What is an IDE and why are they great?

Aaron Seavers • 03.14.2017

Starter Questions:

- Acronym: Integrated Development Environment.
- Application for developers to modify code in their projects.

Where Do IDE's Come From?

eclipse

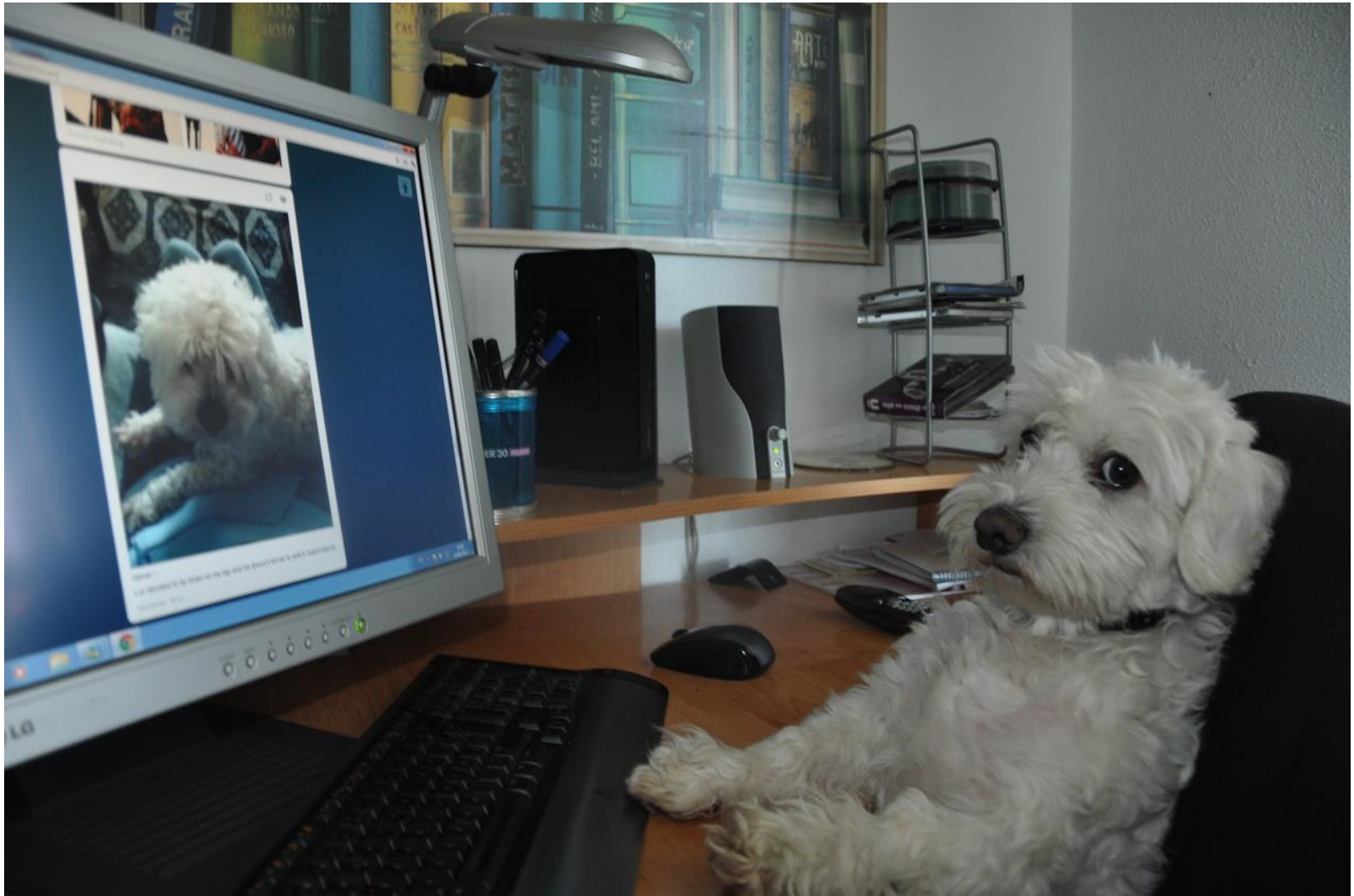
PC

Visual Studio

NetBeans

IntelliJIDEA

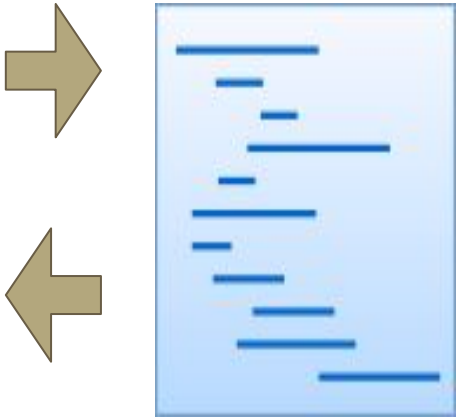
Integrated



Application Components:

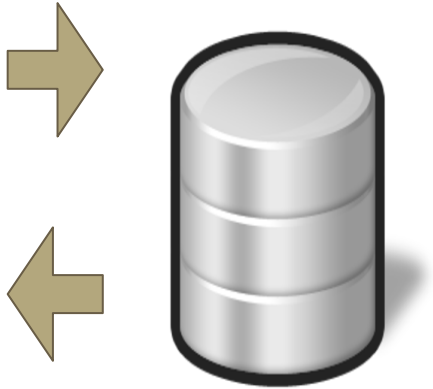
Web pages (ui):

- Html
- Javascript
- CSS



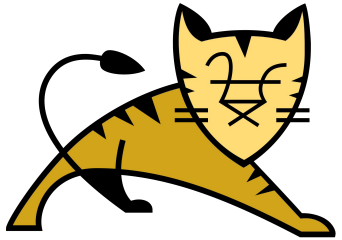
Application Code:

- Java
- C#
- .Net



Database:

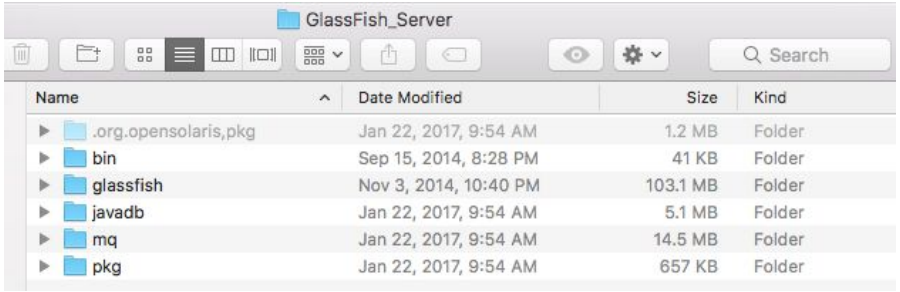
- SQL

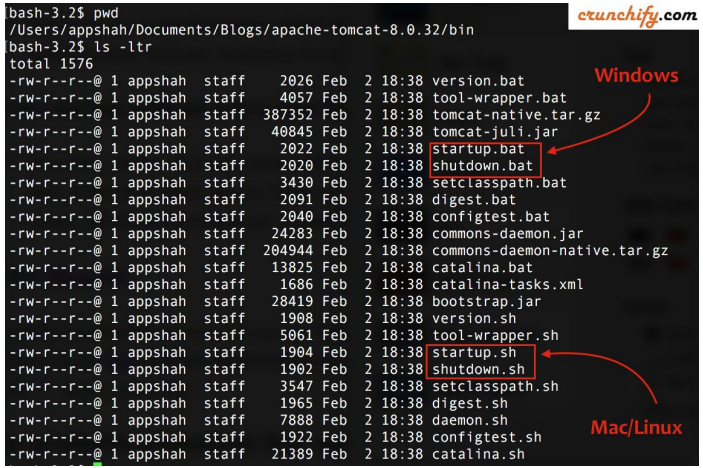


Application Server

To accomplish the task:

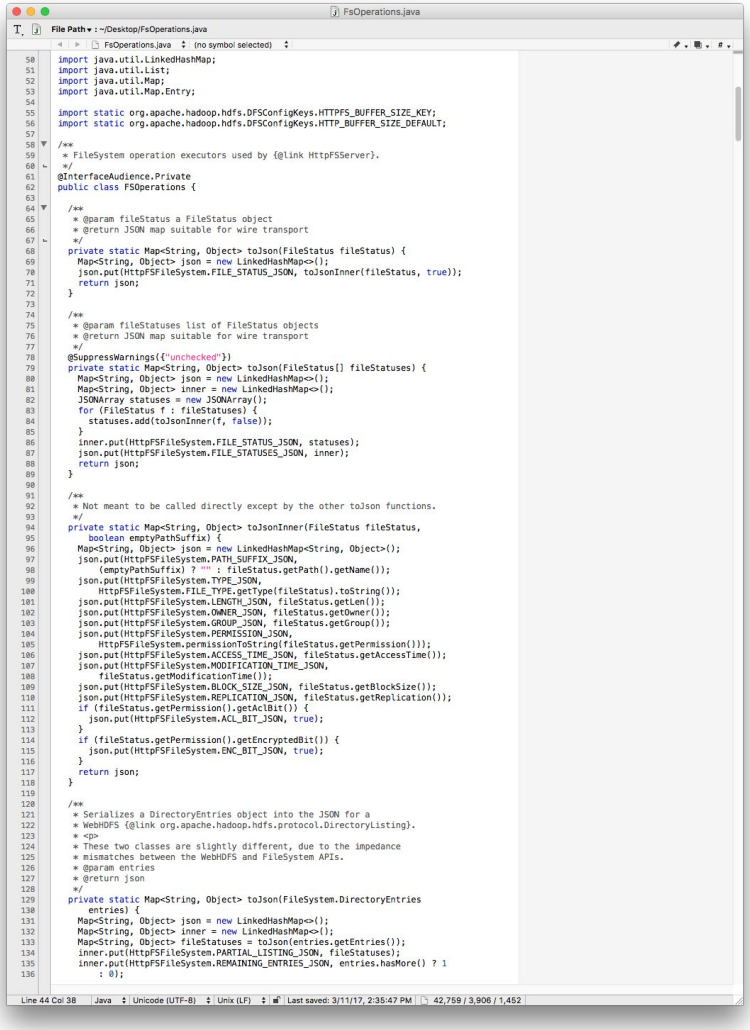
- Download and configure required technologies:
  - Java Runtime Environment
  - Database
    - mySQL
    - Derby
  - Application Server
    - Tomcat
    - GlassFish
- Run them:
  - Command Line



