Intro to Grails

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Grails in One Hour?

Day 1

01 Tool Setup
02 Intro to Groovy
03 Intro to Grails
04 Intro to GORM
05 Controller Basics
06 View basics
07 Testing basics

Day 2

08 Config/Logging/Plugins
09 Services & Transactions
10 GORM 2
11 Controllers 2
12 Testing
13 Views 2

Day 3

a la carte...

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In One Hour...

- grails/spring/hibernate stack and patterns
- grails project layout
  - what's there and
  - where it's located
- grails targets and the command line

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The command line?

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In the Beginning was the Command Line

http://www.cryptonomicon.com/beginning.html
Neal Stephenson

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In the Beginning was the Command Line

"Now the first job that any coder needs to do when writing a new piece of software is to figure out how to take the information that is being worked with (in a graphics program, an image; in a spreadsheet, a grid of numbers) and turn it into a linear string of bytes.

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In the Beginning was the Command Line

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"...became a nerds-only kind of thing, and consequently took on a certain eldritch flavor among those of us who even knew it existed."

http://www.cryptonomicon.com/beginning.html
Neal Stephenson

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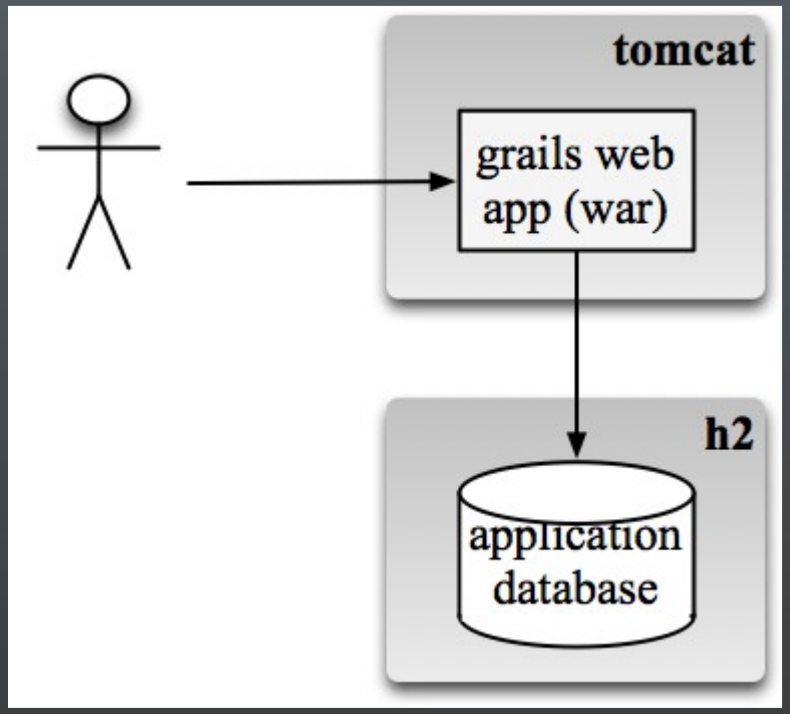
Grails is...

an open source web application framework built on top of Spring and Hibernate and leveraging the Groovy programming language (which is in turn based on the Java platform.) It is intended to be a high-productivity framework by following the “coding by convention” paradigm, providing a stand-alone development environment and hiding much of the configuration detail from the developer.

- 1.0 released in February 2008
- A full featured collection of application frameworks

A Grails Application...



