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A Gentle Introduction

TDD IN GO

Practice, libraries and tools for
Test-Driven Development in the Go language

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AGENDA

Brief introduction

Coding Dojo: Runes (randori style)

Overview of tools, techniques and libraries

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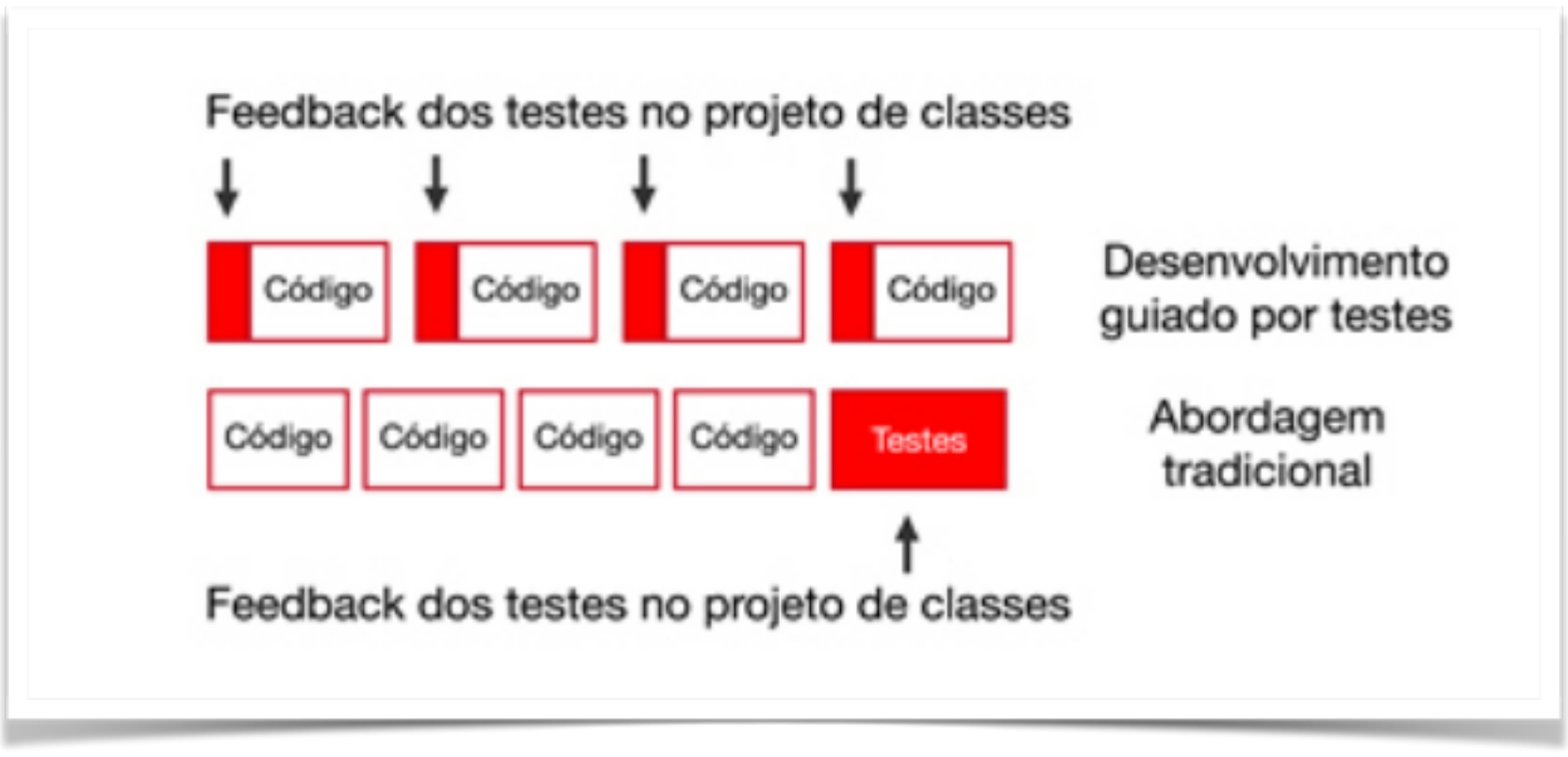
INTRODUCTION