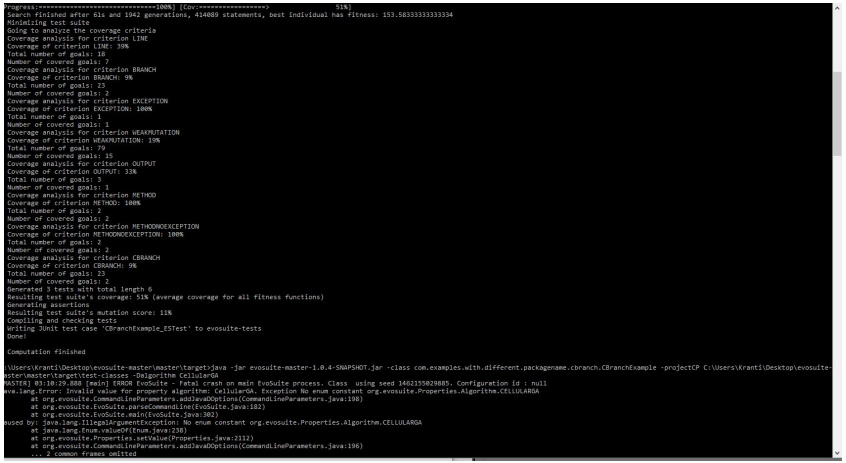


To accomplish the task:

- Manage files
  - System explorer
- Edit files
  - Text Editor
- Run Files
  - Command Line



In Summary:

