Seb Rose - Rational Jazz Server

Jazz is an IBM initiative to help make software delivery teams more effective

- an architecture for lifecycle integration
- a portfolio of products designed to put the team first
- a community of stakeholders - http://jazz.net

Open Services for Lifecycle Collaboration (OSLC) to promote vendor interoperability

- http://open-services.net

JAZZ Integration Architecture (JIA)

- defines a set of cross-tool services (JFS), extended by products
- all services exposed via RESTful interface
- tools separated from definition & access to data

Rational JAZZ Team Server (JTS)

- Implements the JFS

Didier Verna - Lisp, Jazz, Aikido

LISP, Jazz, Aïkido

Three tales of the same story

Didier Verna

April 23, 2009

My philosophy of life

- **Beauty:** being able to evolve comfortably within a set of constraints, which begins with accepting their existence.
- **Fun:** being able to break those constraints at will, and then going back to them at will.
- **Unification:** drawing bridges between (*a priori*) unrelated domains, in the search for the essence of all things.

Where is the beauty ?

- **LISP** Writing code in any language can be beautiful, provided you know how to adapt your own ideas to the language's constraints.
- **Jazz** Playing a song in any kind of music can be beautiful, provided you know how to adapt your own ideas to the music's constraints.

Where is the fun ?

- **LISP** You can adapt the language to your own ideas instead of just having to adapt your own ideas to it, hence effectively breaking the rules or ordinary languages ("programmable programming language").
- **Jazz** Improvisation (the essence of Jazz), lets you adapt the music to your own ideas instead of forcing you to adapt your ideas to it, effectively breaking the rules of ordinary music.

Unification

- **LISP** Because it's a meta-language, LISP is imperative, procedural, functional, object-oriented, declarative, anything you want.
- **Jazz** Because Jazz is not a kind of music, but a way to address all kinds of music, in Jazz there is jazz, classical, pop, rock, hard-rock, rap, electro, anything you want.

Conclusion

The Tao

```
(setq *lisp* (make-instance 'my-phi-of-life))
(setq *jazz* (make-instance 'my-phi-of-life))
```

- Do you love Jazz ?
- Then, you should program in LISP.
- Otherwise, you are **wrong**.

- Do you already program in LISP?
- Then, . . .

Perspectives

- **Rush to** `http://www.didierverna.com`
- **Buy my CD !!**

Available on:

- iTunes
- CDBaby
- Amazon
- Napster
- ...

- Related blog

`http://www.didierverna.com/jazzblog/index.php?entry=entry070403-163007`

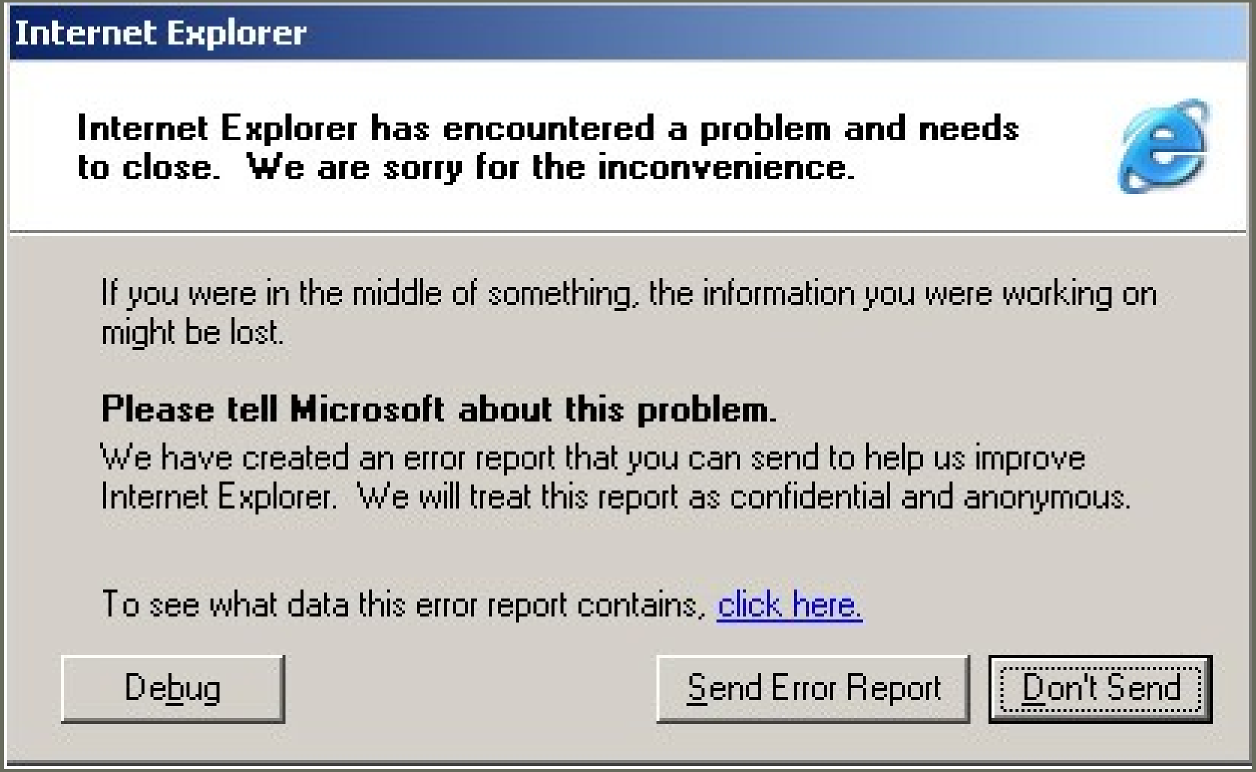
Mark Bartosik - Hunting For Bugs

Golden rules

- You are guilty until proven innocent
- Always generate debugging symbols
- The symbol server is your best friend
- All access violations are deadly
- Save a .DMP file
- Have sharp tools www.sysinternals.com and “Debugging Tools for Windows”, VS2005

Using WER (example crash)

- WER will report Shell detected hangs "Application not responding"
- WER will report unhandled exceptions



Internet Explorer

Internet Explorer has encountered a problem and needs to close. We are sorry for the inconvenience.

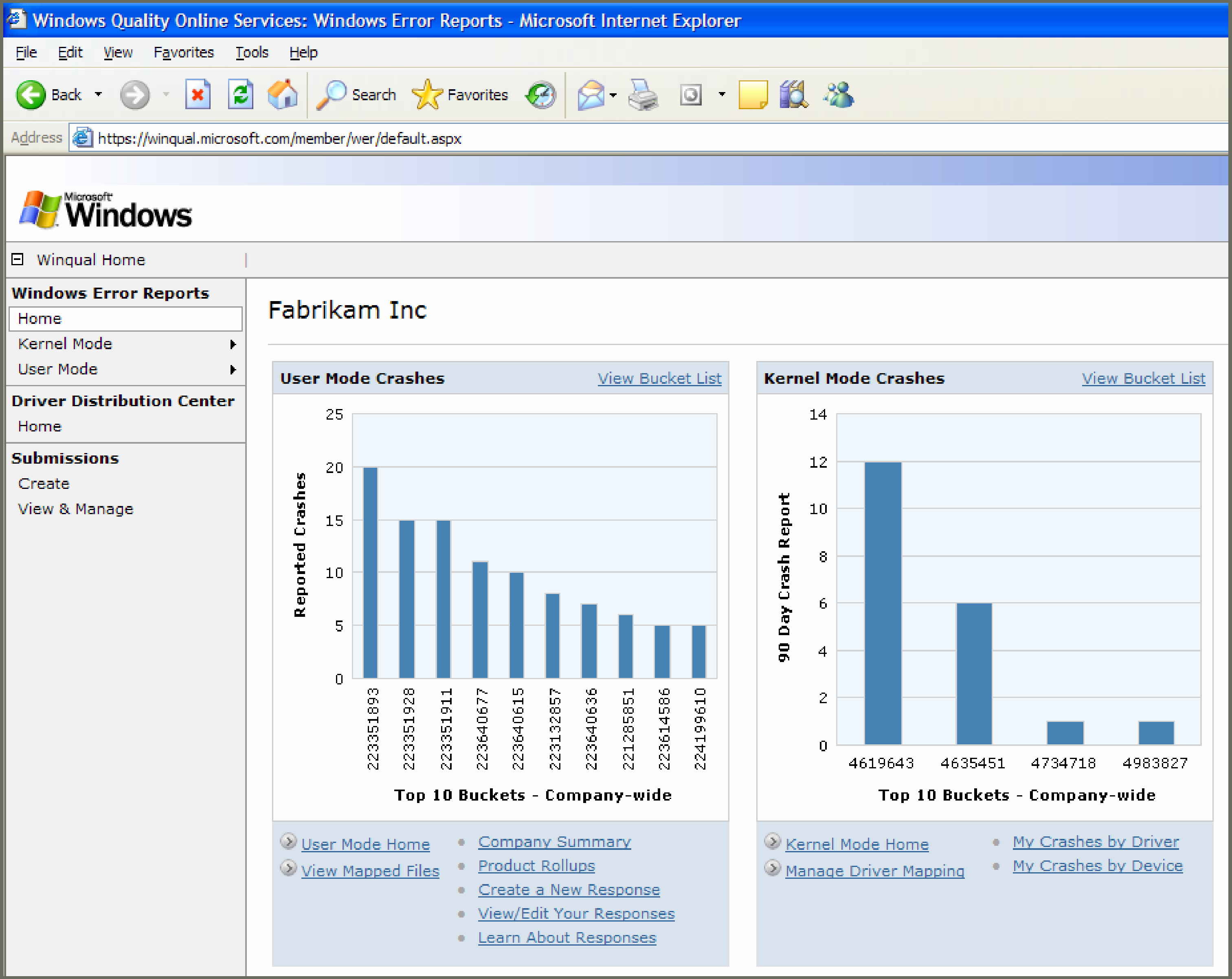
If you were in the middle of something, the information you were working on might be lost.

