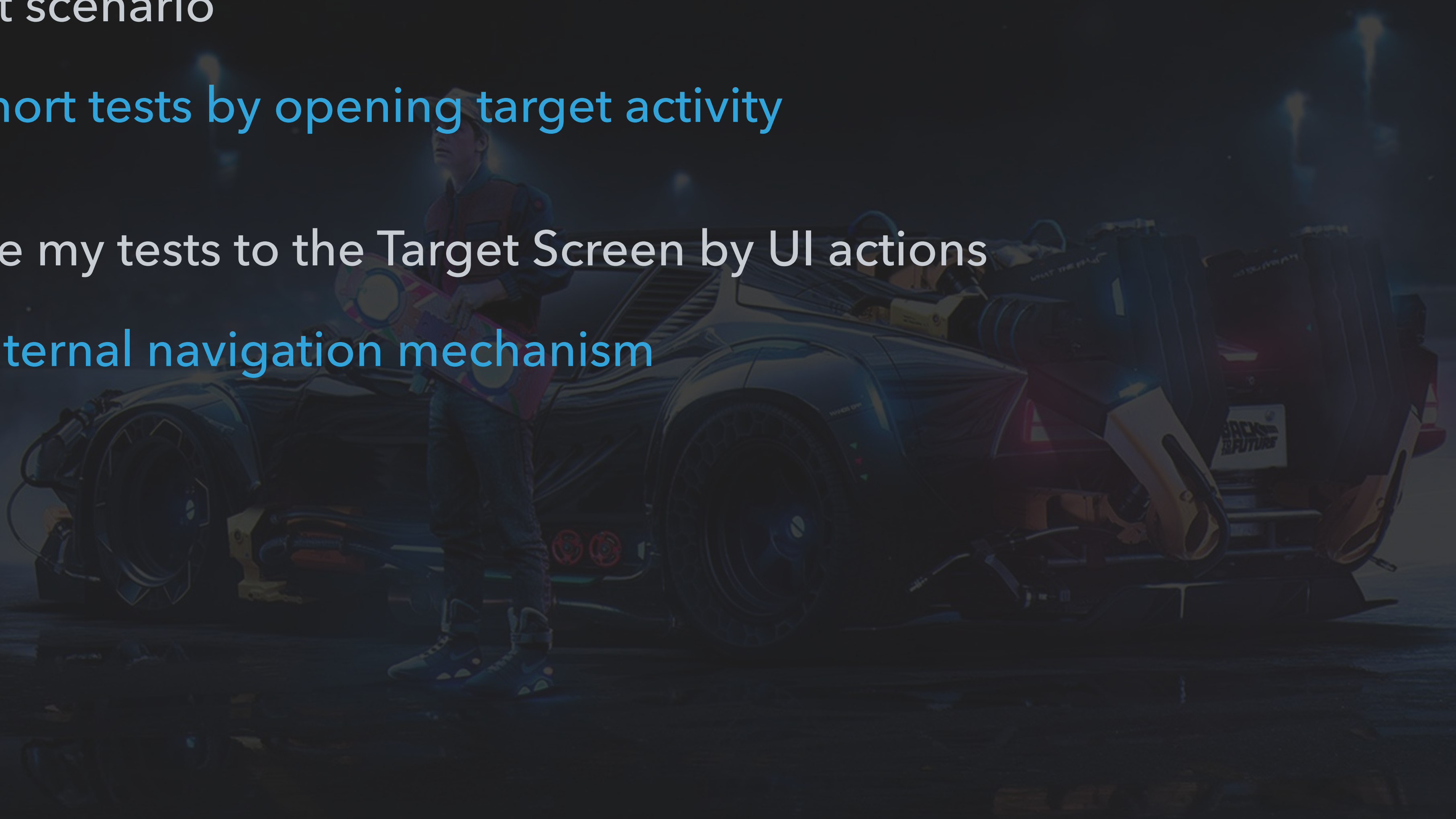
I HAD THE LONGEST TEST EVER BUT NOW ...

- ▶ Long test scenario
 - > Use short tests by opening target activity
- ▶ I navigate my tests to the Target Screen by UI actions



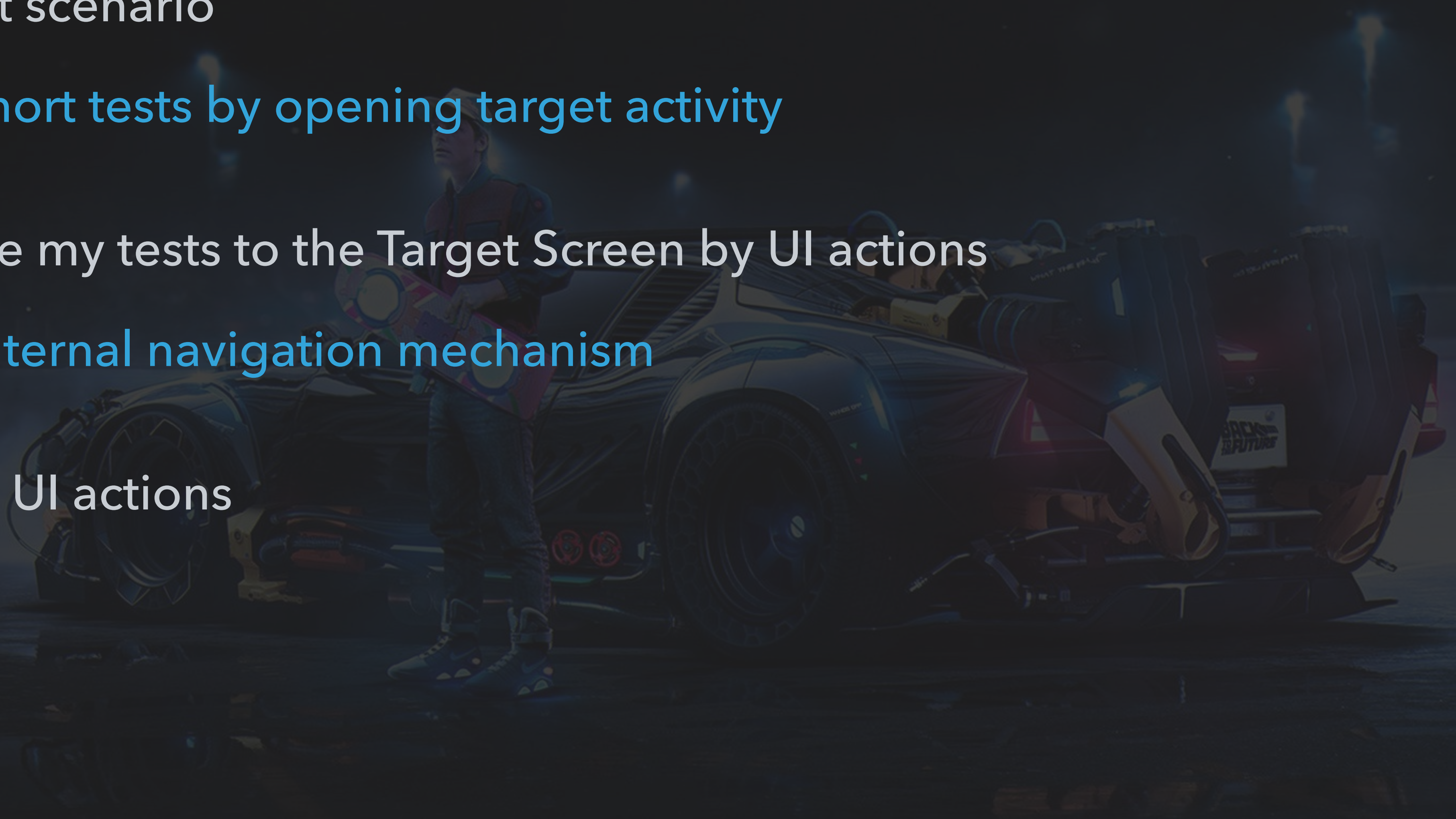
I HAD THE LONGEST TEST EVER BUT NOW ...