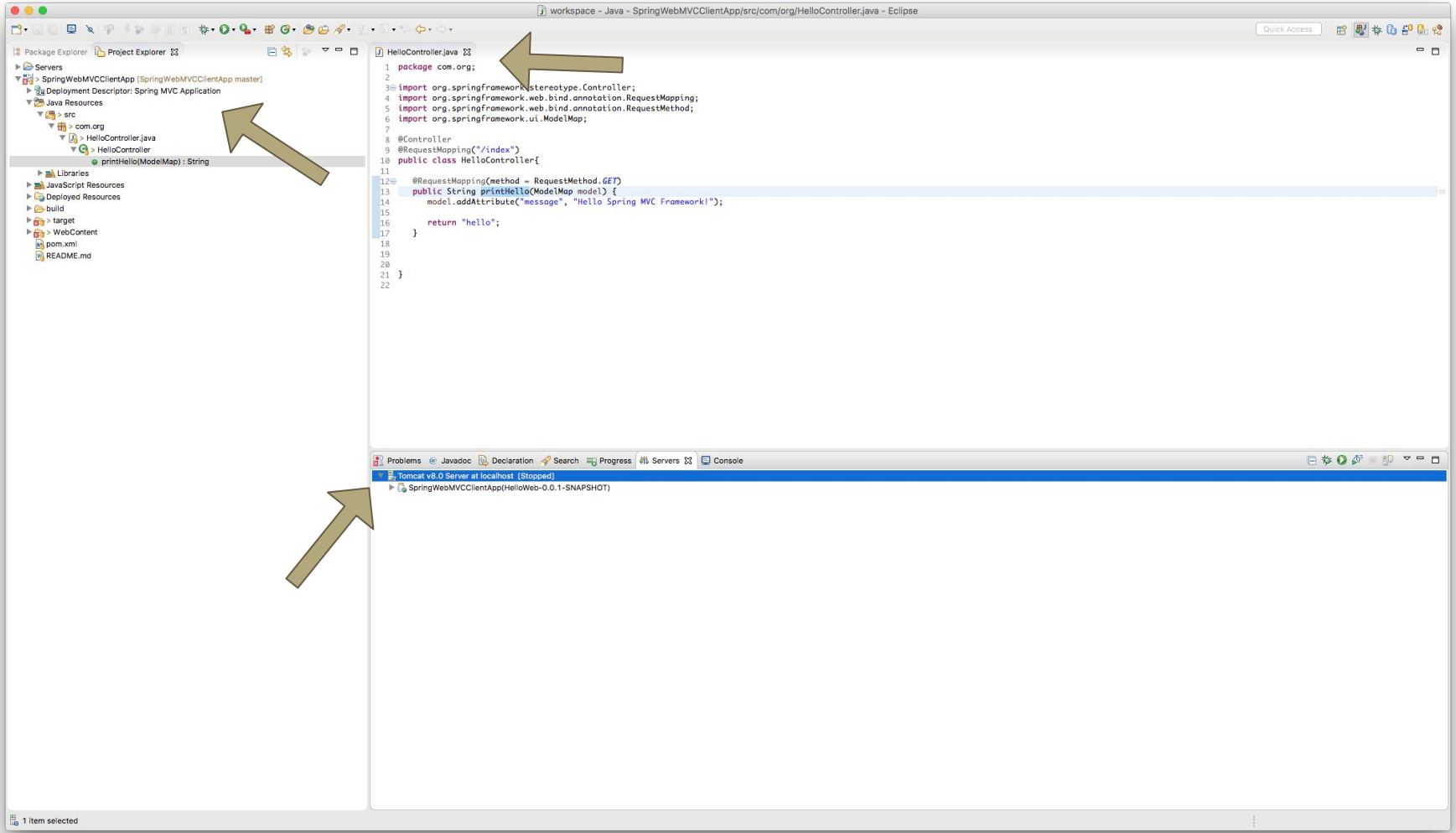


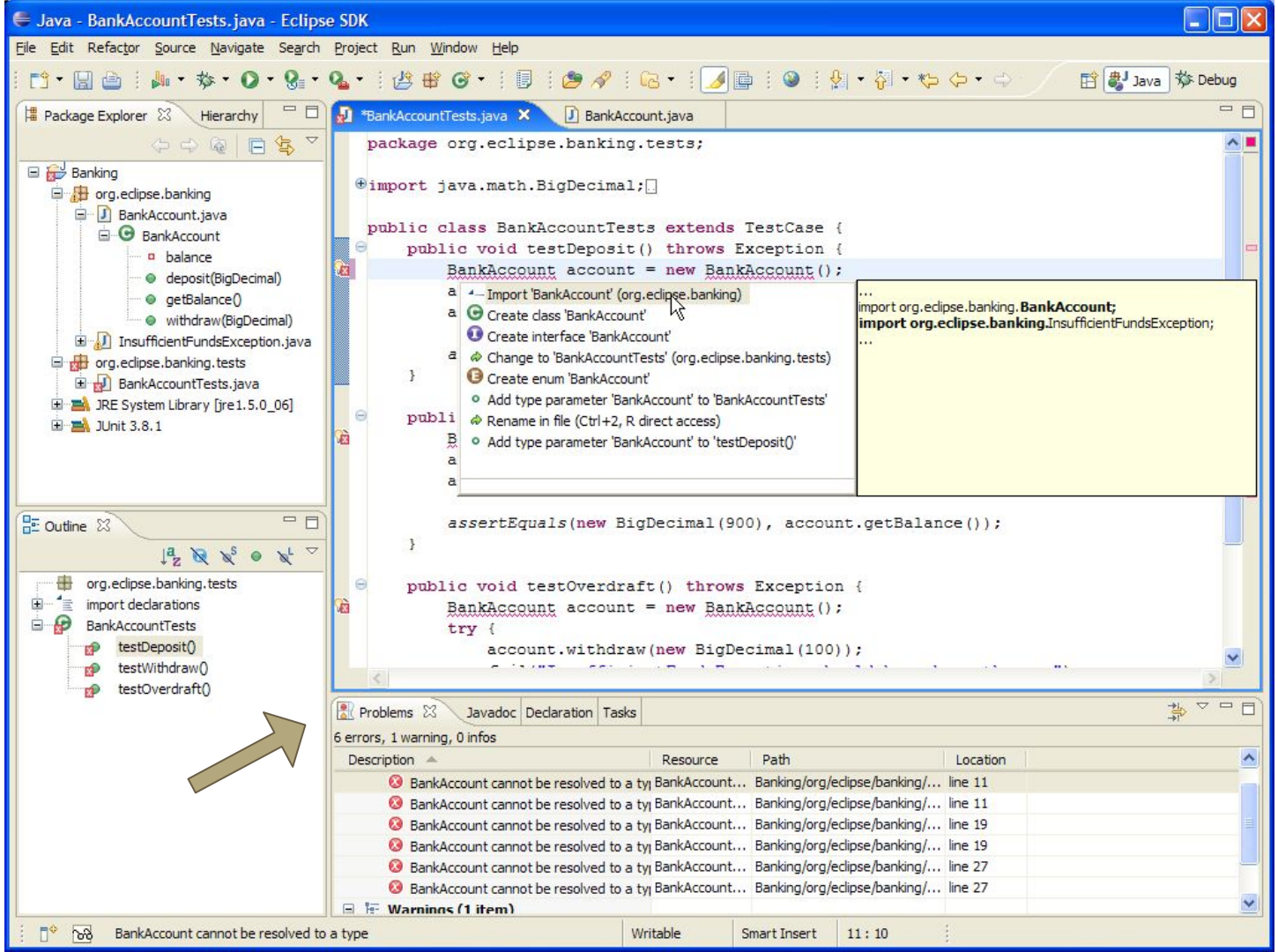
```
Progress:=================================100%] [Cov:=================>                51%]
Search finished after 61s and 1942 generations, 414089 statements, best individual has fitness: 153.58333333333334
Minimizing test suite
Going to analyze the coverage criteria
Coverage analysis for criterion LINE
Coverage of criterion LINE: 39%
Total number of goals: 18
Number of covered goals: 7
Coverage analysis for criterion BRANCH
Coverage of criterion BRANCH: 9%
Total number of goals: 23
Number of covered goals: 2
Coverage analysis for criterion EXCEPTION
Coverage of criterion EXCEPTION: 100%
Total number of goals: 1
Number of covered goals: 1
Coverage analysis for criterion WEAKMUTATION
Coverage of criterion WEAKMUTATION: 19%
Total number of goals: 79
Number of covered goals: 15
Coverage analysis for criterion OUTPUT
Coverage of criterion OUTPUT: 33%
Total number of goals: 3
Number of covered goals: 1
Coverage analysis for criterion METHOD
Coverage of criterion METHOD: 100%
Total number of goals: 2
Number of covered goals: 2
Coverage analysis for criterion METHODNOEXCEPTION
Coverage of criterion METHODNOEXCEPTION: 100%
Total number of goals: 2
Number of covered goals: 2
Coverage analysis for criterion CBRANCH
Coverage of criterion CBRANCH: 9%
Total number of goals: 23
Number of covered goals: 2