Please tell Microsoft about this problem.

We have created an error report that you can send to help us improve Internet Explorer. We will treat this report as confidential and anonymous.

To see what data this error report contains, click here.

Using WER



Windows Quality Online Services: Windows Error Reports - Microsoft Internet Explorer

Fabrikam Inc

User Mode Crashes — View Bucket List

Kernel Mode Crashes — View Bucket List

Reading .dmp files with WinDebug

- First download the latest Debugging Tools for Windows package.
  It is updated about twice a year, plus beta releases, currently at v6.6.
- Set the symbol path:

  .sympath

  or from the menu

  File, Symbol File Path…
- Make sure the Microsoft symbol server is on the path:

  Add SRV*c:\websymbols*http://msdl.microsoft.com/download/symbols

  or use

  .symfix+ c:\websymbols
- Make sure that path to the binary images is set

  .exepath+ c:\where_your_binaries_are

  or from the menu

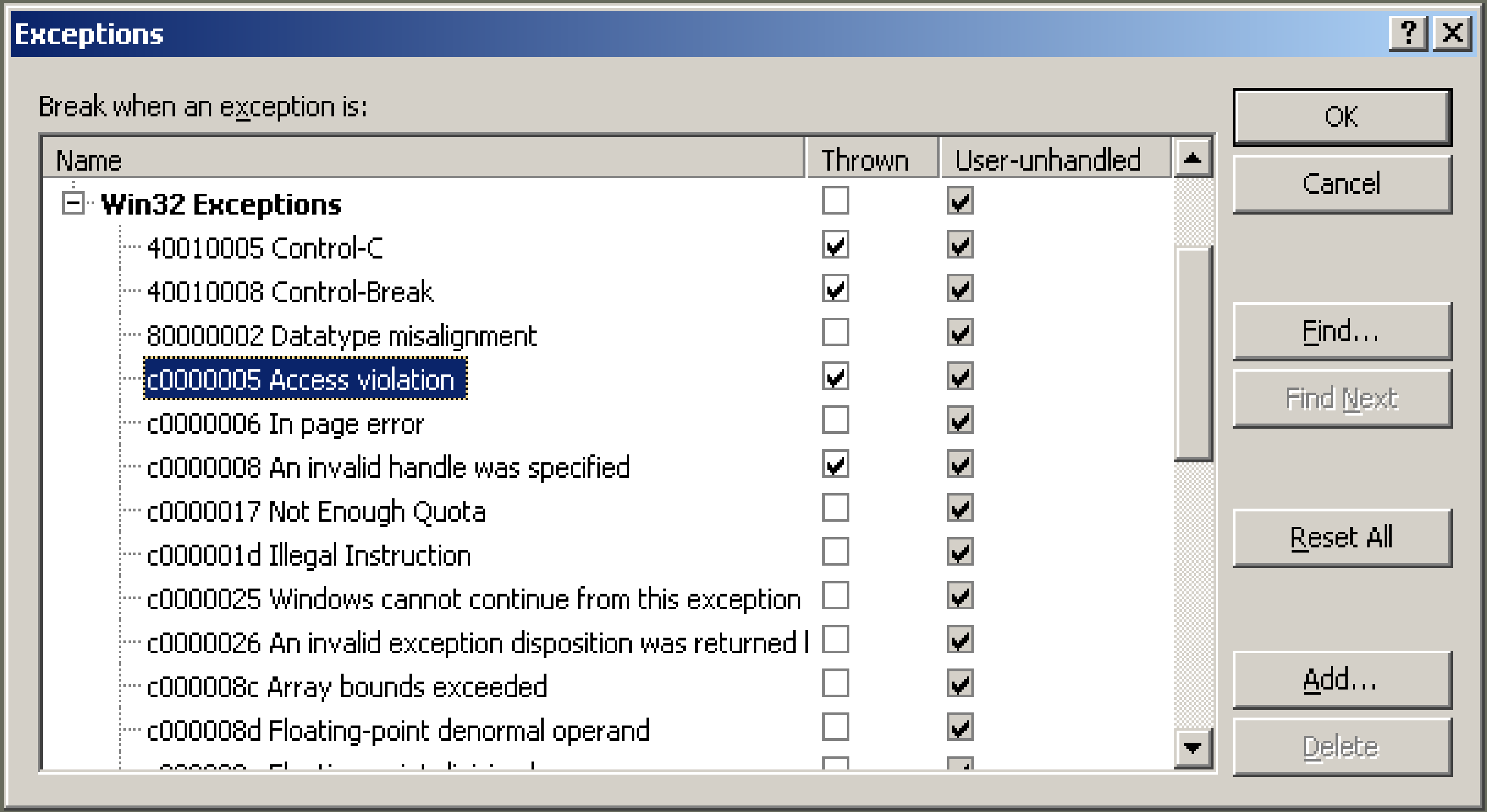
  File, Image File Path…
- File, Open Crash Dump…   (older versions also Debug, Go)

Capturing post mortem files programmatically

- Implement a vectored exception handler,
  not simple, catches almost everything.
- Implement an unhandled exception filter, easy but does not catch everything.
- Implement an se_translator function
  easy but not suitable for all projects.
- Implement an exception filter with __except, can be messy, scoped, easy for per thread, does not catch everything.
- Implement catch(…),
  not recommended.
- Whatever the mechanism used to intercept exceptions, we need a process to create the dumpfile (doing this in-proc is not recommended).
- A typical implementation will `CreateProcess` with a command line of “`dumpcapture-program -p` *`pid`*”.

Debugging exceptions

- Always trap access violations
- First column is *first chance* second column is *second chance* (unhandled)



Exceptions

Break when an exception is:

Name	Thrown	User-unhandled
Win32 Exceptions	☐	✓
40010005 Control-C	✓	✓
40010008 Control-Break	✓	✓
80000002 Datatype misalignment	☐	✓
c0000005 Access violation	✓	✓
c0000006 In page error	☐	✓
c0000008 An invalid handle was specified	✓	✓
c0000017 Not Enough Quota	☐	✓
c000001d Illegal Instruction	☐	✓
c0000025 Windows cannot continue from this exception	☐	✓
c0000026 An invalid exception disposition was returned l	☐	✓
c000008c Array bounds exceeded	☐	✓
c000008d Floating-point denormal operand	☐	✓