- ▶ Long test scenario
 - > Use short tests by opening target activity
- ▶ I navigate my tests to the Target Screen by UI actions
 - > Use internal navigation mechanism



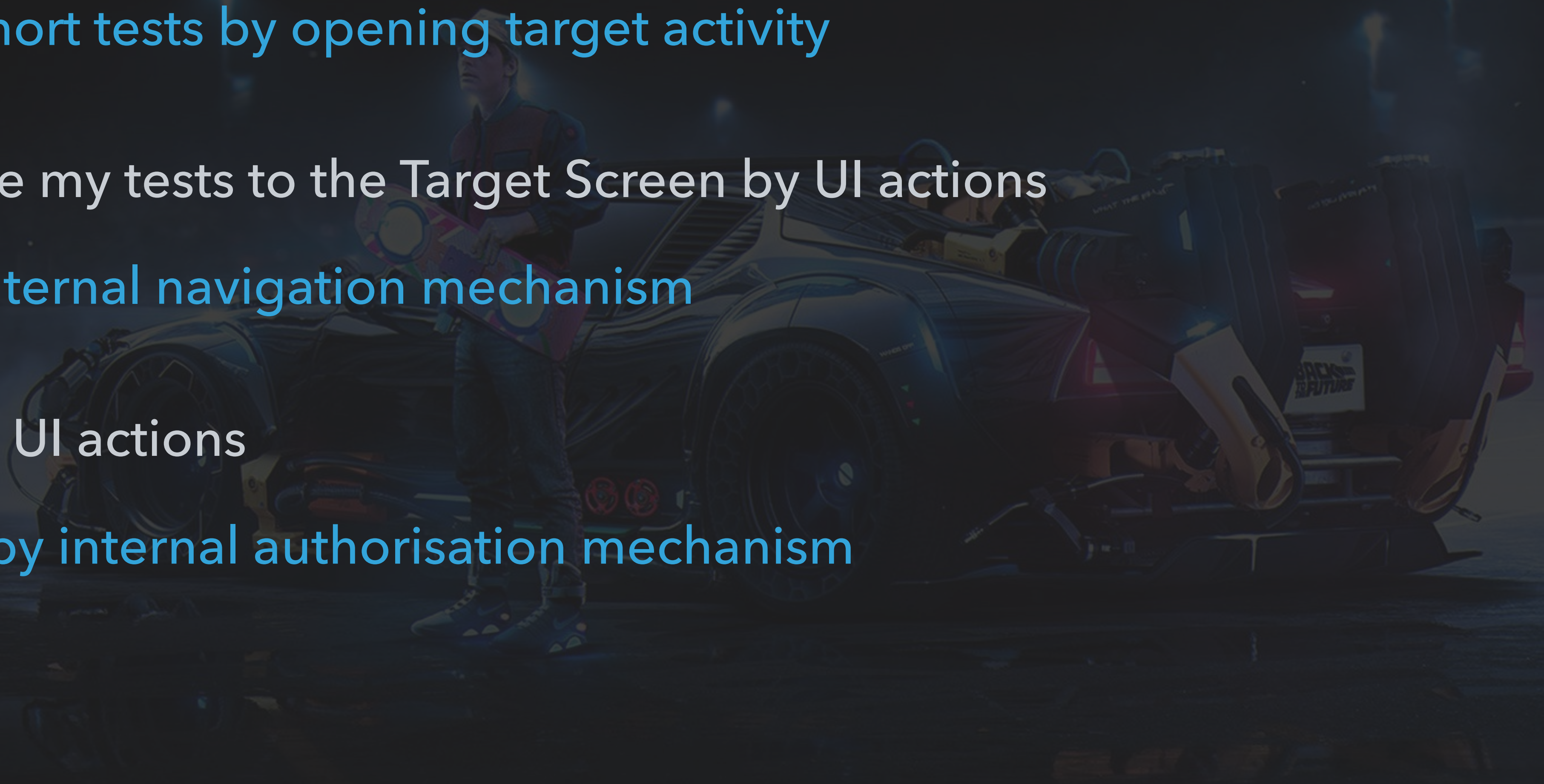
I HAD THE LONGEST TEST EVER BUT NOW ...

- ▶ Long test scenario
 - > Use short tests by opening target activity
- ▶ I navigate my tests to the Target Screen by UI actions
 - > Use internal navigation mechanism
- ▶ Login by UI actions



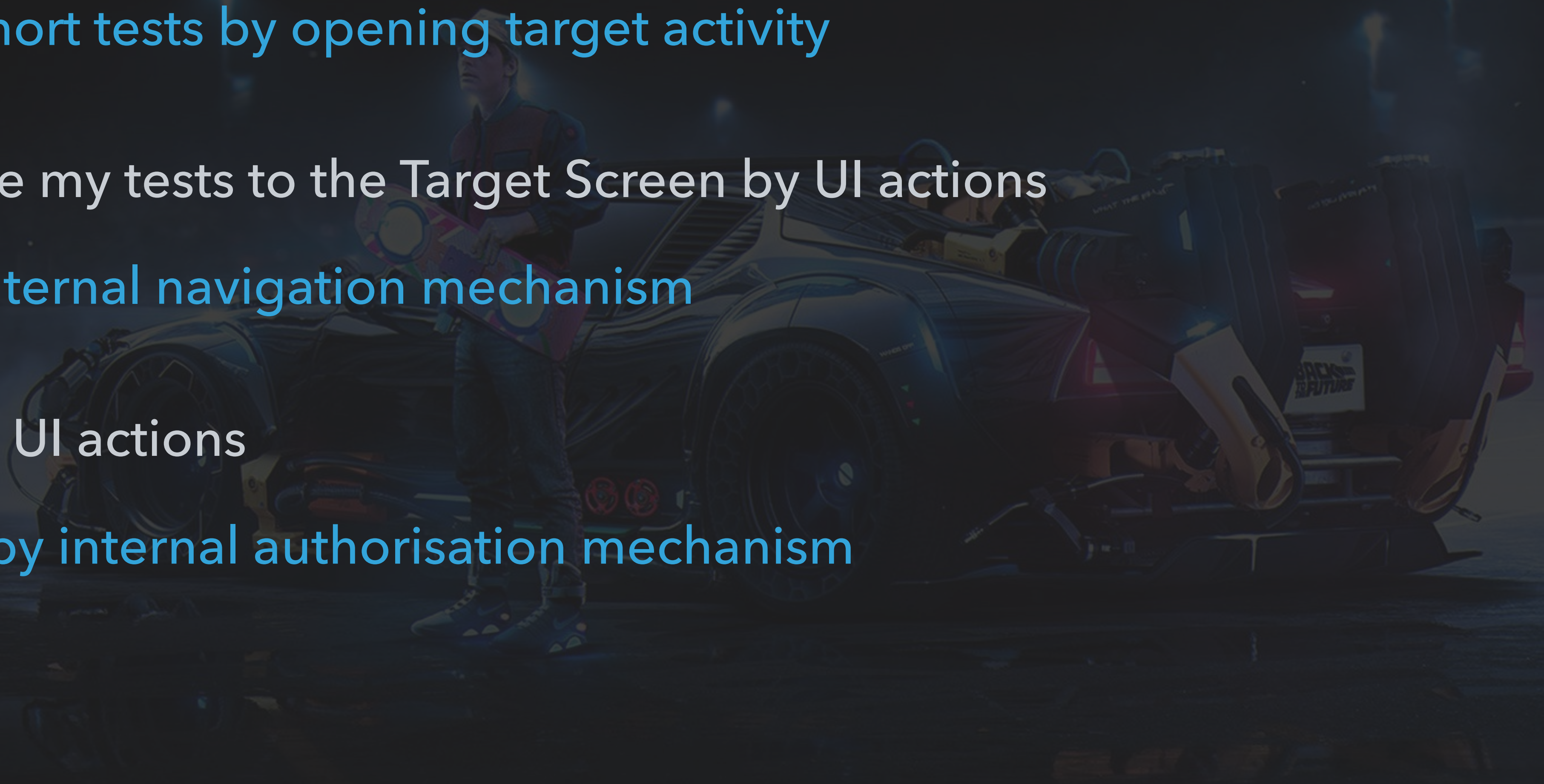
I HAD THE LONGEST TEST EVER BUT NOW ...