What TDD is all about

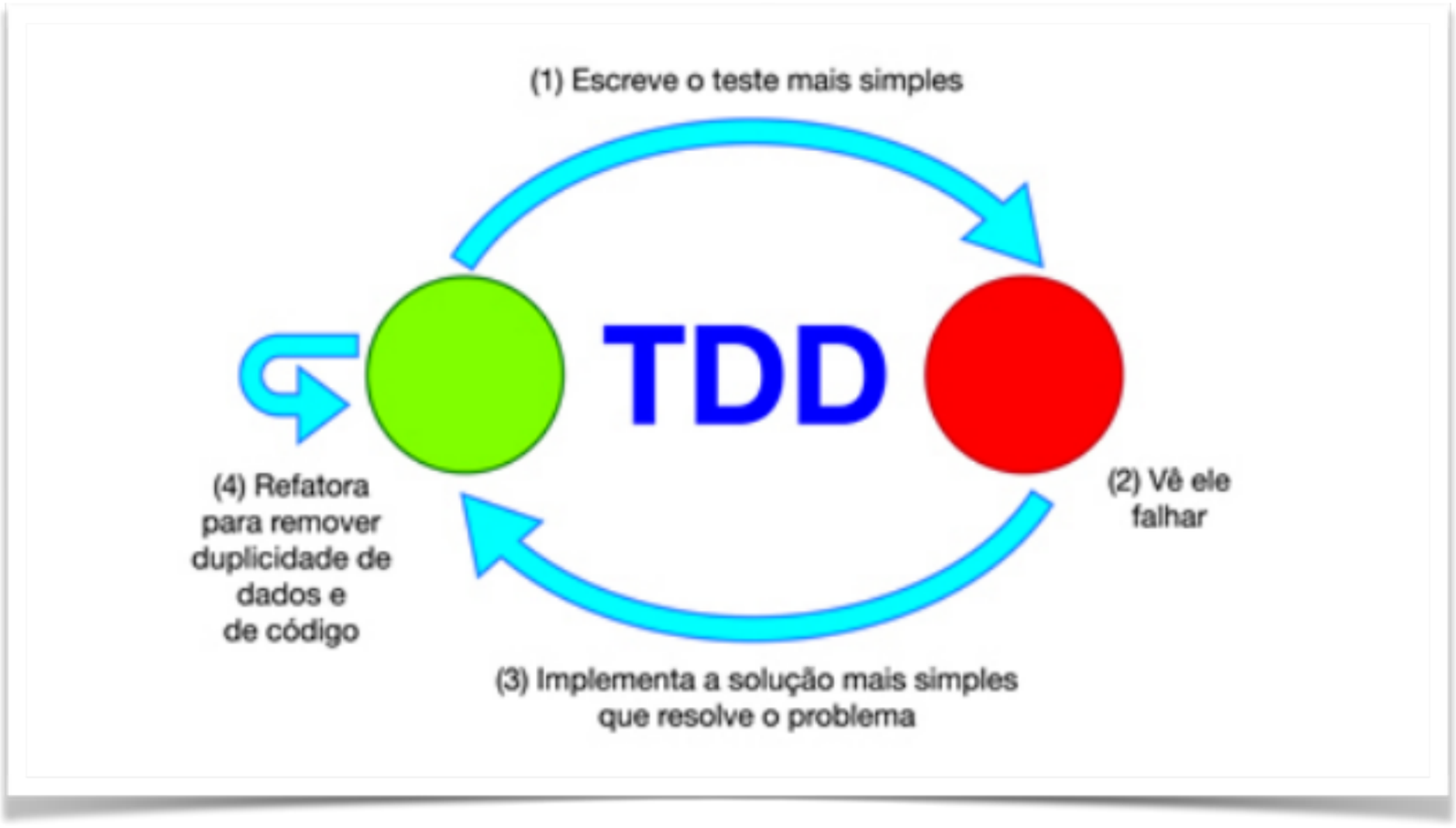
Test-Driven Development | Design

Test-first approach



Source: **Test-Driven Development**, by Hugo Corbucci and Mauricio Aniche

TDD CYCLE



Source: **Test-Driven Development**, by Hugo Corbucci and Mauricio Aniche

Work on small increments

Like 4L on 4WD: no need to engage at all times, but good when the going is tough

At first: practice with the smallest increments you can think

TDD BEST-PRACTICE FOR PAIRING: CALL SHOT

HUGO FALA

Uma técnica divertida e muito útil quando se está usando TDD é a de, antes de rodar o teste, narrar o resultado esperado. Algo como:

- Espero que este teste falhe com uma exceção que diz que o método `maior_valor` não existe.
- Agora espero que o teste falhe dizendo que esperava 250 mas devolveu `nil`.
- Agora o teste vai passar.