A Web Application "Vertical Slice"

javascript	• Dynamic behavior in the browser
servlets	• HTML page generation
controllers	• Application Form Controllers + Tests
command	• Display objects + Tests
validation	• Validation and constraints + Tests
services	• Service Layer + Tests
query	• Data access + Tests
domain	• Domain Model + Tests
DDL	• Database Schema

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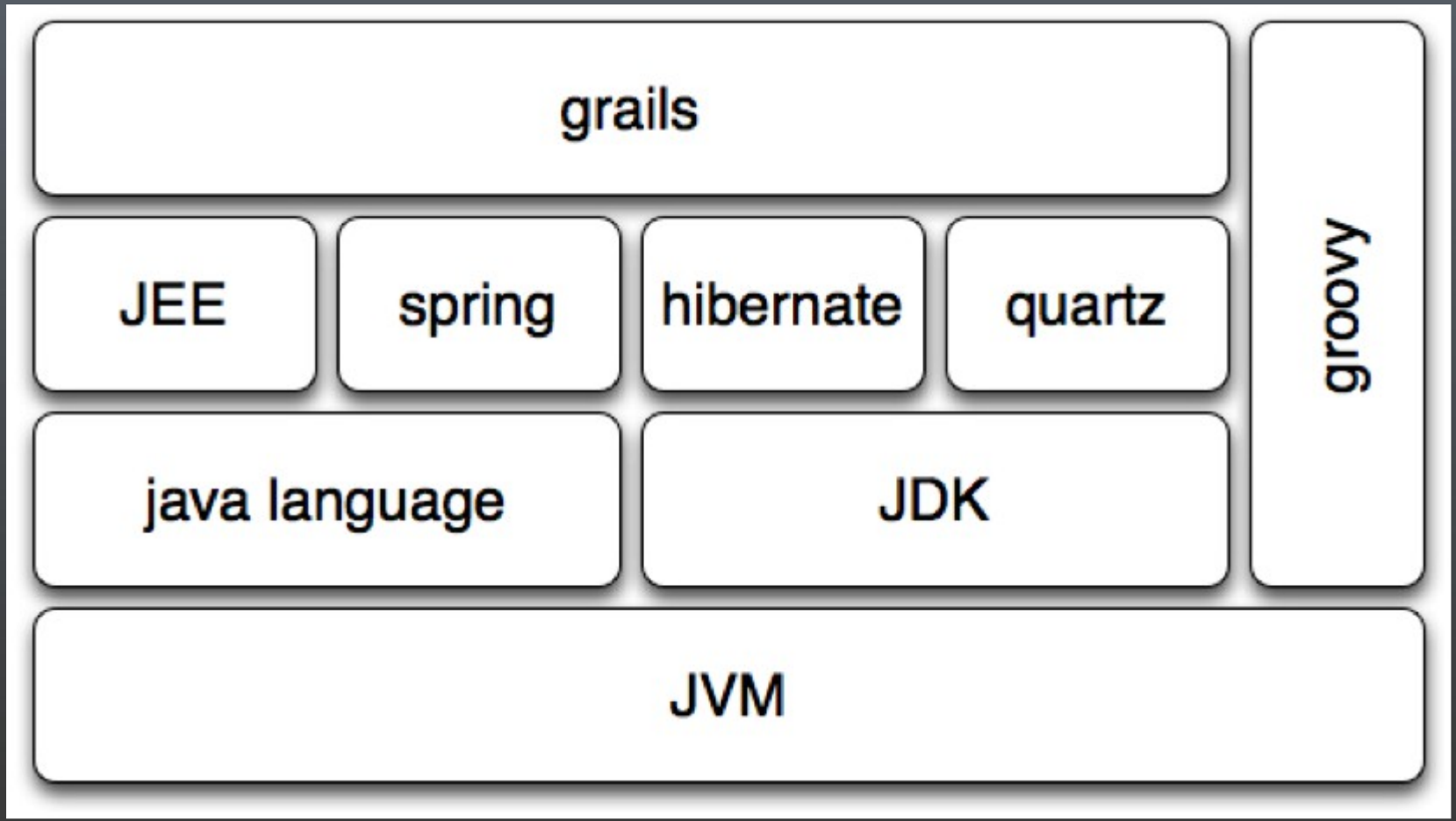
The Grails Application Stack



Spring is...

a widely deployed open source framework for building high quality applications. Spring provides a consistent programming and configuration model that is well understood and used by millions of developers worldwide. Unlike the traditional Java EE platform, Spring provides a range of capabilities for creating enterprise Java, rich web, and enterprise integration applications that can be consumed in a lightweight, a-la-carte manner.