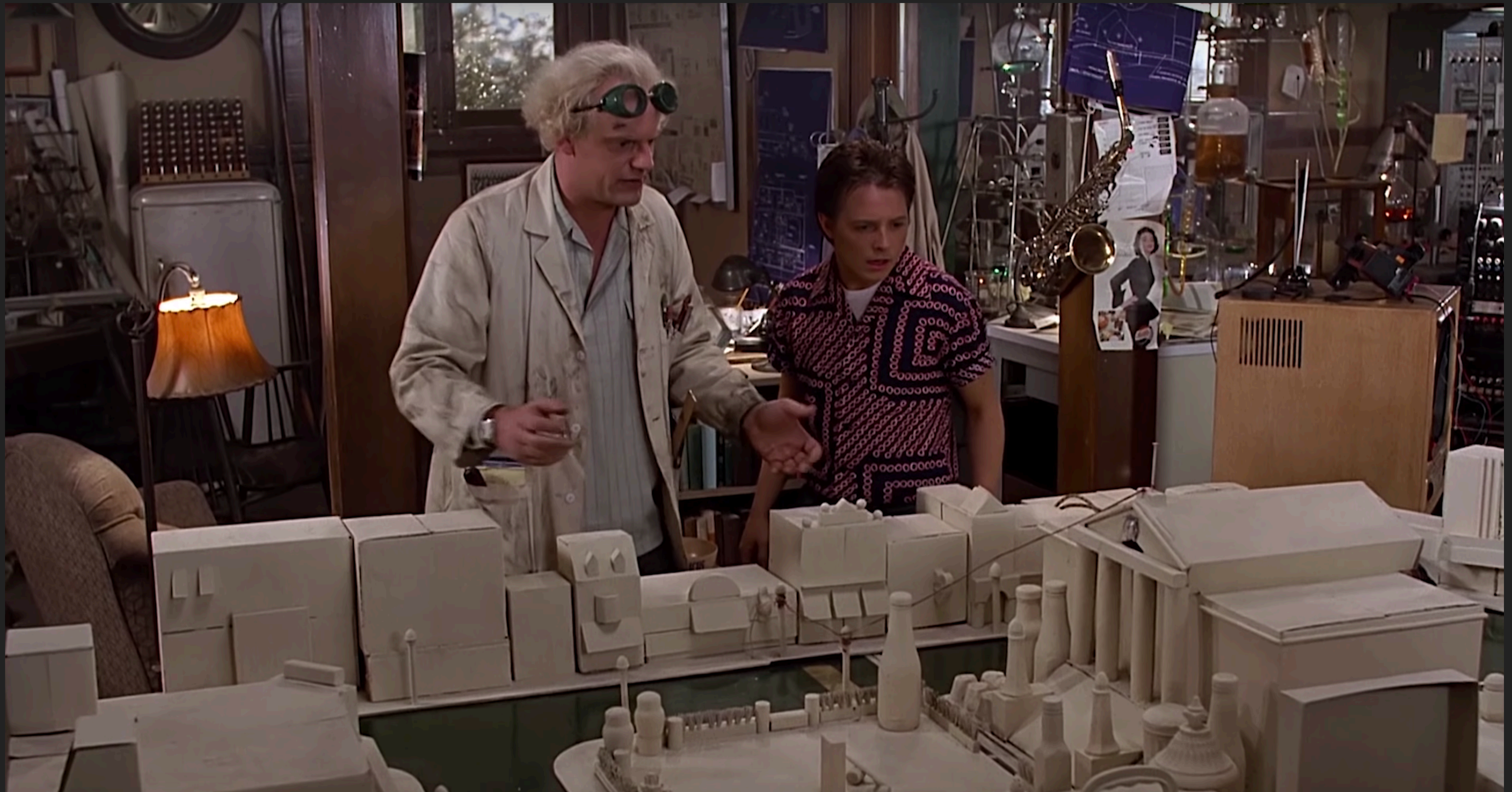
- ▶ Long test scenario
 - > Use short tests by opening target activity
- ▶ I navigate my tests to the Target Screen by UI actions
 - > Use internal navigation mechanism
- ▶ Login by UI actions
 - > Do it by internal authorisation mechanism



I HAD THE LONGEST TEST EVER BUT NOW I HAVE THE SHORTEST ONE

- ▶ Long test scenario
 - > Use short tests by opening target activity
- ▶ I navigate my tests to the Target Screen by UI actions
 - > Use internal navigation mechanism
- ▶ Login by UI actions
 - > Do it by internal authorisation mechanism