Generated 3 tests with total length 6
Resulting test suite's coverage: 51% (average coverage for all fitness functions)
Generating assertions
Resulting test suite's mutation score: 11%
Compiling and checking tests
Writing JUnit test case 'CBranchExample_ESTest' to evosuite-tests
Done!

Computation finished

\Users\Kranti\Desktop\evosuite-master\master\target>java -jar evosuite-master-1.0.4-SNAPSHOT.jar -class com.examples.with.different.packagename.cbranch.CBranchExample -projectCP C:\Users\Kranti\Desktop\evosuite-
aster\master\target\test-classes -Dalgorithm CellularGA
MASTER] 03:10:29.888 [main] ERROR EvoSuite - Fatal crash on main EvoSuite process. Class  using seed 1462155029885. Configuration id : null
ava.lang.Error: Invalid value for property algorithm: CellularGA. Exception No enum constant org.evosuite.Properties.Algorithm.CELLULARGA
        at org.evosuite.CommandLineParameters.addJavaOptions(CommandLineParameters.java:198)
        at org.evosuite.EvoSuite.parseCommandLine(EvoSuite.java:182)
        at org.evosuite.EvoSuite.main(EvoSuite.java:302)
aused by: java.lang.IllegalArgumentException: No enum constant org.evosuite.Properties.Algorithm.CELLULARGA
        at java.lang.Enum.valueOf(Enum.java:238)
        at org.evosuite.Properties.setValue(Properties.java:2112)
        at org.evosuite.CommandLineParameters.addJavaOptions(CommandLineParameters.java:196)
        ... 2 common frames omitted
```