- 1.0 released in March 2004
- A full featured collection of application frameworks

Hibernate is...

an object-relational mapping (ORM) library for the Java language, providing a framework for mapping an object-oriented domain model to a traditional relational database. Hibernate solves object-relational impedance mismatch problems by replacing direct persistence-related database accesses with high-level object handling functions.

- 1.0 released in July 2002
- Excellent separation of code from vendor specific DBMS quirks.

Groovy is...

an object-oriented programming language for the Java platform, and is the second standard language for the Java platform, the first being the Java language itself. It is a dynamic language with features similar to those of Python, Ruby, Perl, and Smalltalk (and Lisp!). It can be used as a scripting language for the Java Platform.

- 1.0 released in January 2007
- A “highly productive” programming language
- It ain’t Java

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The Groovy Language adds to Java...

- static and dynamic typing (with the def keyword)
- closures
- operator overloading
- native syntax for lists and associative arrays (maps)
- native support for regular expressions
- polymorphic iteration
- expressions embedded inside strings
- null-safe navigation operator "?." (example: `variable?.field`)
- many, many additional helper methods

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Groovy is not Java

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Groovy is not Java

```
/** Most excellent toString method. */
String toString() {
    return
    "Brand["
    + "id=" + this.id
    + ",active=" + this.active
    + ",name=" + this.name
    + "]";
}
```

Looks nice, but groovy sees the return keyword and does just that, return. And it returns with the default value of null. Ouch! Do it like this instead:

```
String toString() {
    return "Brand[id=${id},active=${active},name=${name}]"
}
```

Or:

```
def toString() { "Brand[id=$id,active=$active,name=$name]" }
```

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Diving right in...

step 1: grails create-app appname

step 2: grails create-domain-class Question

step 3: grails generate-all Question

step 4: grails run-app

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step 1: grails create-app woody

```
| Created Grails Application at /Users/amiller/dev/woody
```

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step 1: grails create-app woody

```
Woody/
   application.properties
   grails-app/conf/
   grails-app/controllers/
   grails-app/domain/
   grails-app/i18n/
   grails-app/services/
   grails-app/taglib/
   grails-app/utils/
   grails-app/views/
   lib/
   scripts/
   src/
   test/
   web-app/
```

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step 1: grails create-app woody

```
woody/
   application.properties
   grails-app/conf/              --> location of configuration artifacts
   grails-app/conf/hibernate     --> optional hibernate config
   grails-app/conf/spring        --> optional spring config
   grails-app/controllers/       --> location of controller artifacts
   grails-app/domain/            --> location of domain classes
   grails-app/i18n/              --> location of message bundles for i18n
   grails-app/services/          --> location of services
   grails-app/taglib/            --> location of tag libraries
   grails-app/utils/             --> location of grails specific utility classes
   grails-app/views/             --> location of views
   grails-app/views/layouts      --> location of layouts
   lib/                          --> jar files not available via installed plugins
   scripts/                      --> scripts
   src/groovy                    --> optional; location for Groovy source files
                                     (of types other than those in grails-app/*)
   src/java                      --> optional; location for Java source files
   test/                         --> test classes
   web-app/                      --> css, images, etc, etc, etc.
```

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Your ~/.grails directory

```
~/.grails/2.0.3/projects/woody
    plugin-build-classes/
    plugin-classes/
    plugin-provided-classes/
    plugins/
    resources/
    scriptCache/
```

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Or your project's target directory

```
~/.grails/settings.groovy

grails.project.work.dir = "target"
```

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step 2: grails create-domain-class ...

```
> grails create-domain-class Question

| Compiling 38 source files
| Created file grails-app/domain/appname/Question.groovy
| Created file test/unit/appname/QuestionTests.groovy

> _
```

While you wait, grails is downloading and installing required resources.

