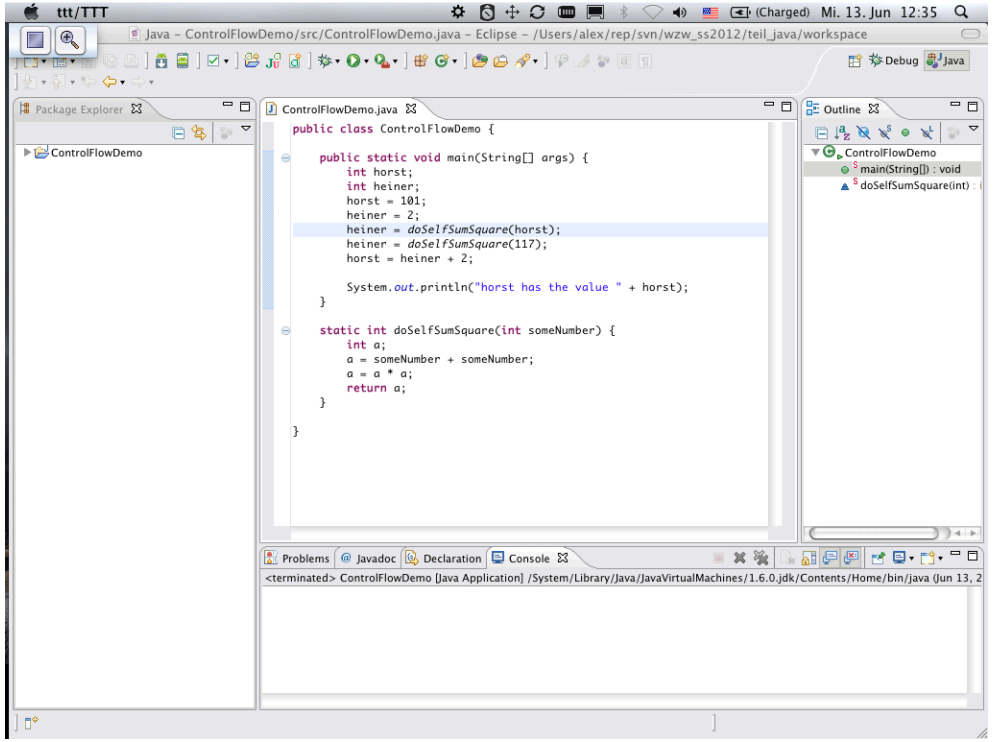
Script **generated by TTT**

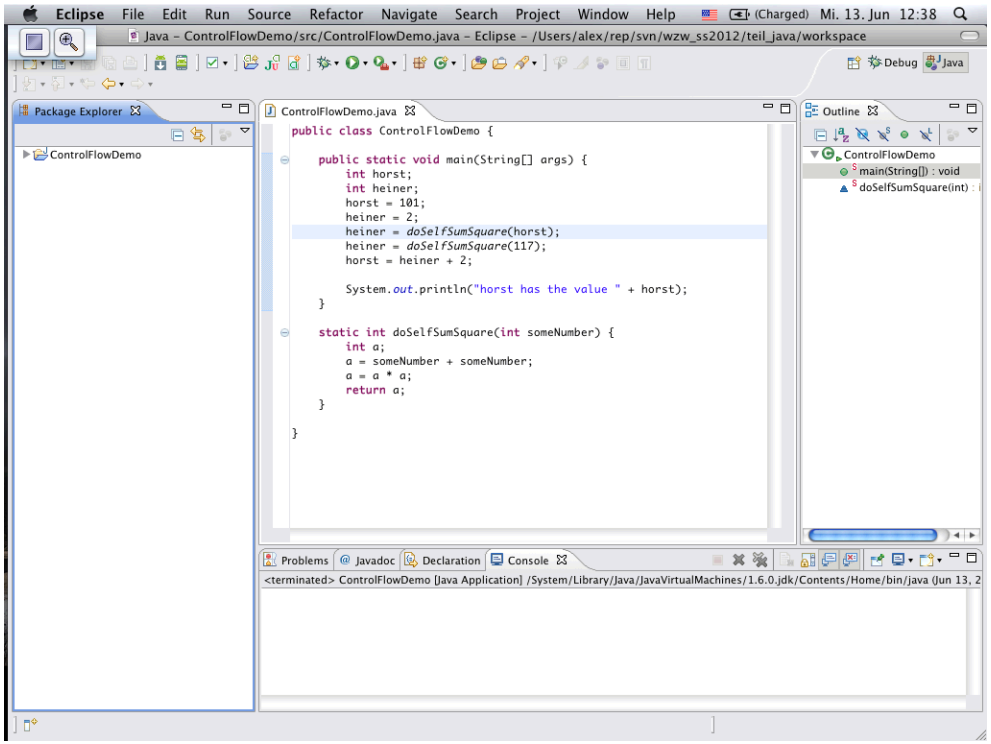
Title: Lehmann: Uebung_Einf_HF (13.06.2012)