Apesar de o exercício parecer fútil, falar em voz alta o resultado que esperamos nos ajuda a tomar consciência do nosso erro quando o resultado não bater. Também torna a prática de programação em pares mais divertida e garante que ambas as pessoas no par estejam acompanhando uma a outra. Nesse caso, a pessoa que não escreveu o teste é a que precisa prever o que vai acontecer.

Source: **Test-Driven Development**, by Hugo Corbucci and Mauricio Aniche

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CODING DOJO

Let's practice

CODING DOJO: RULES FOR RANDORI SESSION

Rotating pairs of pilot and co-pilot.

After 7 minutes, call volunteer for co-pilot.

When tests are green, audience can make suggestions for refactoring or next test.

When a test is red, audience should only offer suggestions when requested by pair.

RUNNING EXAMPLE

```
$ runes cat eyes
U+1F638 😸      GRINNING CAT FACE WITH SMILING EYES
U+1F63B 😻      SMILING CAT FACE WITH HEART-SHAPED EYES
U+1F63D 😽      KISSING CAT FACE WITH CLOSED EYES
$
```

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VARIATIONS

Beyond the classic TDD cycle

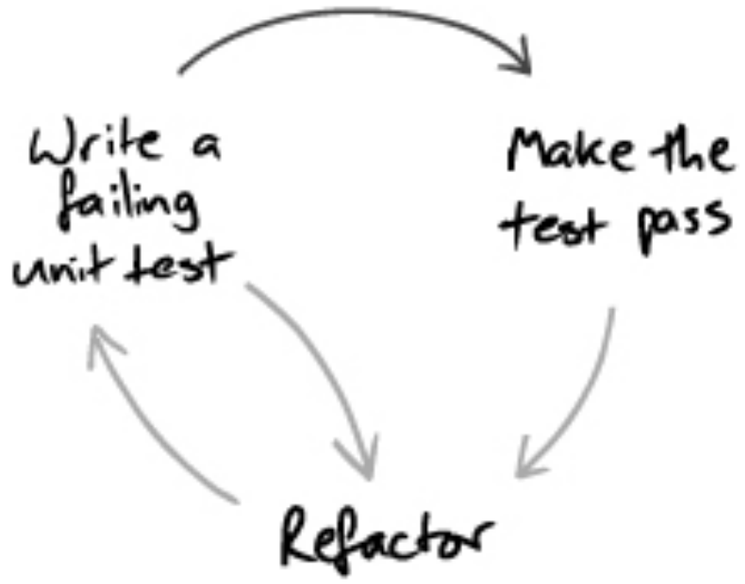
TDD CYCLE: IMPROVE FAILING REPORTS

Figure 5.2 *Improving the diagnostics as part of the TDD cycle*

Source: **Growing Object-Oriented Software, Guided by Tests**
by Steve Freeman, Nat Pryce