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step 2: grails create-domain-class ...

grails-app/domain/appname/Question.groovy

```
package woody

class Question {

    String question
    String answer

    static constraints = {
    }
}
```

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step 2: grails create-domain-class ...

test/unit/appname/QuestionTests.groovy

```
package woody

import grails.test.mixin.*
import org.junit.*

/**
 * See the API for {@link
grails.test.mixin.domain.DomainClassUnitTestMixin} for usage
instructions
 */
@TestFor(Question)
class QuestionTests {

    void testSomething() {
        fail "Implement me"
    }

}
```

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step 3: grails generate-all ...

```
> grails generate-all woody.Question
```

Note the package name.

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step 3: grails generate-all ...

```
grails-app/controllers/appname/QuestionController.groovy


grails-app/views/question/
    _form.gsp
    create.gsp
    edit.gsp
    list.gsp
    show.gsp


test/unit/appname/QuestionControllerTests.groovy
```

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step 4: grails run-app

```
> grails run-app
| Server running. Browse to http://localhost:8080/woody
_
```

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GRAILS

APPLICATION STATUS

App version: 0.1
Grails version: 2.0.3
Groovy version: 1.8.6
JVM version: 1.6.0_33
Reloading active: true
Controllers: 1
Domains: 1
Services: 1
Tag Libraries: 12

INSTALLED PLUGINS

i18n - 2.0.3
logging - 2.0.3
core - 2.0.3
servlets - 2.0.3
groovyPages - 2.0.3
resources - 1.1.6
jquery - 1.7.1
tomcat - 2.0.3
webxml - 1.4.1
dataSource - 2.0.3
urlMappings - 2.0.3
codecs - 2.0.3
controllers - 2.0.3
mimeTypes - 2.0.3
domainClass - 2.0.3
converters - 2.0.3
filters - 2.0.3
scaffolding - 2.0.3
hibernate - 2.0.3
services - 2.0.3
validation - 2.0.3

Welcome to Grails

Congratulations, you have successfully started your first Grails application! At the moment this is the default page, feel free to modify it to either redirect to a controller or display whatever content you may choose. Below is a list of controllers that are currently deployed in this application, click on each to execute its default action:

Available Controllers:

- woody.QuestionController

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Using the application...

javascript	• Dynamic behavior in the browser
servlets	• HTML page generation
controllers	• Application Form Controllers + Tests
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validation	• Validation and constraints + Tests
services	• Service Layer + Tests
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DDL	• Database Schema

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Grails targets

```
grails clean
grails run-app
grails test-app
grails -Duser.timezone=UTC test-app

grails create-domain-class mydomainclass
grails generate-all mydomainclass

grails prod run-app
grails -Dgrails.env=qa run-app

grails dependency-reportgrails war
grails dependency-report
grails schema-export

grails help
grails help 'target-name'
```

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The Grails console

```
> grails console
_
```

