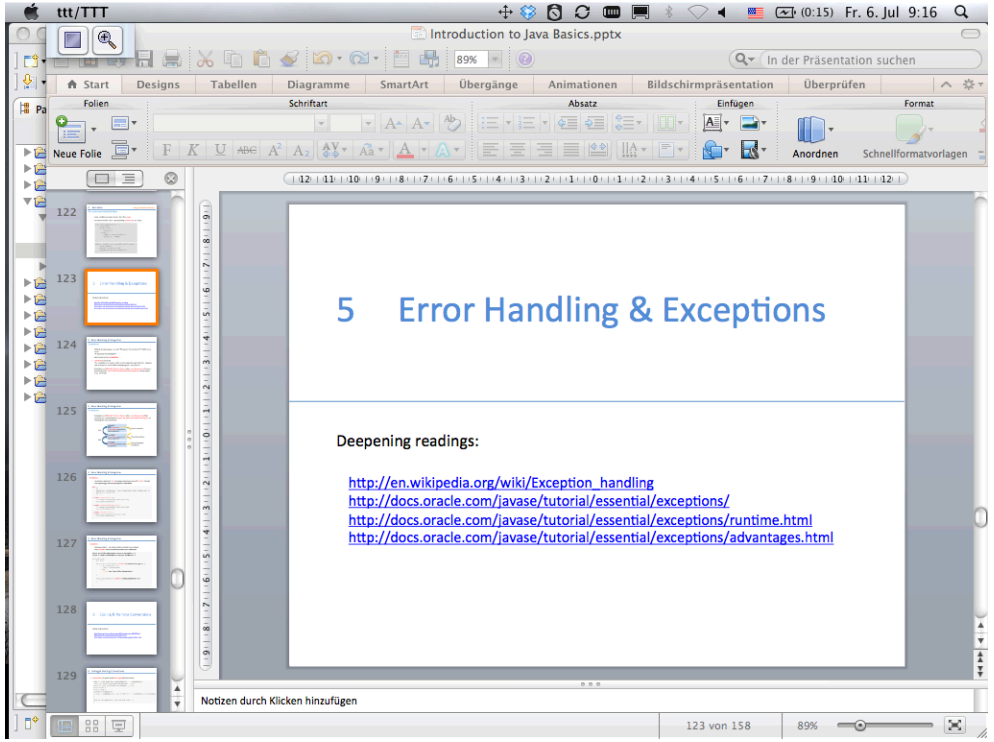
Script **generated by TTT**

Title: Lehmann: Uebung_Einf_HF (06.07.2012)

Date: Fri Jul 06 09:16:59 CEST 2012

Duration: 77:26 min

Pages: 84



5 Handling & Exceptions

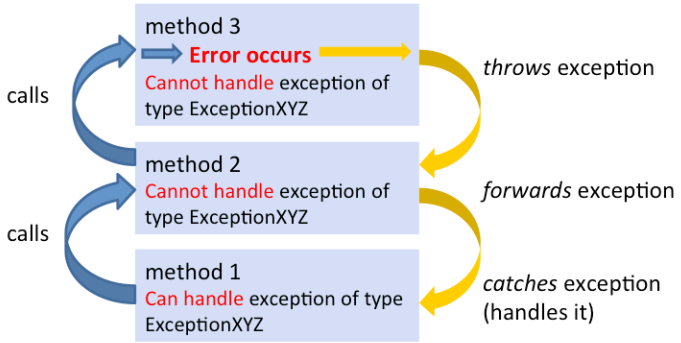
Exceptions

- What if something goes wrong? → Program Termination?!!?! With every Error?
  → Obviously not intelligent!
- Mechanism in Java: **Exceptions**
- Definition [JTutorial]:
  "An *exception* is an event, which occurs during the execution of a program, that disrupts the normal flow of the program's instructions."
- Exceptions are like balls that are thrown when something unusual occurs. Somebody must catch the ball and handle the exception or the program must terminate.

5 Handling & Exceptions

Exceptions

- Exceptions are like balls that are thrown when something unusual (an error) occurs. Somebody must catch the ball and handle the exception or the program must terminate.



Exceptions

- Usual case: Methods "try" possibly dangerous code and "catch" (handle) correspondingly resulting exceptions themselves

```
try {
    // ...
    FileWriter fileWriter = new FileWriter("someFileName.txt");
    fileWriter.write('a');
    // ...

} catch (IOException e) {
    // Exception handling code goes here
    e.printStackTrace();

} catch (SomeOtherException e) {
    // Exception handling code goes here
    e.printStackTrace();

} catch (Exception e) {
 // Exception handling code goes here
    e.printStackTrace();
}
```


Exceptions

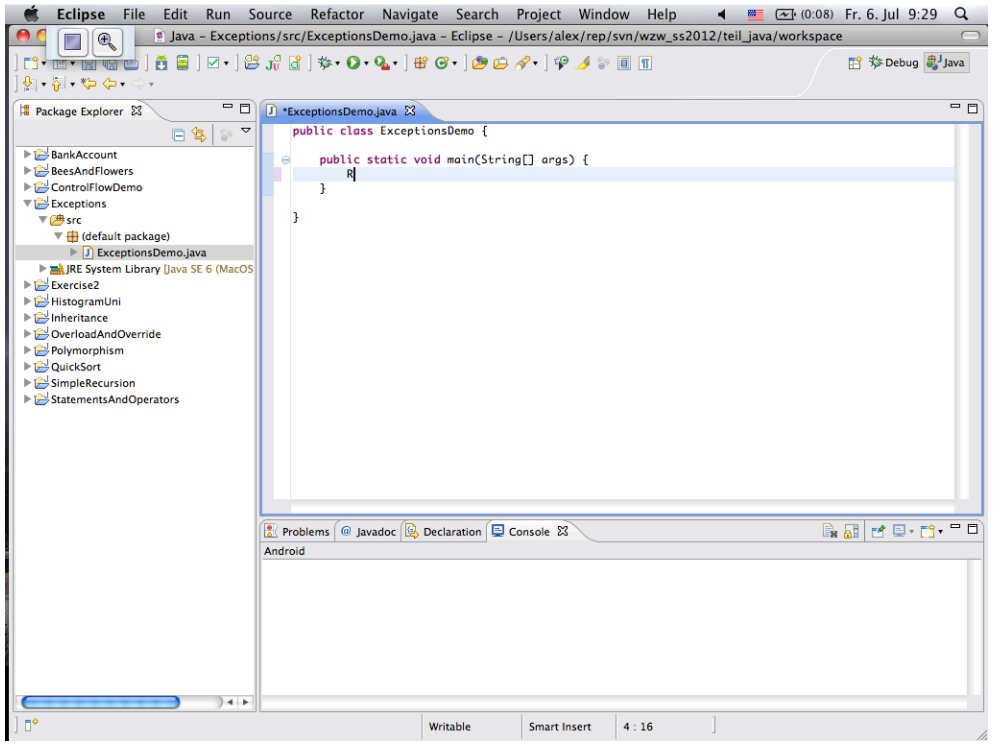
- Other possibility: Let others (callers) handle the problem!
  Add **`throws`** clause to method/constructor definition

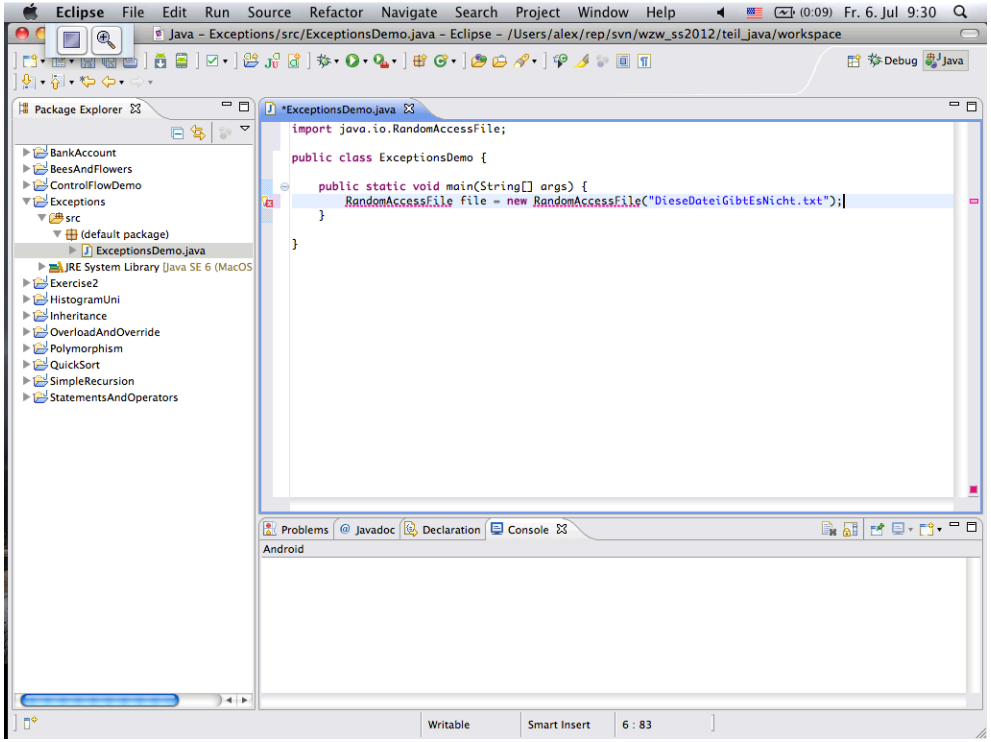
```
class InvalidGearException extends Exception {}
class TireExplodedException extends Exception {}

class Bicycle {
    int gear;

    Bicycle(int initialGear) throws InvalidGearException {
        if (initialGear > 0) {
            gear = initialGear;
        } else {
            throw new InvalidGearException();
        }
    }

    void inflateTires() throws TireExplodedException {
        // ...
    }

}
```

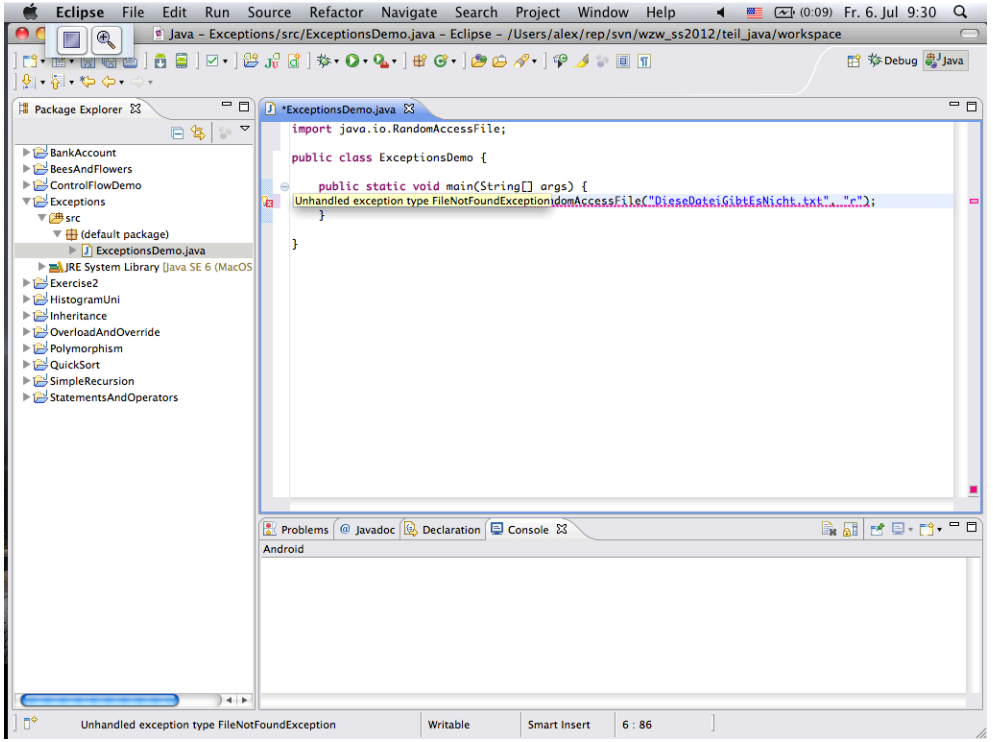
6 Coding & Naming Conventions

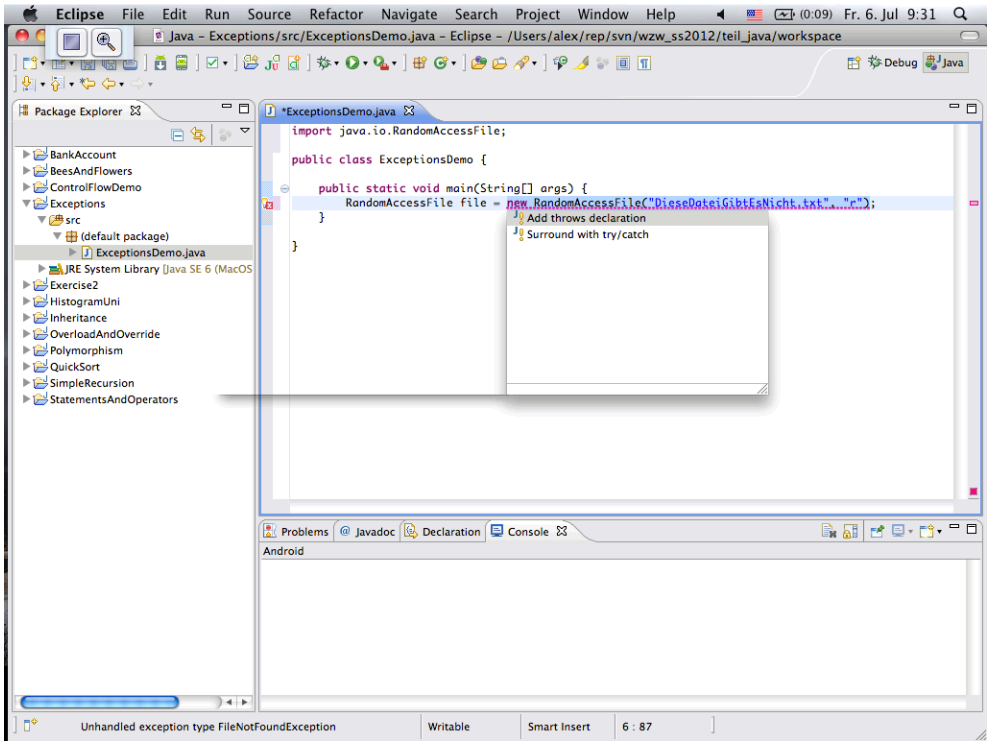
Deepening readings:

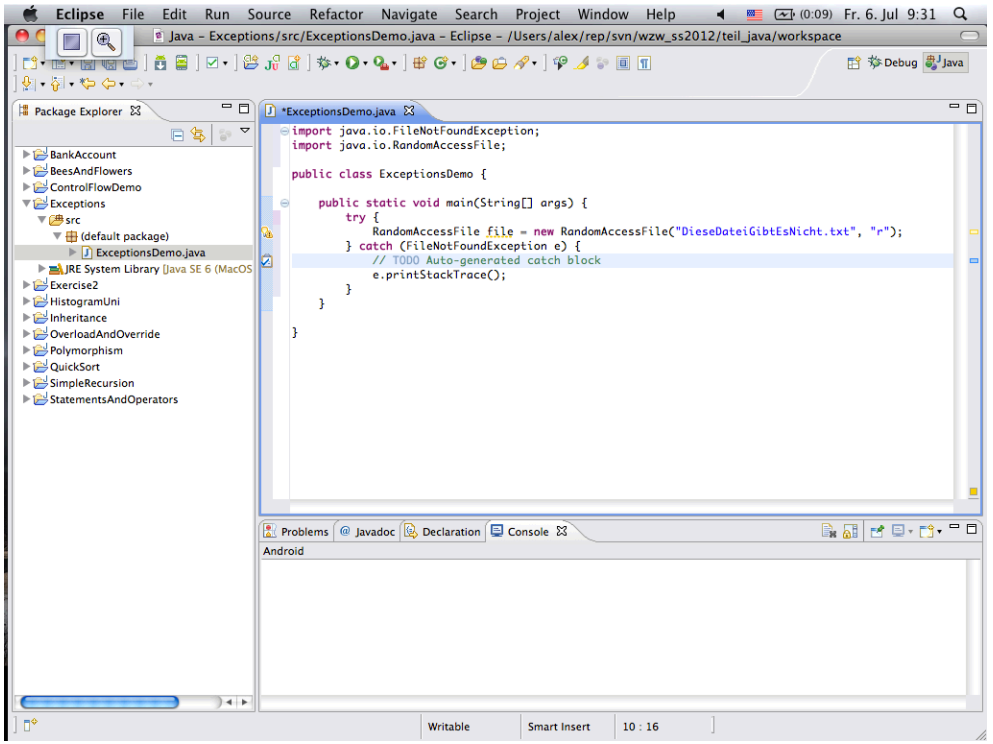
```
        if (initialGear > 0) {
            gear = initialGear;
        } else {
            throw new InvalidGearException();
        }
    }

    void inflateTires() throws TireExplodedException {
        // ...
    }

}
```