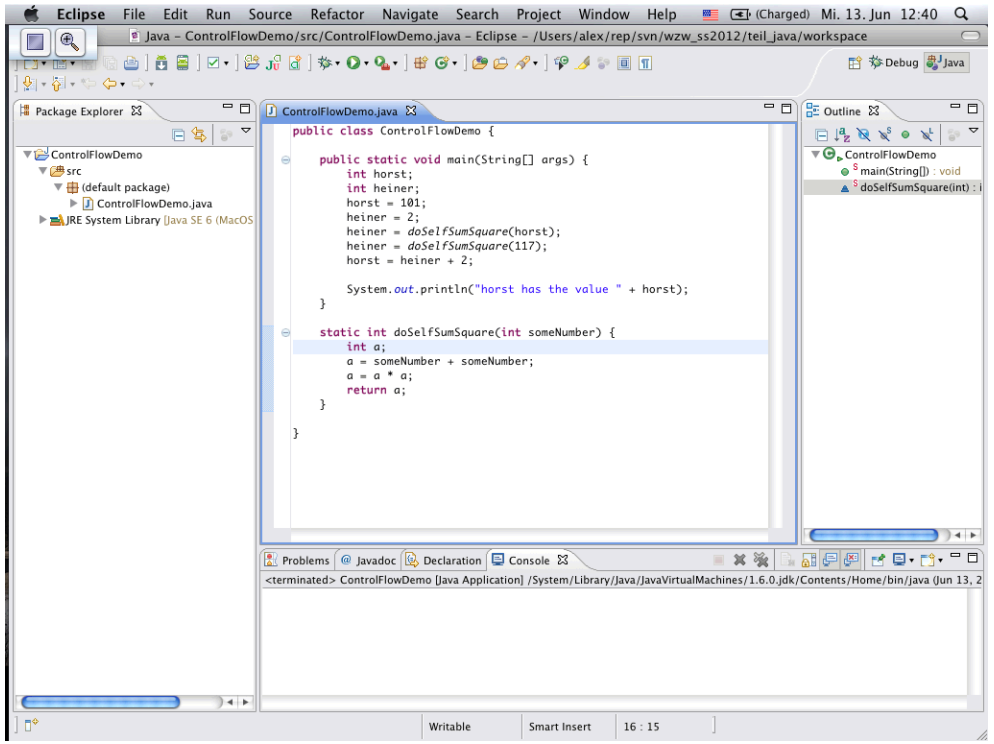
Date: Wed Jun 13 12:35:29 CEST 2012

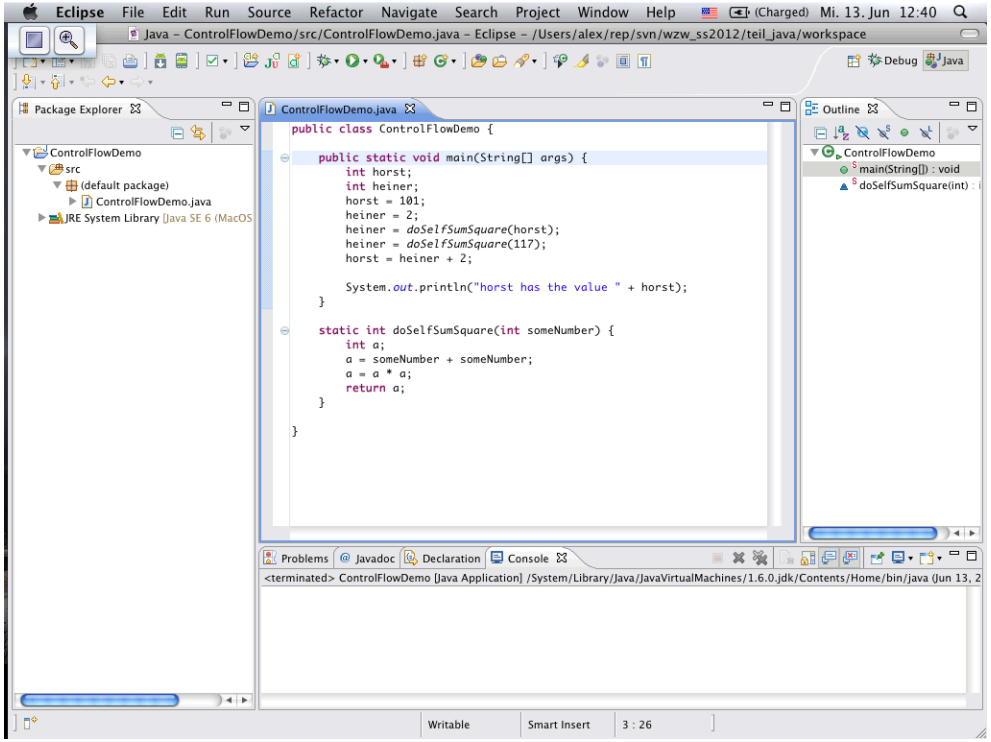
Duration: 45:52 min

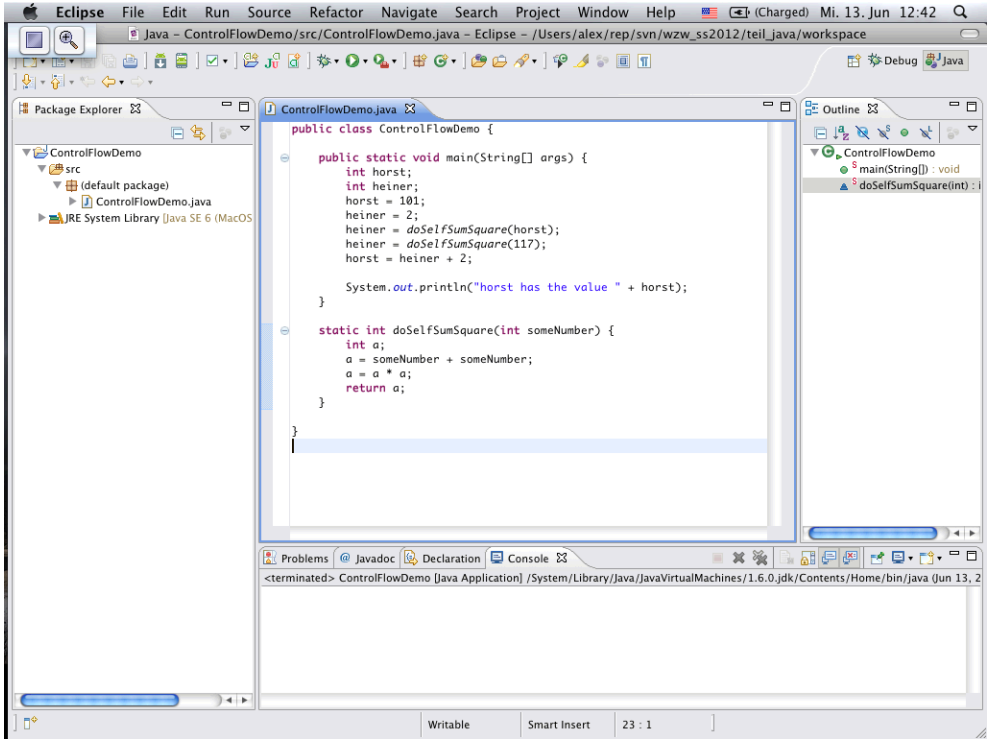
Pages: 28








Eclipse File Edit Run Source Refactor Navigate Search Project Window Help (Charged) Mi. 13. Jun 12:40
Java – ControlFlowDemo/src/ControlFlowDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Debug Java
Package Explorer
ControlFlowDemo
src
(default package)
ControlFlowDemo.java
JRE System Library [Java SE 6 (MacOS
ControlFlowDemo.java
public class ControlFlowDemo {
public static void main(String[] args) {
int horst;
int heiner;
horst = 101;
heiner = 2;
heiner = doSelfSumSquare(horst);
heiner = doSelfSumSquare(117);
horst = heiner + 2;
System.out.println("horst has the value " + horst);
}
static int doSelfSumSquare(int someNumber) {
int a;
a = someNumber + someNumber;
a = a * a;
return a;
}
}
Outline
ControlFlowDemo
main(String[]) : void
doSelfSumSquare(int) : i
Problems Javadoc Declaration Console
<terminated> ControlFlowDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun 13, 2
Writable Smart Insert 3 : 26


Eclipse File Edit Run Source Refactor Navigate Search Project Window Help (Charged) Mi. 13. Jun 12:42
Java – ControlFlowDemo/src/ControlFlowDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Debug Java
Package Explorer
ControlFlowDemo
src
(default package)
ControlFlowDemo.java
JRE System Library [Java SE 6 (MacOS
ControlFlowDemo.java
public class ControlFlowDemo {
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}
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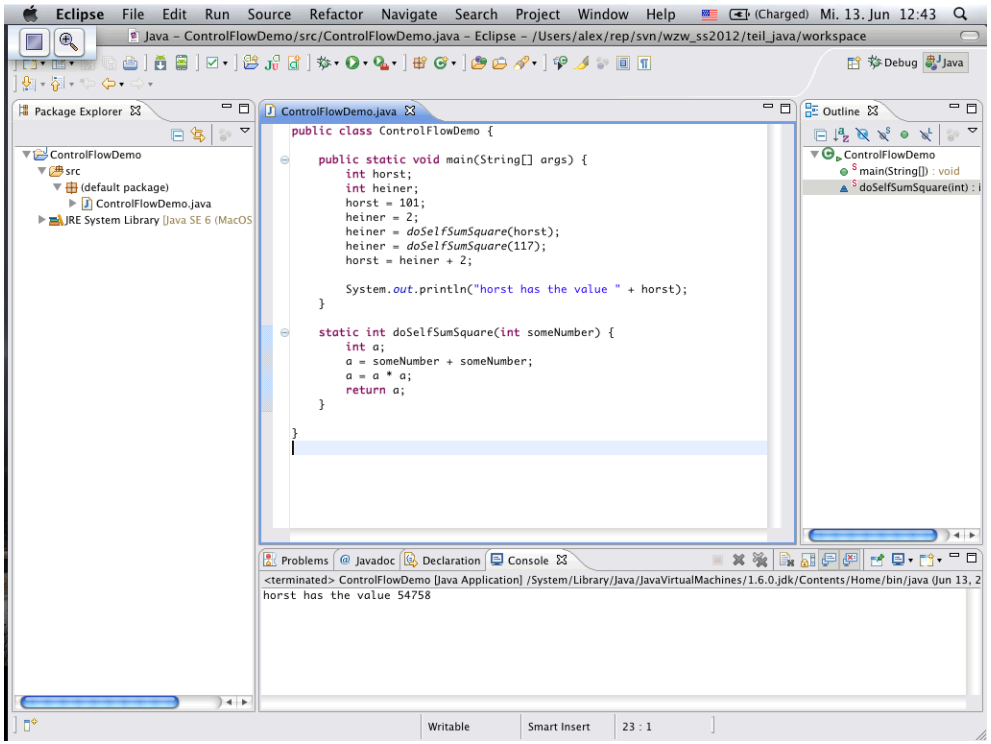
a = a * a;
return a;
}
}
Outline
ControlFlowDemo
main(String[]) : void
doSelfSumSquare(int) : i
Problems Javadoc Declaration Console
<terminated> ControlFlowDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun 13, 2
Writable Smart Insert 23 : 1