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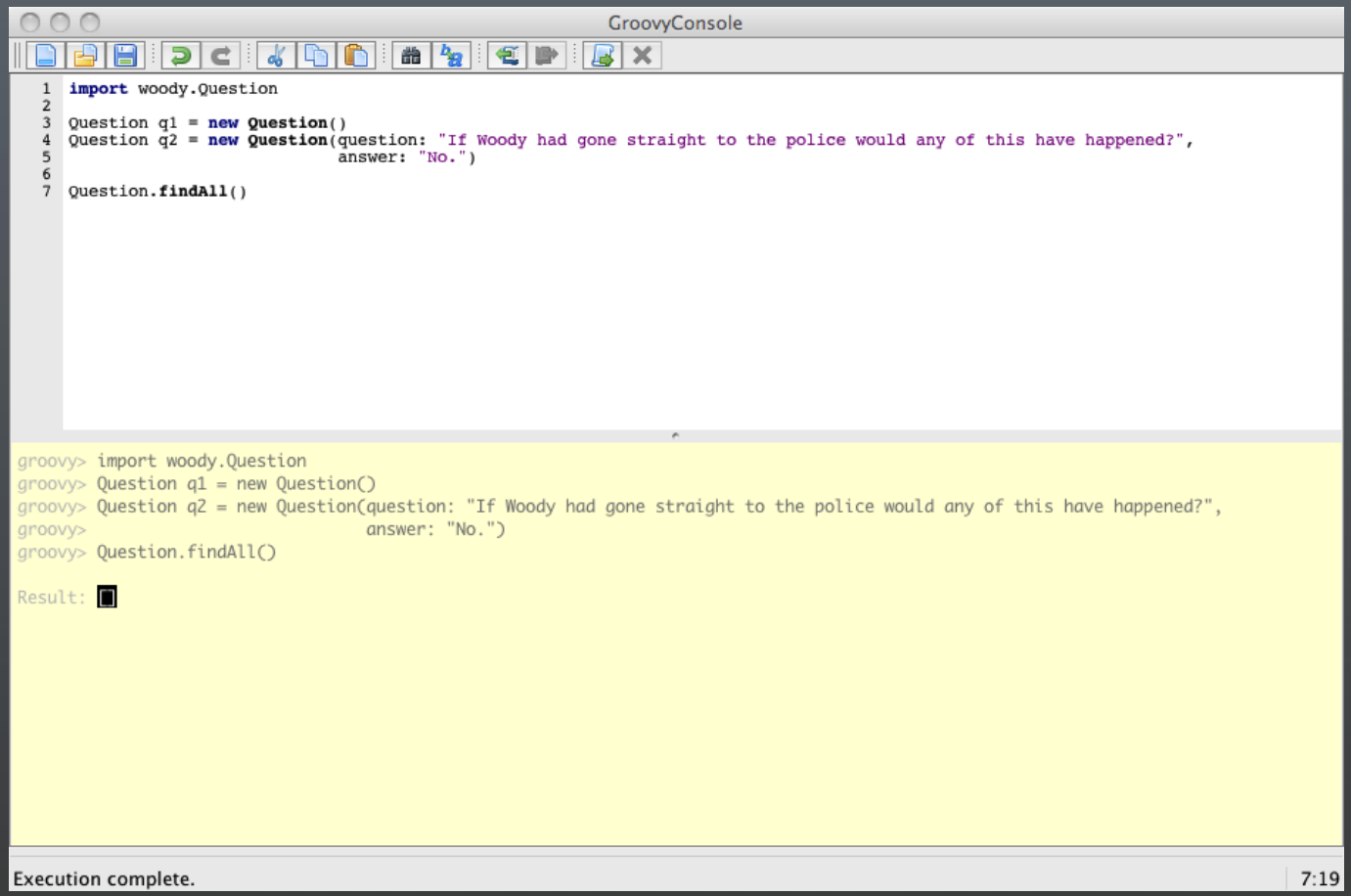
The Grails console