gflags

Part of
Debugging Tools for Windows

Do not enable both heap tail checking and page heap

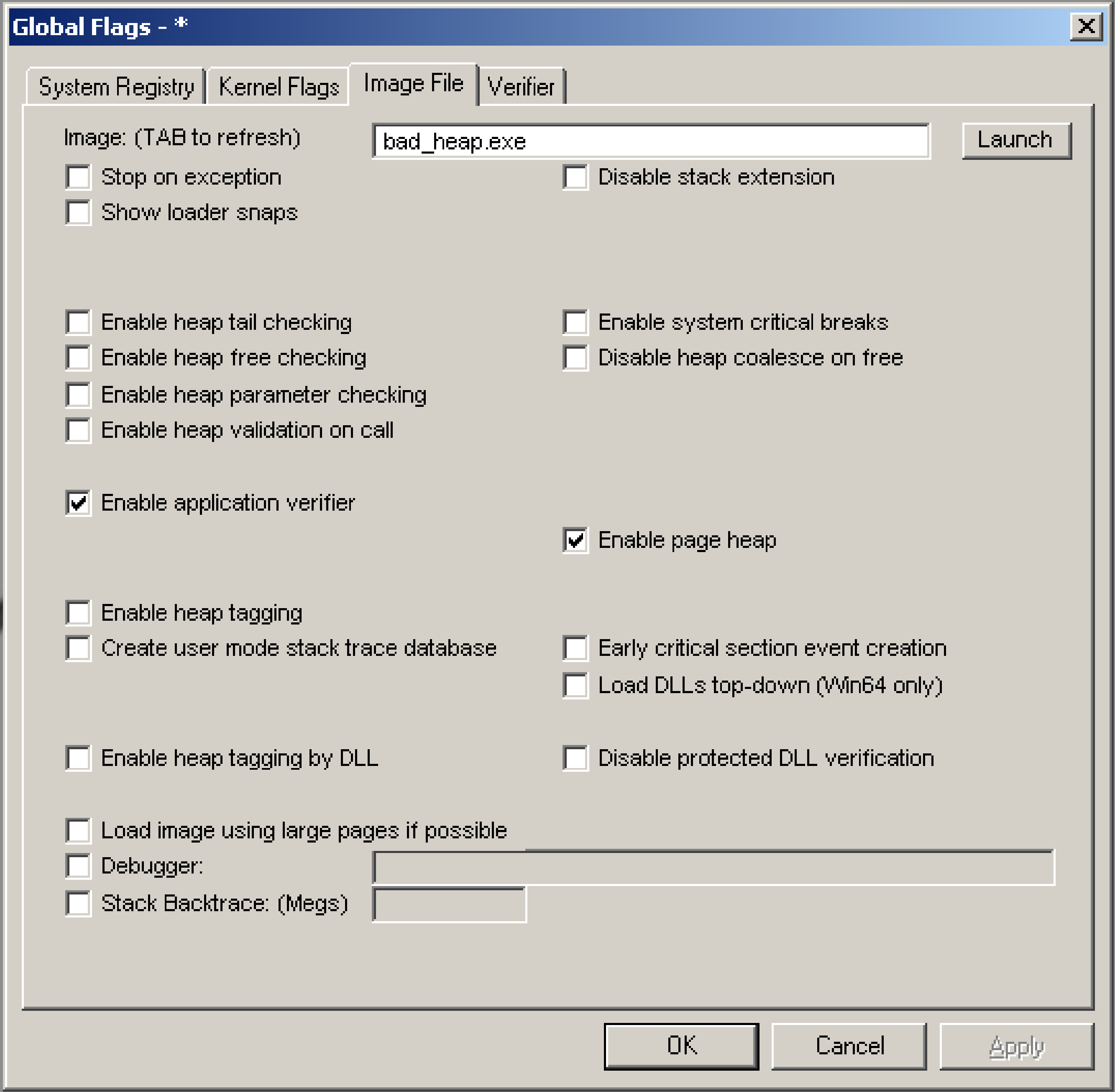


Image: (TAB to refresh) bad_heap.exe

- [ ] Stop on exception
- [ ] Disable stack extension
- [ ] Show loader snaps
- [ ] Enable heap tail checking
- [ ] Enable system critical breaks
- [ ] Enable heap free checking
- [ ] Disable heap coalesce on free
- [ ] Enable heap parameter checking
- [ ] Enable heap validation on call
- [✓] Enable application verifier
- [✓] Enable page heap
- [ ] Enable heap tagging
- [ ] Create user mode stack trace database
- [ ] Early critical section event creation
- [ ] Load DLLs top-down (Win64 only)
- [ ] Enable heap tagging by DLL
- [ ] Disable protected DLL verification
- [ ] Load image using large pages if possible
- [ ] Debugger:
- [ ] Stack Backtrace: (Megs)

Golden rules

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- Save a .DMP file
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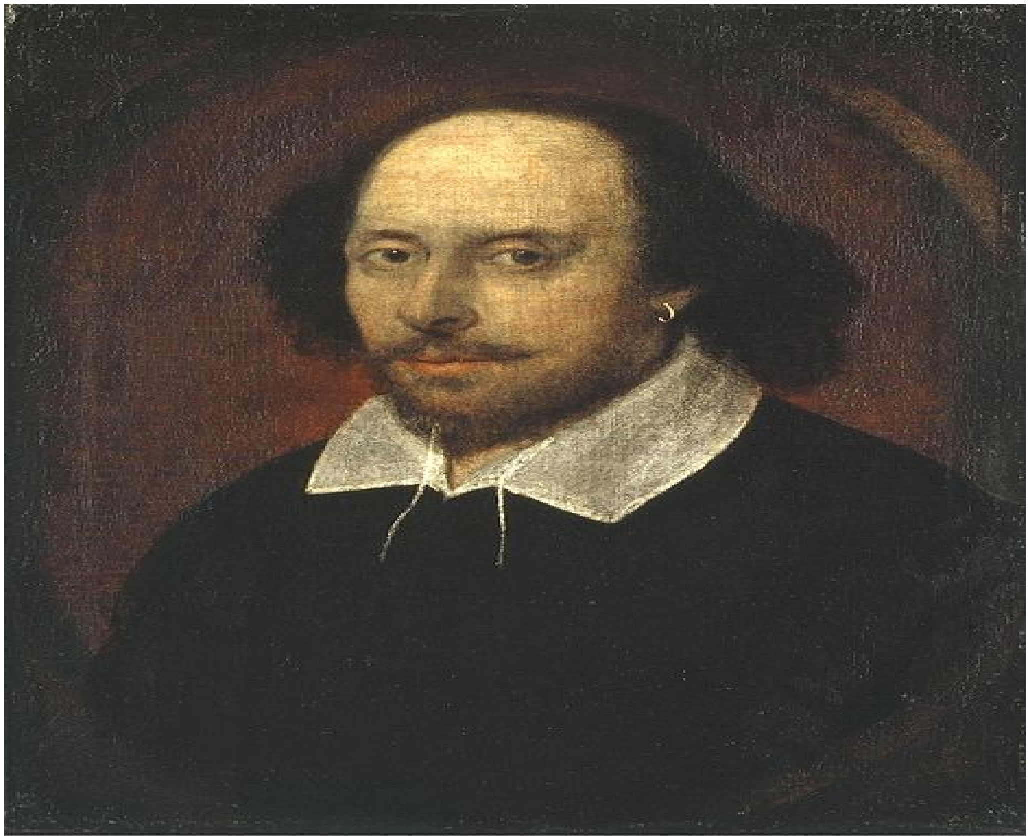
Jim Hague - A Thought For St George's Day

Google



If it were done when 'tis done, then 'twere well
It were done quickly

- Macbeth, Act I Scene VII

Beware the ides of March.

- Julius Caesar, Act I Scene II

Beware the march of IDEs.

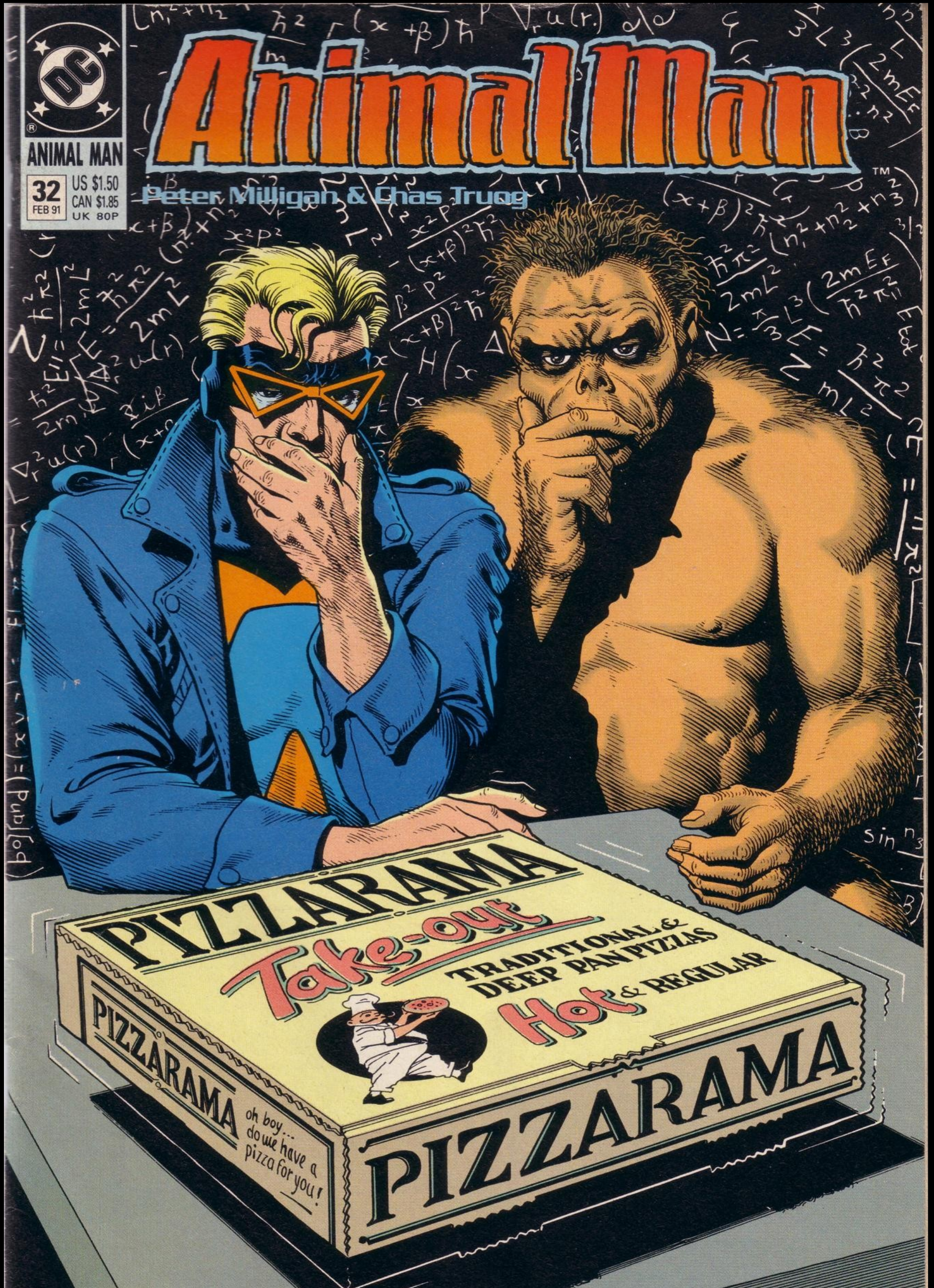
- Build system
- Version control view warping
- Coding by fiddling
- Fixing you into one window
-

Kevlin Henney - The Uncertainty Principle

ANIMAL MAN
32
FEB 91
US $1.50
CAN $1.85
UK 80P

Animal Man

Peter Milligan & Chas Truog


PIZZARAMA
Take-out
TRADITIONAL & DEEP PAN PIZZAS
Hot & REGULAR
PIZZARAMA
PIZZARAMA
oh boy... do we have a pizza for you!
PIZZARAMA

Charles Bailey - git log --summary @{1 year ago} @{now}

Who am I?

Charles Bailey

charles.bailey@igence.com

igence

title – see below

```
git log --summary @{1 year ago} @{now}
```

How many?