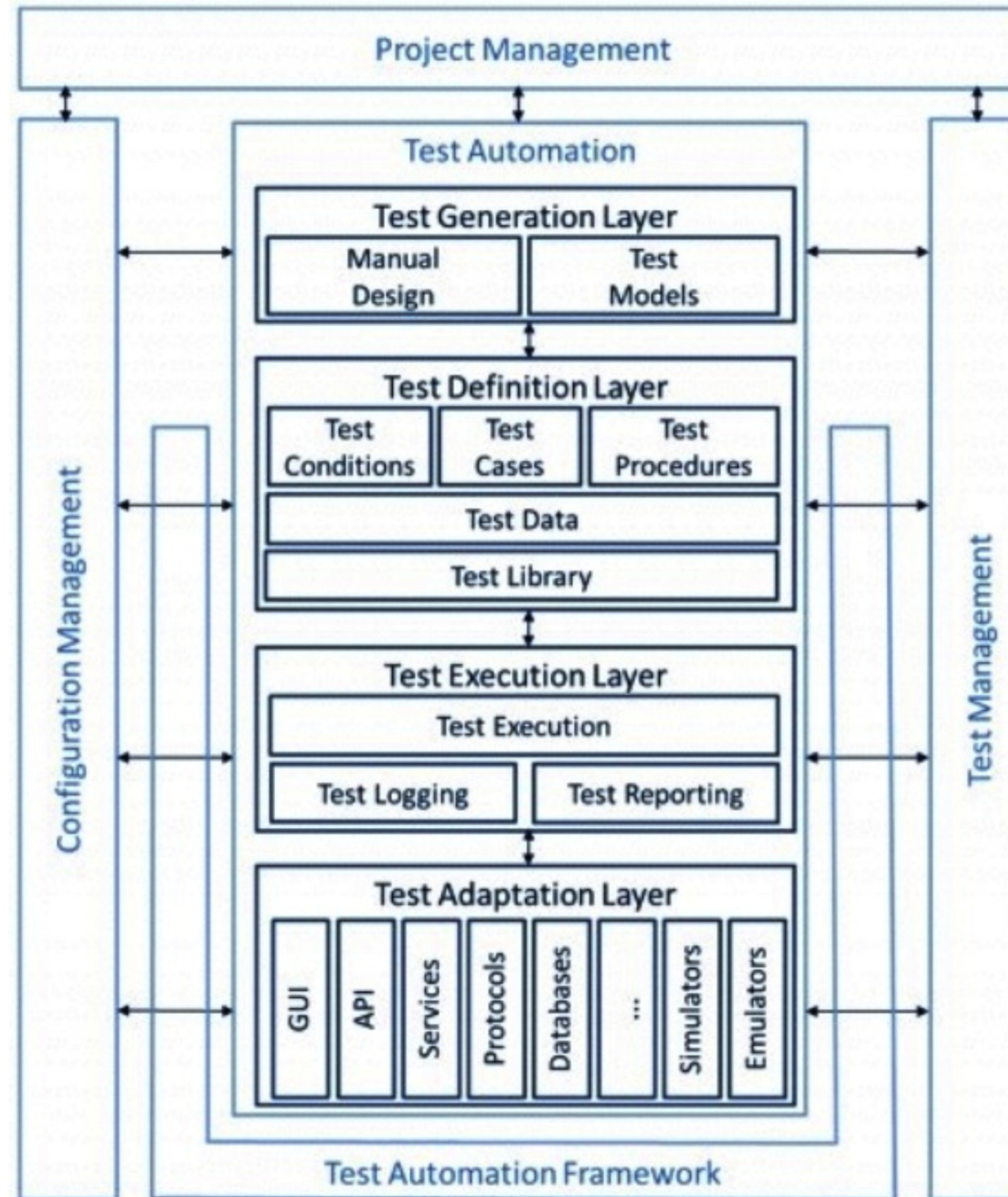


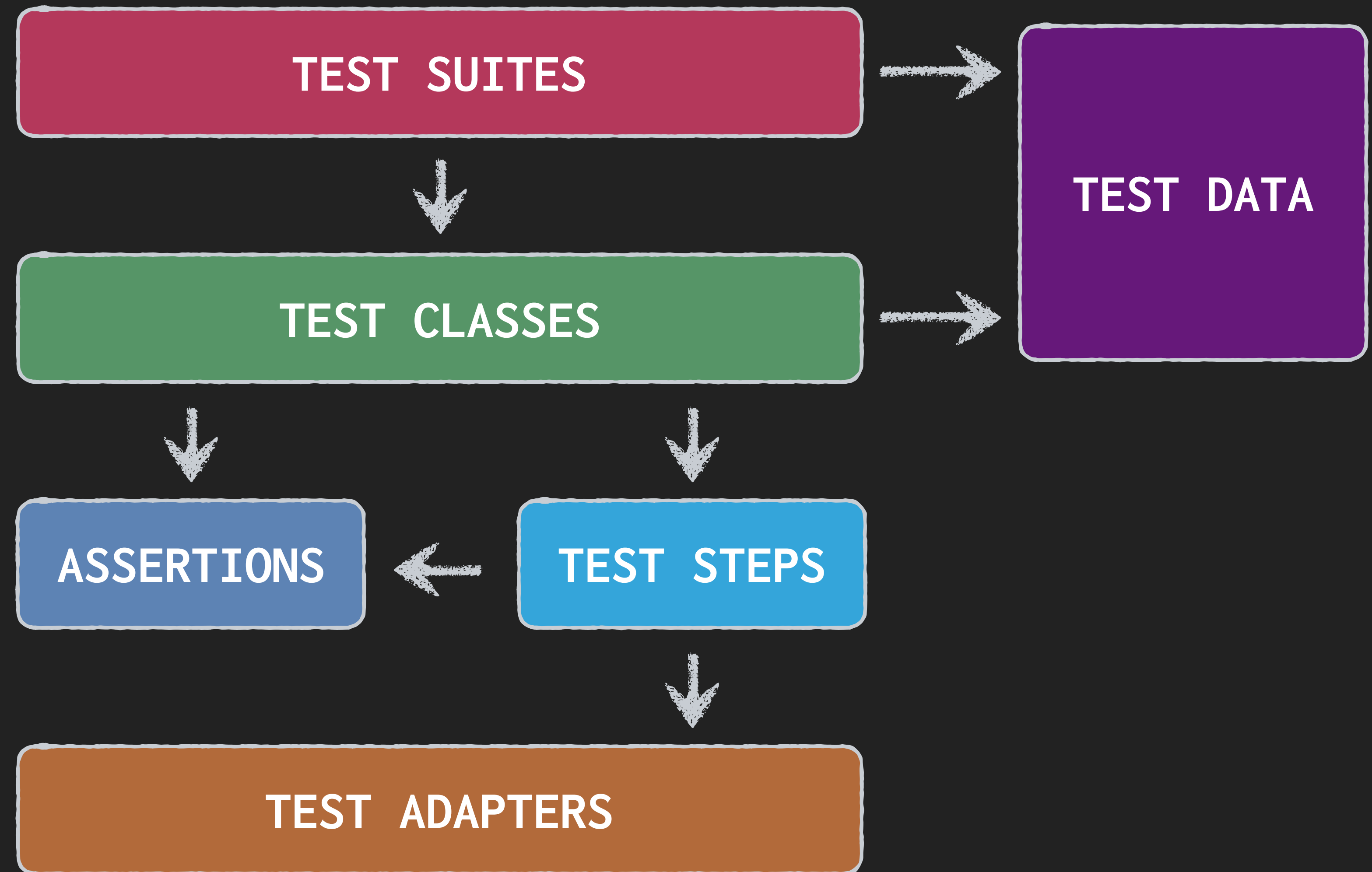
MY FIRST TEST FRAMEWORK