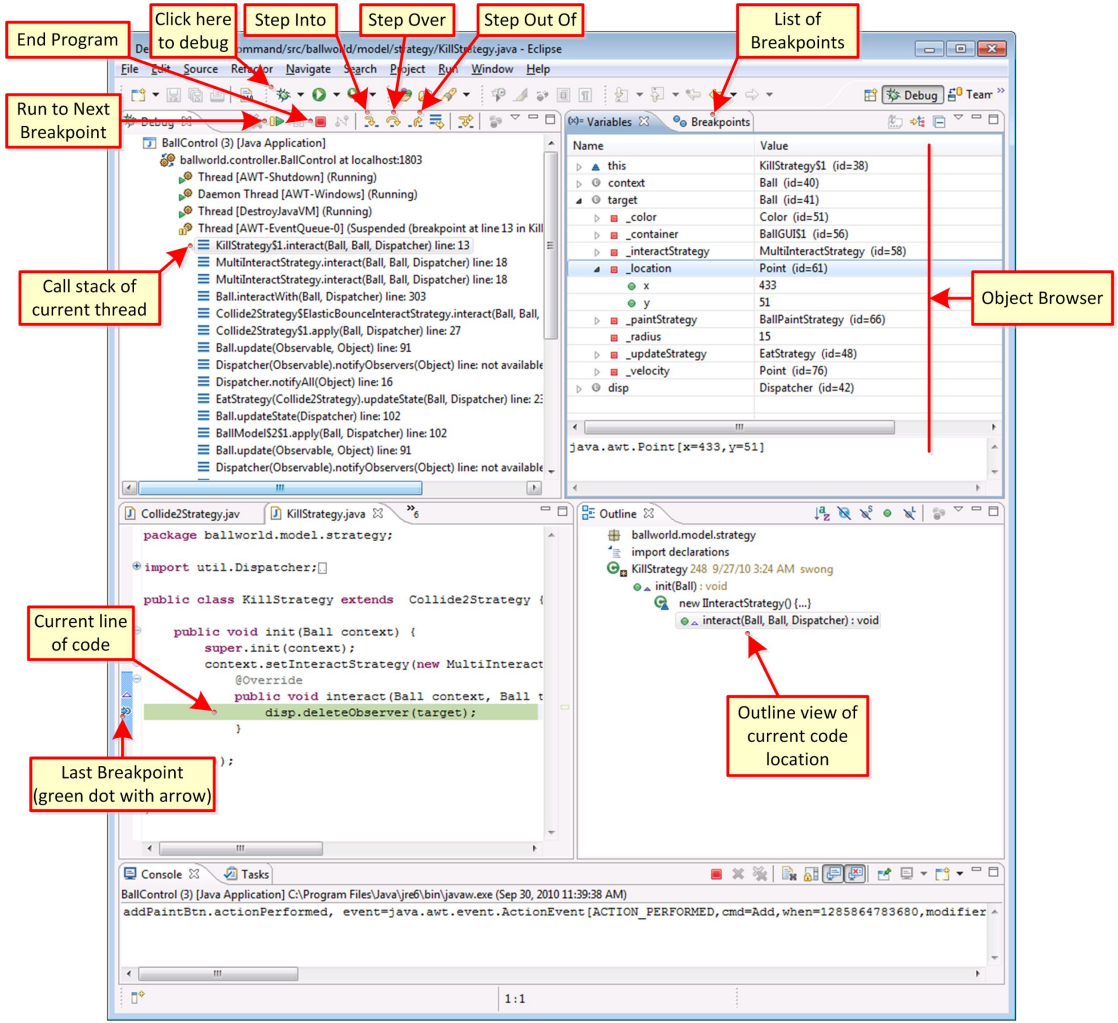
The Benefits of An IDE

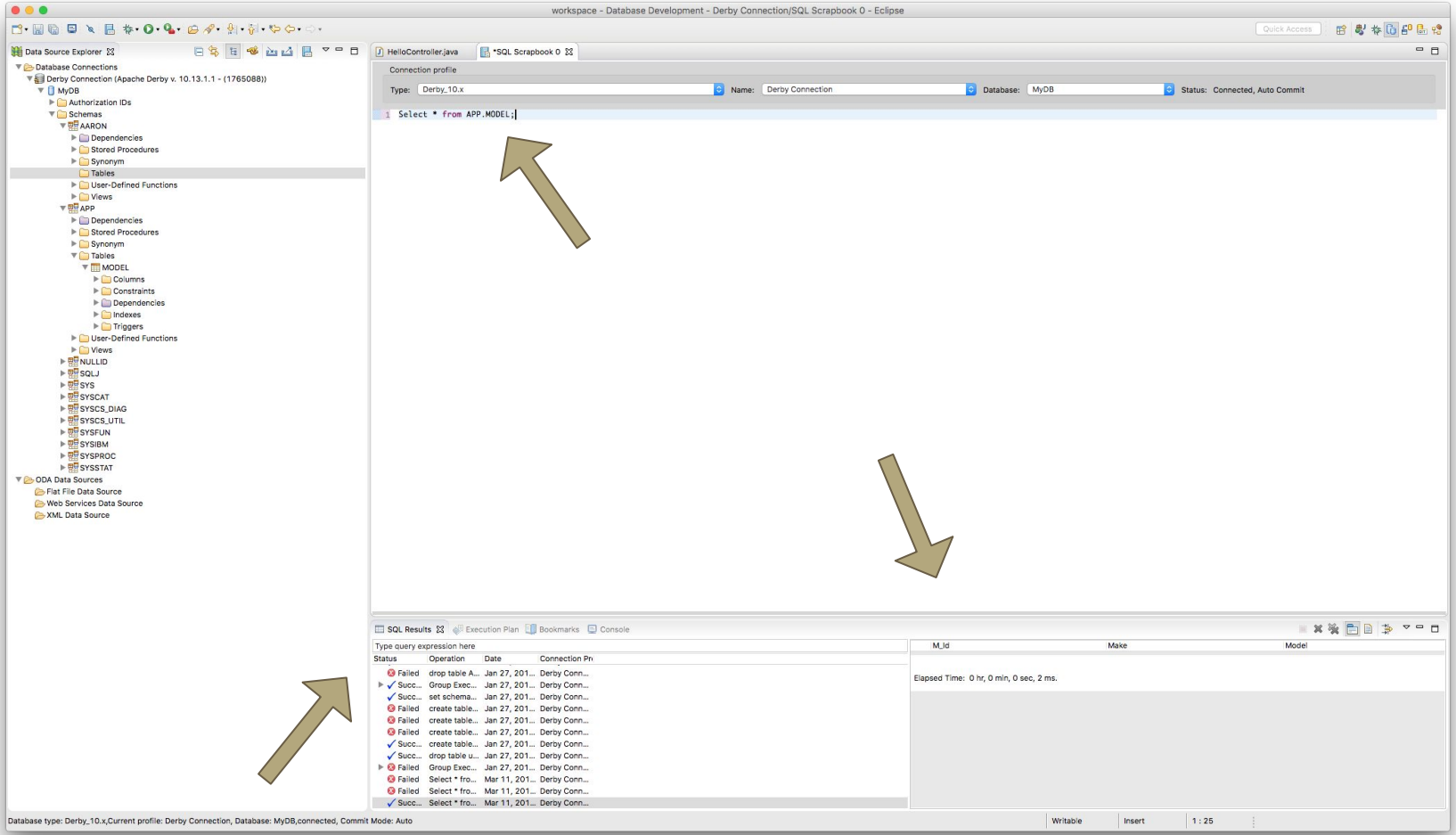
Benefits Of An IDE

- Integration
- Graphical User Interface
- Features
  - Views and perspectives
  - Tools for development
    - Intellisense
    - debugging
  - Marketplace


workspace - Java - SpringWebMVCClientApp/src/com/org/HelloController.java - Eclipse
Quick Access
Package Explorer
Project Explorer
Servers
SpringWebMVCClientApp [SpringWebMVCClientApp master]
Deployment Descriptor: Spring MVC Application
Java Resources
src
com.org
HelloController.java
HelloController
printHello(ModelMap) : String
Libraries
JavaScript Resources
Deployed Resources
build
target
WebContent
pom.xml
README.md
HelloController.java
1 package com.org;
2
3 import org.springframework.stereotype.Controller;
4 import org.springframework.web.bind.annotation.RequestMapping;
5 import org.springframework.web.bind.annotation.RequestMethod;
6 import org.springframework.ui.ModelMap;
7
8 @Controller
9 @RequestMapping("/index")
10 public class HelloController{
11
12 @RequestMapping(method = RequestMethod.GET)
13 public String printHello(ModelMap model) {
14 model.addAttribute("message", "Hello Spring MVC Framework!");
15
16 return "hello";
17 }
18
19
20
21 }
22
Problems
Javadoc
Declaration
Search
Progress
Servers
Console
Tomcat v8.0 Server at localhost [Stopped]
SpringWebMVCClientApp(HelloWeb-0.0.1-SNAPSHOT)
1 item selected


Java - BankAccountTests.java - Eclipse SDK
File Edit Refactor Source Navigate Search Project Run Window Help
Java
Debug