TDD CYCLE: REFACTOR AFTER TEST

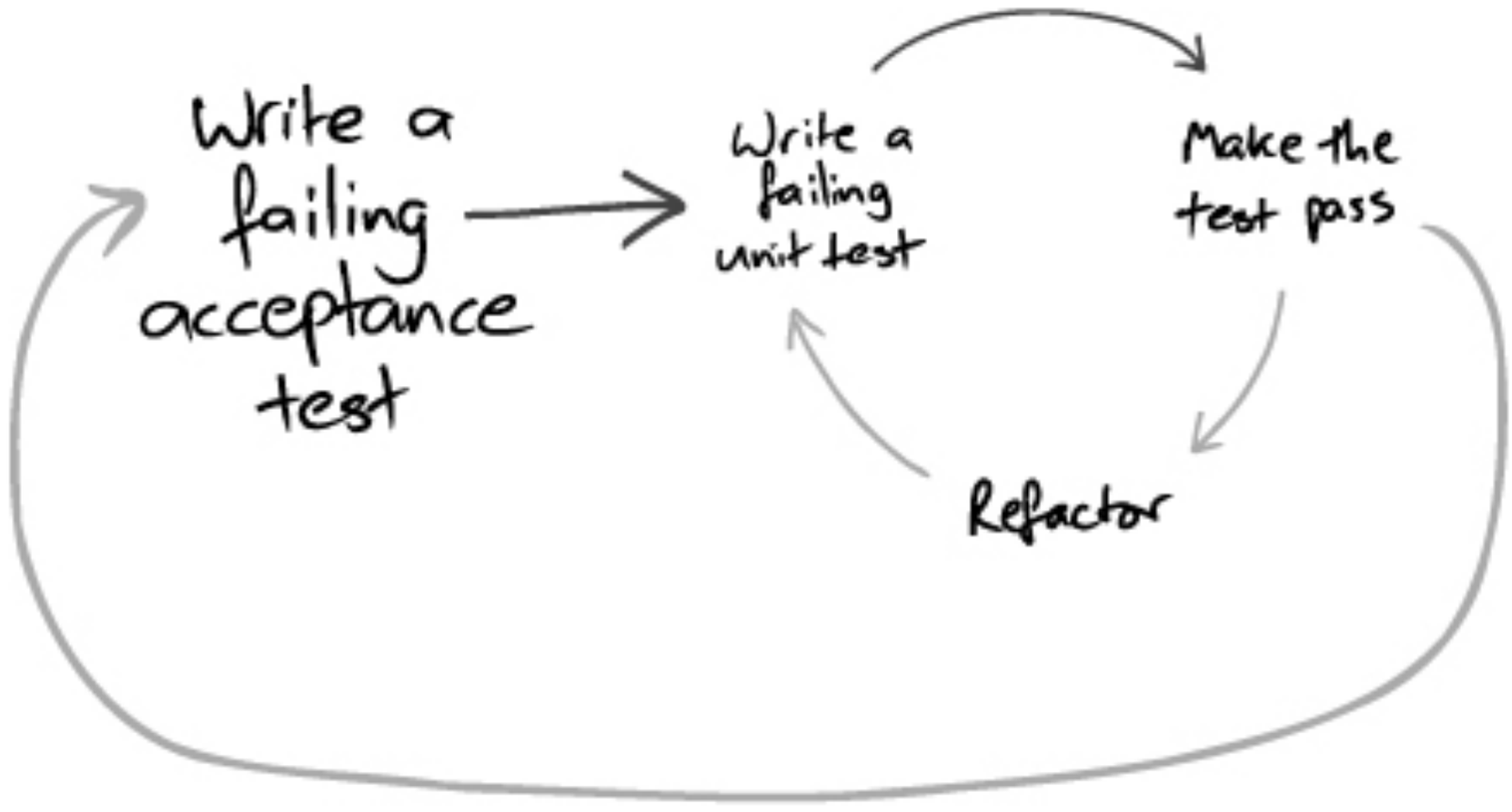
Figure 5.3 *Difficulties writing tests may suggest a need to fix production code*



Source: **Growing Object-Oriented Software, Guided by Tests**
by Steve Freeman, Nat Pryce

TDD CYCLES: MOCKIST STYLE

Figure 5.1 *Each TDD cycle starts with a failing acceptance test*



Source: **Growing Object-Oriented Software, Guided by Tests**
by Steve Freeman, Nat Pryce