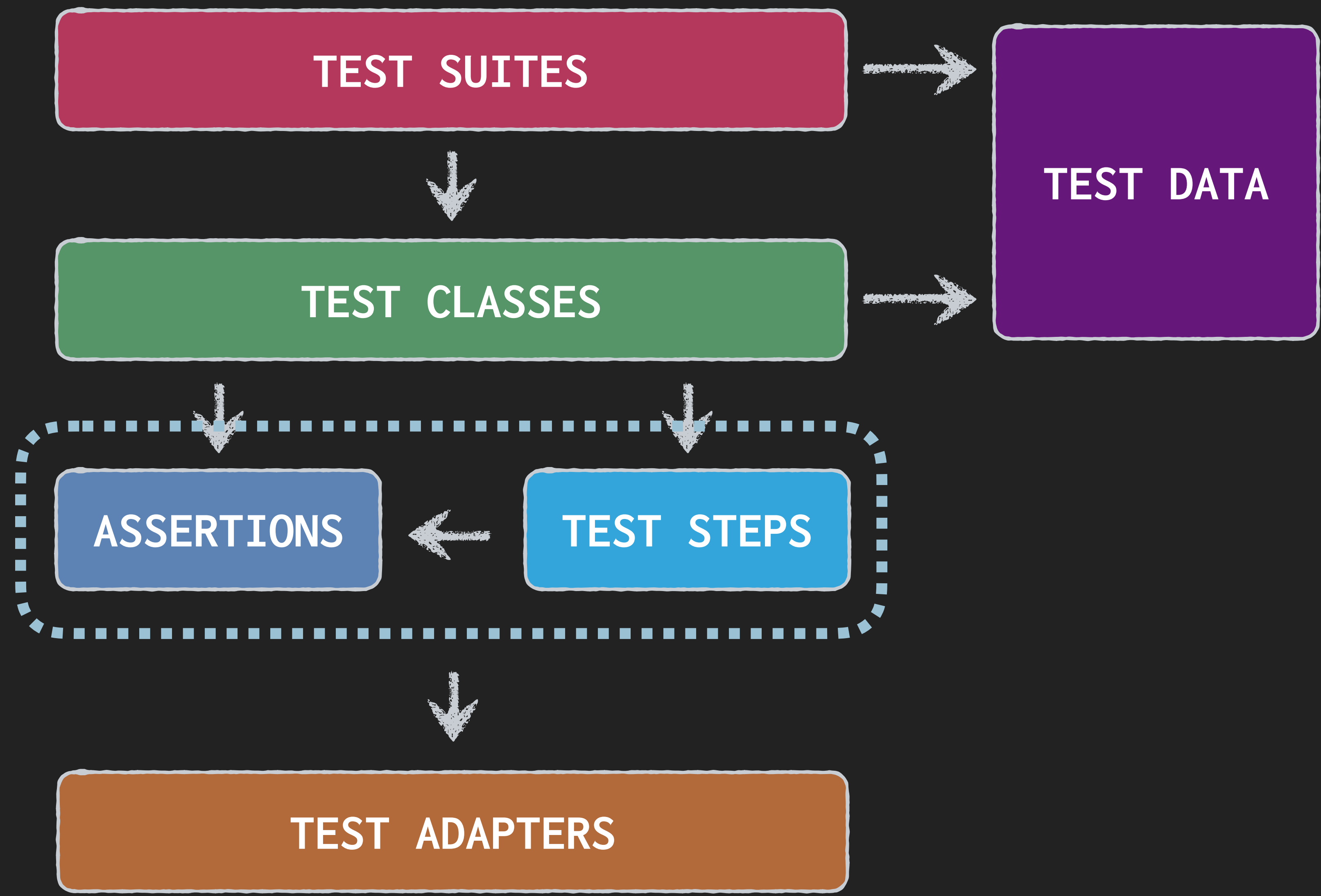


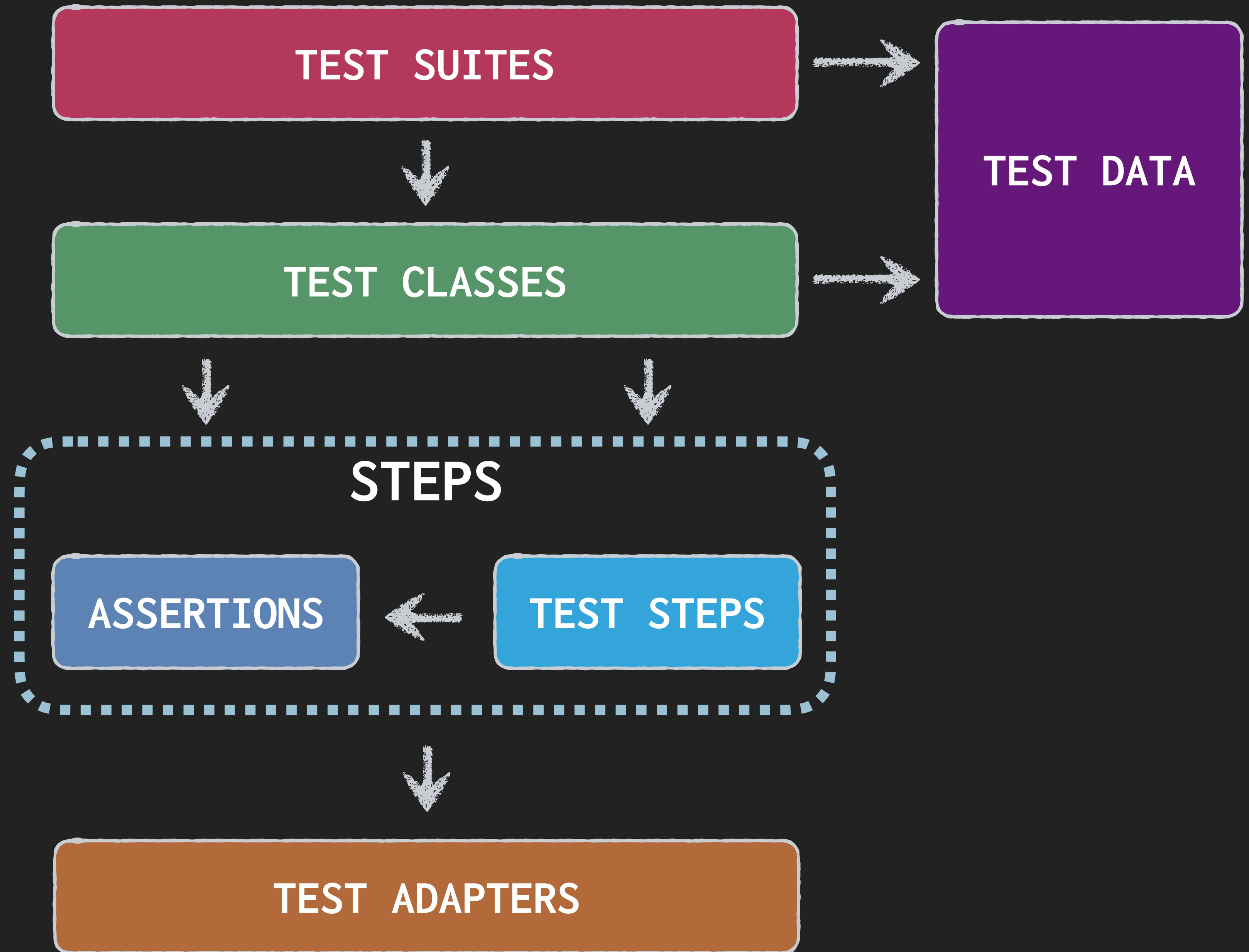
ISTQB Generic Test Automation Architecture