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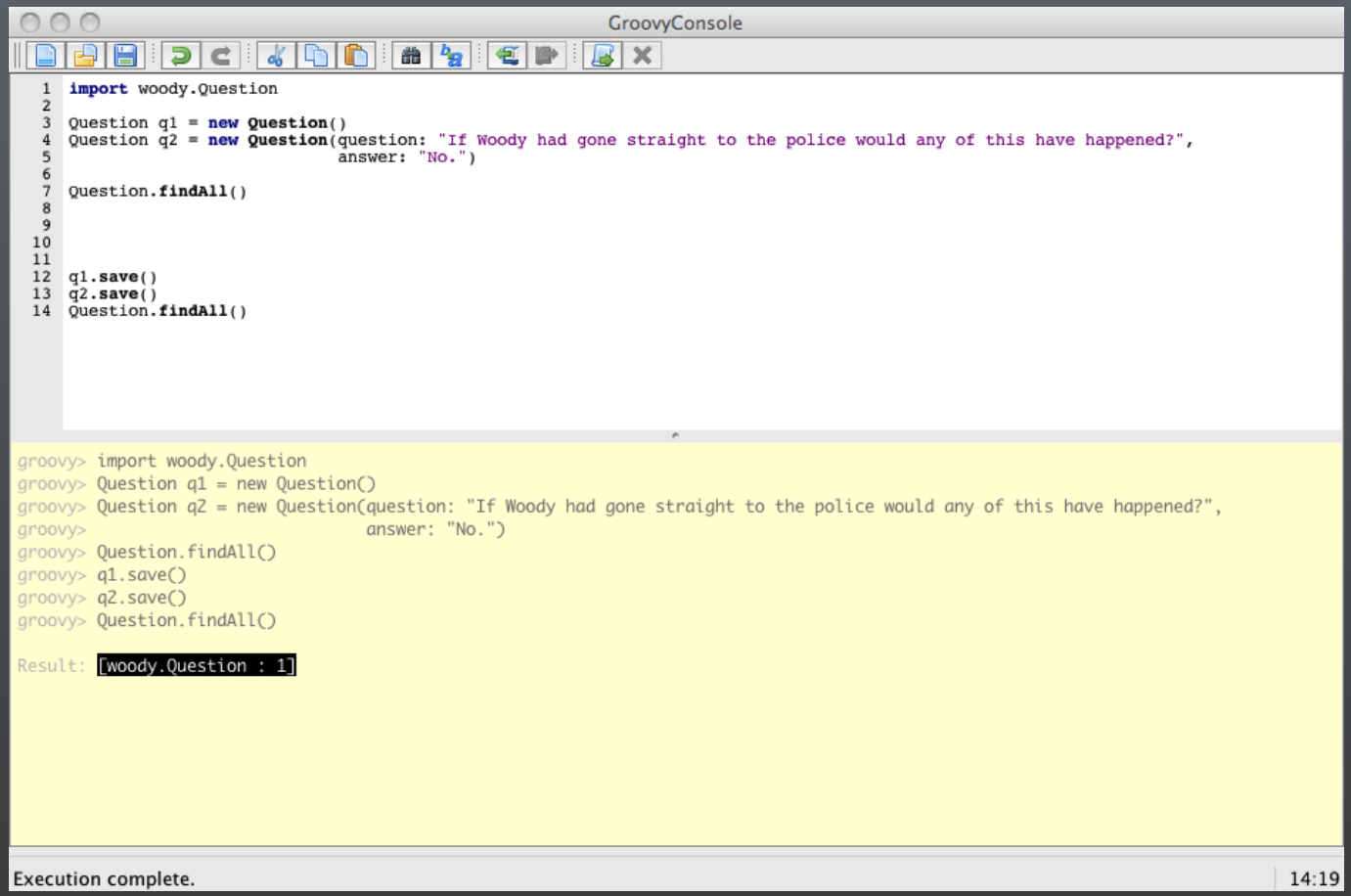