- v1.5.4.5 to v1.6.2.1
- 3410 non-merge commits
- 910 merges

It works

- Built on a simple system that works
- The object model has not changed since 1.0
- It's unlikely to change

Staging area

git stage <files>

(aka: git add)

Stage some changes...

```
git stage -p
```

Don't lose your HEAD

```
git reflog

git reset HEAD@{n}
```

Don't lose your changes

git stash

Status isn't

```
git status =~ git commit --dry-run --verbose
```

rebase: update patch to latest

```
O – O – A – O – O – B
              \ – O – C   <- I'm here
```

git rebase B

```
O – O – A – O – O – B – O' – C'  <- I'm here
            [ \ – O – C ]
```

rebase: move patches to latest

```
O – O – A – O – O – B
                \ – O – C – O – D   <- I'm here
```

git rebase --onto B C

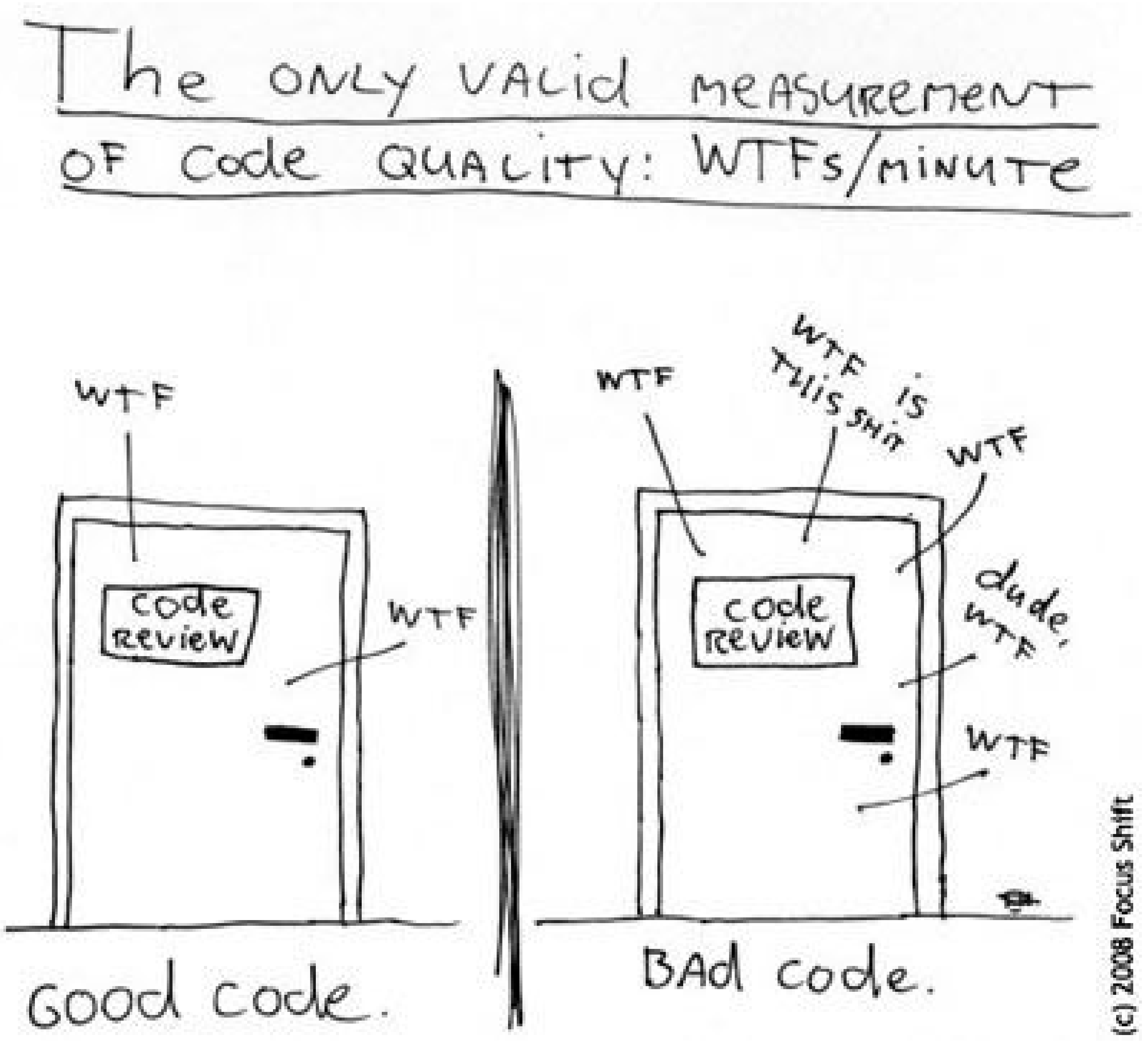
```
O – O – A – O – O – B – O' – D' <- I'm here
                \ – O – C – O – D ]
```

Olve Maudal - Analogy: A Codebase Is Like A Kitchen

Your codebase is like a kitchen

Olve Maudal
oma@pvv.org

5 minute lightening talk at ACCU 2009
April 24, 2009



(reproduced with kind permission of Thom Holwerda)

The state of your codebase determines what you can achieve

Analogy

The codebase is like a kitchen

suppose you are just going to make something nice for yourself

then, really, anything will do.

Even...

but, software development is usually about more than just making something nice for yourself.

It is usually about making something really fancy...

寿司

sushi

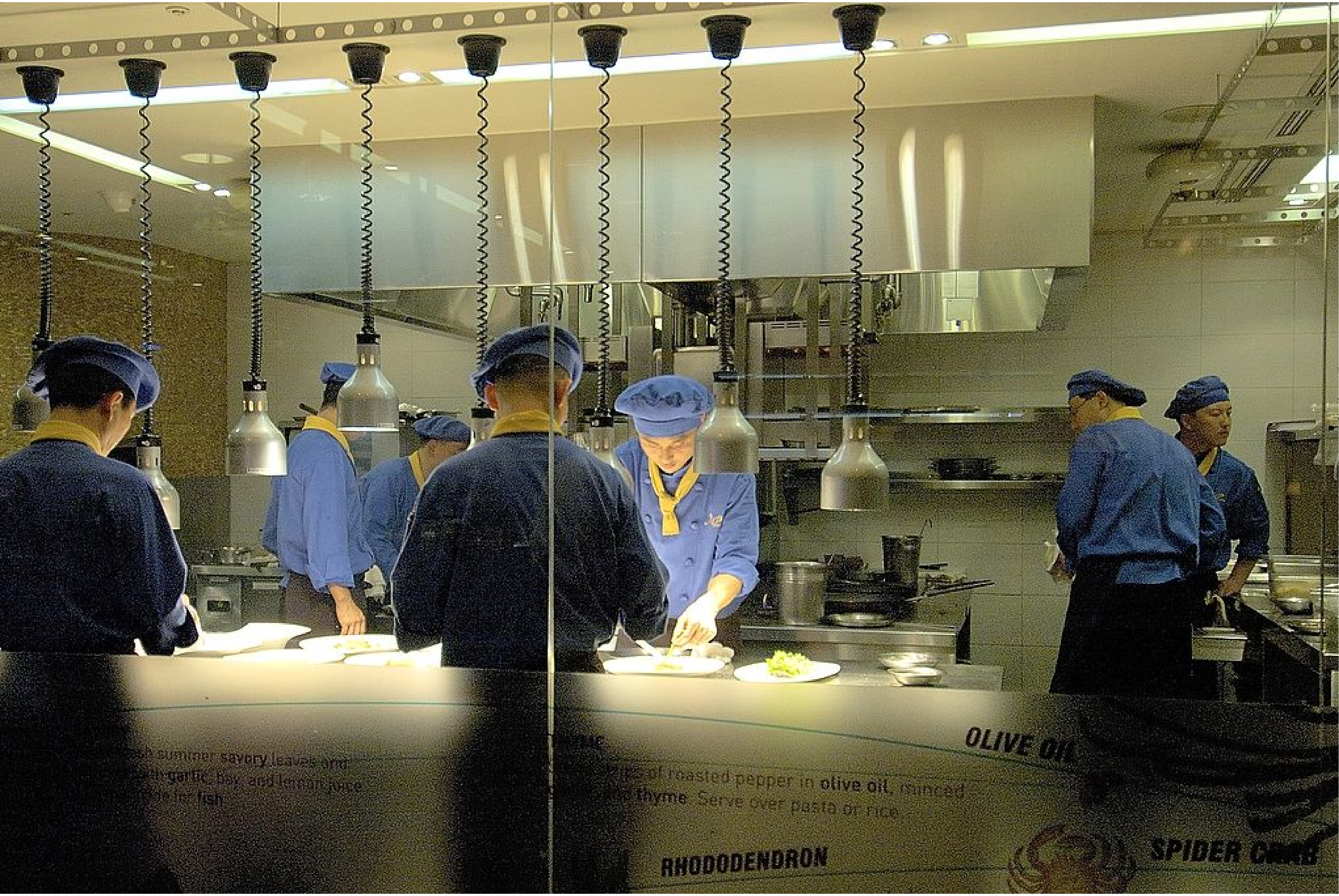
which one do you like best?

together with a large team of professionals...

for some demanding customer...

Then it is obvious:

To succeed you need a clean and functioning working environment.


OLIVE OIL
RHODODENDRON
SPIDER CRAB

Your codebase is like a kitchen.

Keep it clean so that you can create spectacular solutions for your demanding customers!

The Boy Scout Rule

Leave the campground cleaner than you found it.

The Importance of hygiene

Uncle Bob has suggested that we are now about to "discover" techniques and principles in software engineering that can be compared to the discovery of the importance of hygiene in hospitals by Ignaz Semmelweis in the middle of the 19th century.

(Semmelweis in the middle with arms crossed)

Semmelweis found that by introducing hand washing standards before surgery the number of fatal incidence caused by diseases dropped drastically. At the time, diseases were attributed to many different unrelated causes. Each case was considered unique, just like a human person is unique. Semmelweis' hypothesis, that there was only one cause, that all that mattered was cleanliness, was extreme at the time, and was largely ignored, rejected or ridiculed. [wikipedia]

At the point where a certain standard hygiene was accepted and enforced by the medical establishment, doctors started to behave as a group of professionals. This happened about 60 years after Semmelweis' discovery. As software engineers we are not always behaving like professionals, especially not at times where we let pressure from management and customers decide whether we write clean code or not. We know that dirty code is going to slow us down and delay the project, but still, for some reason, we sometimes end up in situations where we do exactly what we are not supposed to do. Imagine how a group of doctors today would react to a situation where they are told not to wash their hands between surgeries? Doctors act as professionals. Unfortunately, as a group of software engineers, we are not there... yet.