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TEST SUITES

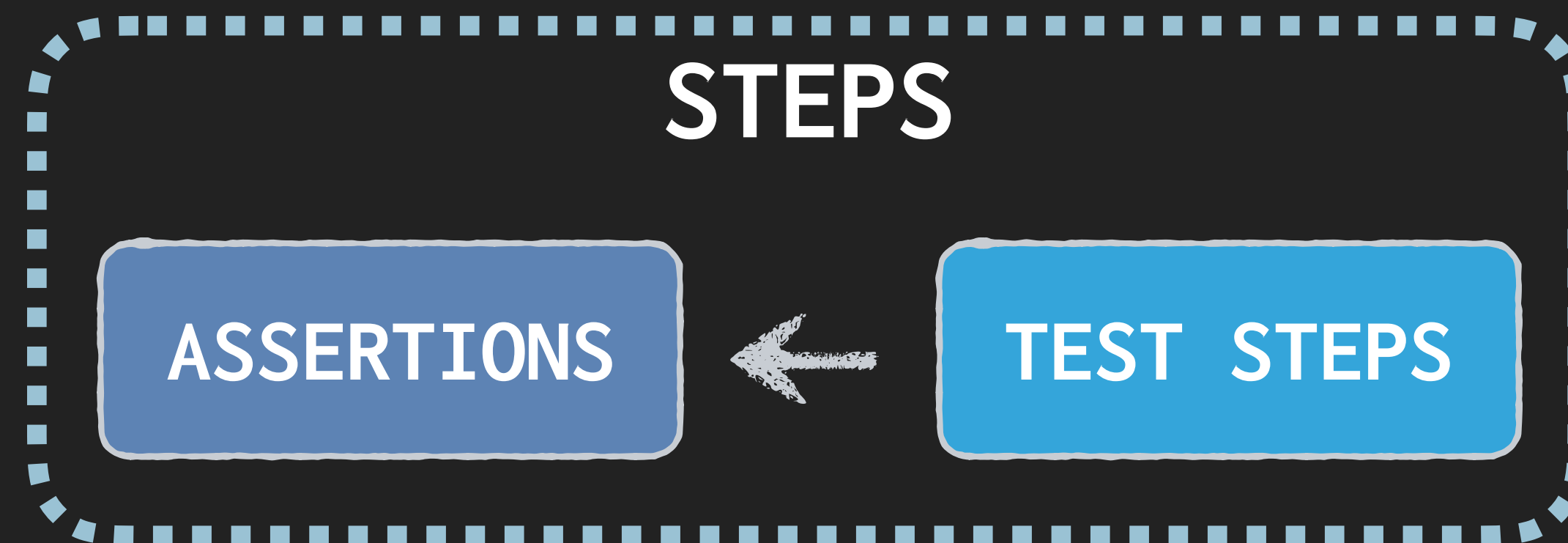


TEST DATA

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TEST CLASSES



STEPS

ASSERTIONS



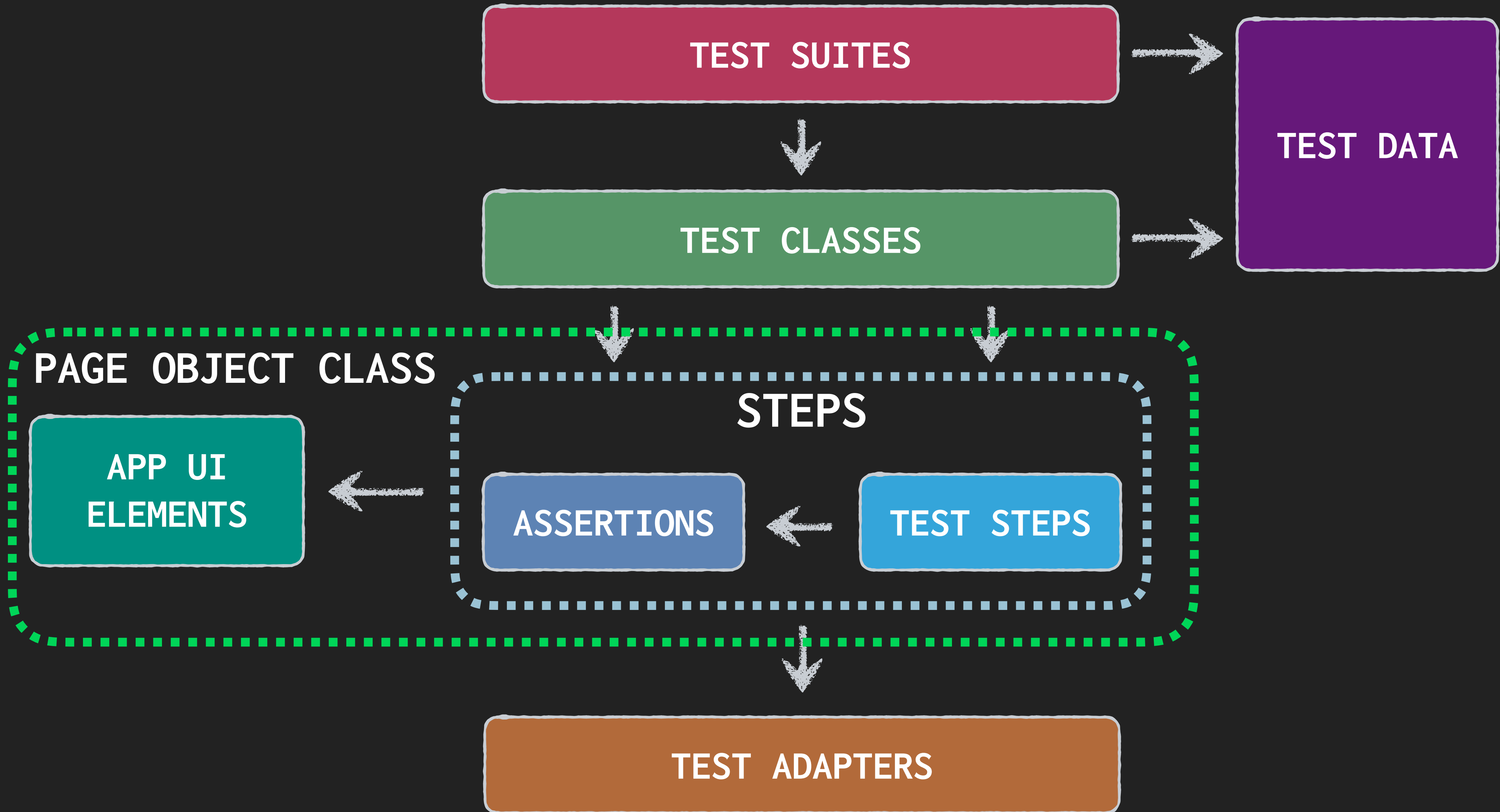
TEST STEPS



APP UI
ELEMENTS



TEST ADAPTERS



MY FIRST TEST FRAMEWORK



MY CURRENT TEST FRAMEWORK





IT WILL LOOKS LIKE THIS





BUT IT LOOKS LIKE THIS





OR LIKE THIS



WHY IT HAPPENS?

WHY IT HAPPENS?

- ▶ Support hell

WHY IT HAPPENS?