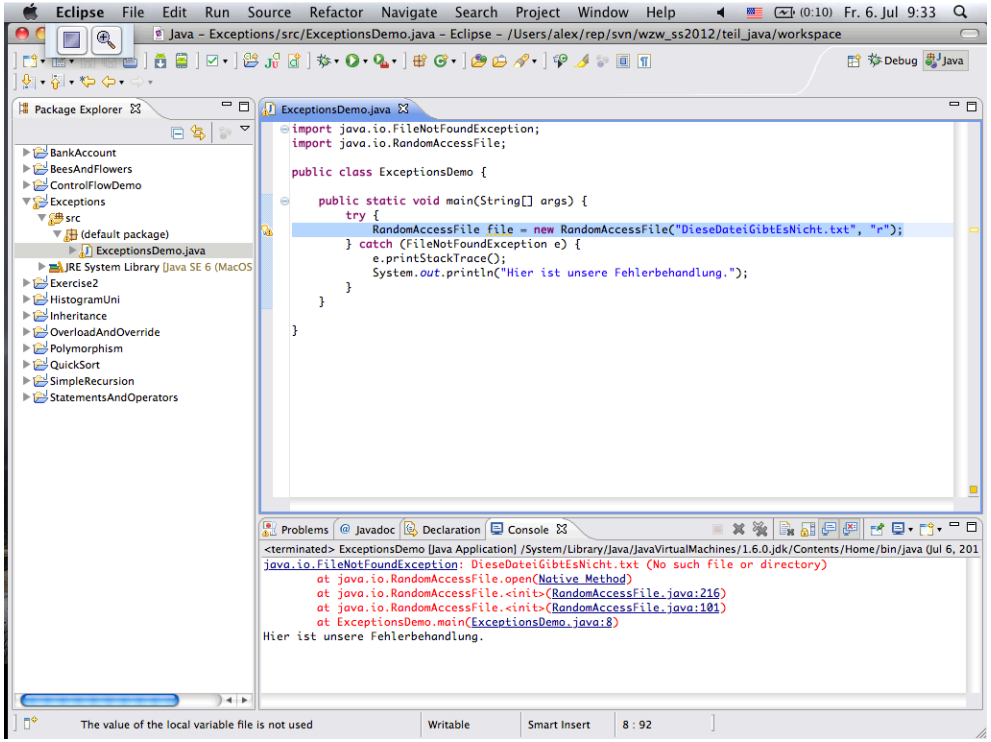


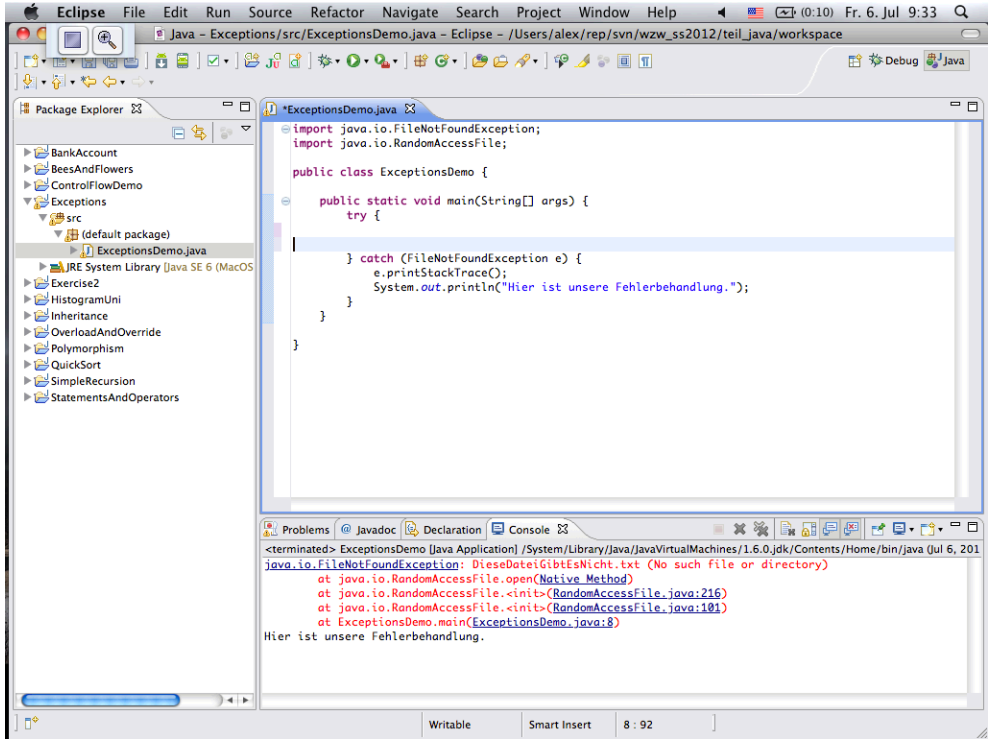

Eclipse File Edit Run Source Refactor Navigate Search Project Window Help
Java – Exceptions/src/ExceptionsDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
*ExceptionsDemo.java
import java.io.RandomAccessFile;
public class ExceptionsDemo {
public static void main(String[] args) {
RandomAccessFile file = new RandomAccessFile("DieseDateiGibtEsNicht.txt");
}
}
BankAccount
BeesAndFlowers
ControlFlowDemo
Exceptions
src
(default package)
ExceptionsDemo.java
JRE System Library [Java SE 6 (MacOS
Exercise2
HistogramUni
Inheritance
OverloadAndOverride
Polymorphism
QuickSort
SimpleRecursion
StatementsAndOperators
Problems Javadoc Declaration Console
Android
Writable
Smart Insert
6 : 83

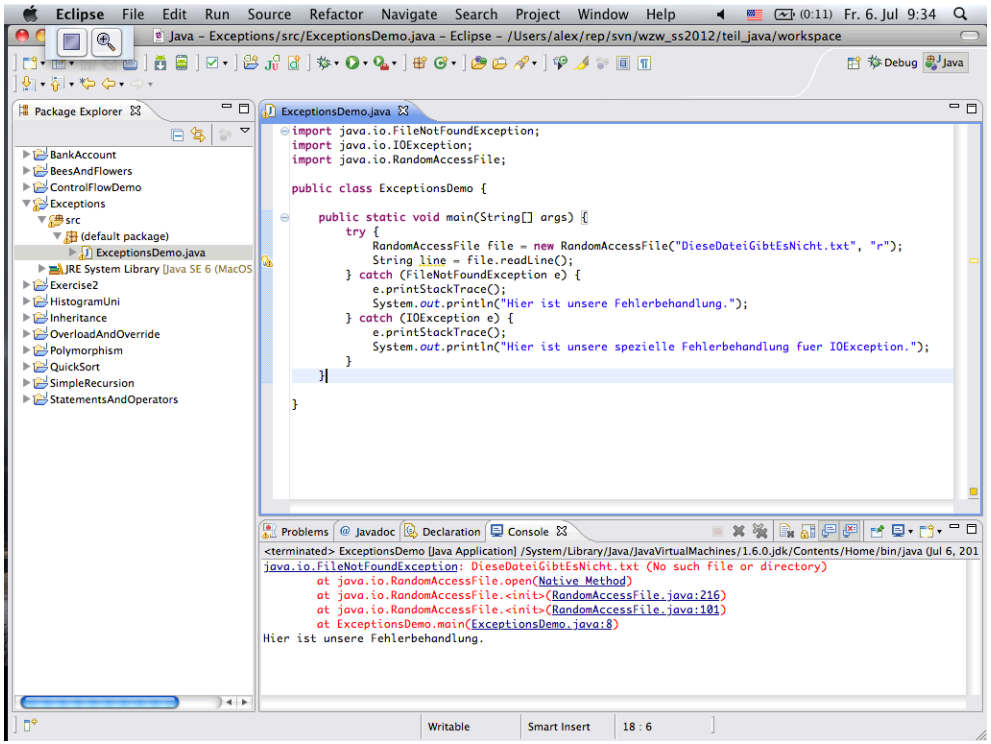

Eclipse File Edit Run Source Refactor Navigate Search Project Window Help
Java – Exceptions/src/ExceptionsDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
*ExceptionsDemo.java
import java.io.RandomAccessFile;
public class ExceptionsDemo {
public static void main(String[] args) {
Unhandled exception type FileNotFoundExceptionomAccessFile("DieseDateiGibtEsNicht.txt","r");
}
}
Problems Javadoc Declaration Console
Android
Unhandled exception type FileNotFoundException
Writable
Smart Insert
6 : 86

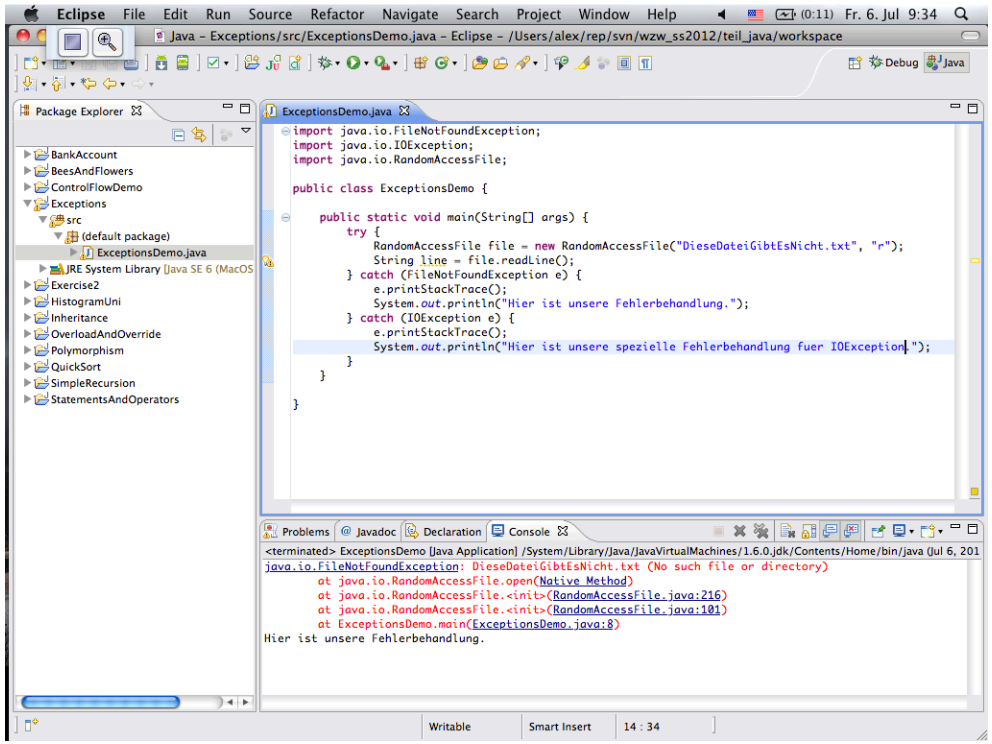

Eclipse File Edit Run Source Refactor Navigate Search Project Window Help
Java – Exceptions/src/ExceptionsDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
*ExceptionsDemo.java
import java.io.RandomAccessFile;
public class ExceptionsDemo {
public static void main(String[] args) {
RandomAccessFile file = new RandomAccessFile("DieseDateiGibtEsNicht.txt","r");
}
}
Add throws declaration
Surround with try/catch
Problems Javadoc Declaration Console
Android
Unhandled exception type FileNotFoundException
Writable
Smart Insert
6 : 87

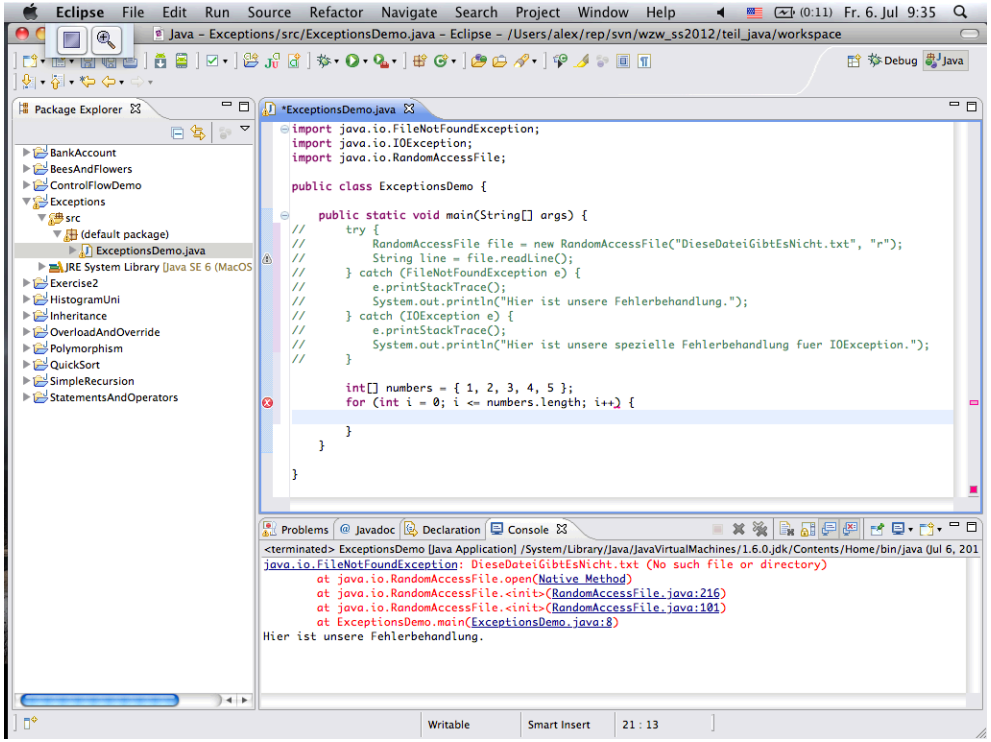

Eclipse File Edit Run Source Refactor Navigate Search Project Window Help
Java – Exceptions/src/ExceptionsDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
*ExceptionsDemo.java
import java.io.FileNotFoundException;
import java.io.RandomAccessFile;
public class ExceptionsDemo {
public static void main(String[] args) {
try {
RandomAccessFile file = new RandomAccessFile("DieseDateiGibtEsNicht.txt", "r");
} catch (FileNotFoundException e) {
// TODO Auto-generated catch block
e.printStackTrace();
}
}
}
Problems Javadoc Declaration Console
Android
Writable
Smart Insert
10 : 16

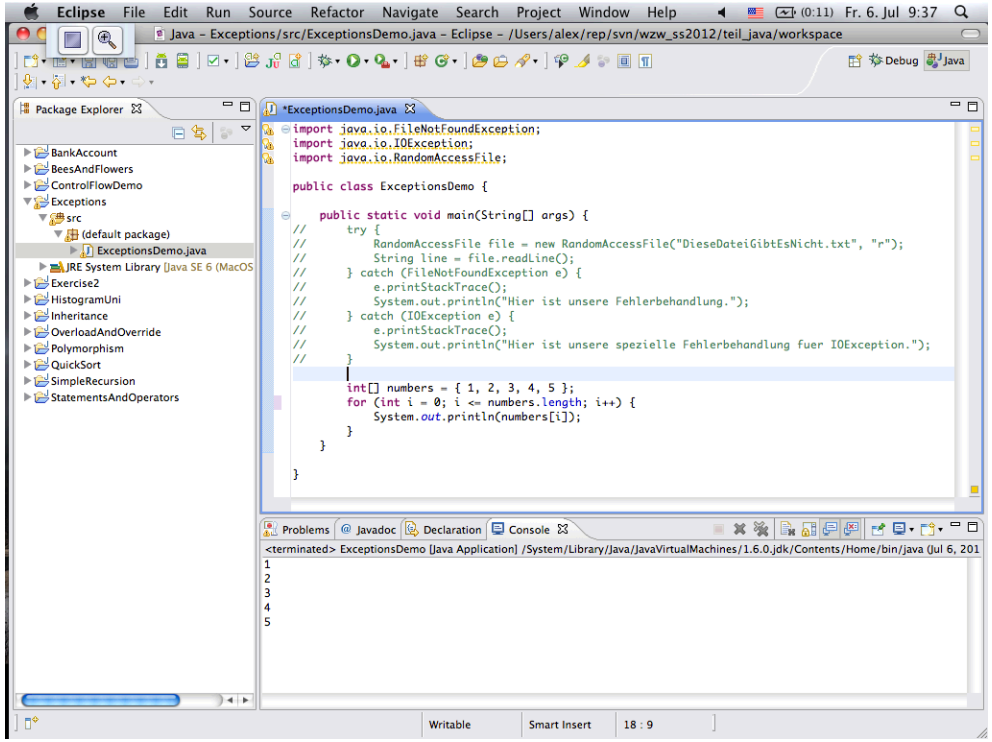

Eclipse File Edit Run Source Refactor Navigate Search Project Window Help
Java – Exceptions/src/ExceptionsDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
BankAccount
BeesAndFlowers
ControlFlowDemo
Exceptions
src
(default package)
ExceptionsDemo.java
JRE System Library [Java SE 6 (MacOS
Exercise2
HistogramUni
Inheritance
OverloadAndOverride
Polymorphism
QuickSort
SimpleRecursion
StatementsAndOperators
ExceptionsDemo.java
import java.io.FileNotFoundException;
import java.io.RandomAccessFile;
public class ExceptionsDemo {
public static void main(String[] args) {
try {
RandomAccessFile file = new RandomAccessFile("DieseDateiGibtEsNicht.txt", "r");
} catch (FileNotFoundException e) {
e.printStackTrace();
System.out.println("Hier ist unsere Fehlerbehandlung.");
}
}
}
Problems Javadoc Declaration Console
<terminated> ExceptionsDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 201
java.io.FileNotFoundException: DieseDateiGibtEsNicht.txt (No such file or directory)
at java.io.RandomAccessFile.open(Native Method)
at java.io.RandomAccessFile.<init>(RandomAccessFile.java:216)
at java.io.RandomAccessFile.<init>(RandomAccessFile.java:101)
at ExceptionsDemo.main(ExceptionsDemo.java:8)
Hier ist unsere Fehlerbehandlung.
The value of the local variable file is not used
Writable
Smart Insert
8 : 92

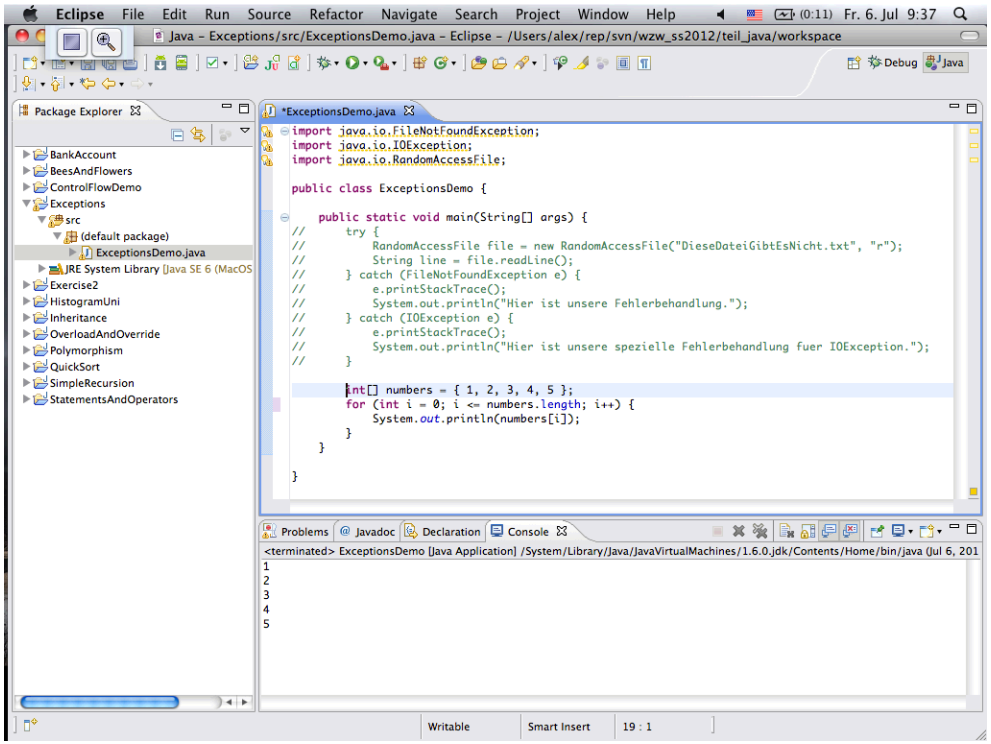

Eclipse File Edit Run Source Refactor Navigate Search Project Window Help
Java – Exceptions/src/ExceptionsDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
*ExceptionsDemo.java
import java.io.FileNotFoundException;
import java.io.RandomAccessFile;
public class ExceptionsDemo {
public static void main(String[] args) {
try {
} catch (FileNotFoundException e) {
e.printStackTrace();
System.out.println("Hier ist unsere Fehlerbehandlung.");
}
}
}
Problems Javadoc Declaration Console
<terminated> ExceptionsDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 201
java.io.FileNotFoundException: DieseDateiGibtEsNicht.txt (No such file or directory)
at java.io.RandomAccessFile.open(Native Method)
at java.io.RandomAccessFile.<init>(RandomAccessFile.java:216)
at java.io.RandomAccessFile.<init>(RandomAccessFile.java:101)
at ExceptionsDemo.main(ExceptionsDemo.java:8)
Hier ist unsere Fehlerbehandlung.
Writable
Smart Insert
8 : 92