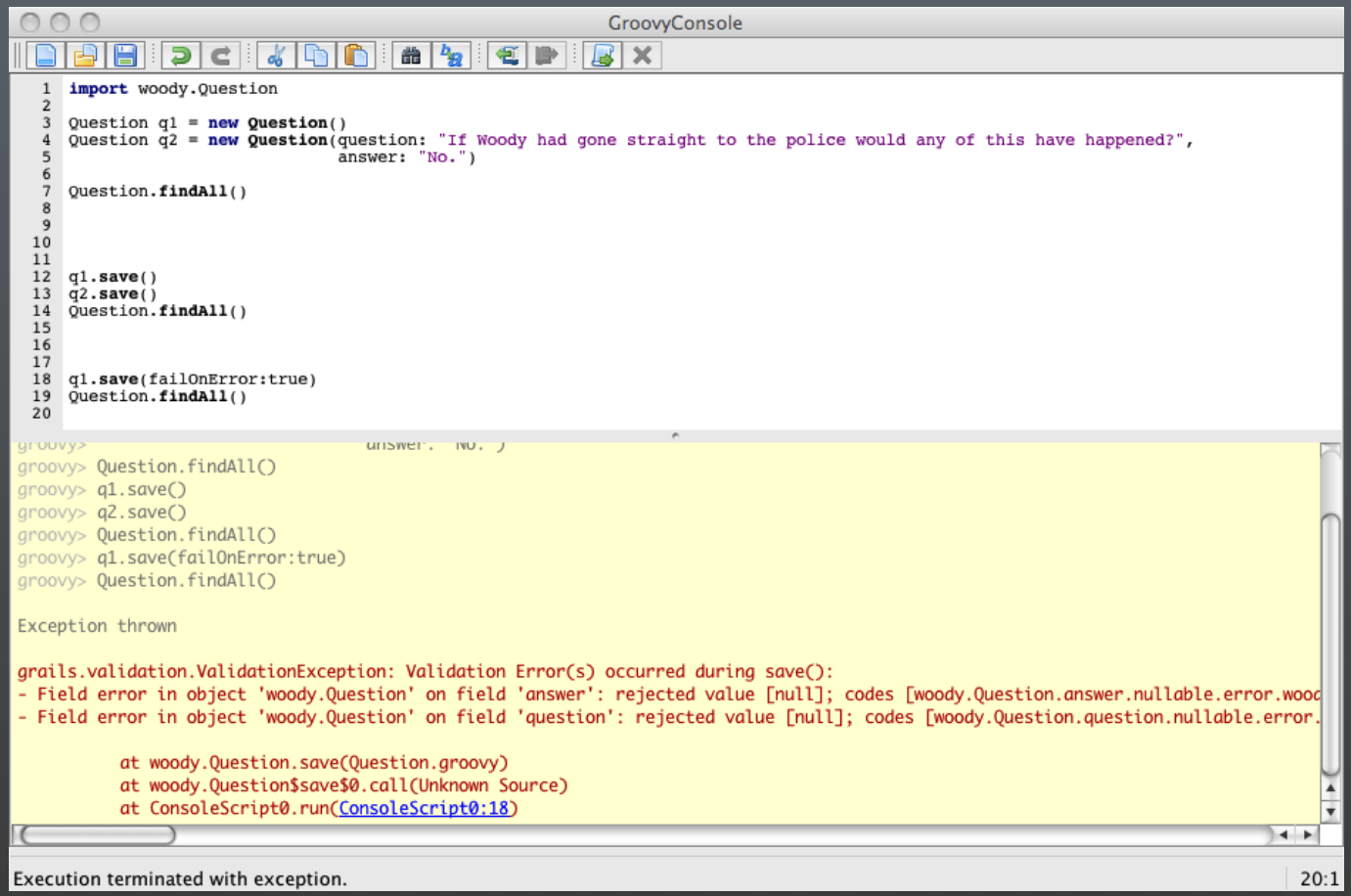
The Grails console