- ▶ Support hell
- ▶ Integration with CI hell

SOLUTION: USE ALREADY MADE LIBS & TOOLS



SOLUTION: USE ALREADY MADE LIBS & TOOLS

- ▶ Allure android



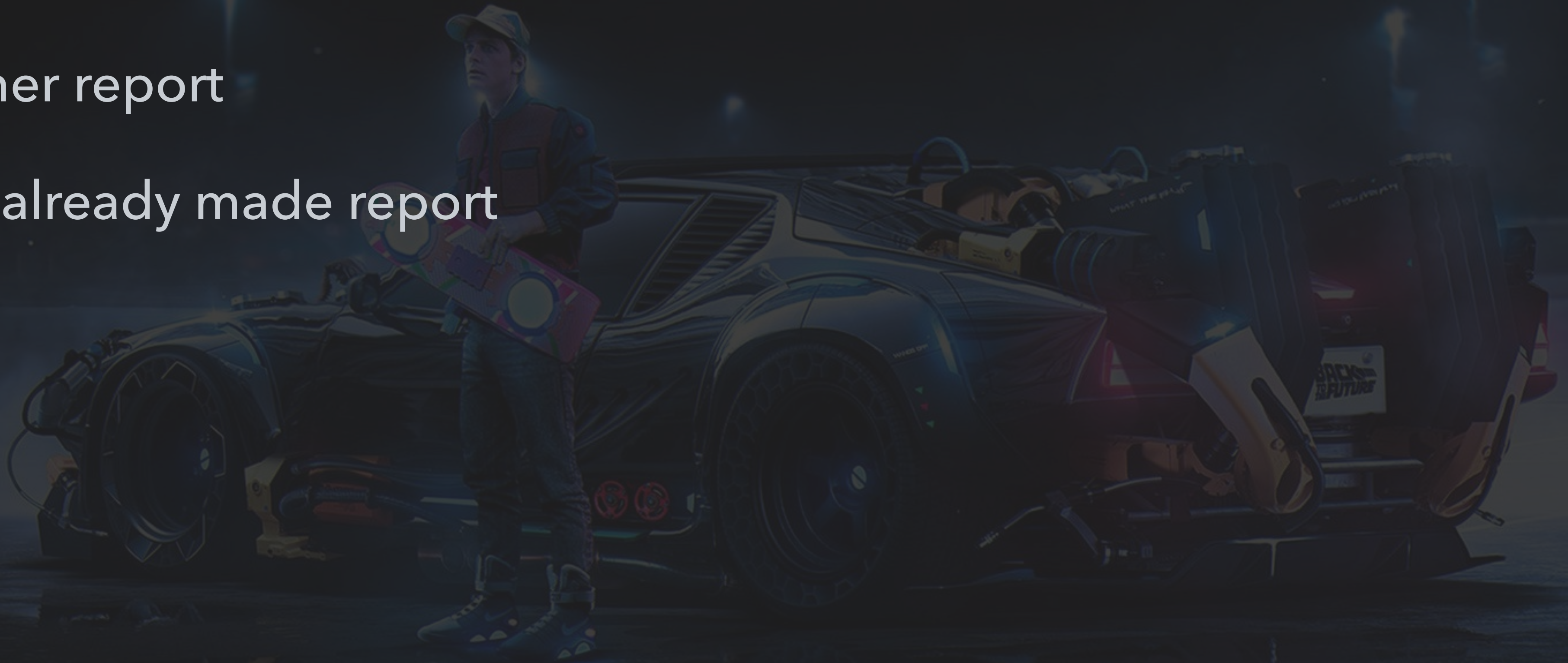
SOLUTION: USE ALREADY MADE LIBS & TOOLS

- ▶ Allure android
- ▶ Test runner report



SOLUTION: USE ALREADY MADE LIBS & TOOLS

- ▶ Allure android
- ▶ Test runner report
- ▶ Another already made report



BACK TO THE PAST

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TYPES OF MISTAKES WE'VE DISCOVERED



TYPES OF MISTAKES WE'VE DISCOVERED

- ▶ Test data usage



- ▶ Test data is used everywhere:
 - > Strict data definition to test suite or test case
 - > Store read-only data as constants
- ▶ Test data is defined after activity launch
 - > Use custom `SetUpTearDown` rule
- ▶ Test data is defined in `@BeforeClass` or `@Before` method for all `@Test` methods
 - > Use `SetUpTearDown` rule + `SetUp` and `TearDown` annotations
- ▶ Test user is related with device `Build.Serial`
 - > Use `TestData` server

BACK TO THE PAST

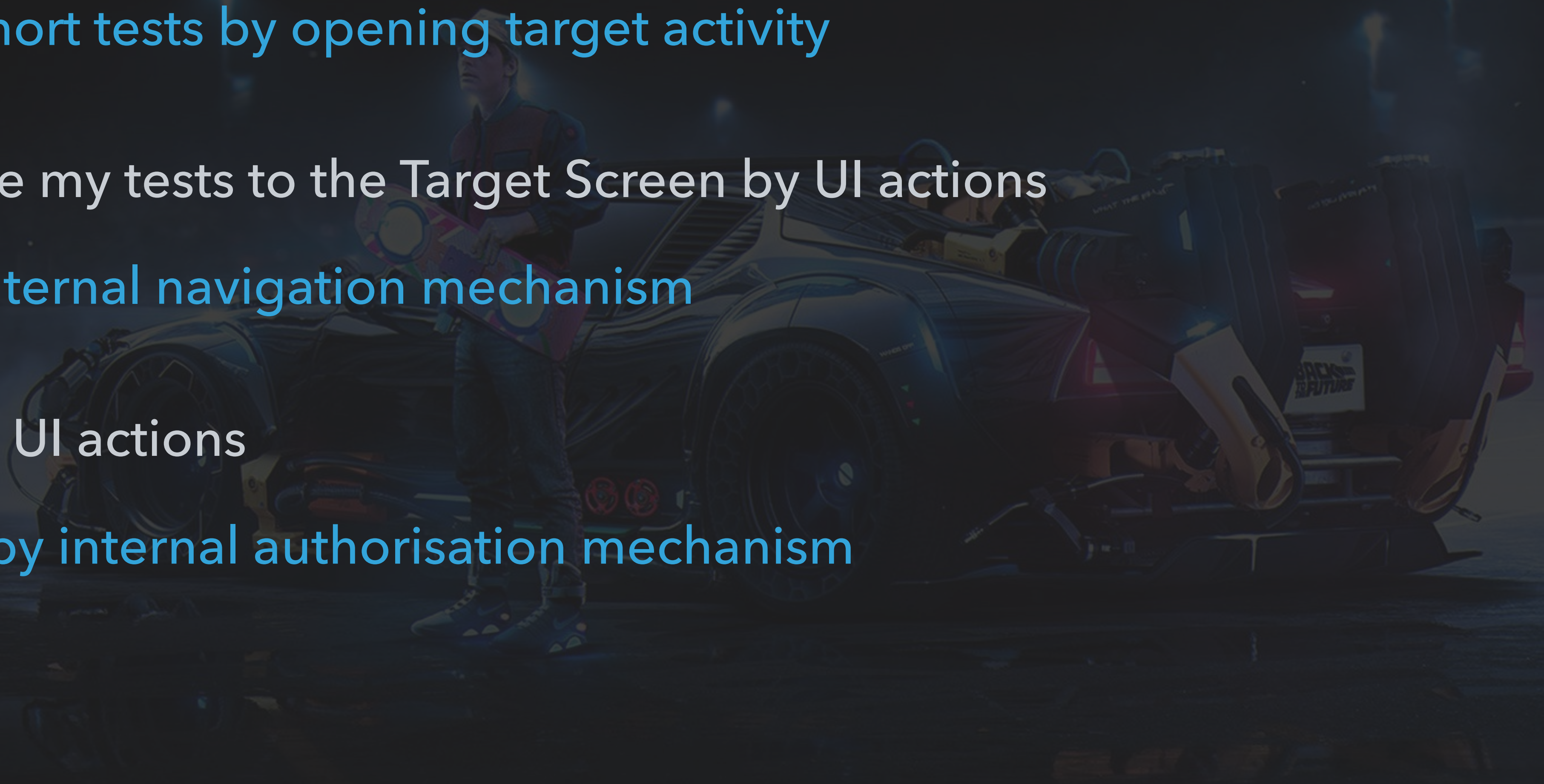
TYPES OF MISTAKES WE'VE DISCOVERED

- ▶ Test data usage
- ▶ Test flow



I HAD THE LONGEST TEST EVER BUT NOW I HAVE THE SHORTEST ONE

- ▶ Long test scenario
 - > Use short tests by opening target activity
- ▶ I navigate my tests to the Target Screen by UI actions
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 - > Do it by internal authorisation mechanism