TDD STYLES

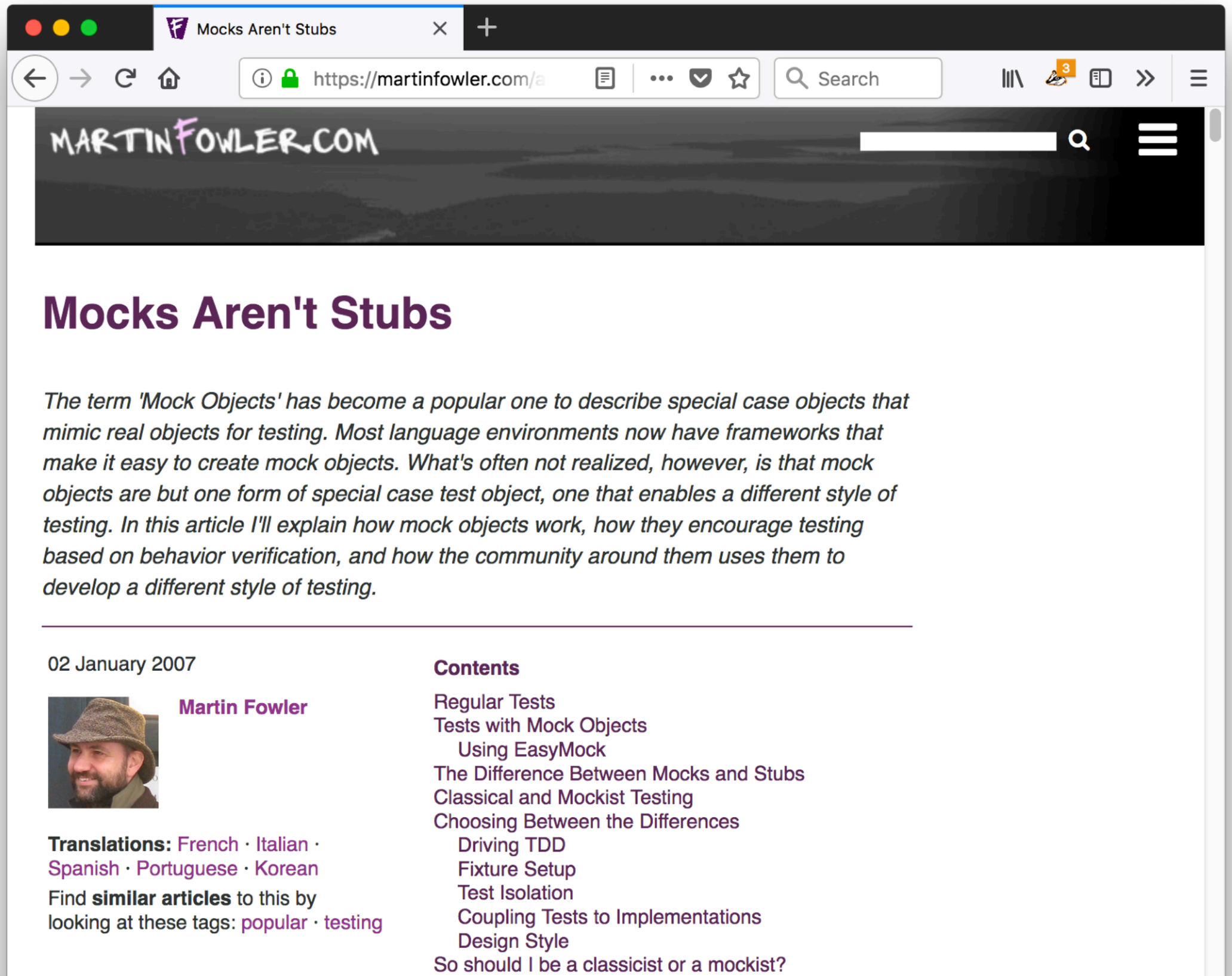
Chicago style, a.k.a. “classic”

Mostly inside-out: from unit tests to acceptance tests

London style, a.k.a. “mockist”

Mostly outside-in: from acceptance tests to unit tests

MARTIN FOWLER ON TDD STYLES



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TOOLS

Libraries and utilities for TDD in Go

LIBRARIES FOR TESTING

Go testing libraries with most Github stars*

5251 ★	stretchr/testify
3685 ★	smartystreets/goconvey
2166 ★	onsi/ginkgo
1452 ★	golang/mock
902 ★	DATA-DOG/go-sqlmock
884 ★	gavv/httpexpect
709 ★	onsi/gomega
575 ★	google/go-cmp
512 ★	franela/goblin
502 ★	h2non/baloo
496 ★	h2non/gock
404 ★	DATA-DOG/godog
387 ★	go-check/check

*Data collected 2018-07-05

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TECHNIQUES

Coding tips

SIMPLE EXAMPLE-TEST

```
func Example() {
        main()
        // Output:
        // Please provide one or more words to search.
}
```

ANOTHER SIMPLE EXAMPLE-TEST

```
func ExampleMake() {
        w := []string{"beta", "alpha", "gamma", "beta"}
        s := Make(w...)
        fmt.Println(s)
        // Output: Set{alpha beta gamma}
}
```

EXAMPLE-TEST WITH NON-DETERMINISTIC OUTPUT

```
func ExampleSet_Channel() {
        set := MakeFromText("beta alpha delta gamma")
        result := []string{}
        for elem := range set.Channel() { // order is undefined
                result = append(result, elem)
        }
        sort.Strings(result) // must sort so example passes
        fmt.Println(result)
        // Output: [alpha beta delta gamma]
}
```