The Grails console



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Domain Model

```
from Party.groovy

class Party implements Serializable {

    String fullName
    String email
    String phone
    User   user

    static belongsTo = [
        deal:Deal
    ]

    static constraints = {
        fullName(nullable:true, maxSize:60)
        email(nullable:true, email:true, maxSize:150)
        phone(nullable:true, maxSize:15)
        user(nullable:true)
    }

}
```

javascript
servlets
controllers
command
validation
services
query
domain
DDL

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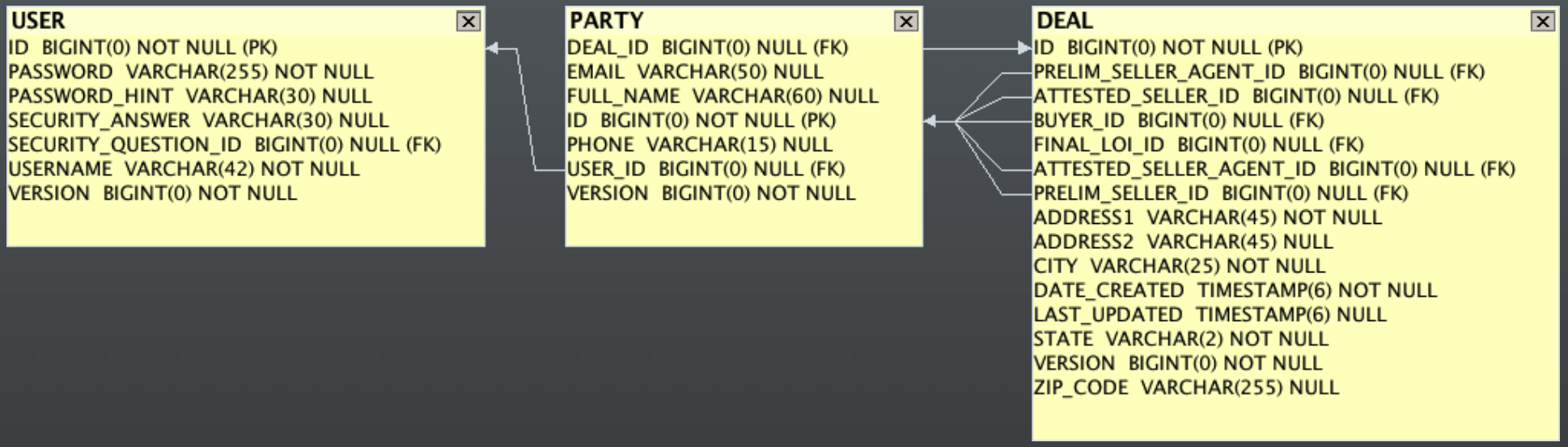
DB Mapping & Schema Evolution

javascript
servlets
controllers
command
validation
services
query
domain
DDL



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DB Platform Portability

```
from DataSurce.groovy

// environment specific settings
environments {
    development {
        dataSource {
            dbCreate = "update" // one of 'create', 'create-drop','update'
            url = "jdbc:hsqldb:file:database/buyerCuriousDB"
        }
    }
    test {
        dataSource {
            dbCreate = "update"
            url = "jdbc:hsqldb:mem:testDb"
        }
    }
    production {
        dataSource {
            pooled = true
            driverClassName = "com.mysql.jdbc.Driver"
            username = "xyzzy"
            password = "freepass"
            url = "jdbc:mysql://localhost/xyzzy"

            //jndiName = "java:comp/env/jdbc/xyzzy"
        }
    }
}
```


javascript
servlets
controllers
command
validation
services
query
domain
DDL

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Validation...

```
from FollowuoCommand.groovy

    static constraints = {
        followupDuration(nullable:false,inList:["Days","Weeks","Months"])
        followupFacilityName(nullable:true, maxSize:255)
        followupFacilityPhone(nullable:true, maxSize:30)
        followupProviderName(nullable:true, maxSize:100)

        followupNumber(min:1,validator:{val, obj ->
            if (val>730 && obj.followupDuration.equals("Days")) {
                return "followupCommand.followupNumber.days.error"
            }
            if (val>104 && (obj.followupDuration.equals("Weeks"))) {
                return "followupCommand.followupNumber.weeks.error"
            }
            if (val>24 && (obj.followupDuration.equals("Months"))) {
                return "followupCommand.followupNumber.months.error"
            }
        } )
    }
```

javascript
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Validation...

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            }
        } )
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```

javascript
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Finding answers...

http://grails.org/

http://grails.org/Documentation

http://grails.org/doc/latest/

http://www.objectpartners.com/

http://www.grails-training.com/

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Questions?

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Three Worlds
M. C. Escher, 1955