Eclipse File Edit Run Source Refactor Navigate Search Project Window Help (Charged) Mi. 13. Jun 12:43
Java – ControlFlowDemo/src/ControlFlowDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Debug Java
Package Explorer
ControlFlowDemo
src
(default package)
ControlFlowDemo.java
JRE System Library [Java SE 6 (MacOS
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}
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a = a * a;
return a;
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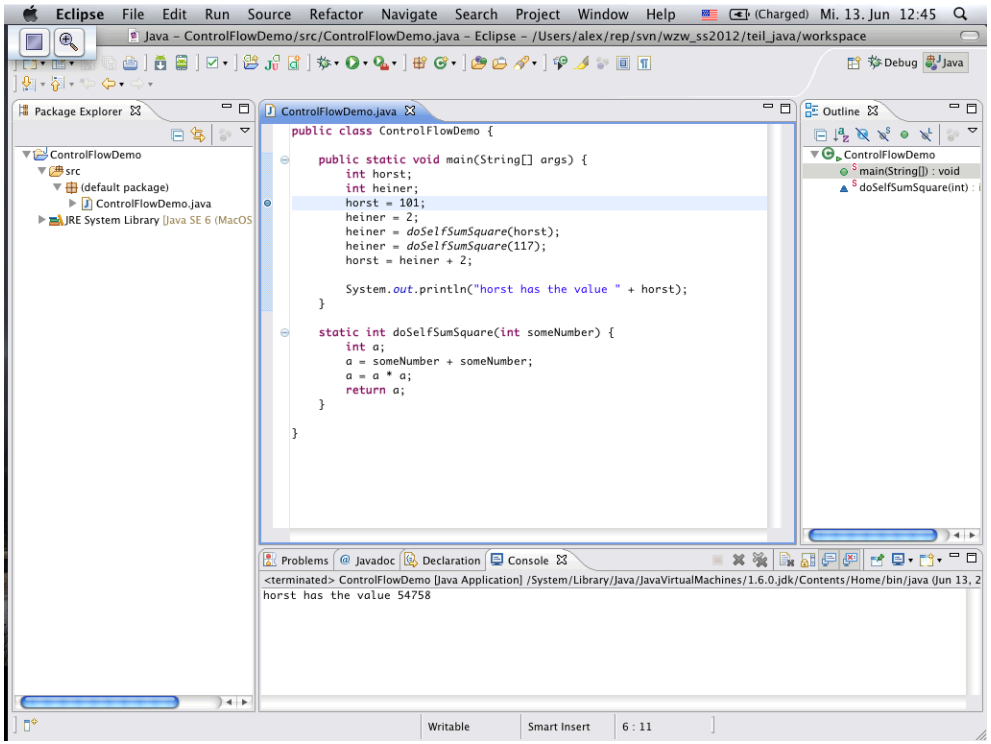
main(String[]) : void
doSelfSumSquare(int) : i
Problems Javadoc Declaration Console
<terminated> ControlFlowDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun 13, 2
horst has the value 54758
Writable Smart Insert 23 : 1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Java – ControlFlowDemo/src/ControlFlowDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Debug Java
Package Explorer
ControlFlowDemo
src
(default package)
ControlFlowDemo.java
JRE System Library [Java SE 6 (MacOS
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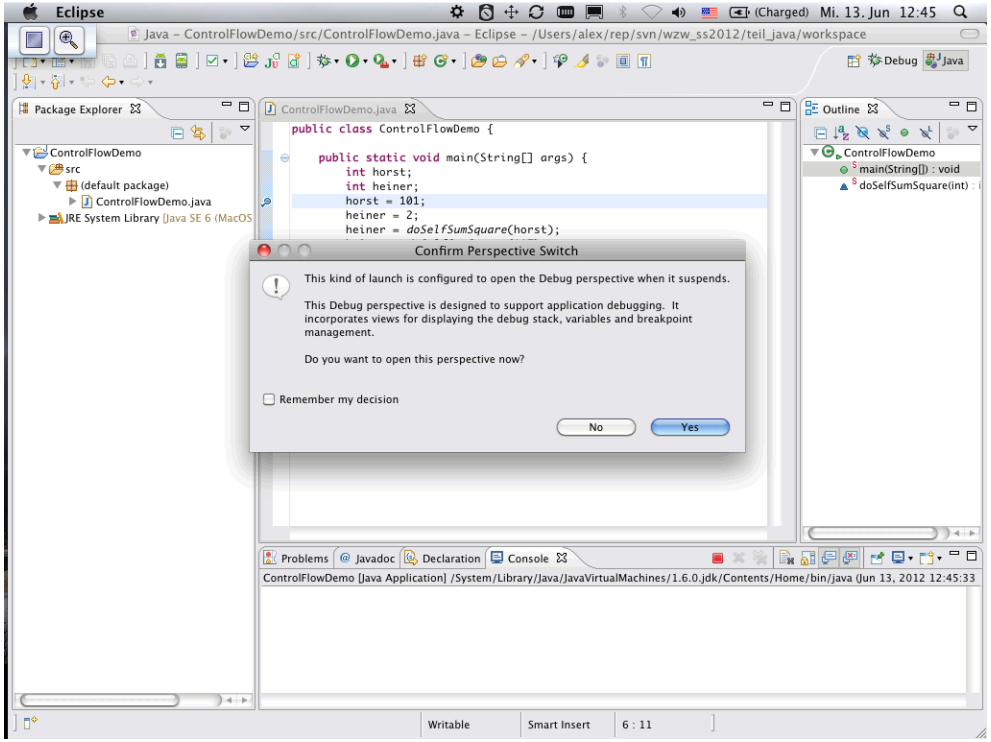
doSelfSumSquare(int) : i
Problems Javadoc Declaration Console
<terminated> ControlFlowDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun 13, 2
horst has the value 54758
Writable Smart Insert 6 : 11