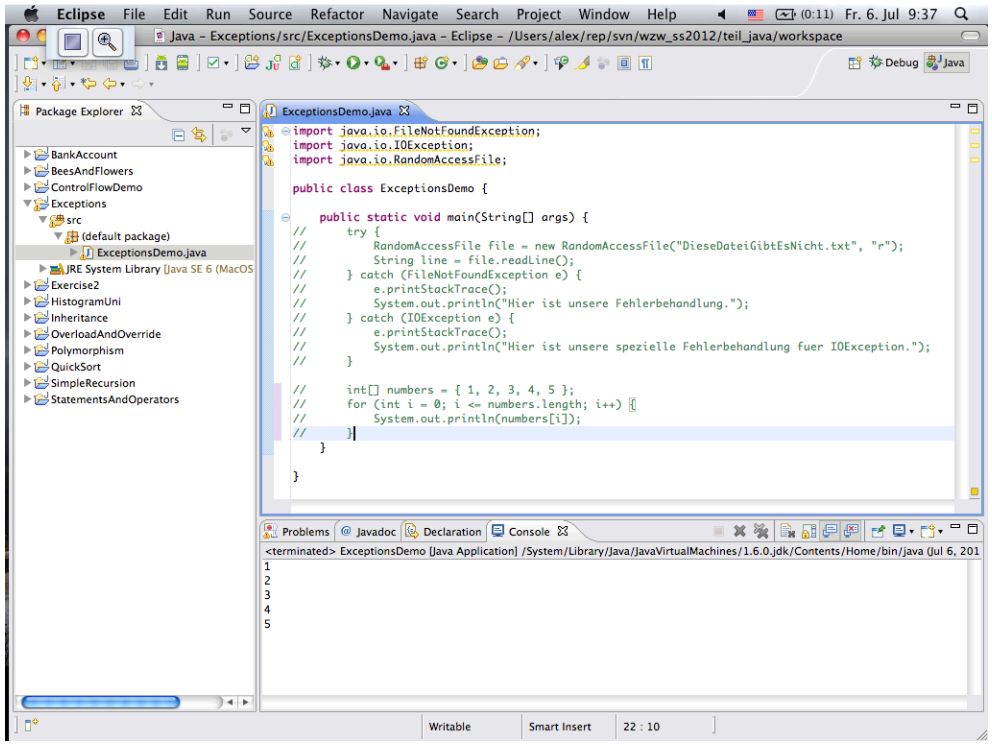

Eclipse File Edit Run Source Refactor Navigate Search Project Window Help
Java – Exceptions/src/ExceptionsDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
ExceptionsDemo.java
import java.io.FileNotFoundException;
import java.io.IOException;
import java.io.RandomAccessFile;
public class ExceptionsDemo {
public static void main(String[] args) {
try {
RandomAccessFile file = new RandomAccessFile("DieseDateiGibtEsNicht.txt", "r");
String line = file.readLine();
} catch (FileNotFoundException e) {
e.printStackTrace();
System.out.println("Hier ist unsere Fehlerbehandlung.");
} catch (IOException e) {
e.printStackTrace();
System.out.println("Hier ist unsere spezielle Fehlerbehandlung fuer IOException.");
}
}
}
Problems Javadoc Declaration Console
<terminated> ExceptionsDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 201
java.io.FileNotFoundException: DieseDateiGibtEsNicht.txt (No such file or directory)
at java.io.RandomAccessFile.open(Native Method)
at java.io.RandomAccessFile.<init>(RandomAccessFile.java:216)
at java.io.RandomAccessFile.<init>(RandomAccessFile.java:101)
at ExceptionsDemo.main(ExceptionsDemo.java:8)
Hier ist unsere Fehlerbehandlung.
Writable
Smart Insert
18 : 6

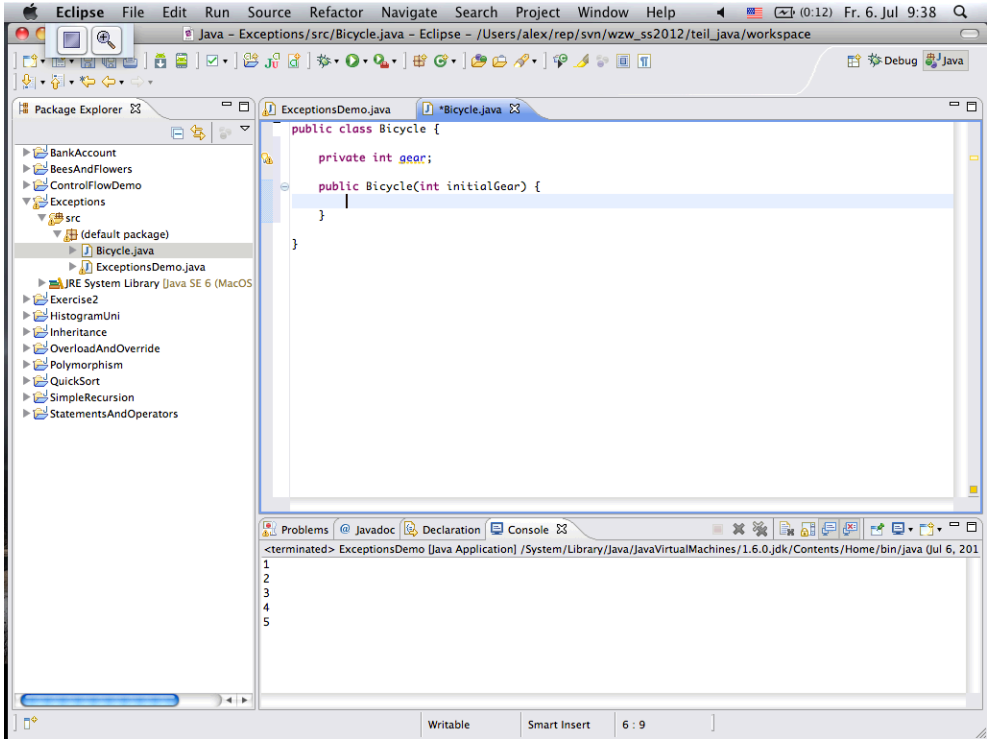

Eclipse File Edit Run Source Refactor Navigate Search Project Window Help
Java – Exceptions/src/ExceptionsDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
ExceptionsDemo.java
import java.io.FileNotFoundException;
import java.io.IOException;
import java.io.RandomAccessFile;
public class ExceptionsDemo {
public static void main(String[] args) {
try {
RandomAccessFile file = new RandomAccessFile("DieseDateiGibtEsNicht.txt", "r");
String line = file.readLine();
} catch (FileNotFoundException e) {
e.printStackTrace();
System.out.println("Hier ist unsere Fehlerbehandlung.");
} catch (IOException e) {
e.printStackTrace();
System.out.println("Hier ist unsere spezielle Fehlerbehandlung fuer IOException.");
}
}
}
Problems Javadoc Declaration Console
<terminated> ExceptionsDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 201
java.io.FileNotFoundException: DieseDateiGibtEsNicht.txt (No such file or directory)
at java.io.RandomAccessFile.open(Native Method)
at java.io.RandomAccessFile.<init>(RandomAccessFile.java:216)
at java.io.RandomAccessFile.<init>(RandomAccessFile.java:101)
at ExceptionsDemo.main(ExceptionsDemo.java:8)
Hier ist unsere Fehlerbehandlung.
Writable
Smart Insert
14 : 34

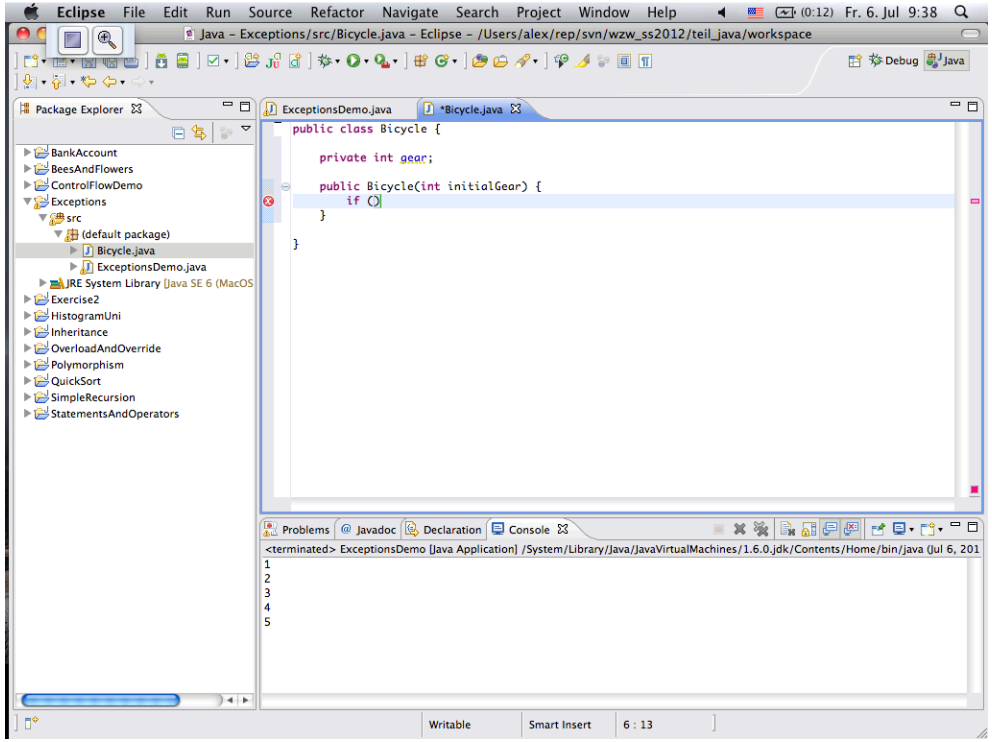

Eclipse File Edit Run Source Refactor Navigate Search Project Window Help
Fr. 6. Jul 9:35
Java – Exceptions/src/ExceptionsDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
BankAccount
BeesAndFlowers
ControlFlowDemo
Exceptions
src
(default package)
ExceptionsDemo.java
JRE System Library [Java SE 6 (MacOS
Exercise2
HistogramUni
Inheritance
OverloadAndOverride
Polymorphism
QuickSort
SimpleRecursion
StatementsAndOperators
*ExceptionsDemo.java
import java.io.FileNotFoundException;
import java.io.IOException;
import java.io.RandomAccessFile;
public class ExceptionsDemo {
public static void main(String[] args) {
// try {
// RandomAccessFile file = new RandomAccessFile("DieseDateiGibtEsNicht.txt", "r");
// String line = file.readLine();
// } catch (FileNotFoundException e) {
// e.printStackTrace();
// System.out.println("Hier ist unsere Fehlerbehandlung.");
// } catch (IOException e) {
// e.printStackTrace();
// System.out.println("Hier ist unsere spezielle Fehlerbehandlung fuer IOException.");
// }
int[] numbers = { 1, 2, 3, 4, 5 };
for (int i = 0; i <= numbers.length; i++) {
}
}
}
Problems Javadoc Declaration Console
<terminated> ExceptionsDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 201
java.io.FileNotFoundException: DieseDateiGibtEsNicht.txt (No such file or directory)
at java.io.RandomAccessFile.open(Native Method)
at java.io.RandomAccessFile.<init>(RandomAccessFile.java:216)
at java.io.RandomAccessFile.<init>(RandomAccessFile.java:101)
at ExceptionsDemo.main(ExceptionsDemo.java:8)
Hier ist unsere Fehlerbehandlung.
Writable
Smart Insert
21 : 13

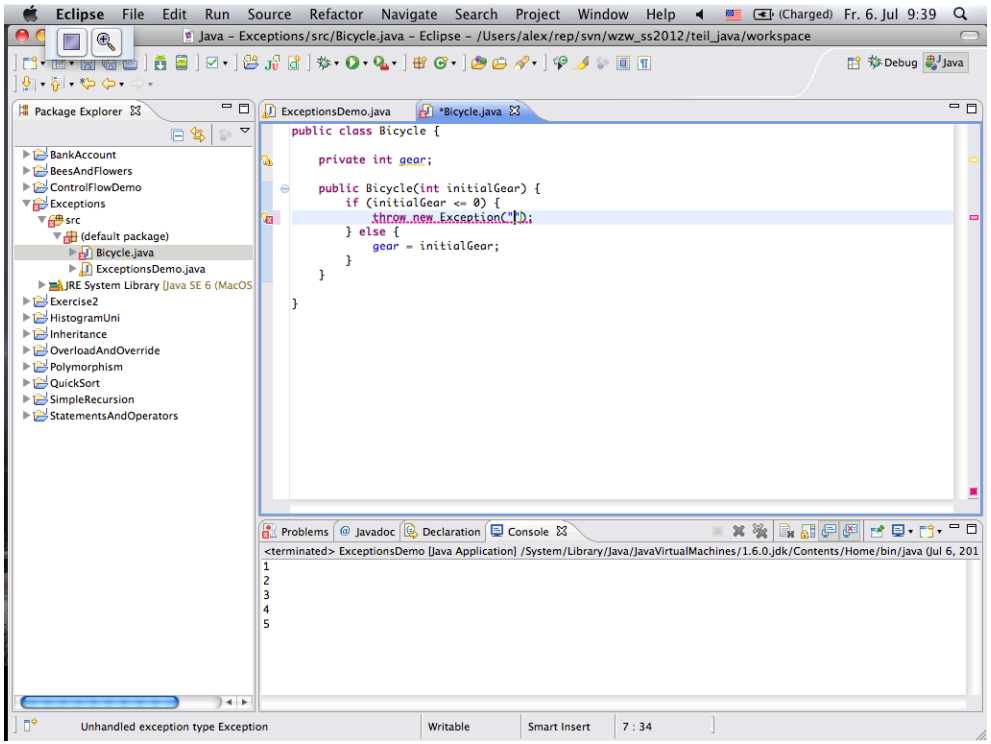

Eclipse File Edit Run Source Refactor Navigate Search Project Window Help
Fr. 6. Jul 9:37
Java – Exceptions/src/ExceptionsDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
BankAccount
BeesAndFlowers
ControlFlowDemo
Exceptions
src
(default package)
ExceptionsDemo.java
JRE System Library [Java SE 6 (MacOS
Exercise2
HistogramUni
Inheritance
OverloadAndOverride
Polymorphism
QuickSort
SimpleRecursion
StatementsAndOperators
*ExceptionsDemo.java
import java.io.FileNotFoundException;
import java.io.IOException;
import java.io.RandomAccessFile;
public class ExceptionsDemo {
public static void main(String[] args) {
// try {
// RandomAccessFile file = new RandomAccessFile("DieseDateiGibtEsNicht.txt", "r");
// String line = file.readLine();
// } catch (FileNotFoundException e) {
// e.printStackTrace();
// System.out.println("Hier ist unsere Fehlerbehandlung.");
// } catch (IOException e) {
// e.printStackTrace();
// System.out.println("Hier ist unsere spezielle Fehlerbehandlung fuer IOException.");
// }
int[] numbers = { 1, 2, 3, 4, 5 };
for (int i = 0; i <= numbers.length; i++) {
System.out.println(numbers[i]);
}
}
}
Problems Javadoc Declaration Console
<terminated> ExceptionsDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 201
1
2
3
4
5
Writable
Smart Insert
18 : 9

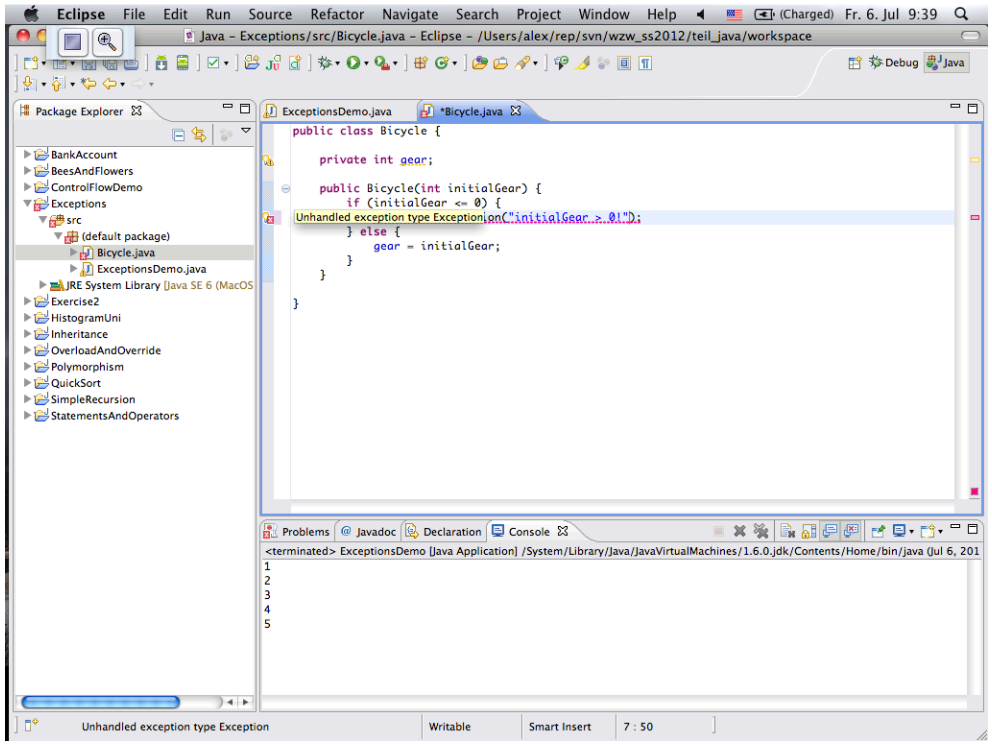

Eclipse File Edit Run Source Refactor Navigate Search Project Window Help
Fr. 6. Jul 9:37
Java – Exceptions/src/ExceptionsDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
BankAccount
BeesAndFlowers
ControlFlowDemo
Exceptions
src
(default package)
ExceptionsDemo.java
JRE System Library [Java SE 6 (MacOS
Exercise2
HistogramUni
Inheritance
OverloadAndOverride
Polymorphism
QuickSort
SimpleRecursion
StatementsAndOperators
*ExceptionsDemo.java
import java.io.FileNotFoundException;
import java.io.IOException;
import java.io.RandomAccessFile;
public class ExceptionsDemo {
public static void main(String[] args) {
// try {
// RandomAccessFile file = new RandomAccessFile("DieseDateiGibtEsNicht.txt", "r");
// String line = file.readLine();
// } catch (FileNotFoundException e) {
// e.printStackTrace();
// System.out.println("Hier ist unsere Fehlerbehandlung.");
// } catch (IOException e) {
// e.printStackTrace();
// System.out.println("Hier ist unsere spezielle Fehlerbehandlung fuer IOException.");
// }
int[] numbers = { 1, 2, 3, 4, 5 };
for (int i = 0; i <= numbers.length; i++) {
System.out.println(numbers[i]);
}
}
}
Problems Javadoc Declaration Console
<terminated> ExceptionsDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 201
1
2
3
4
5
Writable
Smart Insert
19 : 1