Stewart Brodie - Character Encodings: Decoded & Demystified

Encodings: Decoded & Demystified

24th April 2009

Stewart Brodie

Universal Character Set (UCS)

All (UCS-4) characters are identified by a 21-bit number
terminology: “code point”

All characters are also identified by a name

Example: 'Latin Capital Letter A' written as: U+0041

“Universal” means nearly universal

U+1F04E is …

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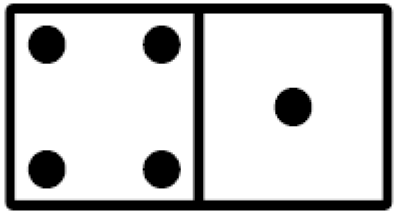

UCS-4: Pros & cons

Pros:

Code points storable in 32-bit integers

Very easy and fast to process in code

Cons:

Wasteful of memory: 4 bytes per character!

(Of course, given enough memory & disc space ...)

Encodings are ...

… a mapping for converting a sequence of bytes to a sequence of code points (and vice versa)

… not always able to represent every code point

e.g. ASCII can only represent code points U+0000-U+007F

… sometimes fixed length, e.g. ISO Latin 1 (ISO 8859-1)

… sometimes variable length, e.g. UTF-8

… sometimes stateful! e.g. ISO/IEC 2022

UCS Translation Format (UTF)

UTF-32: four-byte based encoding (~= UCS-4)

UTF-16: two-byte based encoding (~= UCS-2)

(with different endianness variants!)

UTF-8: single byte based, variable-length encoding

- *Invented by Ken Thompson (Bell Labs) 1992*
- *All basic Latin characters encoded in 1 byte*
- *Most other European characters in 2 bytes*
- *Most Far Eastern characters in 3 bytes*
- *All Basic Multi-lingual Plane in 1, 2 or 3 bytes*
- *Many useful properties (re-sync, error detect, bi-di iteration)*
- *Can be processed (mostly) safely by usual C string APIs*

Using the wrong encoding

“The project cost Â£1M”

Using the wrong encoding

“The project cost Â£1M”

Indicative of using Latin 1 to decode UTF-8 byte stream

UTF-8 encoding for U+00A3 is: 0xC2 0xA3

Latin 1 encoding for U+00C2 (Â) is: 0xC2
Latin 1 encoding for U+00A3 (£) is: 0xA3

Need to use the correct encoding to get the message right!

April 24th is a special day

Happy Birthday, Mum!

Keith Braithwaite - Backing the Truth into a Corner

Backing the Truth into a Corner

Why do examples work so well?

And what can we do about it?

Keith Braithwaite

“I have nothing to sell. I am an entertainer. [...]

I just want you to enjoy a point of view which I enjoy”

—Alan Watts

Cake or Biscuit?

Er…

Er...

Why?

- mainly because fresh cakes are soft and stale ones hard
- biscuits, vice-versa

Er...

Why?

- mainly because fresh cakes are soft and stale ones hard
- biscuits, vice-versa

Says who?

- Mr D. C. Potter, QC
  - United Biscuits v HM Commissioners of Revenue and Customs, Lon/91/160

Er...

Why?

- mainly because fresh cakes are soft and stale ones hard
- biscuits, vice-versa

Says who?

- Mr D. C. Potter, QC
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Why would you care?

- Chocolate covered biscuits attract VAT
- Chocolate covered cakes do not

What Does This Tell Us?

What Does This Tell Us?

zühlke
empowering ideas

Categories are <u>not</u> out in the world waiting for us

Counterintuitive

He actually presents reasons why Jaffa cakes aren't:

- too small
- eaten the wrong way
- little in common with other cakes
- not sold with other cakes
- etc.

And then concludes that they are cakes

- for the purposes of VAT

Concepts and Definitions

The "Classical" view of Concepts:

- Every category C has a Definition D
- D is a set of predicates

$$D = \{p\!:\!\mathrm{Predicate}\}$$

- An object o is understood as part of C iff o satisfies D

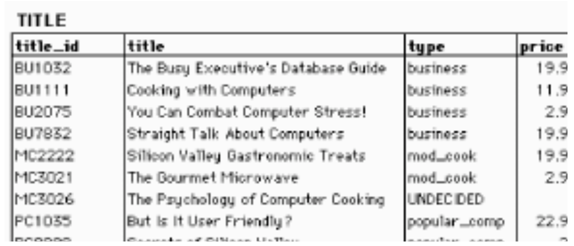
$$o \in C \Leftrightarrow \forall p \in D,\ p(o)$$

- Concepts are categorical
  - $o \in C \vee o \notin C$ and nothing else can be said

The Convenience of Definitions

Technologists find definitions most agreeable:

- They are crisp, unambiguous
- They are compact and yet also universally quantified
- Predicates seem to lead very naturally to:
  - relational table signatures
  - class members
  - rules in a inference engine



TITLE

title_id	title	type	price
BU1032	The Busy Executive's Database Guide	business	19.9
BU1111	Cooking with Computers	business	11.9
BU2075	You Can Combat Computer Stress!	business	2.9
BU7832	Straight Talk About Computers	business	19.9
MC2222	Silicon Valley Gastronomic Treats	mod_cook	19.9
MC3021	The Gourmet Microwave	mod_cook	2.9
MC3026	The Psychology of Computer Cooking	UNDECIDED	
PC1035	But Is It User Friendly?	popular_comp	22.9

Definitions Force Users To Be “Precise”

Forces the user to think our way

- they have to accommodate our way of thinking

Use of definitions is a power play over our users

- are we are afraid of the fuzziness of the world?
- are we afraid of our (in–)ability to deal with that?

An Alternative View

After 2300 years or so...

- Eleanor Rosch does experiments
- Just how do people understand the stuff of the world?

She made several discoveries:

1. categories are probabilistic
2. categories have structure
3. categories are fuzzy
4. categories relate to human capabilities

Categories Have Structure

Rosch describes vertical and horizontal structure

- Some members of a category are better than others

Categories Have Structure

zühlke
empowering ideas

Rosch describes vertical and horizontal structure

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Categories Have Structure

zühlke
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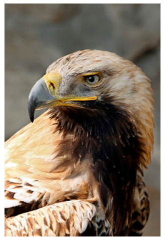
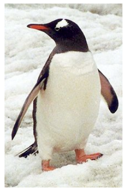
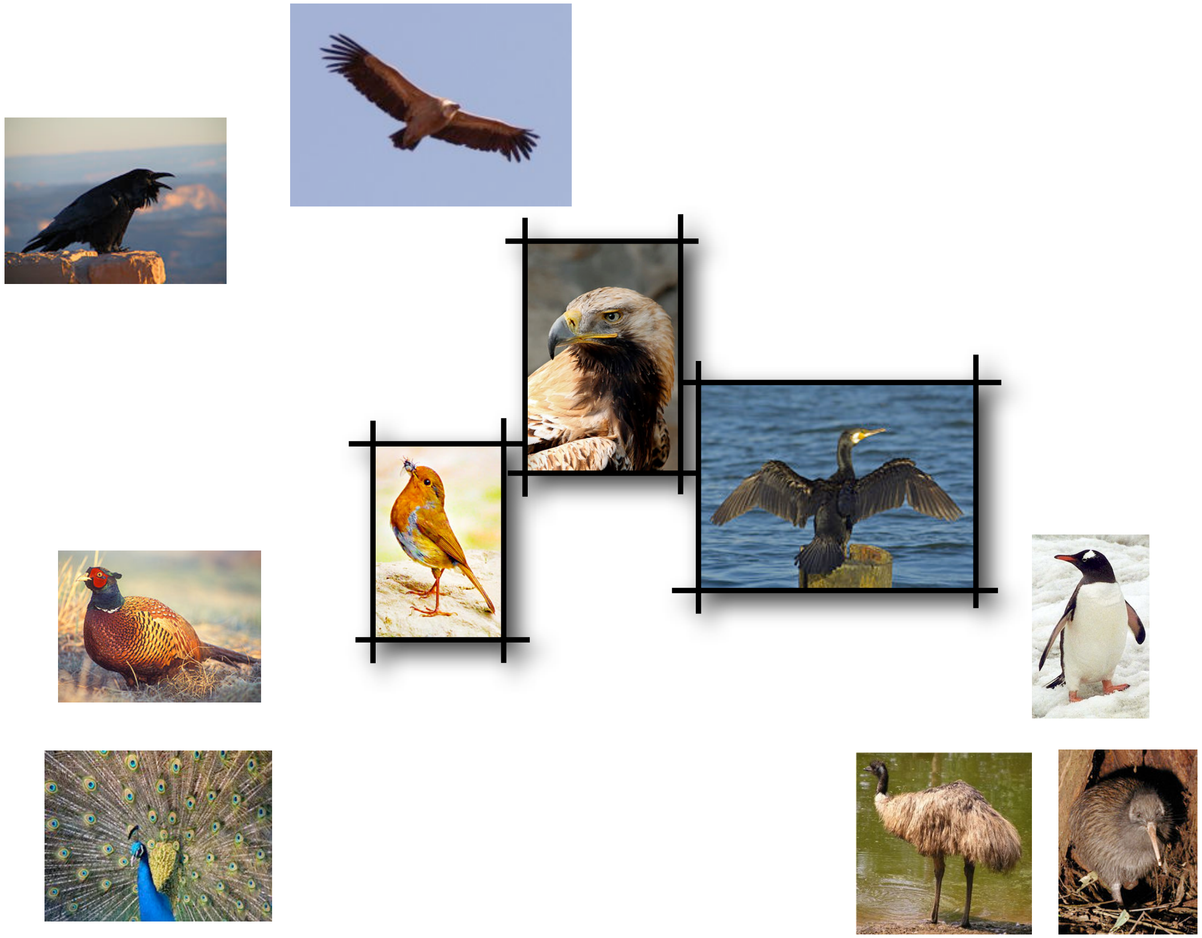
Birds