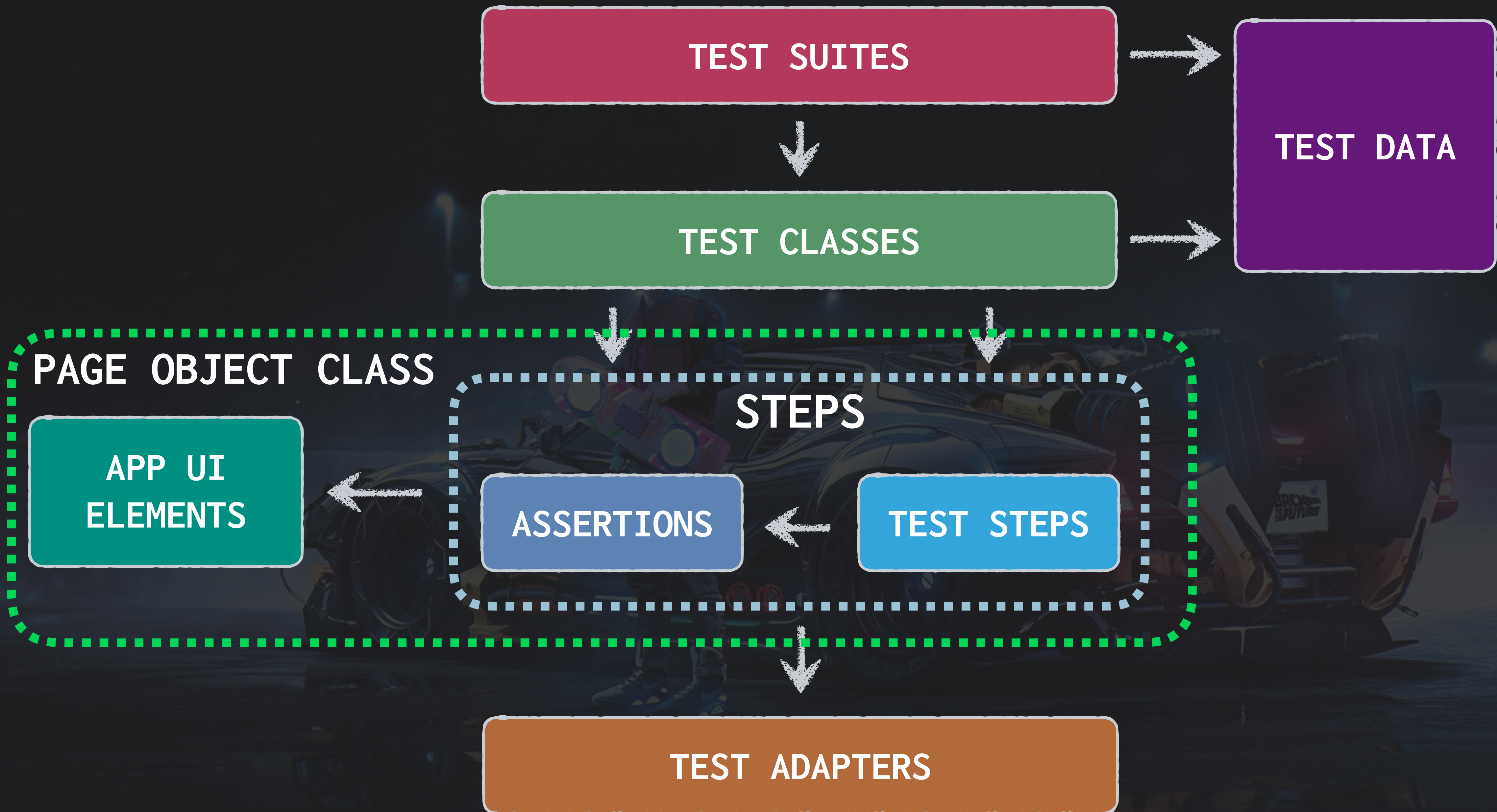
TYPES OF MISTAKES WE'VE DISCOVERED

- ▶ Test data usage
- ▶ Test flow
- ▶ Framework architecture



SOLUTION: USE COMMON PRACTICES AND ADAPT IT

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BACK TO THE PAST

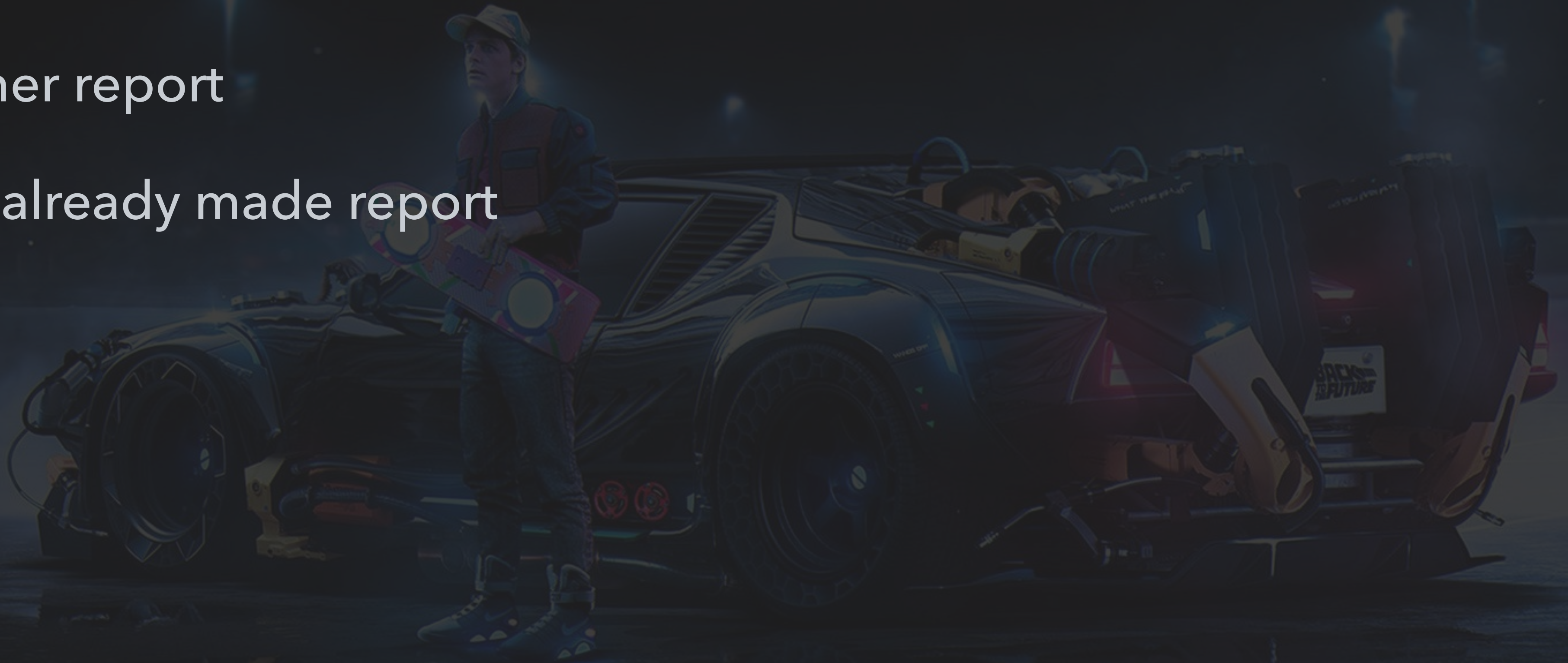
TYPES OF MISTAKES WE'VE DISCOVERED

- ▶ Test data usage
- ▶ Test flow
- ▶ Framework architecture
- ▶ Reporting



SOLUTION: USE ALREADY MADE LIBS & TOOLS

- ▶ Allure android
- ▶ Test runner report
- ▶ Another already made report



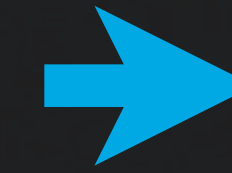
GitHub:

1) Примеры кода

github.com/alex-tiurin/espresso-guide

2) Библиотека с Espresso DSL

github.com/alex-tiurin/espresso-page-object



Как подключить себе в проект?

```
repositories { jcenter() }  
dependencies {  
    //espresso-page-object  
    androidTestImplementation 'com.atiurin.espresso:essessopageobject:0.1.16'  
}
```