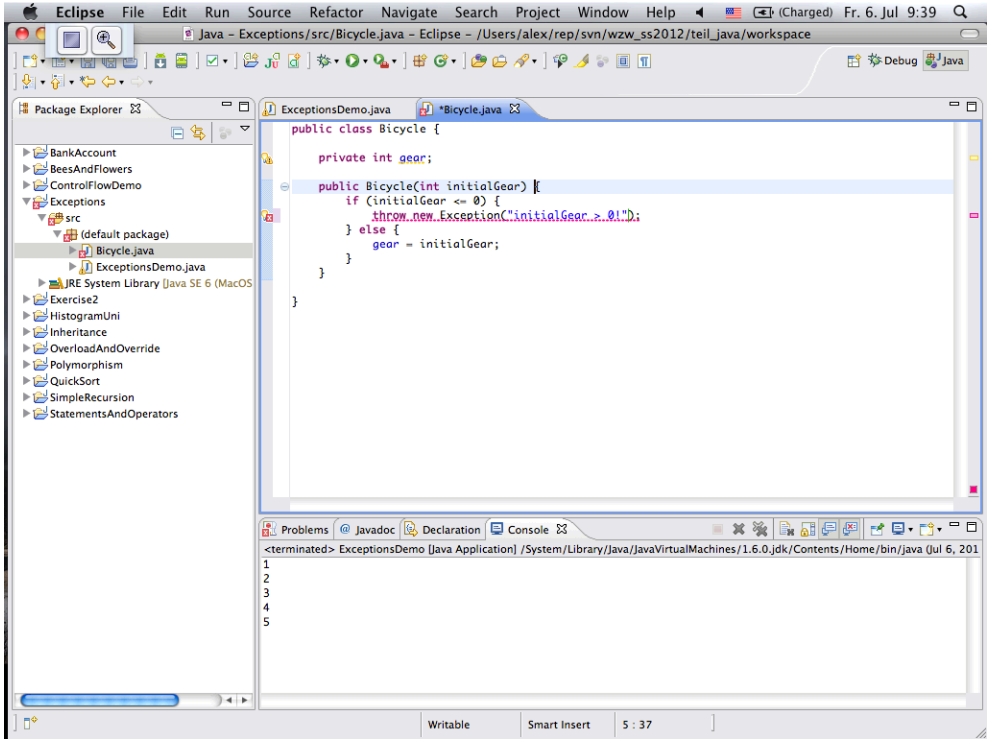

Eclipse File Edit Run Source Refactor Navigate Search Project Window Help
Fr. 6. Jul 9:37
Java – Exceptions/src/ExceptionsDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
BankAccount
BeesAndFlowers
ControlFlowDemo
Exceptions
src
(default package)
ExceptionsDemo.java
JRE System Library [Java SE 6 (MacOS
Exercise2
HistogramUni
Inheritance
OverloadAndOverride
Polymorphism
QuickSort
SimpleRecursion
StatementsAndOperators
ExceptionsDemo.java
import java.io.FileNotFoundException;
import java.io.IOException;
import java.io.RandomAccessFile;
public class ExceptionsDemo {
public static void main(String[] args) {
// try {
// RandomAccessFile file = new RandomAccessFile("DieseDateiGibtEsNicht.txt", "r");
// String line = file.readLine();
// } catch (FileNotFoundException e) {
// e.printStackTrace();
// System.out.println("Hier ist unsere Fehlerbehandlung.");
// } catch (IOException e) {
// e.printStackTrace();
// System.out.println("Hier ist unsere spezielle Fehlerbehandlung fuer IOException.");
// }
// int[] numbers = { 1, 2, 3, 4, 5 };
// for (int i = 0; i <= numbers.length; i++) {
// System.out.println(numbers[i]);
// }
}
}
Problems Javadoc Declaration Console
<terminated> ExceptionsDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 201
1
2
3
4
5
Writable
Smart Insert
22 : 10

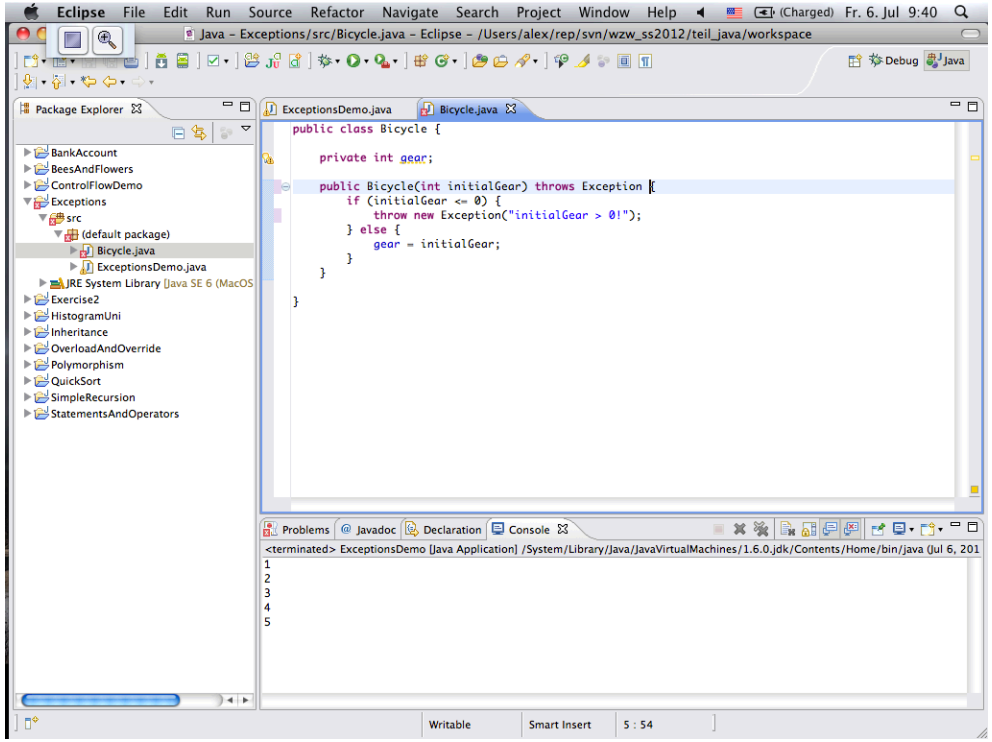

Java – Exceptions/src/Bicycle.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
ExceptionsDemo.java
*Bicycle.java
public class Bicycle {
private int gear;
public Bicycle(int initialGear) {
}
}
Problems
Javadoc
Declaration
Console
<terminated> ExceptionsDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 201
1
2
3
4
5
Writable
Smart Insert
6 : 9

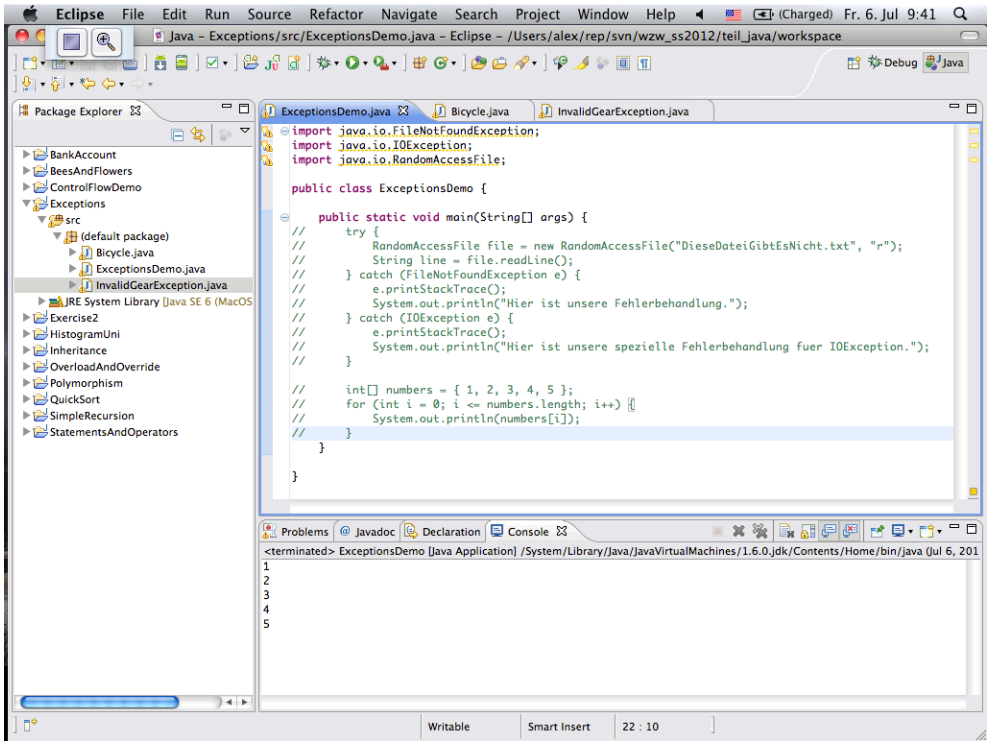

Java – Exceptions/src/Bicycle.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
ExceptionsDemo.java
*Bicycle.java
public class Bicycle {
private int gear;
public Bicycle(int initialGear) {
if ()
}
}
Problems
Javadoc
Declaration
Console
<terminated> ExceptionsDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 201
1
2
3
4
5
Writable
Smart Insert
6 : 13

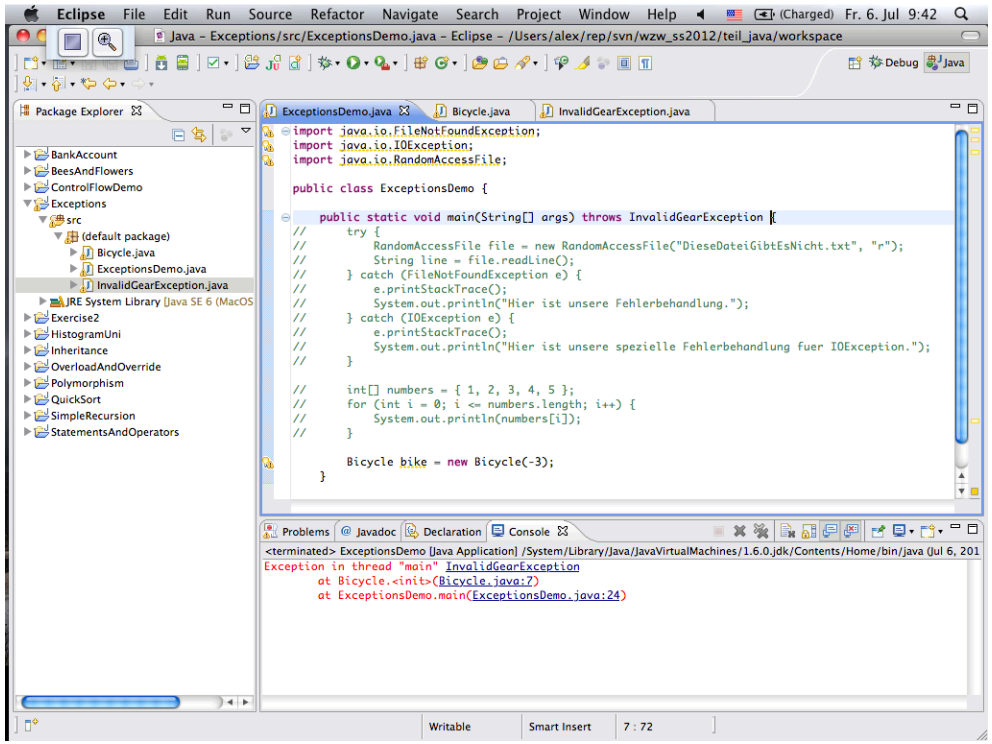

Java – Exceptions/src/Bicycle.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
ExceptionsDemo.java
*Bicycle.java
public class Bicycle {
private int gear;
public Bicycle(int initialGear) {
if (initialGear <= 0) {
throw new Exception("");
} else {
gear = initialGear;
}
}
}
Problems
Javadoc
Declaration
Console
<terminated> ExceptionsDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 201
1
2
3
4
5
Unhandled exception type Exception
Writable
Smart Insert
7 : 34


Java – Exceptions/src/Bicycle.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
ExceptionsDemo.java
*Bicycle.java
public class Bicycle {
private int gear;
public Bicycle(int initialGear) {
if (initialGear <= 0) {
Unhandled exception type Exception
throw new Exception("initialGear > 0!");
} else {
gear = initialGear;
}
}
}
Problems
Javadoc
Declaration
Console
<terminated> ExceptionsDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 201
1
2
3
4
5
Unhandled exception type Exception
Writable
Smart Insert
7 : 50


Eclipse File Edit Run Source Refactor Navigate Search Project Window Help (Charged) Fr. 6. Jul 9:39
Java – Exceptions/src/Bicycle.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
BankAccount
BeesAndFlowers
ControlFlowDemo
Exceptions
src
(default package)
Bicycle.java
ExceptionsDemo.java
JRE System Library [Java SE 6 (MacOS
Exercise2
HistogramUni
Inheritance
OverloadAndOverride
Polymorphism
QuickSort
SimpleRecursion
StatementsAndOperators
ExceptionsDemo.java
*Bicycle.java
public class Bicycle {
private int gear;
public Bicycle(int initialGear) {
if (initialGear <= 0) {
throw new Exception("initialGear > 0!");
} else {
gear = initialGear;
}
}
}
Problems Javadoc Declaration Console
<terminated> ExceptionsDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 201
1
2
3
4
5
Writable
Smart Insert
5 : 37


Eclipse File Edit Run Source Refactor Navigate Search Project Window Help (Charged) Fr. 6. Jul 9:40
Java – Exceptions/src/Bicycle.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
BankAccount
BeesAndFlowers
ControlFlowDemo
Exceptions
src
(default package)
Bicycle.java
ExceptionsDemo.java
JRE System Library [Java SE 6 (MacOS
Exercise2
HistogramUni
Inheritance
OverloadAndOverride
Polymorphism
QuickSort
SimpleRecursion
StatementsAndOperators
ExceptionsDemo.java
Bicycle.java
public class Bicycle {
private int gear;
public Bicycle(int initialGear) throws Exception {
if (initialGear <= 0) {
throw new Exception("initialGear > 0!");
} else {
gear = initialGear;
}
}
}
Problems Javadoc Declaration Console
<terminated> ExceptionsDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 201
1
2
3
4
5
Writable
Smart Insert
5 : 54


Eclipse File Edit Run Source Refactor Navigate Search Project Window Help (Charged) Fr. 6. Jul 9:41
Java – Exceptions/src/ExceptionsDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
BankAccount
BeesAndFlowers
ControlFlowDemo
Exceptions
src
(default package)
Bicycle.java
ExceptionsDemo.java
InvalidGearException.java
JRE System Library [Java SE 6 (MacOS
Exercise2
HistogramUni
Inheritance
OverloadAndOverride
Polymorphism
QuickSort
SimpleRecursion
StatementsAndOperators
ExceptionsDemo.java
Bicycle.java
InvalidGearException.java
import java.io.FileNotFoundException;
import java.io.IOException;
import java.io.RandomAccessFile;
public class ExceptionsDemo {
public static void main(String[] args) {
// try {
// RandomAccessFile file = new RandomAccessFile("DieseDateiGibtEsNicht.txt", "r");
// String line = file.readLine();
// } catch (FileNotFoundException e) {
// e.printStackTrace();
// System.out.println("Hier ist unsere Fehlerbehandlung.");
// } catch (IOException e) {
// e.printStackTrace();
// System.out.println("Hier ist unsere spezielle Fehlerbehandlung fuer IOException.");
// }
// int[] numbers = { 1, 2, 3, 4, 5 };
// for (int i = 0; i <= numbers.length; i++) {
// System.out.println(numbers[i]);
// }
}
}
Problems Javadoc Declaration Console
<terminated> ExceptionsDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 201
1
2
3
4
5
Writable
Smart Insert
22 : 10


Eclipse File Edit Run Source Refactor Navigate Search Project Window Help (Charged) Fr. 6. Jul 9:42
Java – Exceptions/src/ExceptionsDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
BankAccount
BeesAndFlowers
ControlFlowDemo
Exceptions
src
(default package)
Bicycle.java
ExceptionsDemo.java
InvalidGearException.java
JRE System Library [Java SE 6 (MacOS
Exercise2
HistogramUni
Inheritance
OverloadAndOverride
Polymorphism
QuickSort
SimpleRecursion
StatementsAndOperators
ExceptionsDemo.java
Bicycle.java
InvalidGearException.java
import java.io.FileNotFoundException;
import java.io.IOException;
import java.io.RandomAccessFile;
public class ExceptionsDemo {
public static void main(String[] args) throws InvalidGearException {
// try {
// RandomAccessFile file = new RandomAccessFile("DieseDateiGibtEsNicht.txt", "r");
// String line = file.readLine();
// } catch (FileNotFoundException e) {
// e.printStackTrace();
// System.out.println("Hier ist unsere Fehlerbehandlung.");
// } catch (IOException e) {
// e.printStackTrace();
// System.out.println("Hier ist unsere spezielle Fehlerbehandlung fuer IOException.");
// }
// int[] numbers = { 1, 2, 3, 4, 5 };
// for (int i = 0; i <= numbers.length; i++) {
// System.out.println(numbers[i]);
// }
Bicycle bike = new Bicycle(-3);
}
Problems Javadoc Declaration Console
<terminated> ExceptionsDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 201
Exception in thread "main" InvalidGearException
at Bicycle.<init>(Bicycle.java:7)
at ExceptionsDemo.main(ExceptionsDemo.java:24)
Writable
Smart Insert
7 : 72

6 Coding & Naming Conventions

Deepening readings:

http://www.oracle.com/technetwork/java/codeconv-138413.html
http://geosoft.no/development/javastyle.html
http://docs.oracle.com/javase/1.5.0/docs/guide/javadoc/index.html

6 Coding & Naming Conventions

Deepening readings:

http://www.oracle.com/technetwork/java/codeconv-138413.html
http://geosoft.no/development/javastyle.html
http://docs.oracle.com/javase/1.5.0/docs/guide/javadoc/index.html

6 Coding & Naming Conventions

- Indentation (4 spaces) and line length (80 characters):

```
public void initializeMatrix(int[][] someMatrix){
 for(int i=0; i<someMatrix.length; i++){
for(int j=0; j<someMatrix.length; j++){
if(i%2==0) {
if(i==2*j) {
someMatrix[i][j]=7;
} else { someMatrix[i][j] = 3*i+72*j + (int)Math.floor(i/(j+1
}
}
System.out.println("This is the end!");
}
```

6 Coding & Naming Conventions

- Indentation (4 spaces) and line length (80 characters):

```
public void initializeMatrix(int[][] someMatrix) {
    for (int i = 0; i < someMatrix.length; i++) {
        for (int j = 0; j < someMatrix.length; j++) {
            if (i % 2 == 0) {
                if (i == 2 * j) {
                    someMatrix[i][j] = 7;
                } else {
                    someMatrix[i][j] = 3 * i + 72 * j +
                          (int)Math.floor(i / (j + 1));
                }
            }
        }
    }
    System.out.println("This is the end!");
}
```

6 Coding & Naming Conventions

- Indentation (4 spaces) and line length (80 characters):

```
public void initializeMatrix(int[][] someMatrix) {
    for (int i = 0; i < someMatrix.length; i++) {
        for (int j = 0; j < someMatrix.length; j++) {
            if (i % 2 == 0) {
                if (i == 2 * j) {
                    someMatrix[i][j] = 7;
                } else {
                    someMatrix[i][j] = 3 * i + 72 * j +
                          (int)Math.floor(i / (j + 1));
                }
            }
        }
    }
    System.out.println("This is the end!");
}
```

Tip: Use IDE/editor with syntax highlighting!