Eclipse
Java – ControlFlowDemo/src/ControlFlowDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
ControlFlowDemo
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JRE System Library [Java SE 6 (MacOS
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public class ControlFlowDemo {
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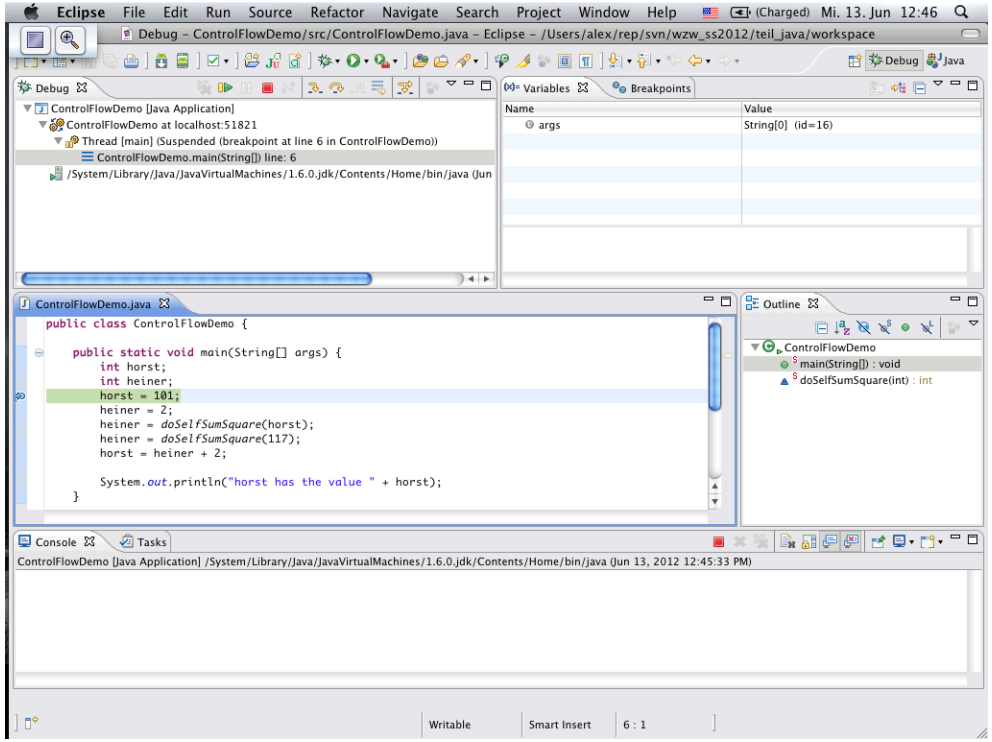
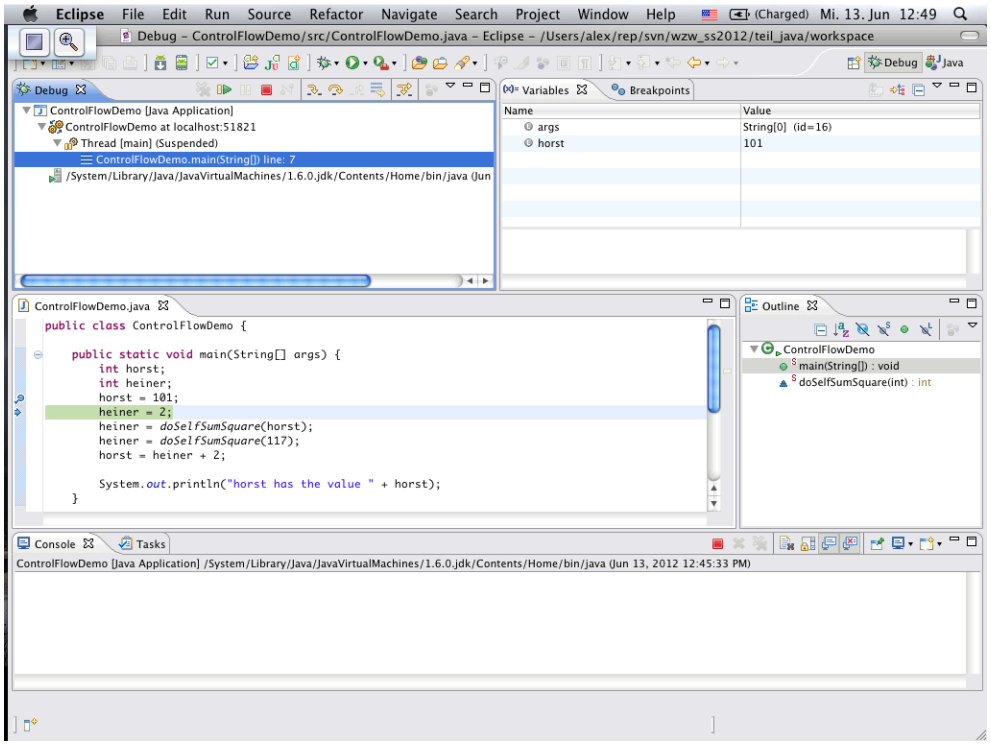
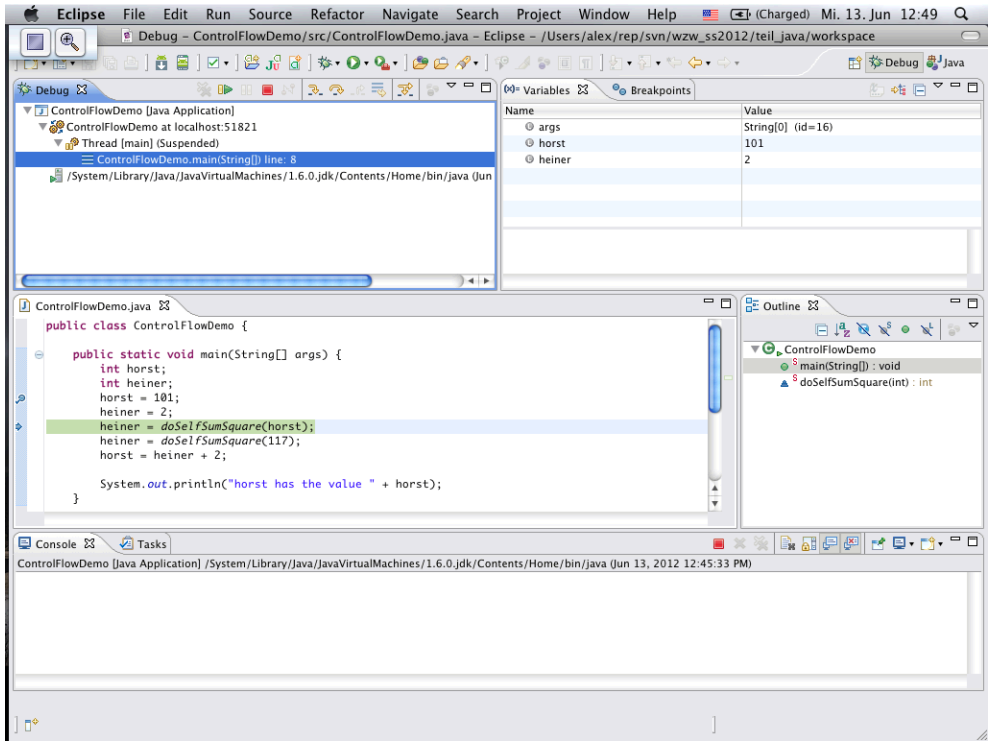
horst = 101;
heiner = 2;
heiner = doSelfSumSquare(horst);
Outline
ControlFlowDemo
main(String[]) : void
doSelfSumSquare(int) :
Confirm Perspective Switch
This kind of launch is configured to open the Debug perspective when it suspends.
This Debug perspective is designed to support application debugging. It incorporates views for displaying the debug stack, variables and breakpoint management.
Do you want to open this perspective now?
Remember my decision
No
Yes
Problems
Javadoc
Declaration
Console
ControlFlowDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun 13, 2012 12:45:33
Writable
Smart Insert
6 : 11


Eclipse File Edit Run Source Refactor Navigate Search Project Window Help
Debug – ControlFlowDemo/src/ControlFlowDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Debug
ControlFlowDemo [Java Application]
ControlFlowDemo at localhost:51821
Thread [main] (Suspended (breakpoint at line 6 in ControlFlowDemo))
ControlFlowDemo.main(String[]) line: 6
/System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun
Variables
Breakpoints
Name
Value
args
String[0] (id=16)
ControlFlowDemo.java
public class ControlFlowDemo {
public static void main(String[] args) {
int horst;
int heiner;
horst = 101;
heiner = 2;
heiner = doSelfSumSquare(horst);
heiner = doSelfSumSquare(117);
horst = heiner + 2;
System.out.println("horst has the value " + horst);
}
Outline
ControlFlowDemo
main(String[]) : void
doSelfSumSquare(int) : int
Console
Tasks
ControlFlowDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun 13, 2012 12:45:33 PM)
Writable
Smart Insert
6 : 1


Eclipse File Edit Run Source Refactor Navigate Search Project Window Help
Debug – ControlFlowDemo/src/ControlFlowDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Debug
ControlFlowDemo [Java Application]
ControlFlowDemo at localhost:51821
Thread [main] (Suspended)
ControlFlowDemo.main(String[]) line: 7
/System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun
Variables
Breakpoints
Name
Value
args
String[0] (id=16)
horst
101
ControlFlowDemo.java
public class ControlFlowDemo {
public static void main(String[] args) {
int horst;
int heiner;
horst = 101;
heiner = 2;
heiner = doSelfSumSquare(horst);
heiner = doSelfSumSquare(117);
horst = heiner + 2;
System.out.println("horst has the value " + horst);
}
Outline
ControlFlowDemo
main(String[]) : void
doSelfSumSquare(int) : int
Console
Tasks
ControlFlowDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun 13, 2012 12:45:33 PM)