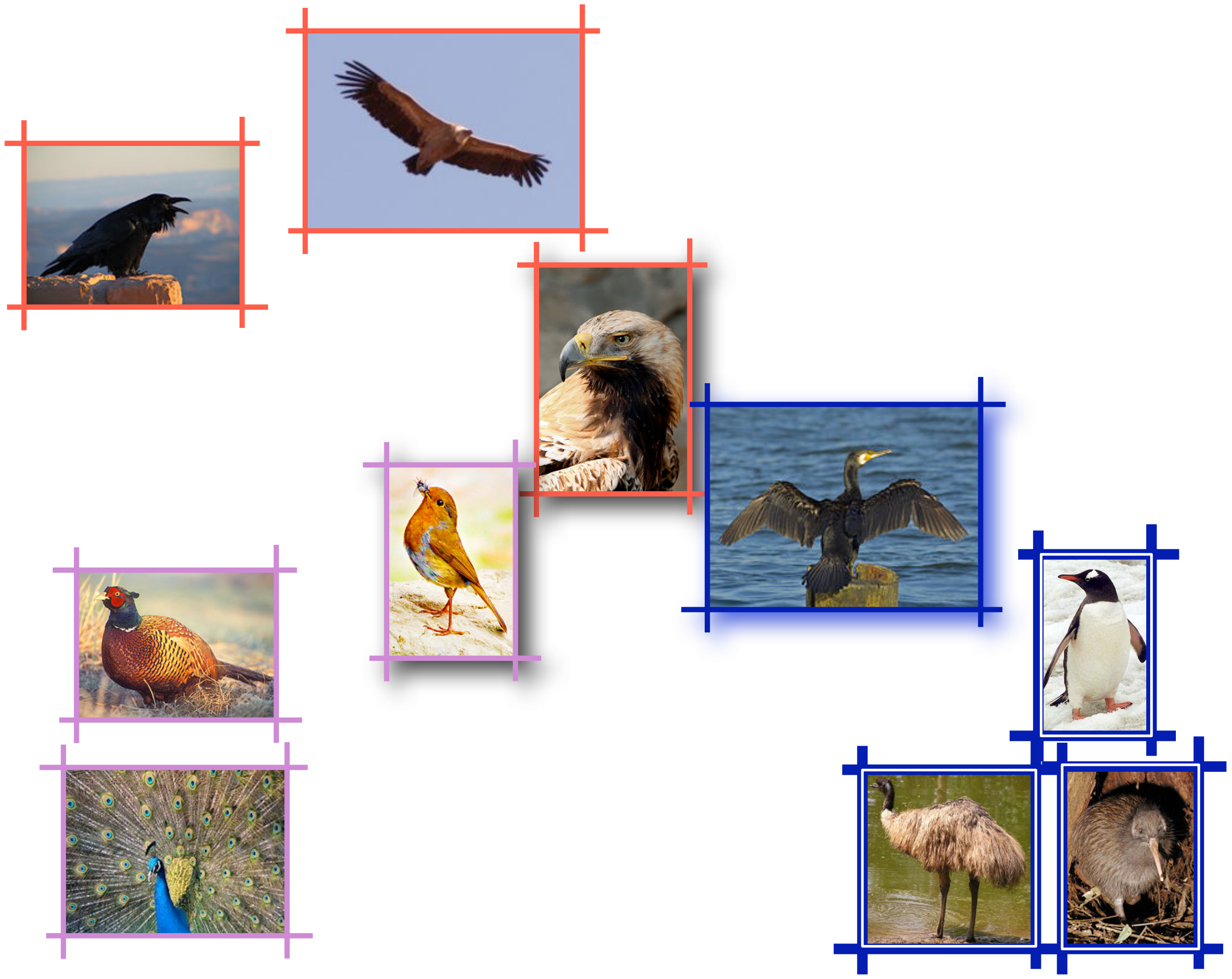




Prototypical Birds

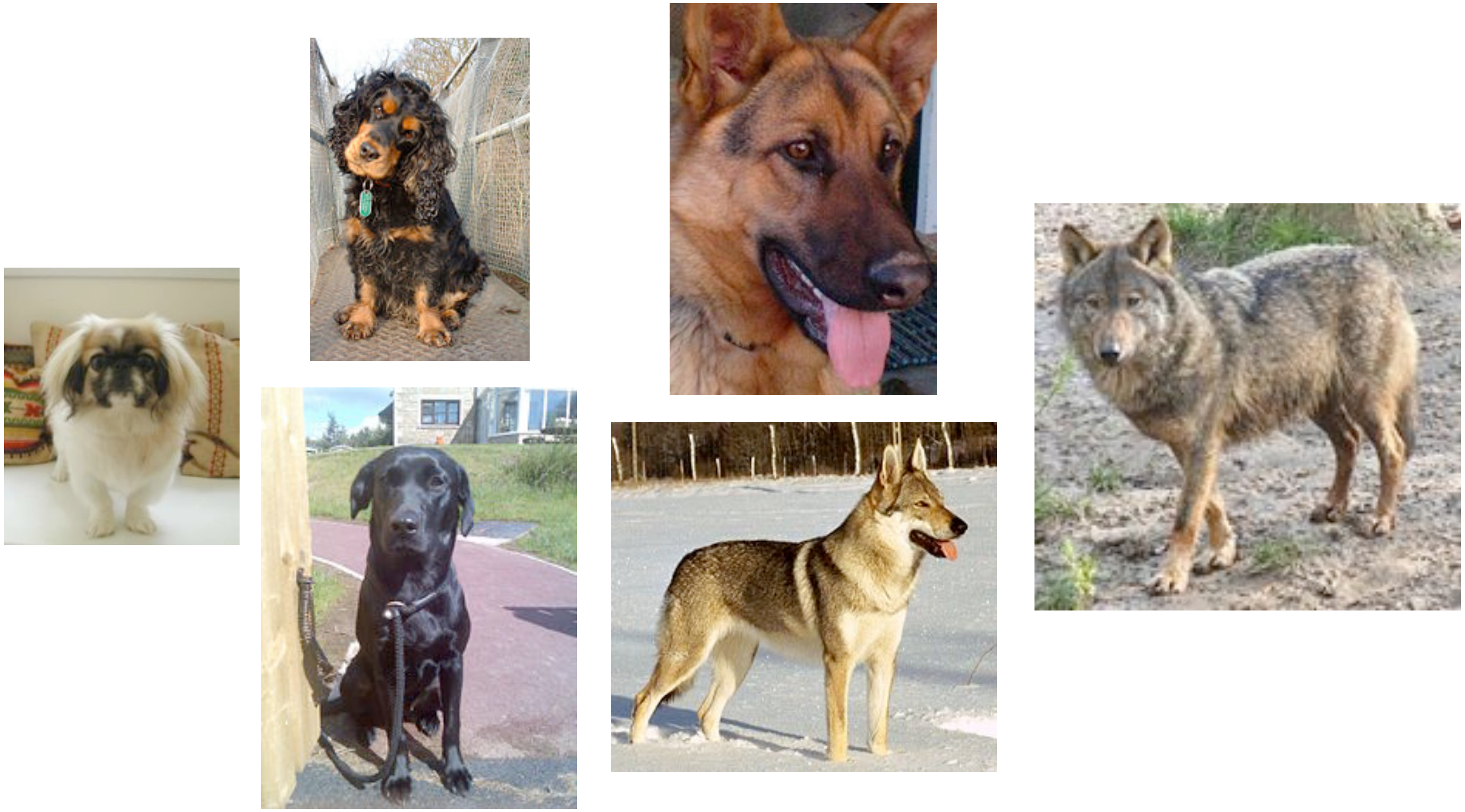


Structure of “Bird”



Categories Are Fuzzy

Near the edges, categories can blur into one-another



Categories Relate to Human Capabilities

Remember the cakes?

Categories are grounded in human experience

- more than physics

Automated Tests Are...

User/acceptance/functional tests have escaped:

- no longer applied at the the end of development
- no longer primarily about defects

Automated Tests are (Checked) Examples?

Checked examples metaphor emphasises:

- verification
- concreteness
- explicitness

Do We Have Any Clues Now About That?