6 Coding & Naming Conventions

- Names of variables and methods
  - ***Short*** and ***meaningingful***
  - *Indicate* to the casual observer the *intent of its use*
  - *Mixed case* with the *first letter lowercase*, with the *first letter of each internal word capitalized*
  - *Booleans* with prefix "`is`"
  - Examples:

```
int rowIndex
int columnIndex
boolean isValid
static boolean copyFile(URL from, URL to)
```

- Names of constants
  - *Uppercase* with *words separated by underscores*

```
static final int MIN_ALLOWED_VALUE = 42;
```

6 Coding & Naming Conventions

- Names of classes and interfaces
  - ***Short*** and ***meaningingful***
  - *Nouns* in *mixed case* with the *first letter lowercase*, with the *first letter of each internal word capitalized*
  - Good style: Use only [a..z] and [A..Z]
  - Examples:

```
class Bicycle
class ImageSprite
interface RasterDelegate
interface Comparable
```

6 Coding & Naming Conventions

- Use English for everything, e.g. names, comments etc.
- Adhere STRICTLY to *common* coding styles
  ➔ Do not use exotic "own" coding styles!
- Use default style of DIE
  (Integrated Development Environment, e.g. Eclipse)
- Use comments REGULARLY and THOROUGHLY
- Use Javadoc (not only for larger projects)

7 Using the Java Class Library

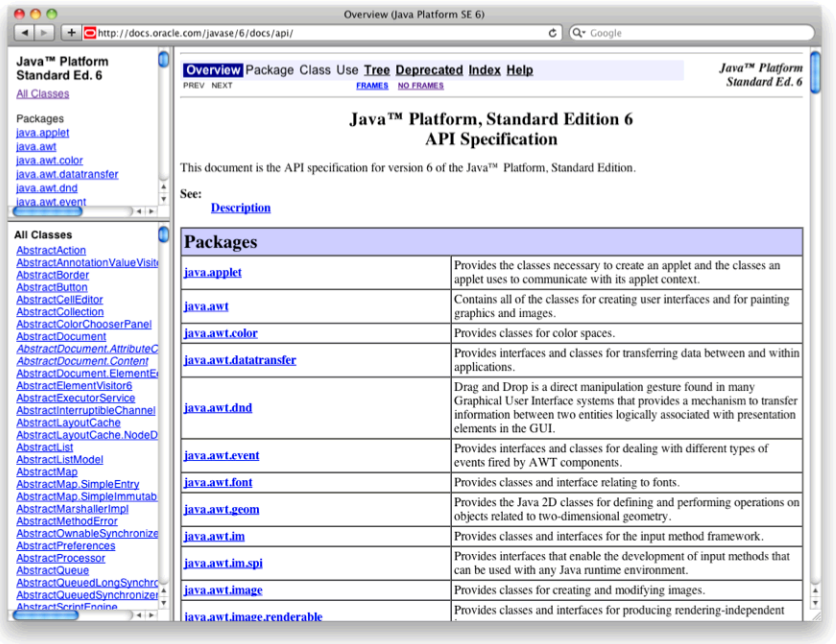
Deepening readings (optional):

http://docs.oracle.com/javase/tutorial/java/data/index.html
http://docs.oracle.com/javase/tutorial/java/generics/index.html

Main reference:

http://docs.oracle.com/javase/6/docs/api/

- So far:
  - Classes, objects, methods, fields, variables, control flow statements etc.
  - These are only *basic tools*
- Advanced problems require a multitude of specialized types (classes etc.)
- Write them all by yourself?
  - **No!** Java's strength: Types for almost EVERYTHING exist
- "Class Library"
  → Documentation at http://java.sun.com/javase/6/docs/api/
- Similar class libraries exist for .NET, C++, and other languages/platforms



Packages and Imports

- Java's classes and types are organized in hierarchical packages

```
java.lang.String
java.net.URLConnection
java.util.Collection
javax.xml.parsers.SAXParser
org.w3c.dom.events.DocumentEvent
```

- All types from package `java.lang` are imported automatically
- Other types need to be imported

```
import java.net.URLConnection;
import java.util.Collection;
import some.other.package.*;    // * means all types
```

Packages and Imports

- Java's classes and types are organized in hierarchical packages

```
java.lang.String
java.net.URLConnection
java.util.Collection
javax.xml.parsers.SAXParser
org.w3c.dom.events.DocumentEvent
```

- All types from package `java.lang` are imported automatically
- Other types need to be imported

```
import java.net.URLConnection;
import java.util.Collection;
import some.other.package.*;    // * means all types
```


Generics

- Some types may be parameterized with other types
- Typical examples are classes that implement data structures
- Advantages:
  - Type checks at compile time
  - Programmers can implement algorithms generically
- Examples:

```
Vector nonGenericVector = new Vector();
nonGenericVector.add( 1234 );
nonGenericVector.add( "Hello world" );
Object typeUnknown = nonGenericVector.get(0);

Vector<Bicycle> bicycles = new Vector<Bicycle>();
bicycles.add( new Bicycle() );
bicycles.add( 123 ); // Compile time error!
Bicycle typeKnown = bicycles.get(0);
```


Wrapper-Classes

- Parameters restricted to *reference types* (classes, interfaces)
- For each *primitive type*, a corresponding wrapper class exists
- Examples:

```
java.long.Short
java.lang.Integer
java.lang.Long
java.lang.Float
java.lang.Double
```

etc.

- Primitive types are automatically boxed and unboxed when necessary

```
Integer i = 723;
int j = i;
```

8 Solving a Problem

Deepening readings (optional):

The Internet

Main reference:

http://docs.oracle.com/javase/6/docs/api/

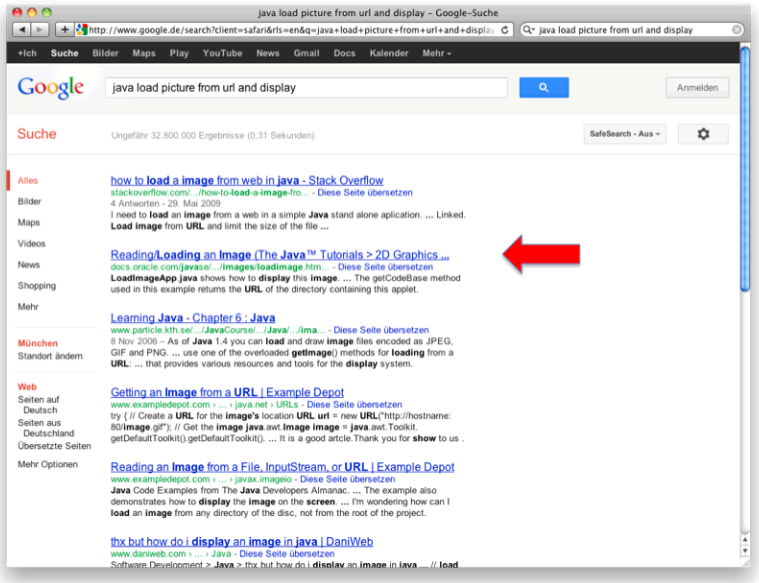
Example Task

- Example task:
  Load an image from the internet and display that image

- How would **you** start?
  - Google is your friend
  - So is the Java Tutorial
  - Look up corresponding classes, fields and methods in API documentation
  - Write program
  - Test program
  - Repeat all of the above as long as necessary
  - DONE ☺