Eclipse File Edit Run Source Refactor Navigate Search Project Window Help
Debug – ControlFlowDemo/src/ControlFlowDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Debug
ControlFlowDemo [Java Application]
ControlFlowDemo at localhost:51821
Thread [main] (Suspended)
ControlFlowDemo.main(String[]) line: 8
/System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun
Variables
Breakpoints
Name
Value
args
String[0] (id=16)
horst
101
heiner
2
ControlFlowDemo.java
public class ControlFlowDemo {
public static void main(String[] args) {
int horst;
int heiner;
horst = 101;
heiner = 2;
heiner = doSelfSumSquare(horst);
heiner = doSelfSumSquare(117);
horst = heiner + 2;
System.out.println("horst has the value " + horst);
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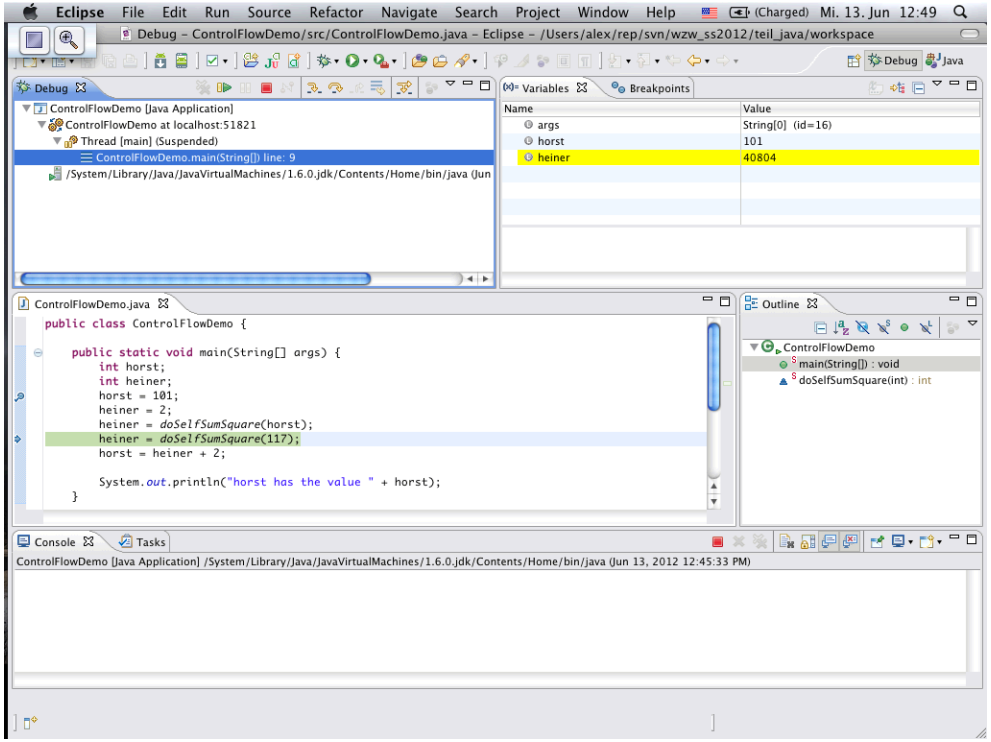
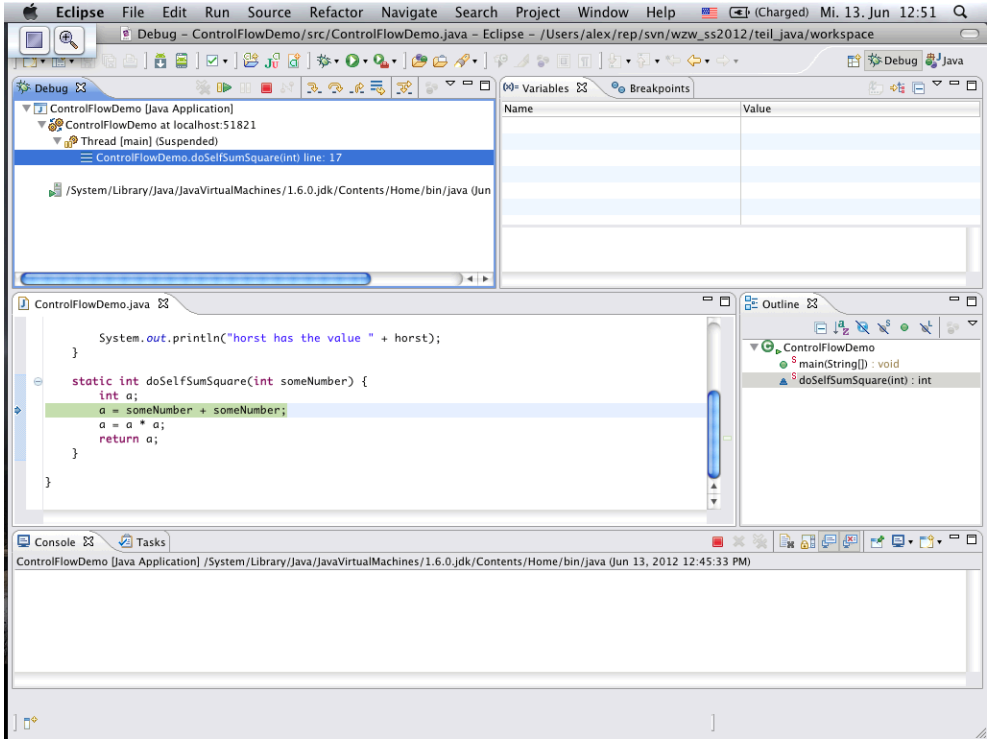
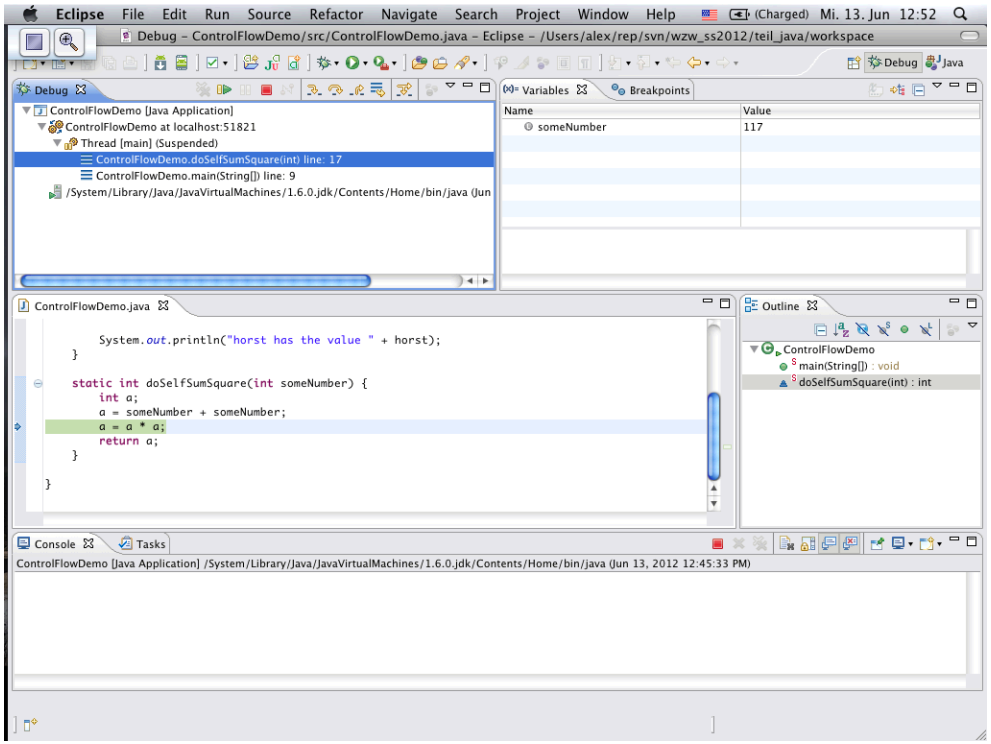
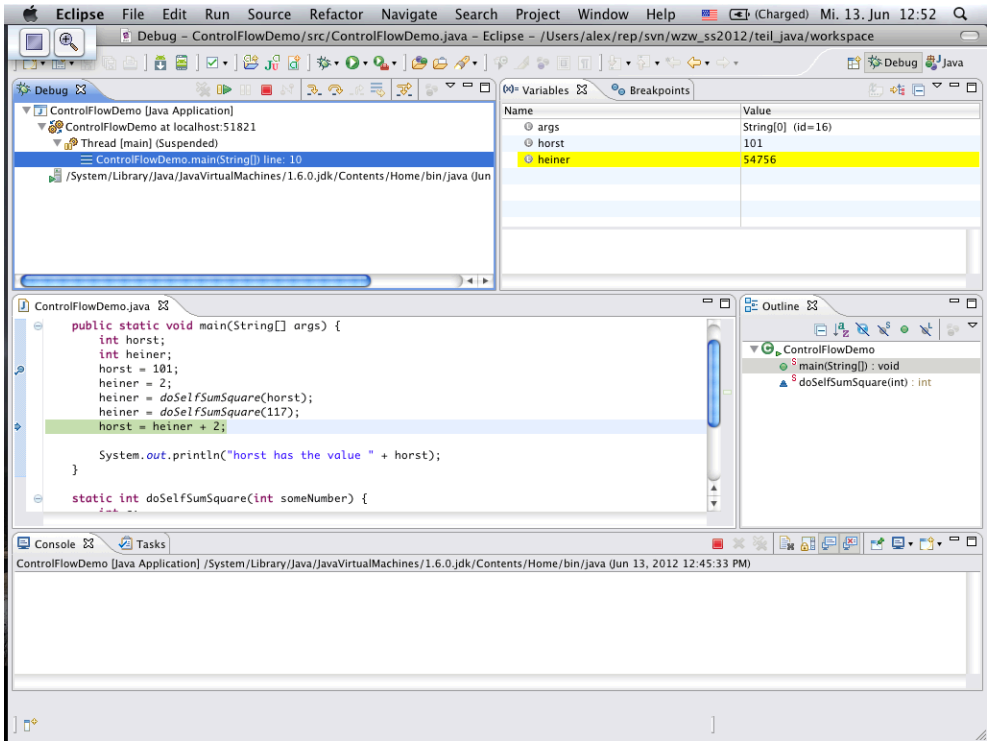
ControlFlowDemo
main(String[]) : void
doSelfSumSquare(int) : int
Console
Tasks
ControlFlowDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun 13, 2012 12:45:33 PM)