If examples fit the way people think

- using them moves us towards our users
- connects us with their existential state
- corrects the power balance

Mark Dalgarno - Attack Of The Clones

Attack of the Clones

Mark Dalgarno

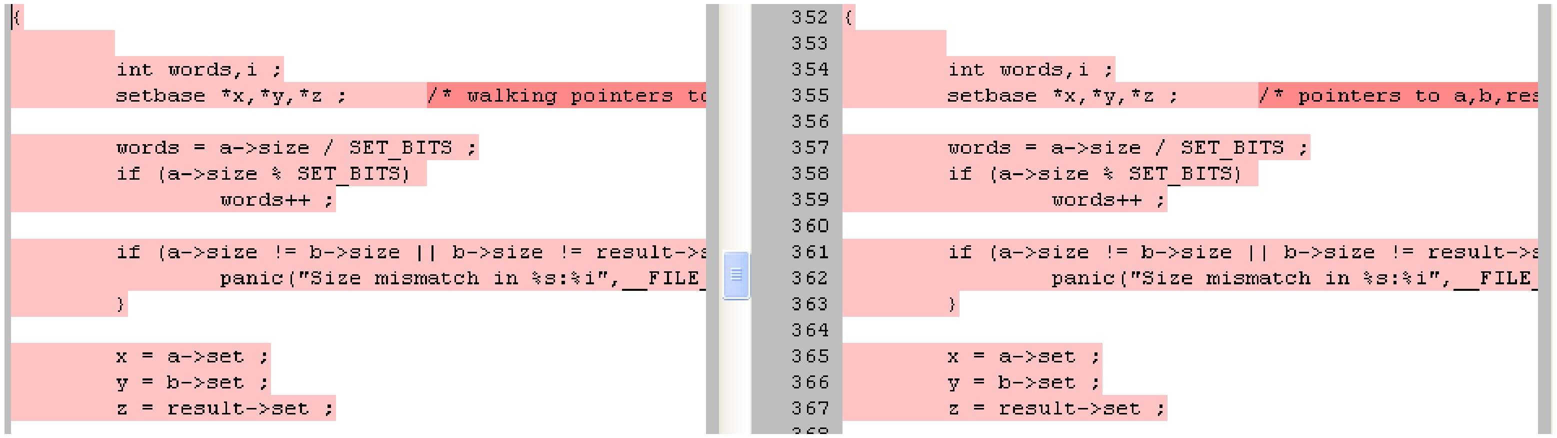
Software Acumen

Email: mark@software-acumen.com

Blog: blog.software-acumen.com

Software Acumen

These types of clone



```
{

        int words,i ;
        setbase *x,*y,*z ;          /* walking pointers to

        words = a->size / SET_BITS ;
        if (a->size % SET_BITS)
                words++ ;

        if (a->size != b->size || b->size != result->s
                panic("Size mismatch in %s:%i",__FILE_
        }

        x = a->set ;
        y = b->set ;
        z = result->set ;
```

```
{

        int words,i ;
        setbase *x,*y,*z ;          /* pointers to a,b,res

        words = a->size / SET_BITS ;
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        if (a->size != b->size || b->size != result->s
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```
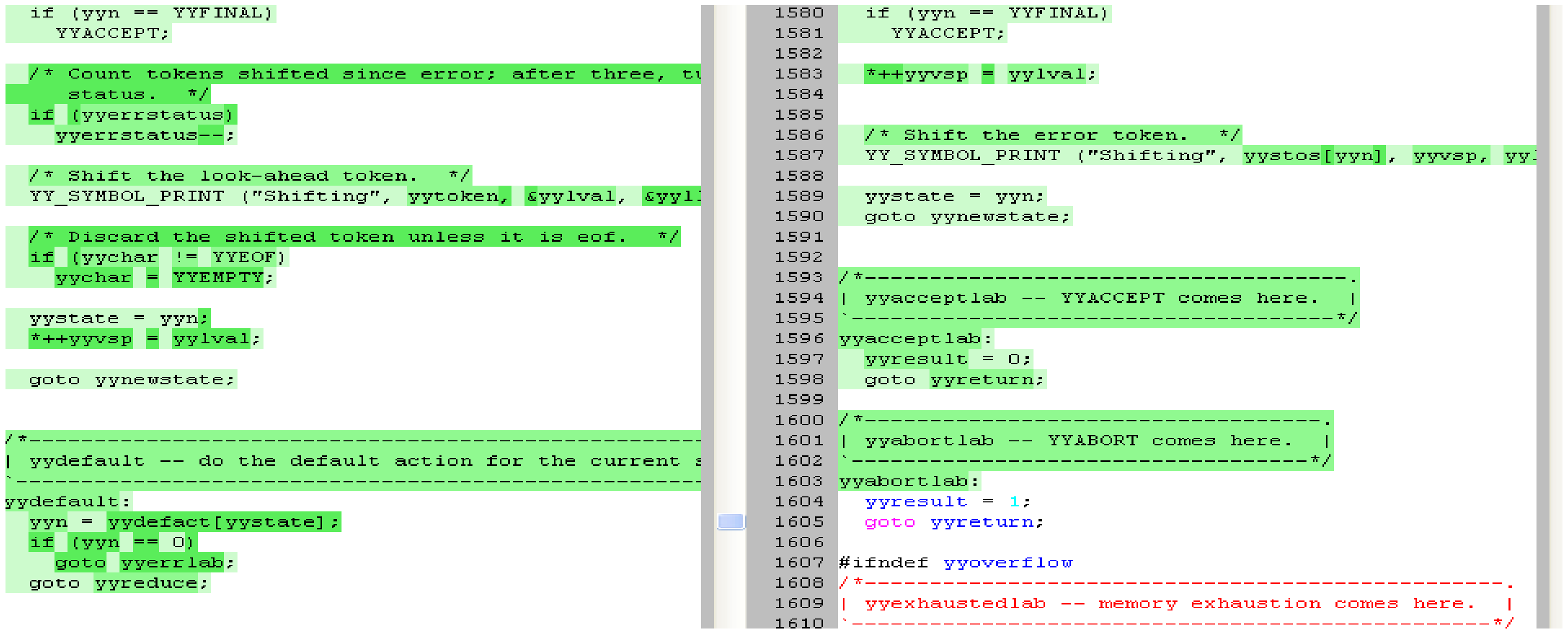



```
  if (yyn == YYFINAL)
    YYACCEPT;

  /* Count tokens shifted since error; after three, tu
     status.  */
  if (yyerrstatus)
    yyerrstatus--;

  /* Shift the look-ahead token.  */
  YY_SYMBOL_PRINT ("Shifting", yytoken, &yylval, &yyl

  /* Discard the shifted token unless it is eof.  */
  if (yychar != YYEOF)
    yychar = YYEMPTY;

  yystate = yyn;
  *++yyvsp = yylval;

  goto yynewstate;


/*-----------------------------------------------------------
| yydefault -- do the default action for the current s
`-----------------------------------------------------------
yydefault:
  yyn = yydefact[yystate];
  if (yyn == 0)
    goto yyerrlab;
  goto yyreduce;
```

```
  if (yyn == YYFINAL)
    YYACCEPT;

  *++yyvsp = yylval;


  /* Shift the error token.  */
  YY_SYMBOL_PRINT ("Shifting", yystos[yyn], yyvsp, yy

  yystate = yyn;
  goto yynewstate;


/*-------------------------------------.
| yyacceptlab -- YYACCEPT comes here.  |
`-------------------------------------*/
yyacceptlab:
  yyresult = 0;
  goto yyreturn;

/*-----------------------------------.
| yyabortlab -- YYABORT comes here.  |
`-----------------------------------*/
yyabortlab:
  yyresult = 1;
  goto yyreturn;