Package Explorer
Hierarchy
Banking
org.eclipse.banking
BankAccount.java
BankAccount
balance
deposit(BigDecimal)
getBalance()
withdraw(BigDecimal)
InsufficientFundsException.java
org.eclipse.banking.tests
BankAccountTests.java
JRE System Library [jre1.5.0_06]
JUnit 3.8.1
Outline
org.eclipse.banking.tests
import declarations
BankAccountTests
testDeposit()
testWithdraw()
testOverdraft()
*BankAccountTests.java
BankAccount.java
package org.eclipse.banking.tests;
import java.math.BigDecimal;
public class BankAccountTests extends TestCase {
public void testDeposit() throws Exception {
BankAccount account = new BankAccount();
Import 'BankAccount' (org.eclipse.banking)
Create class 'BankAccount'
Create interface 'BankAccount'
Change to 'BankAccountTests' (org.eclipse.banking.tests)
Create enum 'BankAccount'
Add type parameter 'BankAccount' to 'BankAccountTests'
Rename in file (Ctrl+2, R direct access)
Add type parameter 'BankAccount' to 'testDeposit()'
...
import org.eclipse.banking.BankAccount;
import org.eclipse.banking.InsufficientFundsException;
...
assertEquals(new BigDecimal(900), account.getBalance());
}
public void testOverdraft() throws Exception {
BankAccount account = new BankAccount();
try {
account.withdraw(new BigDecimal(100));
Problems
Javadoc
Declaration
Tasks
6 errors, 1 warning, 0 infos
Description
Resource
Path
Location
BankAccount cannot be resolved to a type
BankAccount...
Banking/org/eclipse/banking/...
line 11
line 19
line 27
Warnings (1 item)
BankAccount cannot be resolved to a type
Writable
Smart Insert
11 : 10