Eclipse File Edit Run Source Refactor Navigate Search Project Window Help (Charged) Mi. 13. Jun 12:49
Debug - ControlFlowDemo/src/ControlFlowDemo.java - Eclipse - /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Debug
ControlFlowDemo [Java Application]
ControlFlowDemo at localhost:51821
Thread [main] (Suspended)
ControlFlowDemo.main(String[]) line: 9
/System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun
Variables
Breakpoints
Name
Value
args
String[0] (id=16)
horst
101
heiner
40804
ControlFlowDemo.java
public class ControlFlowDemo {
public static void main(String[] args) {
int horst;
int heiner;
horst = 101;
heiner = 2;
heiner = doSelfSumSquare(horst);
heiner = doSelfSumSquare(117);
horst = heiner + 2;
System.out.println("horst has the value " + horst);
}
Outline
ControlFlowDemo
main(String[]) : void
doSelfSumSquare(int) : int
Console
Tasks
ControlFlowDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun 13, 2012 12:45:33 PM)


Eclipse File Edit Run Source Refactor Navigate Search Project Window Help (Charged) Mi. 13. Jun 12:51
Debug - ControlFlowDemo/src/ControlFlowDemo.java - Eclipse - /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Debug
ControlFlowDemo [Java Application]
ControlFlowDemo at localhost:51821
Thread [main] (Suspended)
ControlFlowDemo.doSelfSumSquare(int) line: 17
/System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun
Variables
Breakpoints
Name
Value
ControlFlowDemo.java
System.out.println("horst has the value " + horst);
}
static int doSelfSumSquare(int someNumber) {
int a;
a = someNumber + someNumber;
a = a * a;
return a;
}
}
Outline
ControlFlowDemo
main(String[]) : void
doSelfSumSquare(int) : int
Console
Tasks
ControlFlowDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun 13, 2012 12:45:33 PM)


Eclipse File Edit Run Source Refactor Navigate Search Project Window Help (Charged) Mi. 13. Jun 12:52
Debug - ControlFlowDemo/src/ControlFlowDemo.java - Eclipse - /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Debug
ControlFlowDemo [Java Application]
ControlFlowDemo at localhost:51821
Thread [main] (Suspended)
ControlFlowDemo.doSelfSumSquare(int) line: 17
ControlFlowDemo.main(String[]) line: 9
/System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun
Variables
Breakpoints
Name
Value
someNumber
117
ControlFlowDemo.java
System.out.println("horst has the value " + horst);
}
static int doSelfSumSquare(int someNumber) {
int a;
a = someNumber + someNumber;
a = a * a;
return a;
}
}
Outline
ControlFlowDemo
main(String[]) : void
doSelfSumSquare(int) : int
Console
Tasks
ControlFlowDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun 13, 2012 12:45:33 PM)


Eclipse File Edit Run Source Refactor Navigate Search Project Window Help (Charged) Mi. 13. Jun 12:52
Debug - ControlFlowDemo/src/ControlFlowDemo.java - Eclipse - /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Debug
ControlFlowDemo [Java Application]
ControlFlowDemo at localhost:51821
Thread [main] (Suspended)
ControlFlowDemo.main(String[]) line: 10
/System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun
Variables
Breakpoints
Name
Value
args
String[0] (id=16)
horst
101
heiner
54756
ControlFlowDemo.java
public static void main(String[] args) {
int horst;
int heiner;
horst = 101;
heiner = 2;
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heiner = doSelfSumSquare(117);
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Console
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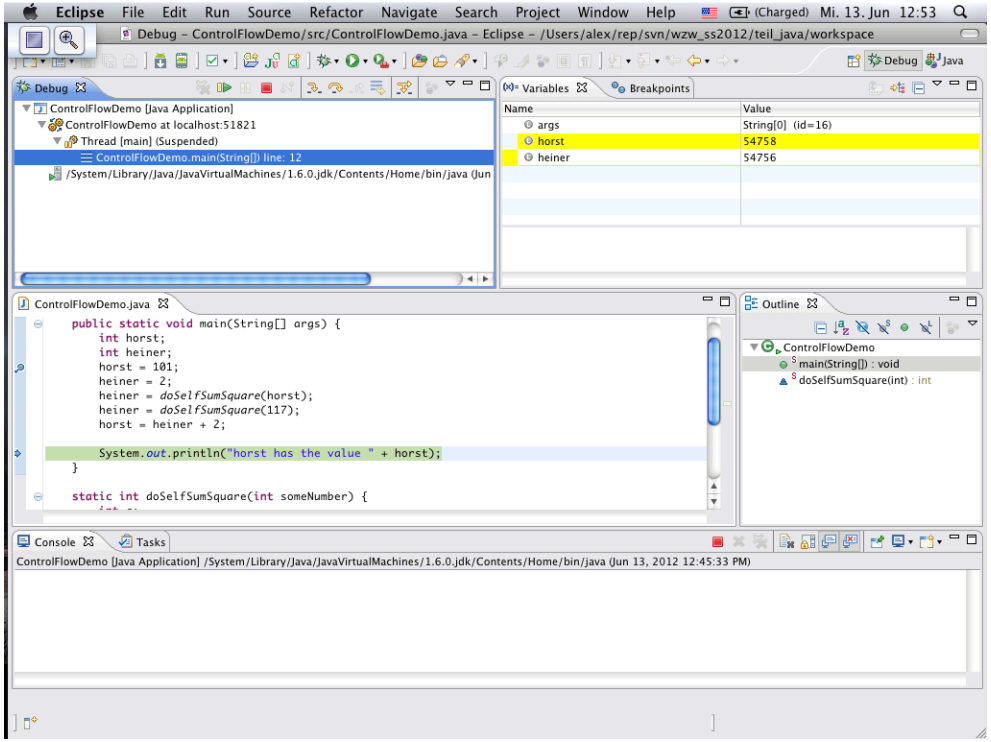
ControlFlowDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun 13, 2012 12:45:33 PM)