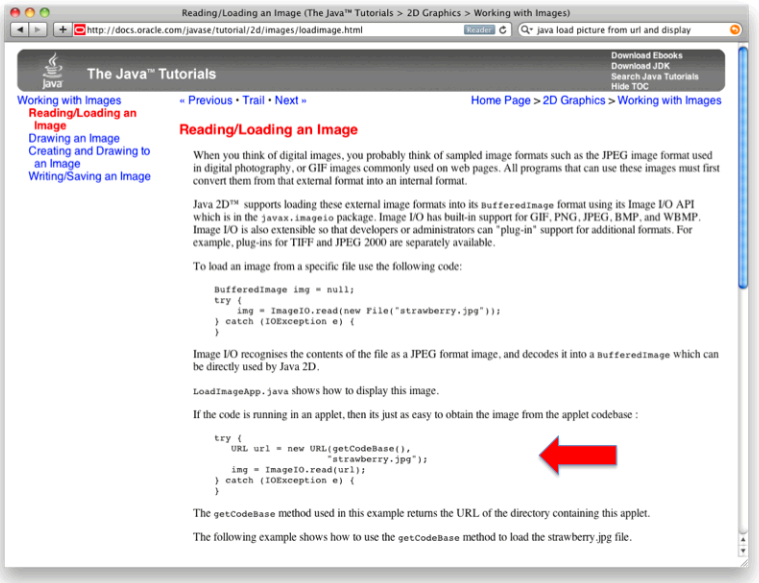
8 Solving a Problem

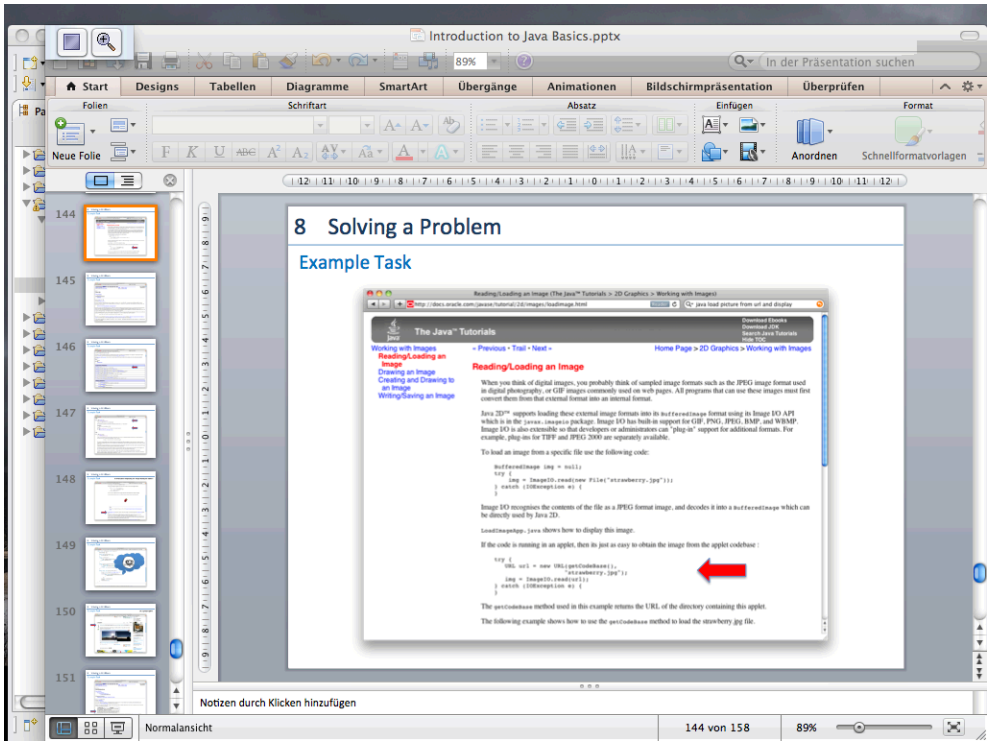
Example Task



8 Solving a Problem

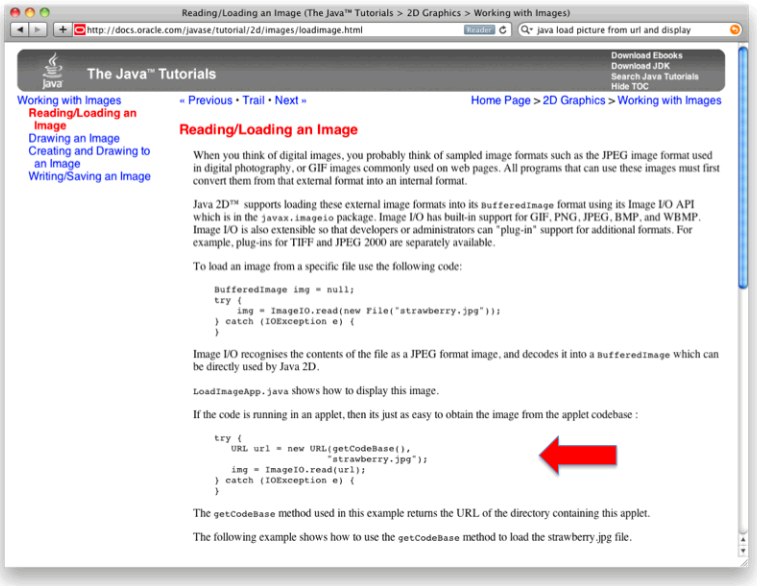
Example Task





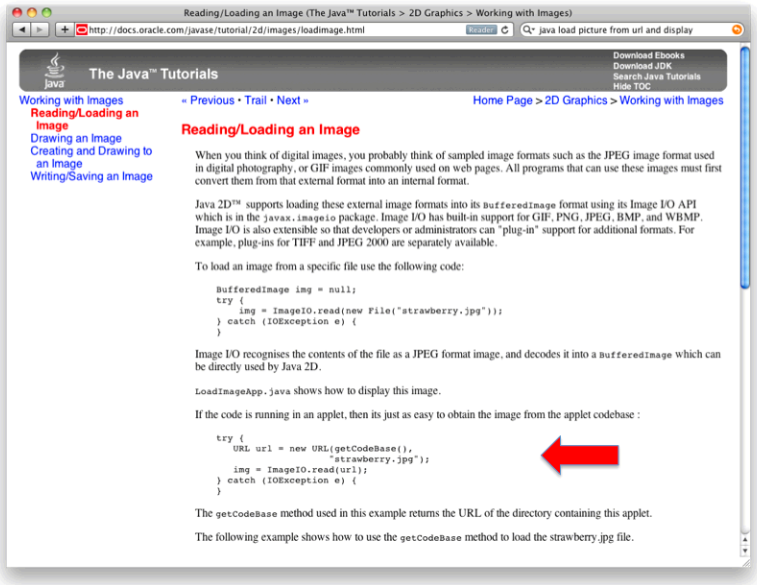
8 Solving a Problem

Example Task



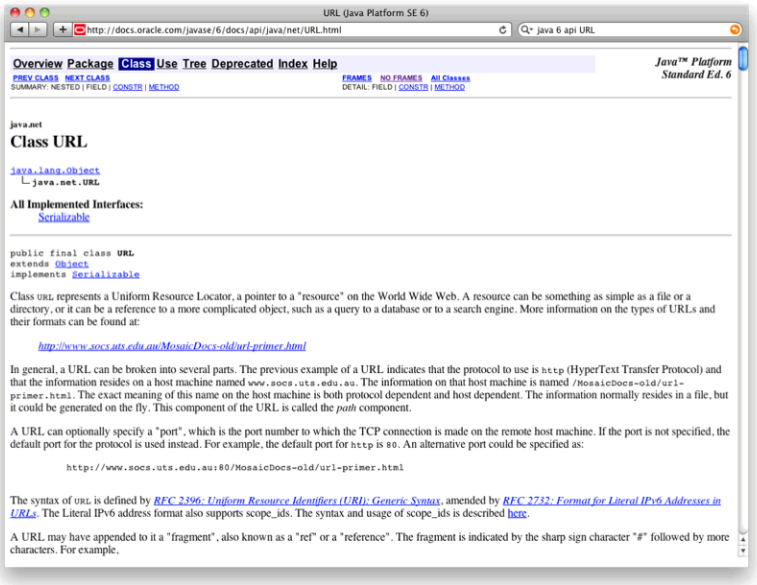
8 Solving a Problem

Example Task



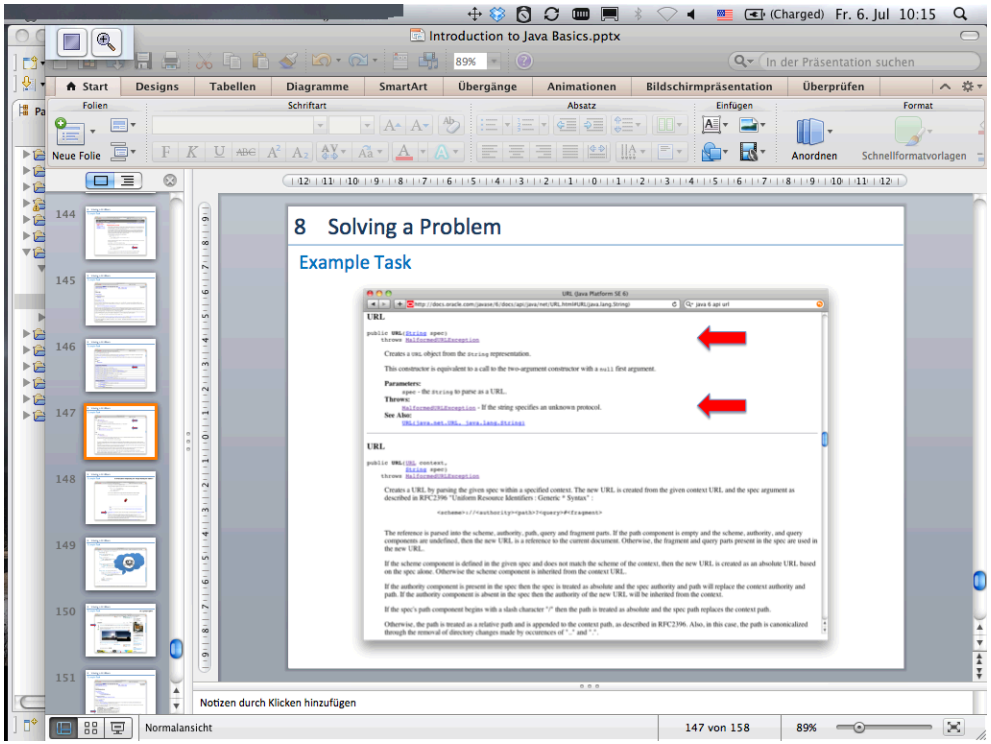
8 Solving a Problem

Example Task



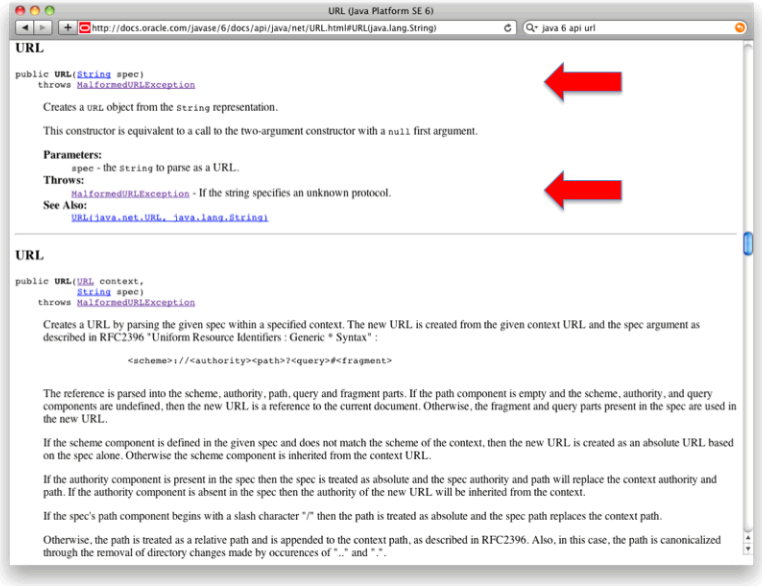
8 Solving a Problem

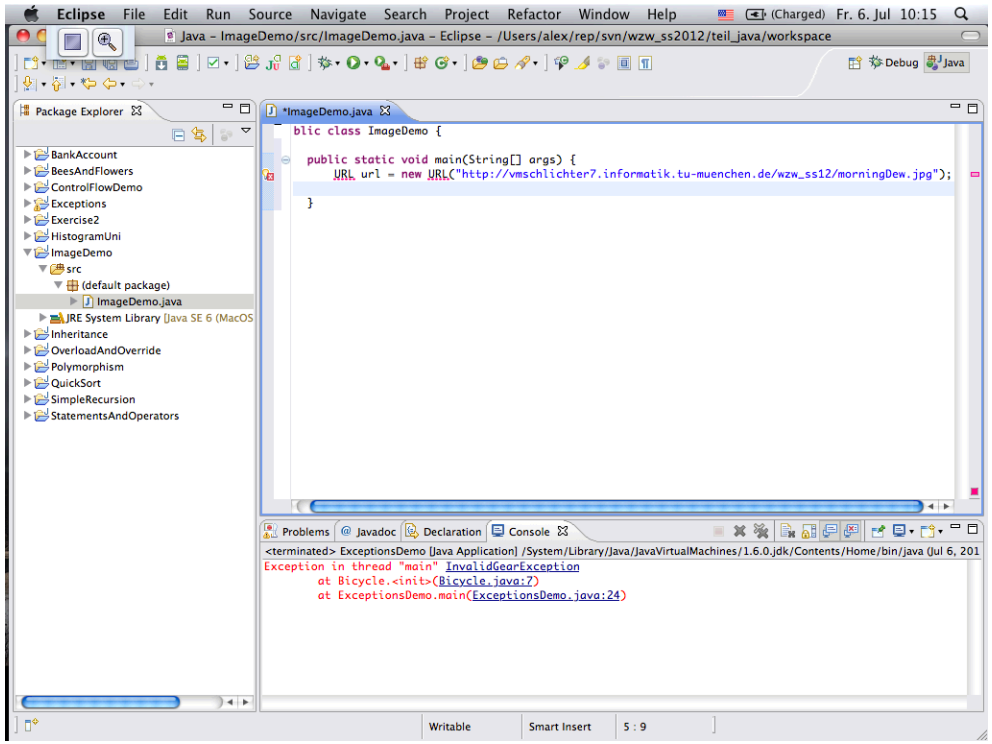
Example Task

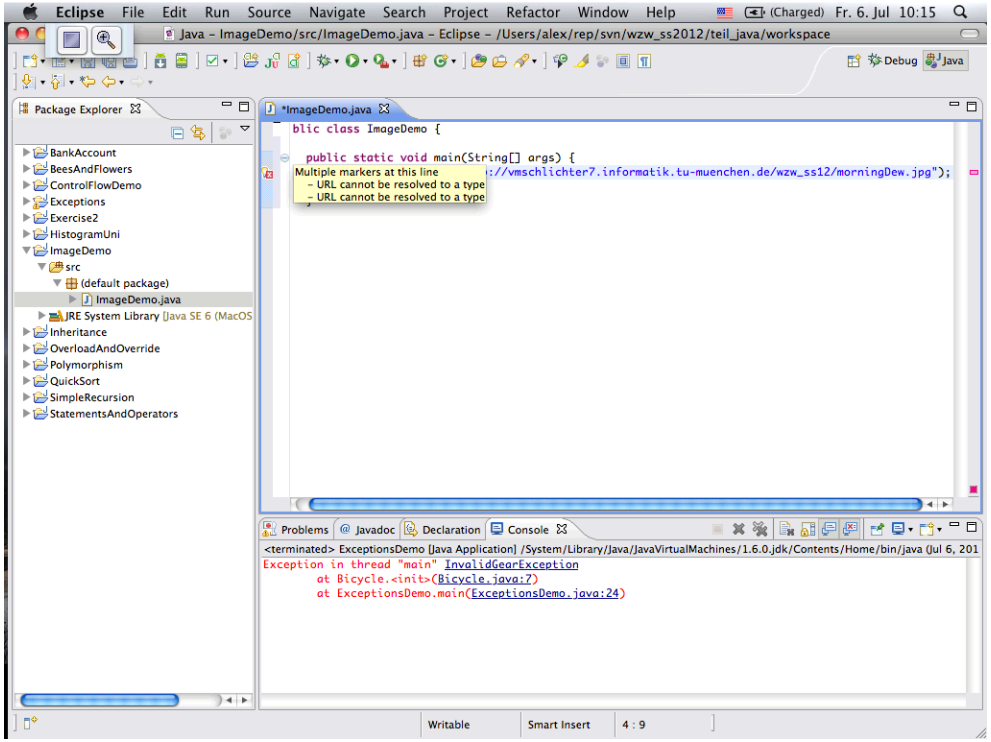


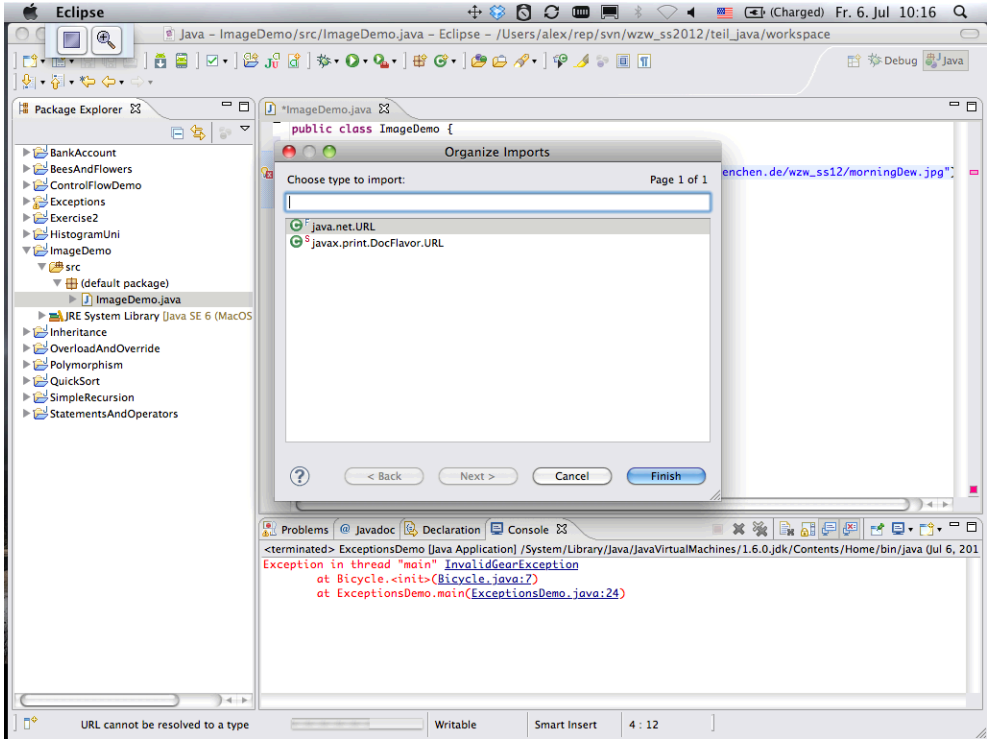
8 Solving a Problem

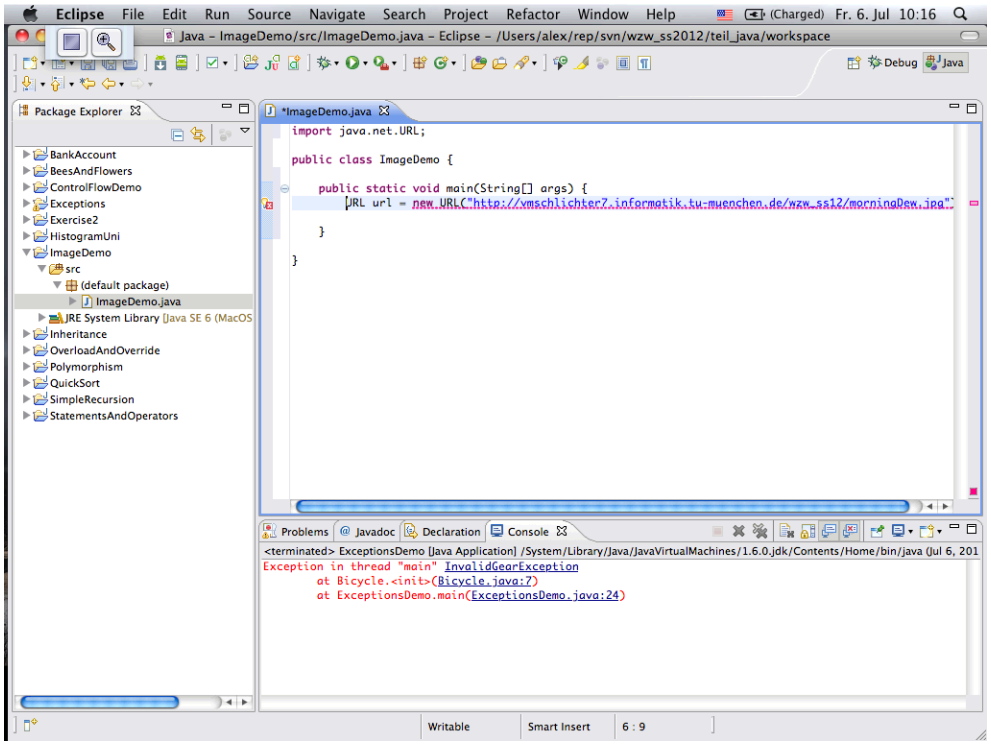
Example Task

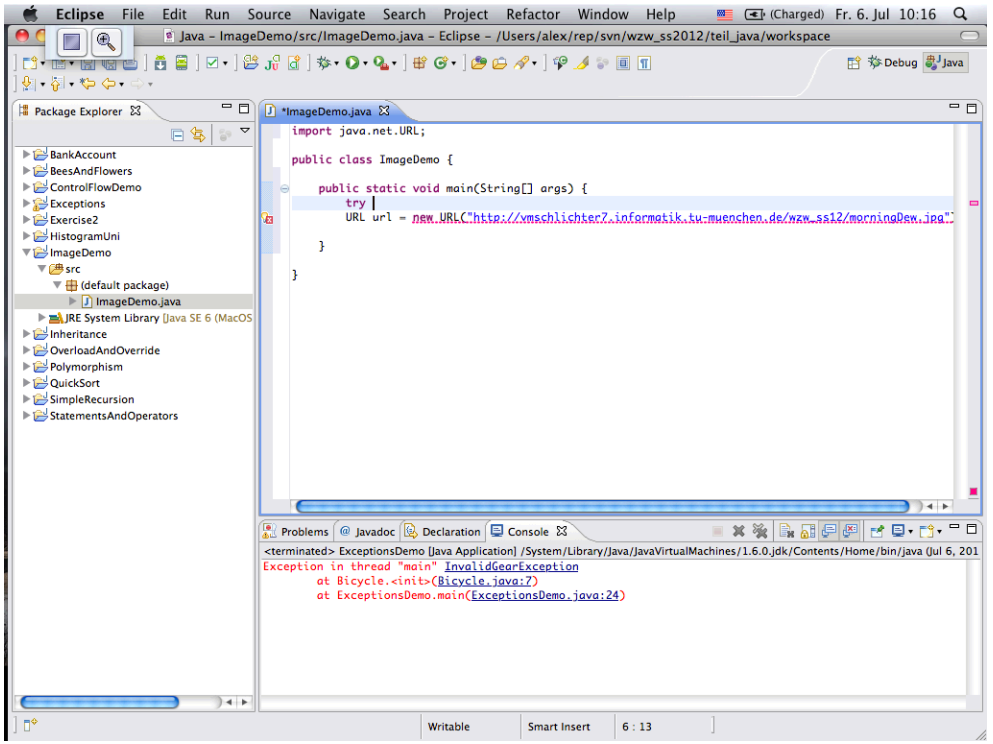


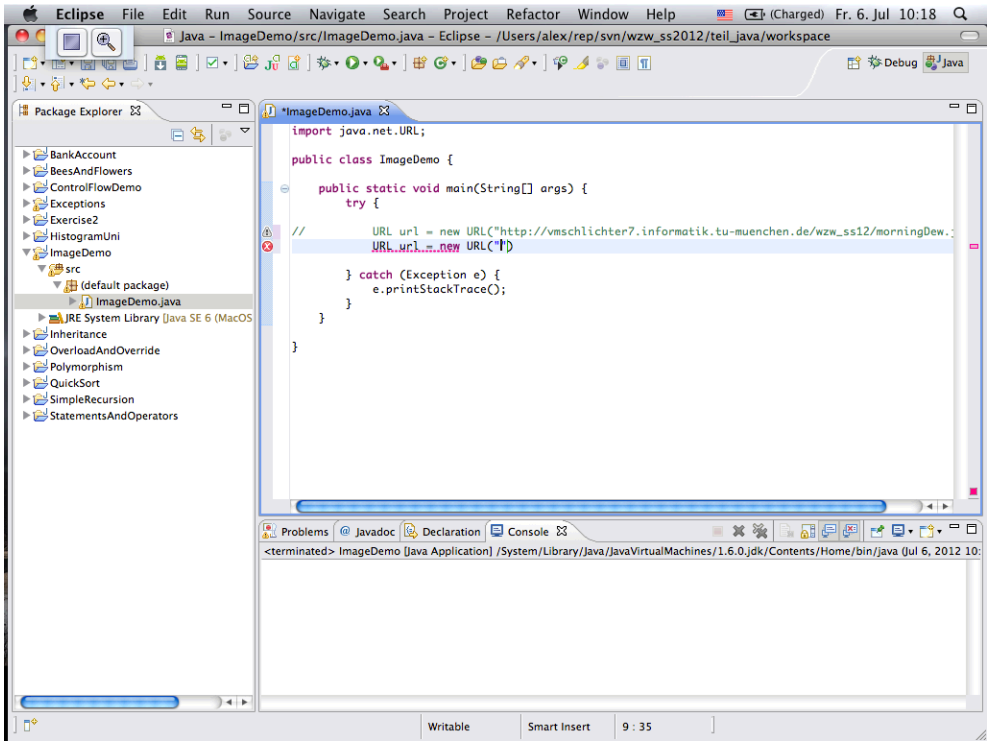


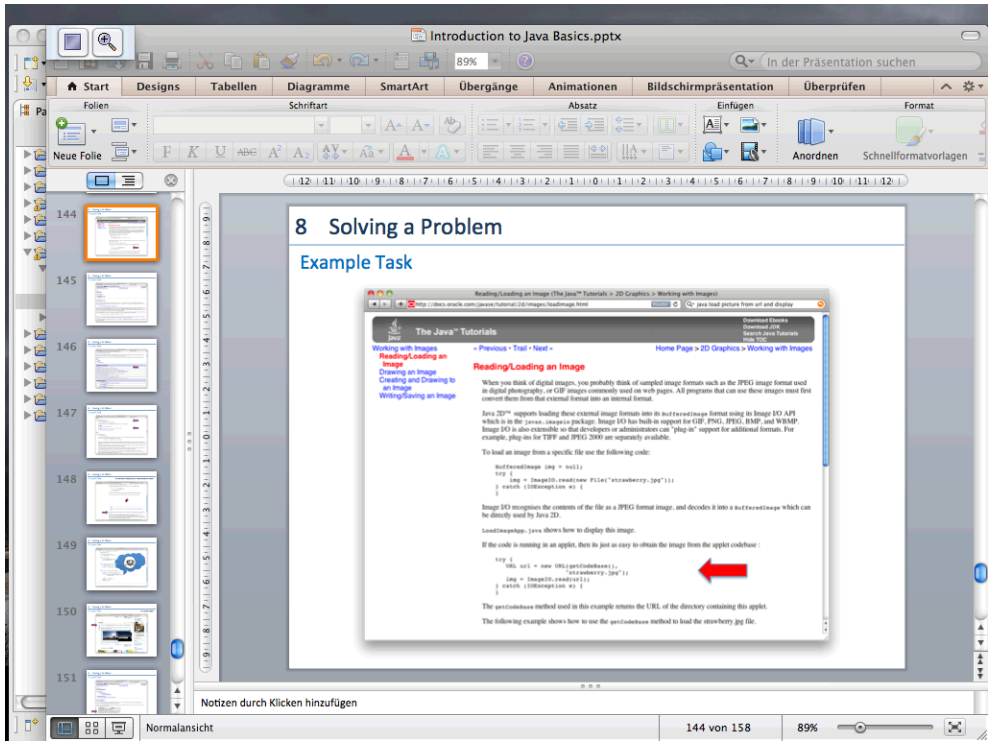

Eclipse File Edit Run Source Navigate Search Project Refactor Window Help
Java – ImageDemo/src/ImageDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
BankAccount
BeesAndFlowers
ControlFlowDemo
Exceptions
Exercise2
HistogramUni
ImageDemo
src
(default package)
ImageDemo.java
JRE System Library [Java SE 6 (MacOS
Inheritance
OverloadAndOverride
Polymorphism
QuickSort
SimpleRecursion
StatementsAndOperators
*ImageDemo.java
blic class ImageDemo {
public static void main(String[] args) {
Multiple markers at this line
- URL cannot be resolved to a type
- URL cannot be resolved to a type
Problems Javadoc Declaration Console
<terminated> ExceptionsDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 201
Exception in thread "main" InvalidGearException
at Bicycle.<init>(Bicycle.java:7)
at ExceptionsDemo.main(ExceptionsDemo.java:24)
Writable
Smart Insert
4 : 9