#ifndef yyoverflow
/*-------------------------------------------------.
| yyexhaustedlab -- memory exhaustion comes here.  |
`-------------------------------------------------*/
```

What's the problem?

- Cloning code increases your code size, this can make it
  - harder to understand,
  - slower to build &
  - have a larger footprint (expensive in an embedded setting).

- Cloning code increases your maintenance effort
  - Having to fix bugs in more than once place
  - Having to find bugs in more than once place
  - Having to add features in more than one place

Software Acumen

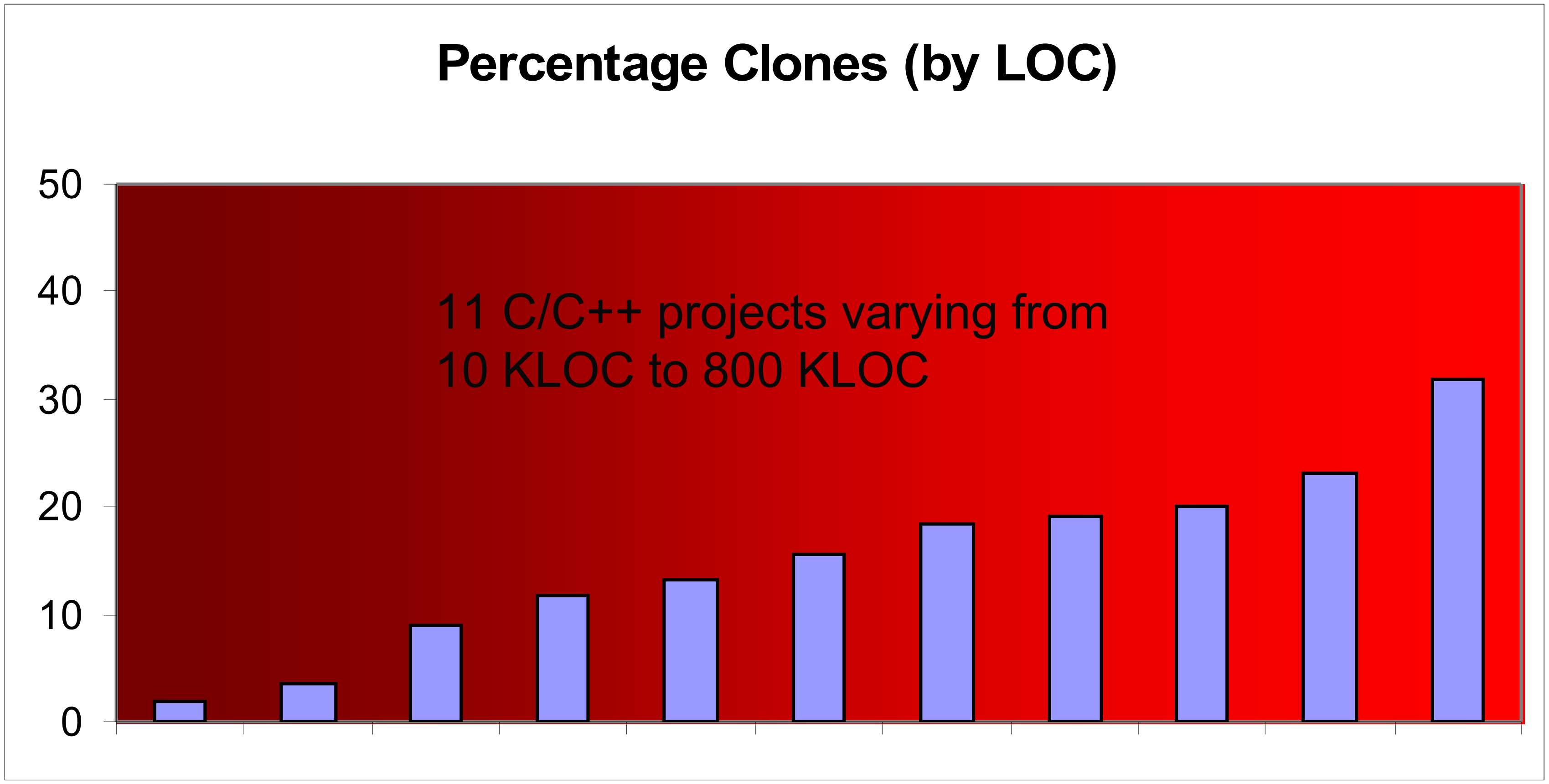
How big is the problem?

“I am a clone I’m not alone.

Is that the spirit of the age?”

Robert Calvert (1945-1988), (Hawkwind) *Spirit of the Age* from the album *Quark, Strangeness & Charm* (1977 Charisma)

Our recent industrial experience



1.8%

31.9%

The Copy-and-Paste Programming Manifesto

I will **not** copy and paste code

See http://tinyurl.com/d5cd26 for further resources or email mark@software-acumen.com

Software Acumen

Guy Bolton-King - Test Your Java With Java

Test your Java code with Scala

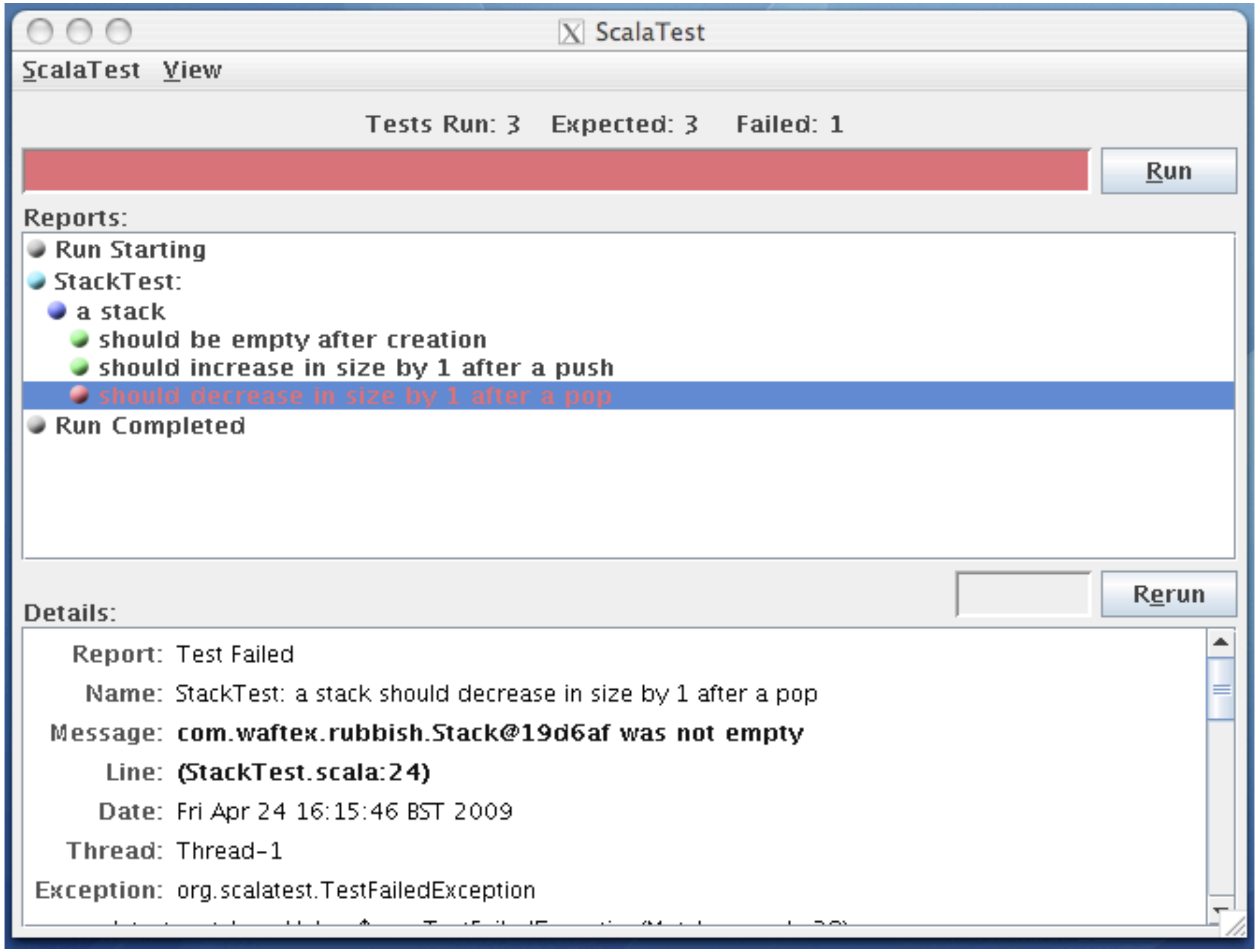
Internal DSLs are easy in Scala

```
class MustBe(val name: String) {
  def mustEqual(s: String) {
    if (s != name)
      throw new RuntimeException
        (s + " was not equal to " + name)
  }
}

val m = new MustBe("foo")

m.mustEqual("foo")

m mustEqual "foo"

implicit def convertStringToMustBe(s: String) =
  new MustBe(s)
```

```java
public class Stack<T>
{
  private ArrayList<T> _stack = new ArrayList<T>();

  static class Empty extends RuntimeException {}

  public void push(T x) { _stack.add(x); }

  public T pop() {
    if (_stack.size() == 0)
      throw new Empty();
    return _stack.get(_stack.size() - 1);
  }

  public int size() { return _stack.size(); }

  public boolean empty() { return size() == 0; }
}
```

```
public class StackTestJUnit {
  @Test
  public void shouldBeEmptyAfterCreation() {
    Stack<Integer> stack = new Stack<Integer>();
    assertTrue(stack.size() == 0);
  }

  @Test
  public void shouldIncreaseInSizeBy1AfterAPush() {
    Stack<Integer> stack = new Stack<Integer>();
    stack.push(1);
    assertTrue(stack.size() == 1);
  }

  @Test
  public void shouldDecreaseInSizeBy1AfterAPop() {
    Stack<Integer> stack = new Stack<Integer>();
    stack.push(1);
    stack.pop();
    assertTrue(stack.empty());
  }
}
```

```
class StackTest extends Suite with Spec with ShouldMatchers {

  describe("a stack") {
    it("should be empty after creation") {
      val stack = new Stack[Int]
      stack should have size 0
    }

    it("should increase in size by 1 after a push") {
      val stack = new Stack[Int]
      stack.push(1)
      stack should have size 1
    }

    it("should decrease in size by 1 after a pop") {
      val stack = new Stack[Int]
      stack.push(1)
      stack.pop()
      stack should be ('empty)
    }
  }
}
```



```
Tests Run: 3   Expected: 3   Failed: 1

Reports:
Run Starting
StackTest:
  a stack
    should be empty after creation
    should increase in size by 1 after a push
    should decrease in size by 1 after a pop
Run Completed

Details:
   Report: Test Failed
     Name: StackTest: a stack should decrease in size by 1 after a pop
  Message: com.waftex.rubbish.Stack@19d6af was not empty
     Line: (StackTest.scala:24)
     Date: Fri Apr 24 16:15:46 BST 2009
   Thread: Thread-1
Exception: org.scalatest.TestFailedException
```

```
object should have length (3)

string should startWith ("Hello")

string should fullyMatch regex ("""(-)?(\d+)(\.\d*)?""")

one should be < (7)

emptySet should be ('empty)

seven should be (6 plusOrMinus 2)

map should contain key (1)

map should contain value ("Howdy")
```

```
object Lunar extends Baysick {
  def main(args:Array[String]) = {
    10 PRINT "Welcome to Baysick Lunar Lander v0.9"
    20 LET ('dist := 100)
    30 LET ('v := 1)
    40 LET ('fuel := 1000)
    50 LET ('mass := 1000)

    60 PRINT "You are drifting towards the moon."
    70 PRINT "You must decide how much fuel to burn."
    80 PRINT "To accelerate enter a positive number"
    90 PRINT "To decelerate a negative"

    100 PRINT "Distance " % 'dist % "km, " % "Velocity " % 'v % "km/s, " % "Fuel " % 'fuel
    110 INPUT 'burn
    120 IF ABS('burn) <= 'fuel THEN 150
    130 PRINT "You don't have that much fuel"
    140 GOTO 100
    150 LET ('v := 'v + 'burn * 10 / ('fuel + 'mass))
    160 LET ('fuel := 'fuel - ABS('burn))
    170 LET ('dist := 'dist - 'v)
    180 IF 'dist > 0 THEN 100
    190 PRINT "You have hit the surface"
    200 IF 'v < 3 THEN 240
    210 PRINT "Hit surface too fast (" % 'v % ")km/s"
    220 PRINT "You Crashed!"
    230 GOTO 250
    240 PRINT "Well done"

    250 END

    RUN
  }
}
```