Debug – ControlFlowDemo/src/ControlFlowDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
ControlFlowDemo [Java Application]
ControlFlowDemo at localhost:51821
Thread [main] (Suspended)
ControlFlowDemo.main(String[]) line: 12
/System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun
Name
Value
args
String[0] (id=16)
horst
54758
heiner
54756
ControlFlowDemo.java
public static void main(String[] args) {
int horst;
int heiner;
horst = 101;
heiner = 2;
heiner = doSelfSumSquare(horst);
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horst = heiner + 2;
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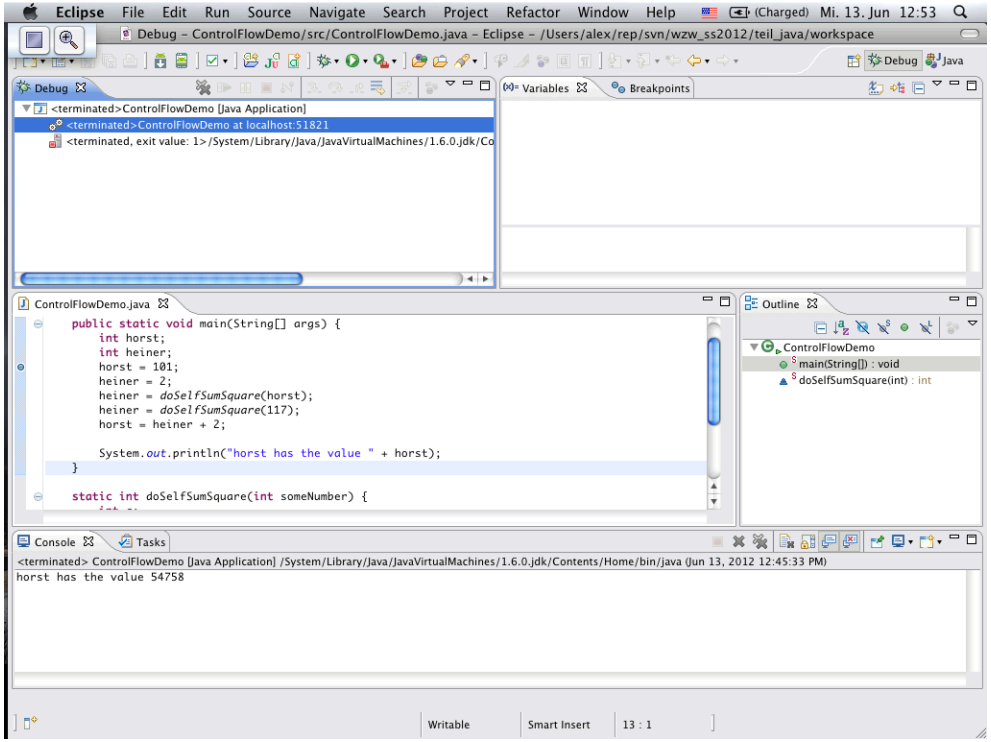
Debug – ControlFlowDemo/src/ControlFlowDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
<terminated>ControlFlowDemo [Java Application]
<terminated>ControlFlowDemo at localhost:51821
<terminated, exit value: 1>/System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Co
ControlFlowDemo.java
public static void main(String[] args) {
int horst;
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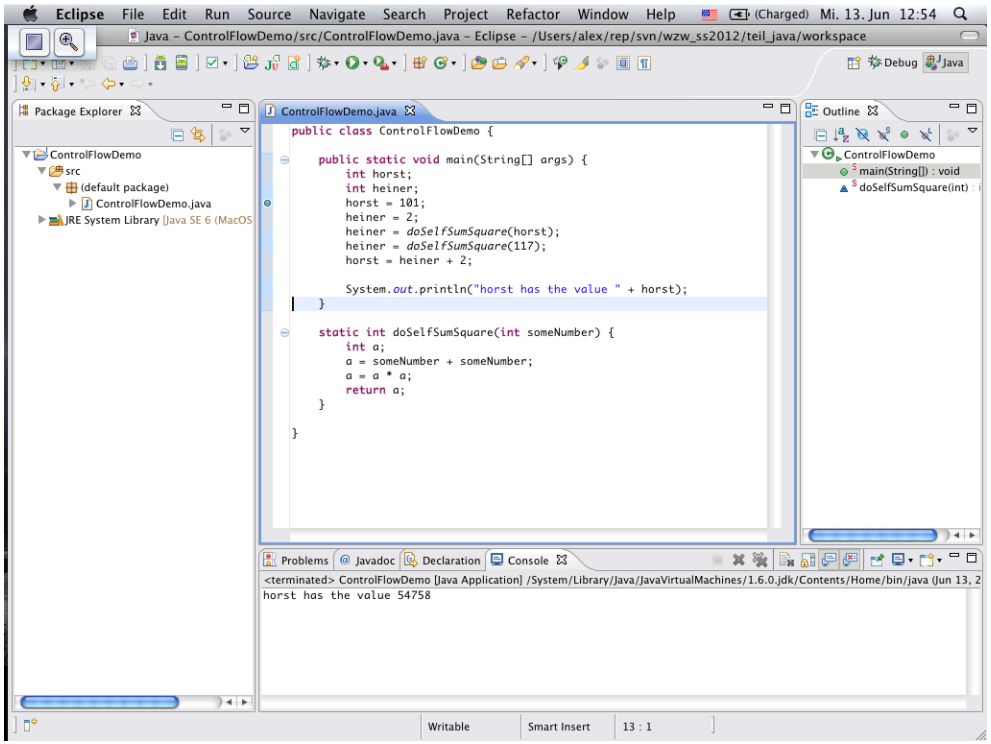
<terminated> ControlFlowDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun 13, 2012 12:45:33 PM)
horst has the value 54758
Writable
Smart Insert
13 : 1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Javadoc
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Console
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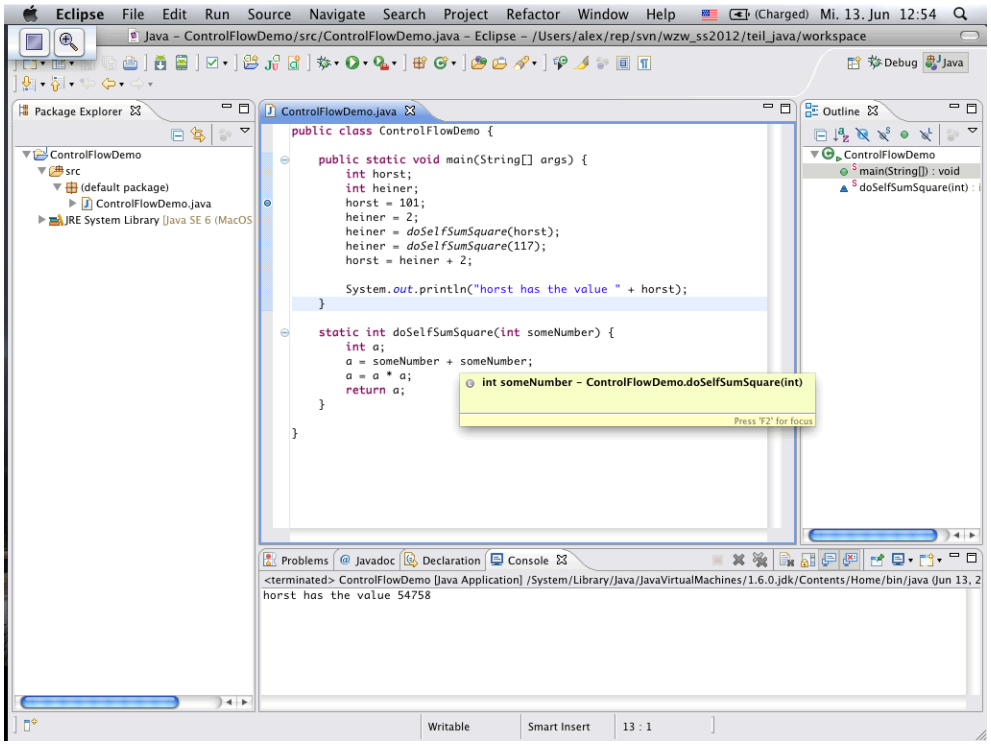
horst has the value 54758
Writable
Smart Insert
13 : 1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Package Explorer
ControlFlowDemo
src
(default package)
ControlFlowDemo.java
JRE System Library [Java SE 6 (MacOS
ControlFlowDemo.java
public class ControlFlowDemo {
public static void main(String[] args) {
int horst;
int heiner;
horst = 101;
heiner = 2;
heiner = doSelfSumSquare(horst);
heiner = doSelfSumSquare(117);
horst = heiner + 2;
System.out.println("horst has the value " + horst);
}
static int doSelfSumSquare(int someNumber) {
int a;
a = someNumber + someNumber;
a = a * a;
return a;
}
}
int someNumber – ControlFlowDemo.doSelfSumSquare(int)
Press 'F2' for focus
Outline
ControlFlowDemo
main(String[]) : void
doSelfSumSquare(int) :
Problems
Javadoc
Declaration
Console
<terminated> ControlFlowDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun 13, 2
horst has the value 54758
Writable
Smart Insert
13 : 1

Object-oriented Programming

- Object-oriented programming:

  Group data and procedures into objects ←→
  Models of state and behaviour of **real world** objects
  state „fields“ ; behaviour „methods“

- Methods should mainly act on an object‘s fields
- Classes: Blueprints for objects → Objects: Instances of classes
- Advantages
  - Intuitive models
  - Information hiding
  - Increased modularity, locality etc.
  - Increased code re-use
  - etc.


```
class Bicycle {
       int cadence = 0;
       int speed = 0;
       int gear = 1;

       void changeCadence(int newValue) {
            cadence = newValue;
       }

       void changeGear(int newValue) {
            gear = newValue;
       }

       void speedUp(int increment) {
            speed = speed + increment;
       }

       void applyBrakes(int decrement) {
            speed = speed - decrement;
       }
}
```

fields (state)

methods (behaviour)

class

Source: [JTutorial]