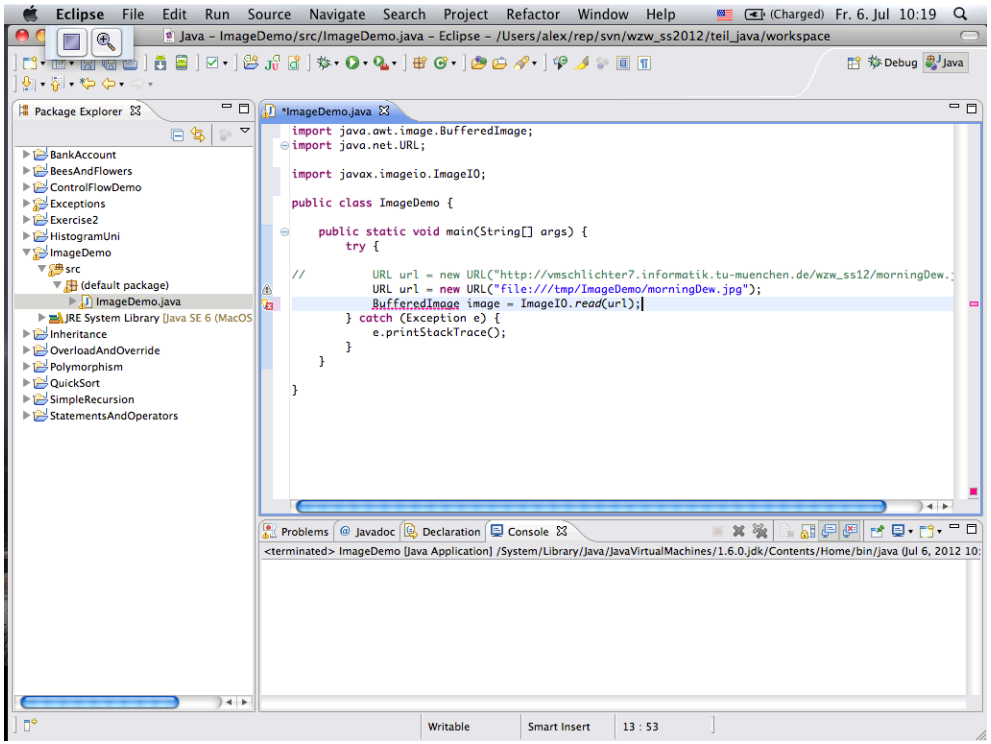

Eclipse
Java – ImageDemo/src/ImageDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Organize Imports
Choose type to import:
Page 1 of 1
java.net.URL
javax.print.DocFlavor.URL
< Back
Next >
Cancel
Finish
URL cannot be resolved to a type
Writable
Smart Insert
4 : 12

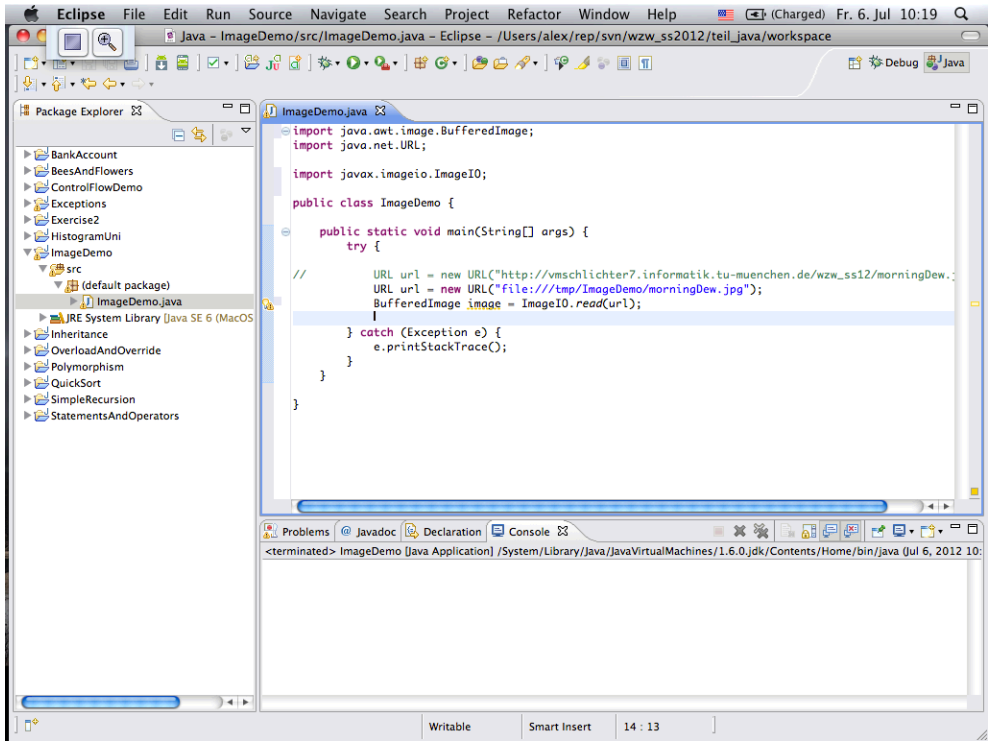

Eclipse File Edit Run Source Navigate Search Project Refactor Window Help
Java – ImageDemo/src/ImageDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
import java.net.URL;
public class ImageDemo {
public static void main(String[] args) {
URL url = new URL("http://vmschlichter7.informatik.tu-muenchen.de/wzw_ss12/morningDew.jpg");
}
}
Problems Javadoc Declaration Console
<terminated> ExceptionsDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 201
Exception in thread "main" InvalidGearException
at Bicycle.<init>(Bicycle.java:7)
at ExceptionsDemo.main(ExceptionsDemo.java:24)
Writable
Smart Insert
6 : 9

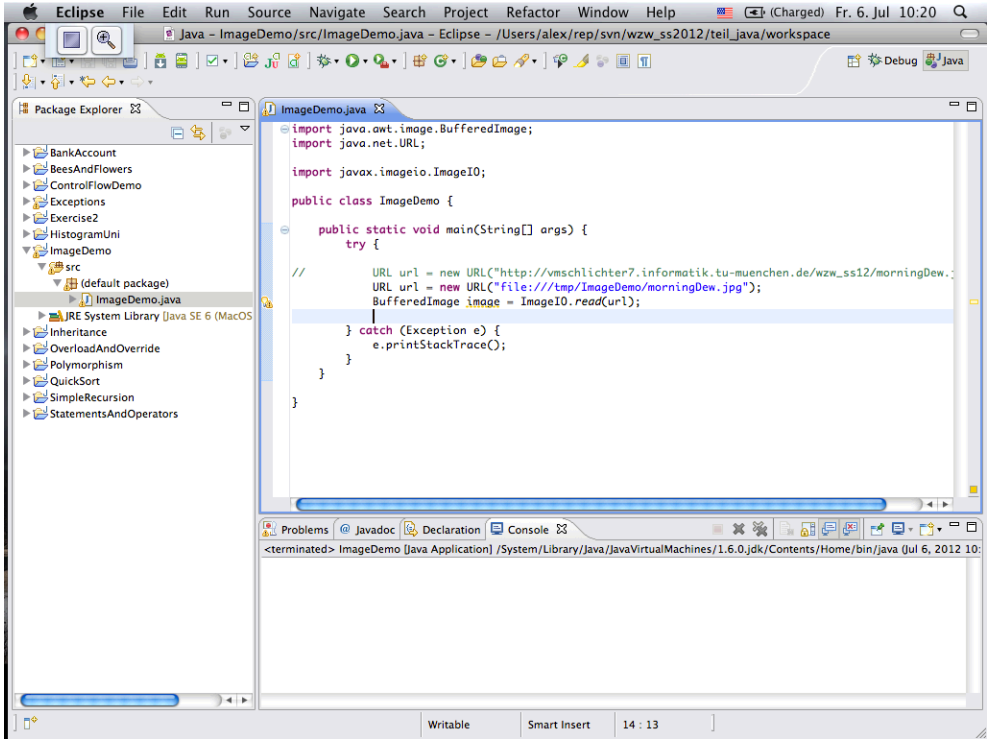

Eclipse File Edit Run Source Navigate Search Project Refactor Window Help
Java – ImageDemo/src/ImageDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
import java.net.URL;
public class ImageDemo {
public static void main(String[] args) {
try
URL url = new URL("http://vmschlichter7.informatik.tu-muenchen.de/wzw_ss12/morningDew.jpg");
}
}
Problems Javadoc Declaration Console
<terminated> ExceptionsDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 201
Exception in thread "main" InvalidGearException
at Bicycle.<init>(Bicycle.java:7)
at ExceptionsDemo.main(ExceptionsDemo.java:24)
Writable
Smart Insert
6 : 13

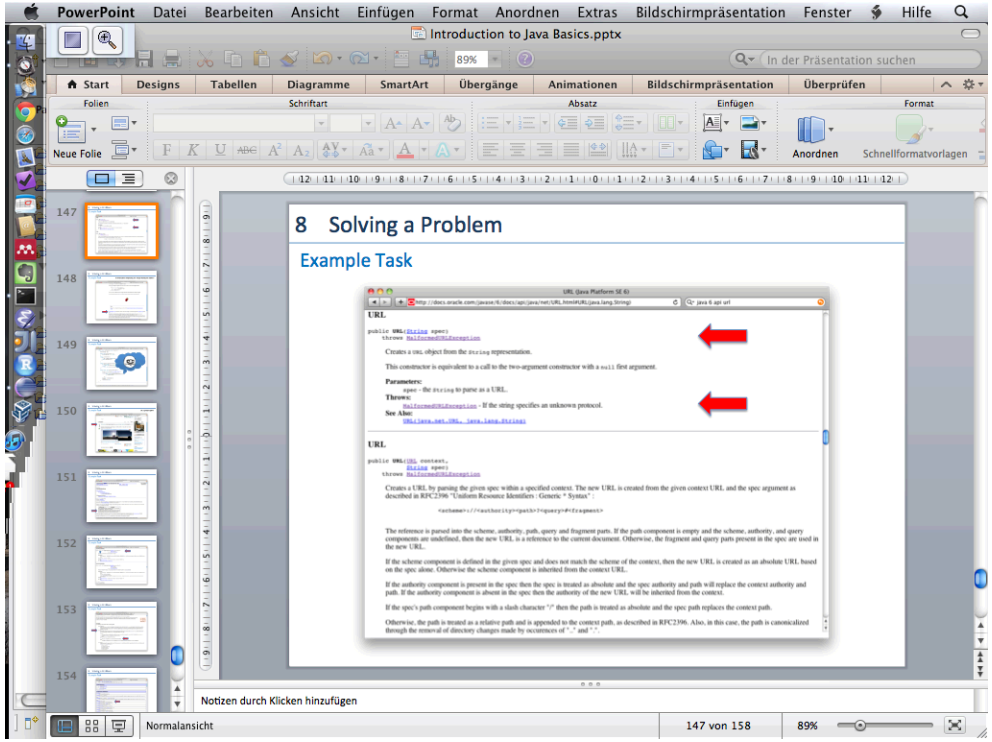

Eclipse File Edit Run Source Navigate Search Project Refactor Window Help
Java – ImageDemo/src/ImageDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
BankAccount
BeesAndFlowers
ControlFlowDemo
Exceptions
Exercise2
HistogramUni
ImageDemo
src
(default package)
ImageDemo.java
JRE System Library [Java SE 6 (MacOS
Inheritance
OverloadAndOverride
Polymorphism
QuickSort
SimpleRecursion
StatementsAndOperators
*ImageDemo.java
import java.net.URL;
public class ImageDemo {
public static void main(String[] args) {
try {
// URL url = new URL("http://vmschlichter7.informatik.tu-muenchen.de/wzw_ss12/morningDew.
URL url = new URL("f")
} catch (Exception e) {
e.printStackTrace();
}
}
}
Problems Javadoc Declaration Console
<terminated> ImageDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 2012 10:
Writable
Smart Insert
9 : 35


Introduction to Java Basics.pptx
Start Designs Tabellen Diagramme SmartArt Übergänge Animationen Bildschirmpräsentation Überprüfen
8 Solving a Problem
Example Task
Reading/Loading an Image
Notizen durch Klicken hinzufügen
Normalansicht
144 von 158
89%


Eclipse File Edit Run Source Navigate Search Project Refactor Window Help
Java – ImageDemo/src/ImageDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
*ImageDemo.java
import java.awt.image.BufferedImage;
import java.net.URL;
import javax.imageio.ImageIO;
public class ImageDemo {
public static void main(String[] args) {
try {
// URL url = new URL("http://vmschlichter7.informatik.tu-muenchen.de/wzw_ss12/morningDew.
URL url = new URL("file:///tmp/ImageDemo/morningDew.jpg");
BufferedImage image = ImageIO.read(url);
} catch (Exception e) {
e.printStackTrace();
}
}
}
Problems Javadoc Declaration Console
<terminated> ImageDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 2012 10:
Writable
Smart Insert
13 : 53


Eclipse File Edit Run Source Navigate Search Project Refactor Window Help
Java – ImageDemo/src/ImageDemo.java – Eclipse – /Users/alex/rep/svn/wzw_ss2012/teil_java/workspace
Package Explorer
ImageDemo.java
import java.awt.image.BufferedImage;
import java.net.URL;
import javax.imageio.ImageIO;
public class ImageDemo {
public static void main(String[] args) {
try {
// URL url = new URL("http://vmschlichter7.informatik.tu-muenchen.de/wzw_ss12/morningDew.
URL url = new URL("file:///tmp/ImageDemo/morningDew.jpg");
BufferedImage image = ImageIO.read(url);
} catch (Exception e) {
e.printStackTrace();
}
}
}
Problems Javadoc Declaration Console
<terminated> ImageDemo [Java Application] /System/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home/bin/java (Jul 6, 2012 10:
Writable
Smart Insert
14 : 13

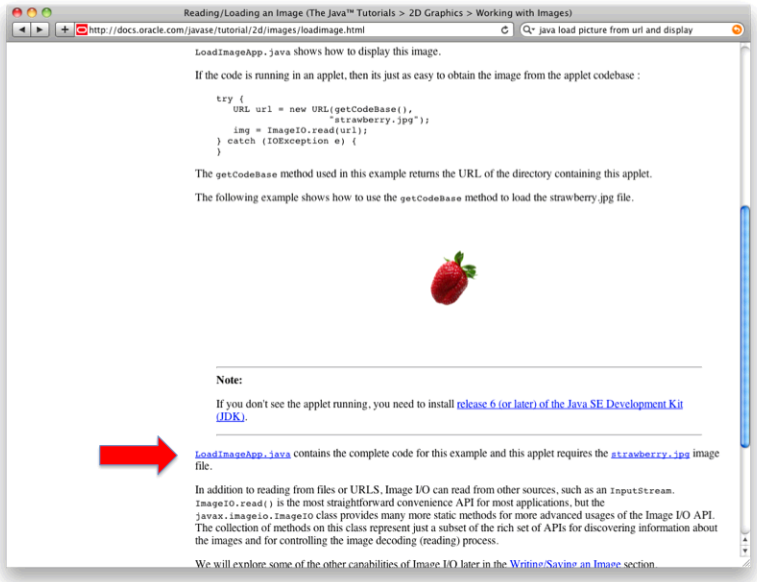




8 Solving a Problem

Example Task

So what about displaying the image we've just loaded?



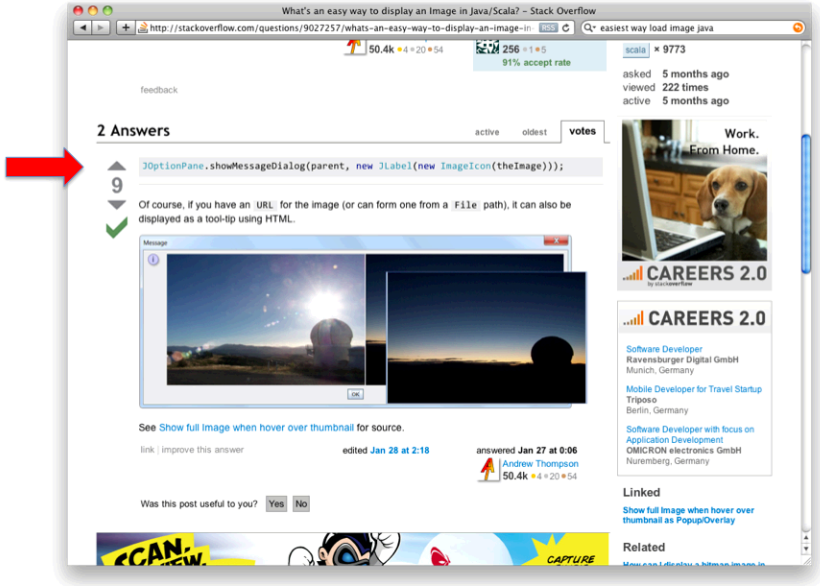
8 Solving a Problem

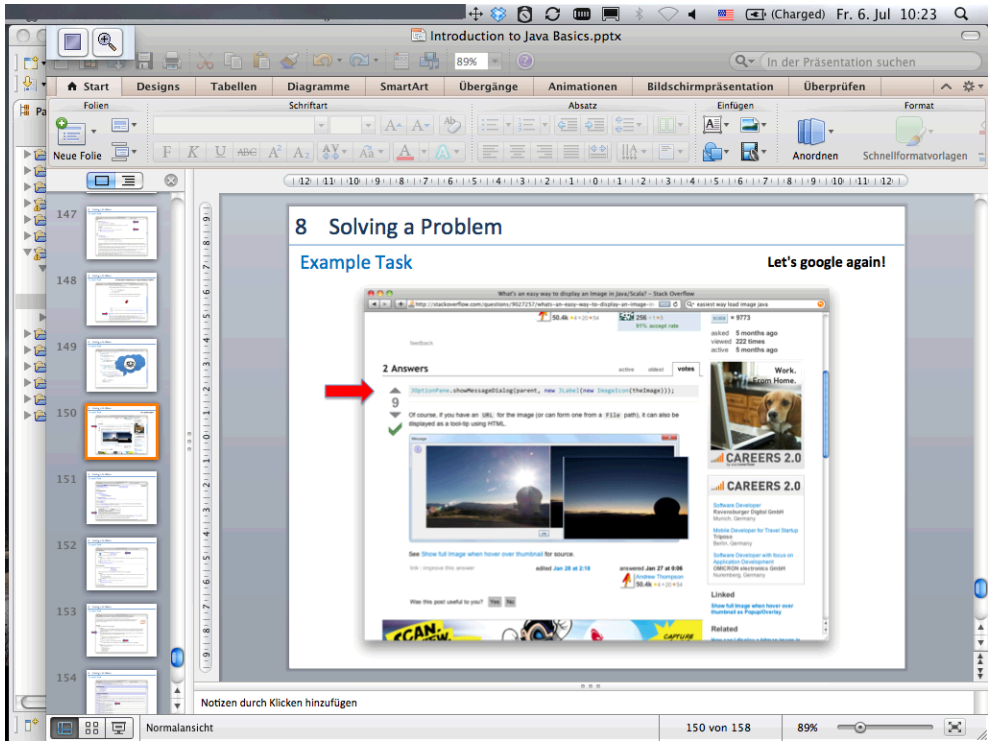
Example Task

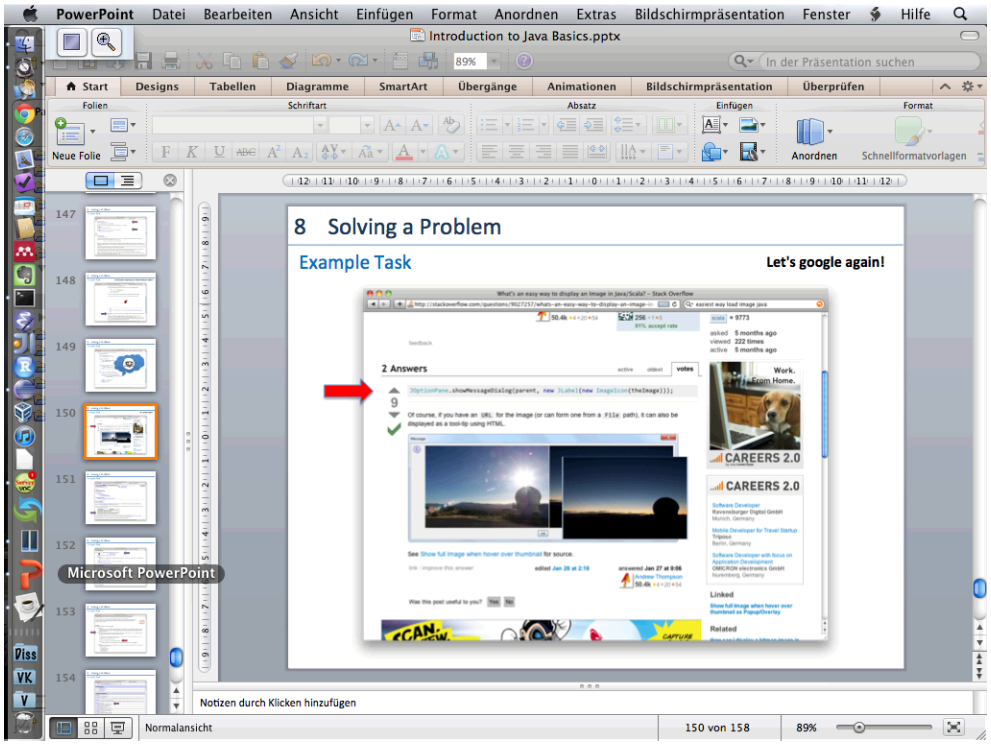
8 Solving a Problem

Example Task

Let's google again!