EXAMPLE-TEST WITH FAKE COMMAND-LINE ARGUMENTS

```
func Example_2WordQuery() { // ❶
        oldArgs := os.Args // ❷
        defer func() { os.Args = oldArgs }()
        os.Args = []string{"", "cat", "smiling"}
        main() // ❸
        // Output:
        // U+1F638      😸      GRINNING CAT FACE WITH SMILING EYES
        // U+1F63A      😺      SMILING CAT FACE WITH OPEN MOUTH
        // U+1F63B      😻      SMILING CAT FACE WITH HEART-SHAPED EYES
}
```

TABLE TEST WITH SUB-TESTS

```
func TestMake(t *testing.T) {
        testCases := []struct {
                elems   []string
                wantLen int
        }{
                {[]string{}, 0},
                {[]string{"a"}, 1},
                {[]string{"a", "b"}, 2},
                {[]string{"a", "b", "a"}, 2},
        }
        for _, tc := range testCases {
                t.Run(fmt.Sprintf("%v gets %d", tc.elems, tc.wantLen), func(t *testing.T) {
                        s := Make(tc.elems...)
                        assert.Equal(t, tc.wantLen, s.Len())
                })
        }
}
```

TEST WITH FAKE ENVIRONMENT VARIABLE

```
func restore(nameVar, value string, existed bool) {
        if existed {
                os.Setenv(nameVar, value)
        } else {
                os.Unsetenv(nameVar)
        }
}

func TestGetUCDPath_isSet(t *testing.T) {
        pathBefore, existed := os.LookupEnv("UCD_PATH")
        defer restore("UCD_PATH", pathBefore, existed)
        ucdPath := fmt.Sprintf("./TEST%d-UnicodeData.txt", time.Now().UnixNano())
        os.Setenv("UCD_PATH", ucdPath)
        got := getUCDPath()
        if got != ucdPath {
                t.Errorf("getUCDPath() [set]\nwant: %q; got: %q", ucdPath, got)
        }
}
```

TEST WITH HTTP SERVER DOUBLE

```
func TestFetchUCD(t *testing.T) {
        srv := httptest.NewServer(http.HandlerFunc(
                func(w http.ResponseWriter, r *http.Request) {
                        w.Write([]byte(lines3Dto43))
                }))
        defer srv.Close()

        ucdPath := fmt.Sprintf("./TEST%d-UnicodeData.txt", time.Now().UnixNano())
        done := make(chan bool)                  // ❶
        go fetchUCD(srv.URL, ucdPath, done) // ❷
        _ = <-done                               // ❸
        ucd, err := os.Open(ucdPath)
        if os.IsNotExist(err) {
                t.Errorf("fetchUCD did not save:%v\n%v", ucdPath, err)
        }
        ucd.Close()
        os.Remove(ucdPath)
}
```

SLOW TEST THAT CAN BE SKIPPED

```
func TestOpenUCD_remote(t *testing.T) {
        if testing.Short() { // ❶
                t.Skip("skipped test [-test.short option]") // ❷
        }
        ucdPath := fmt.Sprintf("./TEST%d-UnicodeData.txt", time.Now().UnixNano())
        ucd, err := openUCD(ucdPath)
        if err != nil {
                t.Errorf("openUCD(%q):\n%v", ucdPath, err)
        }
        ucd.Close()
        os.Remove(ucdPath)
}
```

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REFERENCES

Where to learn more

REFERENCES


Test-Driven Development
Teste e Design no Mundo Real com Ruby
Casa do Código
HUGO CORBUCCI
MAURICIO ANICHE

MORE REFERENCES

Books

Kent Beck: **Test Driven Development: By Example** https://tgo.li/2NvBfcX

Steve Freeman, Nat Pryce:
Growing Object-Oriented Software, Guided by Tests https://tgo.li/2tV8QoK

Posts|Videos

Martin Fowler: **Mocks Aren't Stubs** https://tgo.li/2lUqTXv

Martin Fowler: **Is TDD Dead?** https://tgo.li/2IWOAYn

Michael Feathers , Steve Freeman:
Test Driven Development: Ten Years Later https://tgo.li/2KD2Gnm

Stanislav Pankevich:
Notes on "TDD by Example" by Kent Beck https://tgo.li/2ufKWDN

THANK YOU

Let's connect!

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