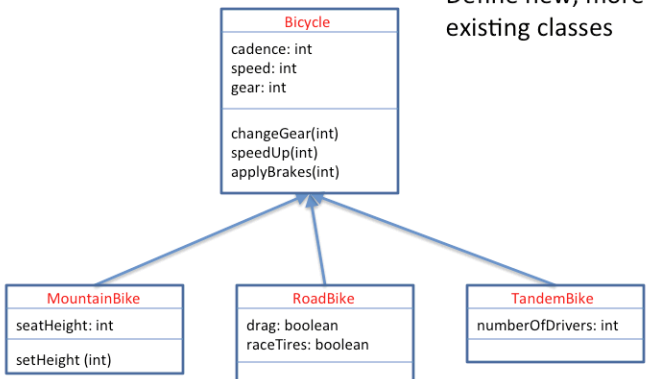

```
class BicycleDemo {
     public static void main(String[] args) {
          // Create two different Bicycle objects
          Bicycle bike1 = new Bicycle();
          Bicycle bike2 = new Bicycle();

          // Invoke methods on these objects
          bike1.changeCadence(50);
          bike1.speedUp(10);
          bike1.changeGear(2);

          bike2.changeCadence(50);
          bike2.speedUp(10);
          bike2.changeGear(2);
          bike2.changeCadence(40);
          bike2.speedUp(10);
          bike2.changeGear(3);
       }
}
```

```
class Bicycle {
       int cadence = 0;
       int speed = 0;
       int gear = 1;

       void changeCadence(int newValue) {
            cadence = newValue;
       }

       void changeGear(int newValue) {
            gear = newValue;
       }

       void speedUp(int increment) {
            speed = speed + increment;
       }

       void applyBrakes(int decrement) {
            speed = speed - decrement;
       }
}
```

Source: [JTutorial]

Inheritance

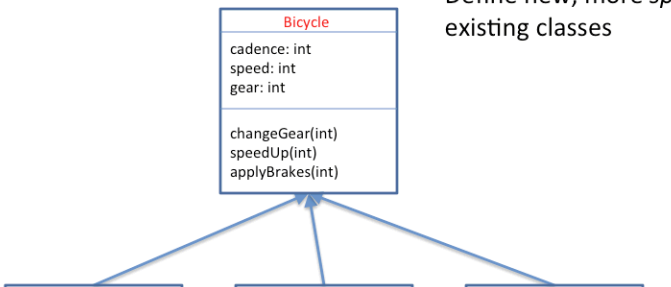
Inheritance:
Define new, more *specialized* classes from existing classes




```
class RoadBike extends Bicycle {
    // additional fields and methods
    // that define a road bike
    // go here
}
```

Inheritance

Inheritance:
Define new, more *specialized* classes from existing classes




```
class RoadBike extends Bicycle {
    // additional fields and methods
    // that define a road bike
    // go here
}
```


Interfaces

Interface:
Specify in an abstract way what a class implementing that interface should exhibit as behaviours (create blueprint for blueprints)

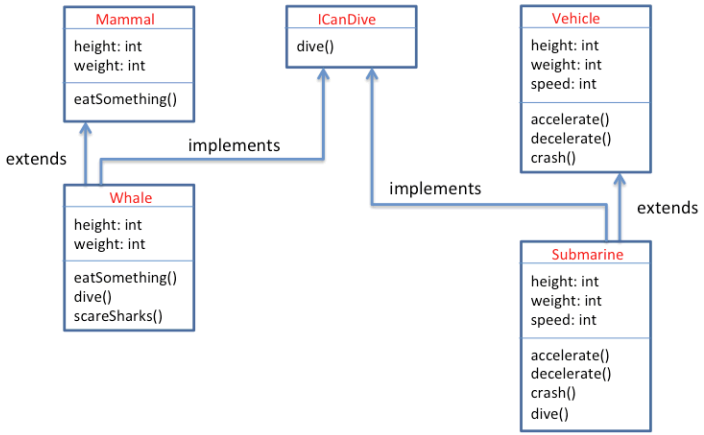
```
interface IBicycle {
       void changeCadence(int newValue);

       void changeGear(int newValue);

       void speedUp(int increment);

       void applyBrakes(int decrement);
}
```

```
class Bicycle implements IBicycle {
   // remainder of this class implemented as before
   // except that above methods must be public
}
```

see: [JTutorial]

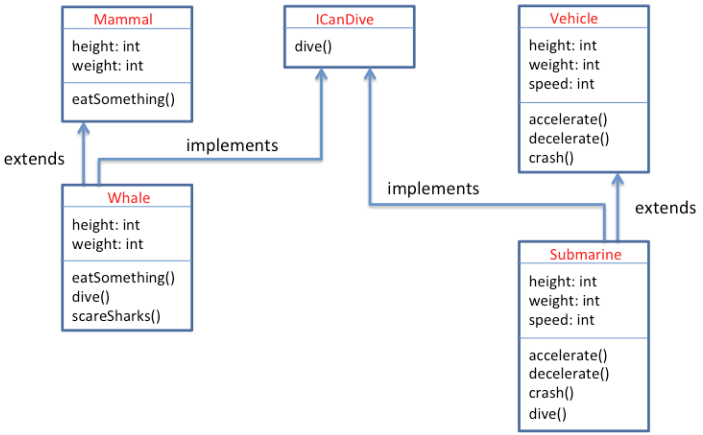
Interfaces

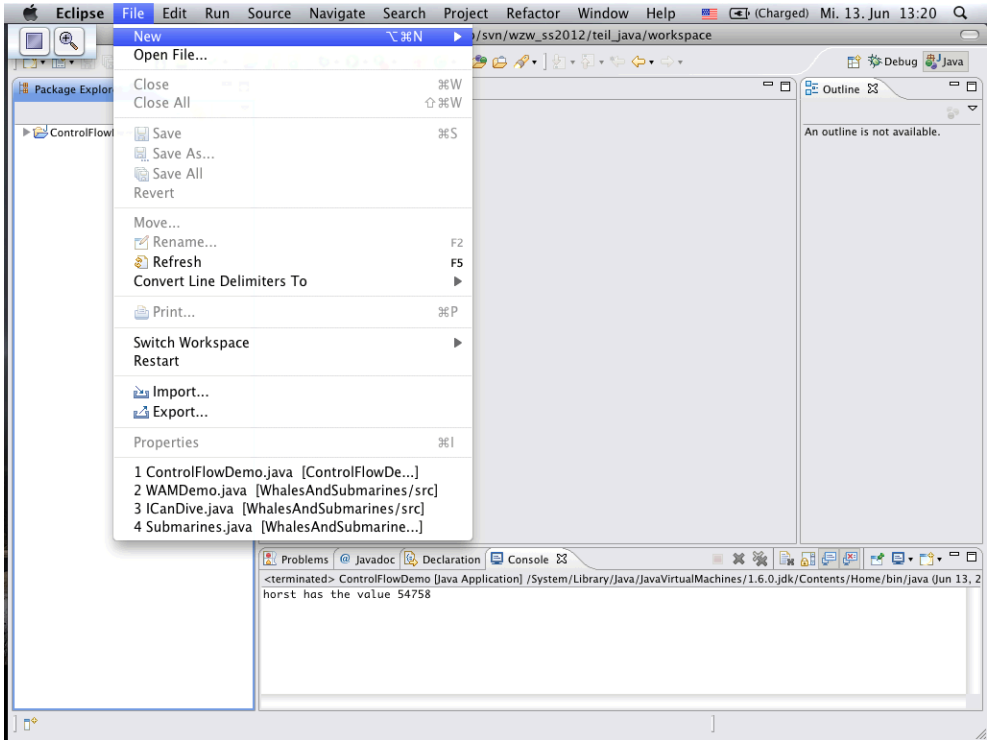
Example:



Interfaces

Example:

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Refresh F5
Convert Line Delimiters To
Print... ⌘P
Switch Workspace
Restart
Import...
Export...
Properties ⌘I
1 ControlFlowDemo.java [ControlFlowDe...]
2 WAMDemo.java [WhalesAndSubmarines/src]
3 ICanDive.java [WhalesAndSubmarines/src]
4 Submarines.java [WhalesAndSubmarine...]
Debug
Java
Package Explor
ControlFlowI
Outline
An outline is not available.
Problems
Javadoc
Declaration
Console
<terminated> ControlFlowDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jun 13, 2
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