End Program
Click here to debug
Step Into
Step Over
Step Out Of
List of Breakpoints
Run to Next Breakpoint
Call stack of current thread
Object Browser
Current line of code
Last Breakpoint (green dot with arrow)
Outline view of current code location
File Edit Source Refactor Navigate Search Project Run Window Help
Debug
Team
Variables
Breakpoints
Name
Value
BallControl (3) [Java Application]
ballworld.controller.BallControl at localhost:1803
Thread [AWT-Shutdown] (Running)
Daemon Thread [AWT-Windows] (Running)
Thread [DestroyJavaVM] (Running)
Thread [AWT-EventQueue-0] (Suspended (breakpoint at line 13 in Kill
KillStrategy$1.interact(Ball, Ball, Dispatcher) line: 13
MultiInteractStrategy.interact(Ball, Ball, Dispatcher) line: 18
MultiInteractStrategy.interact(Ball, Ball, Dispatcher) line: 18
Ball.interactWith(Ball, Dispatcher) line: 303
Collide2Strategy$ElasticBounceInteractStrategy.interact(Ball, Ball,
Collide2Strategy$1.apply(Ball, Dispatcher) line: 27
Ball.update(Observable, Object) line: 91
Dispatcher(Observable).notifyObservers(Object) line: not available
Dispatcher.notifyAll(Object) line: 16
EatStrategy(Collide2Strategy).updateState(Ball, Dispatcher) line: 2
Ball.updateState(Dispatcher) line: 102
BallModel$2$1.apply(Ball, Dispatcher) line: 102
Ball.update(Observable, Object) line: 91
Dispatcher(Observable).notifyObservers(Object) line: not available
this
KillStrategy$1 (id=38)
context
Ball (id=40)
target
Ball (id=41)
_color
Color (id=51)
_container
BallGUI$1 (id=56)
_interactStrategy
MultiInteractStrategy (id=58)
_location
Point (id=61)
x
433
y
51
_paintStrategy
BallPaintStrategy (id=66)
_radius
15
_updateStrategy
EatStrategy (id=48)
_velocity
Point (id=76)
disp
Dispatcher (id=42)
java.awt.Point[x=433,y=51]
Collide2Strategy.jav
KillStrategy.java
package ballworld.model.strategy;
import util.Dispatcher;
public class KillStrategy extends Collide2Strategy {
public void init(Ball context) {
super.init(context);
context.setInteractStrategy(new MultiInteract
@Override
public void interact(Ball context, Ball t
disp.deleteObserver(target);
}
);
Outline
ballworld.model.strategy
import declarations
KillStrategy 248 9/27/10 3:24 AM swong
init(Ball) : void
new IInteractStrategy() {...}
interact(Ball, Ball, Dispatcher) : void
Console
Tasks
BallControl (3) [Java Application] C:\Program Files\Java\jre6\bin\javaw.exe (Sep 30, 2010 11:39:38 AM)
addPaintBtn.actionPerformed, event=java.awt.event.ActionEvent[ACTION_PERFORMED,cmd=Add,when=1285864783680,modifier
1:1


workspace - Database Development - Derby Connection/SQL Scrapbook 0 - Eclipse
Data Source Explorer
Database Connections
Derby Connection (Apache Derby v. 10.13.1.1 - (1765088))
MyDB
Authorization IDs
Schemas
AARON
Dependencies
Stored Procedures
Synonym
Tables
User-Defined Functions
Views
APP
Dependencies
Stored Procedures
Synonym
Tables
MODEL
Columns
Constraints
Dependencies
Indexes
Triggers
User-Defined Functions
Views
NULLID
SQLJ
SYS
SYSCAT
SYSCS_DIAG
SYSCS_UTIL
SYSFUN
SYSIBM
SYSPROC
SYSSTAT
ODA Data Sources
Flat File Data Source
Web Services Data Source
XML Data Source
HelloController.java
*SQL Scrapbook 0
Connection profile
Type: Derby_10.x
Name: Derby Connection
Database: MyDB
Status: Connected, Auto Commit
1 Select * from APP.MODEL;
SQL Results
Execution Plan
Bookmarks
Console
Type query expression here
Status
Operation
Date
Connection Pr
Failed drop table A... Jan 27, 201... Derby Conn...
Succ... Group Exec... Jan 27, 201... Derby Conn...
Succ... set schema... Jan 27, 201... Derby Conn...
Failed create table... Jan 27, 201... Derby Conn...
Failed create table... Jan 27, 201... Derby Conn...
Failed create table... Jan 27, 201... Derby Conn...
Succ... create table... Jan 27, 201... Derby Conn...
Succ... drop table u... Jan 27, 201... Derby Conn...
Failed Group Exec... Jan 27, 201... Derby Conn...
Failed Select * fro... Mar 11, 201... Derby Conn...
Failed Select * fro... Mar 11, 201... Derby Conn...
Succ... Select * fro... Mar 11, 201... Derby Conn...
M_Id
Make
Model
Elapsed Time: 0 hr, 0 min, 2 sec, 2 ms.
Database type: Derby_10.x,Current profile: Derby Connection, Database: MyDB,connected, Commit Mode: Auto
Writable
Insert
1 : 25

Questions? Comments?