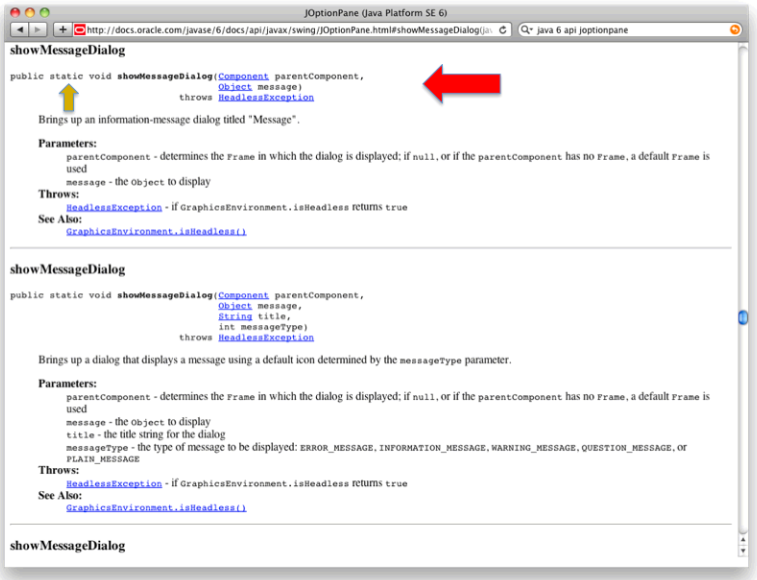


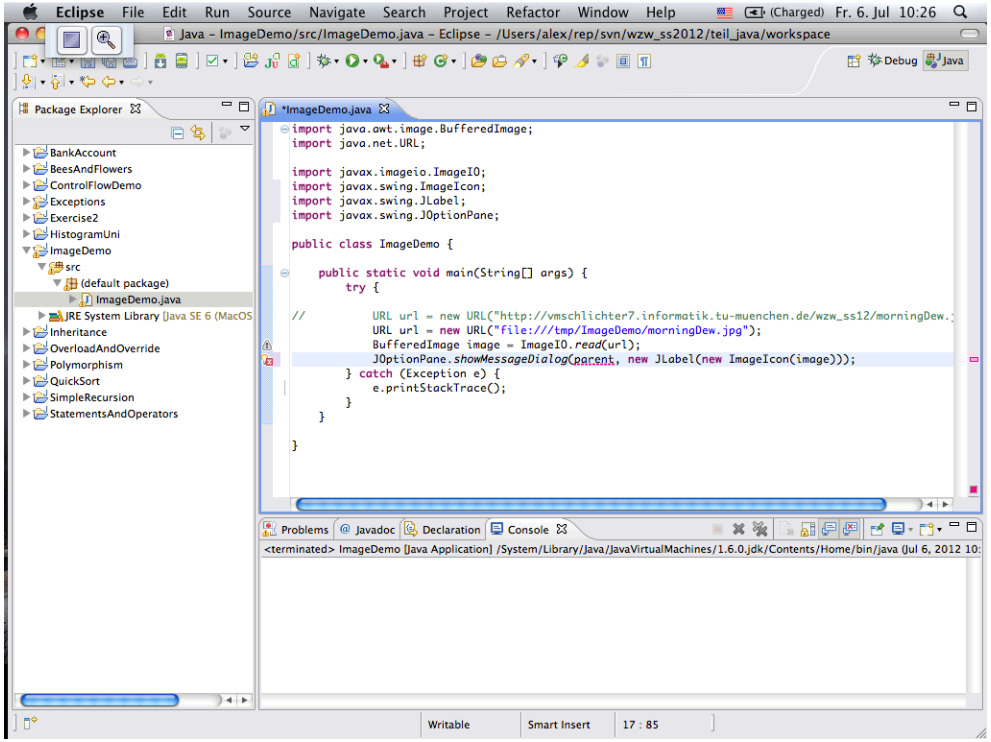


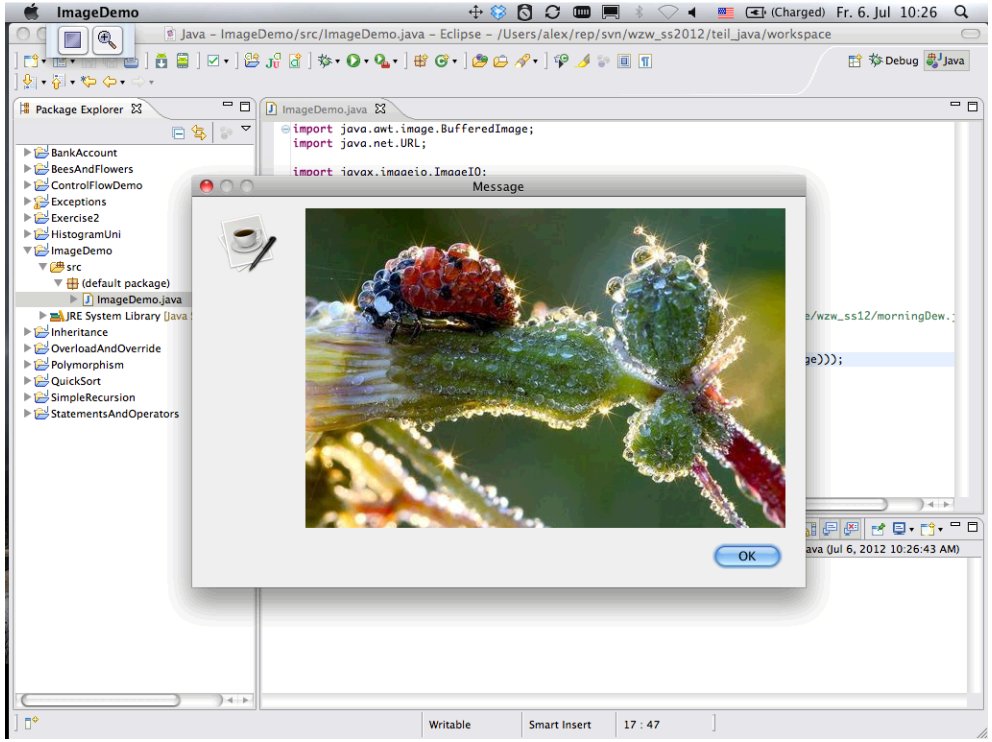


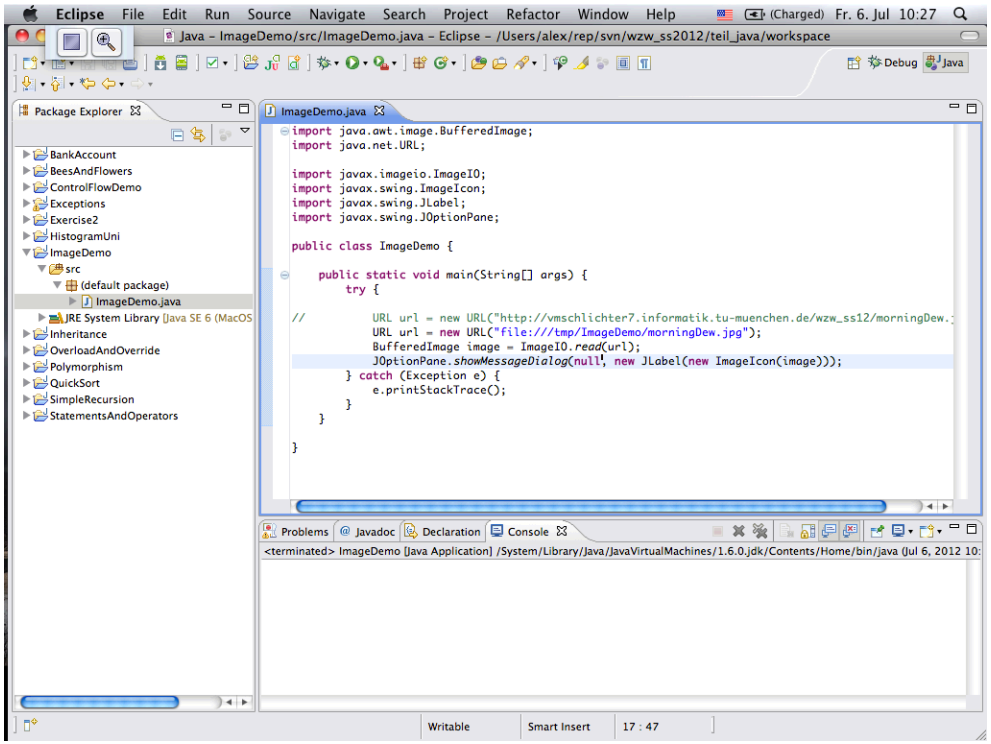
8 Solving a Problem

Example Task



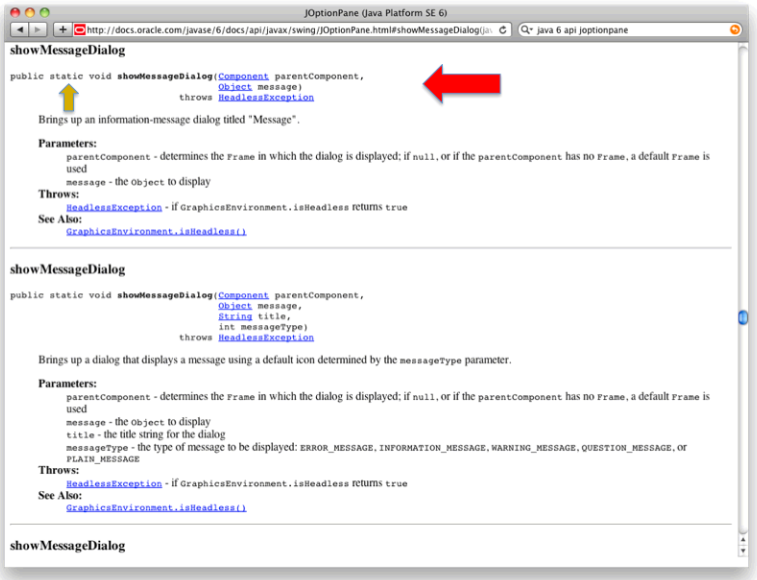






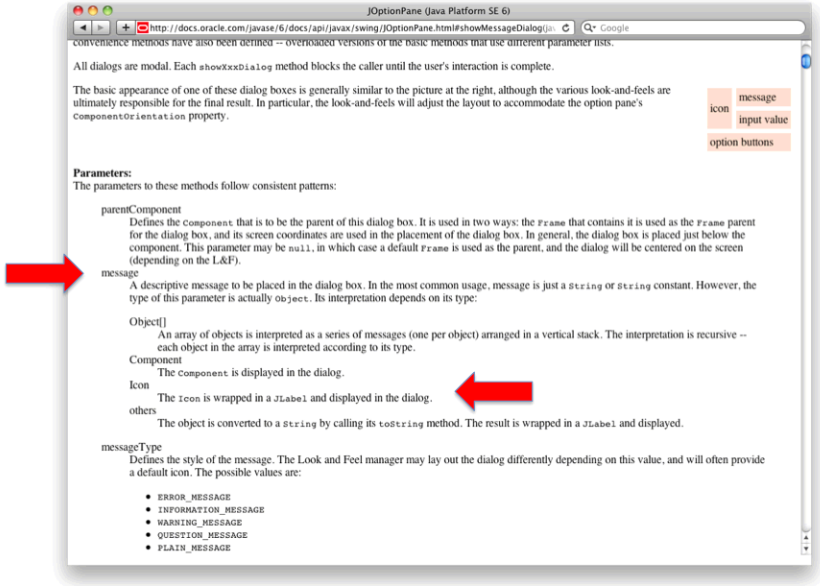
8 Solving a Problem

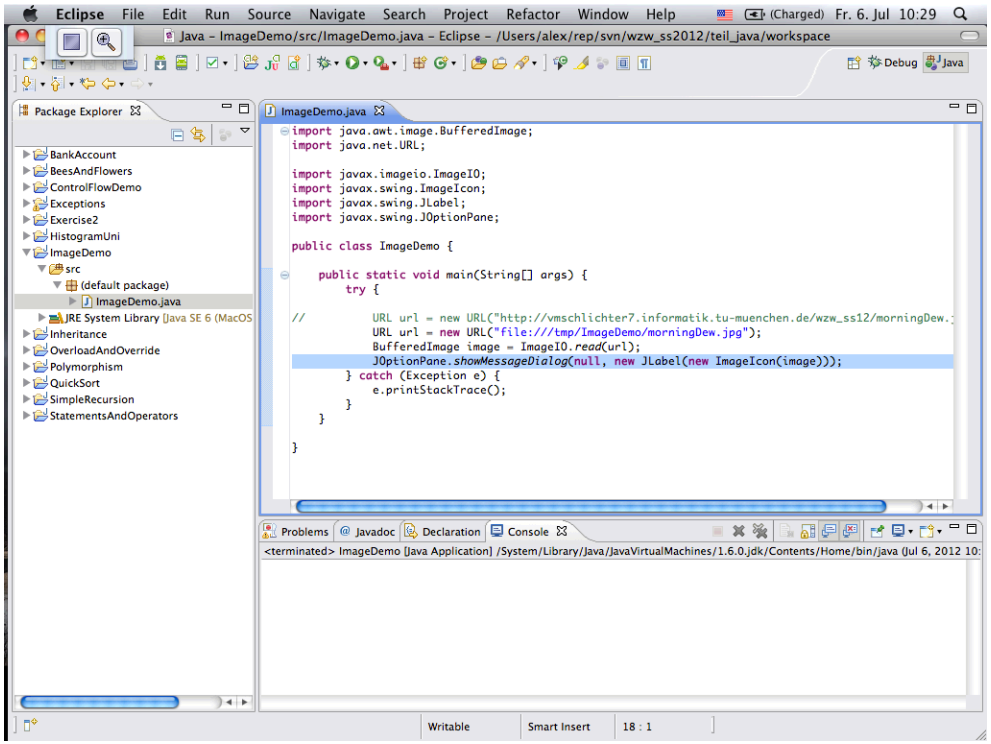
Example Task



8 Solving a Problem

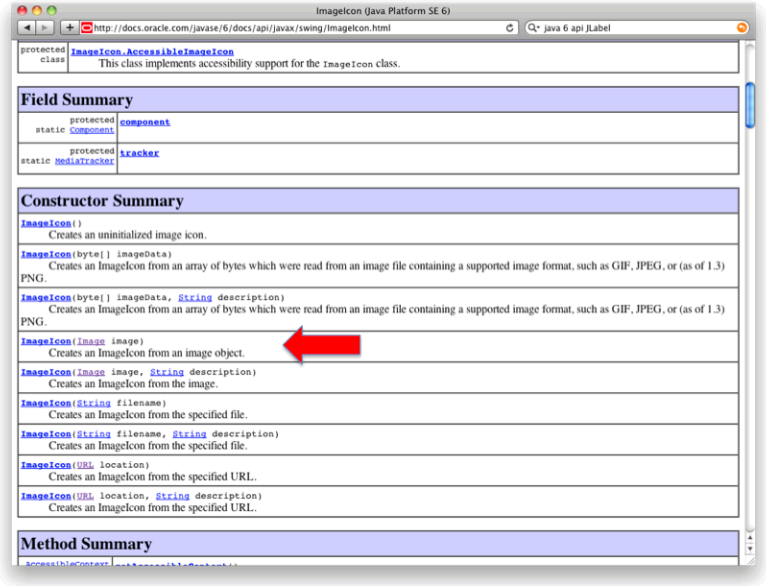
Example Task

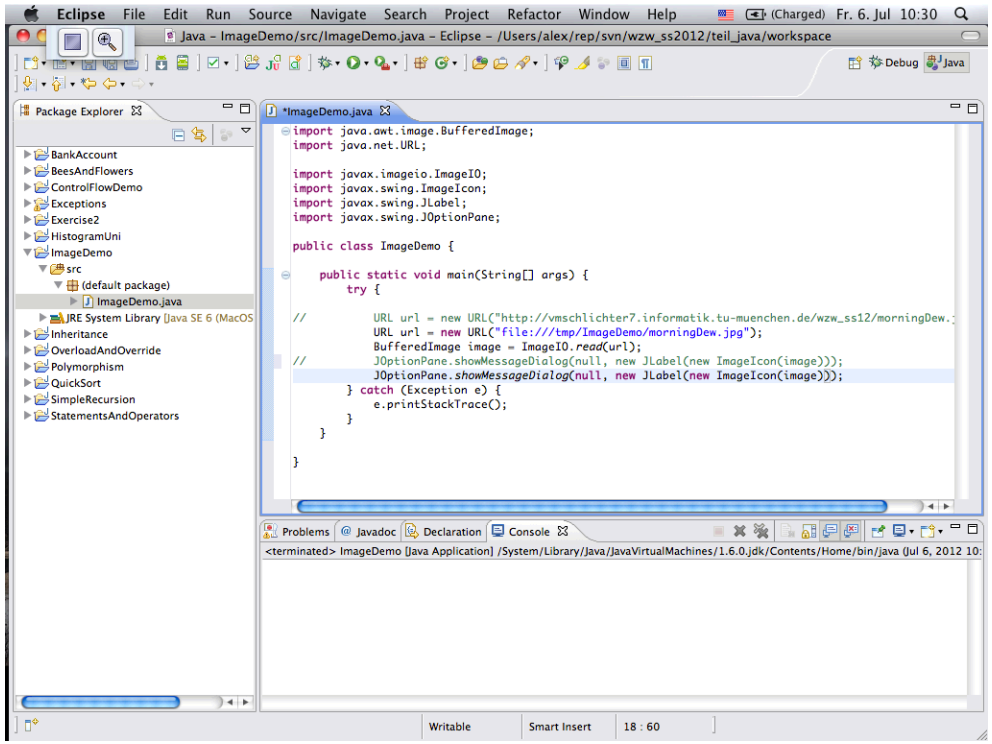




8 Solving a Problem

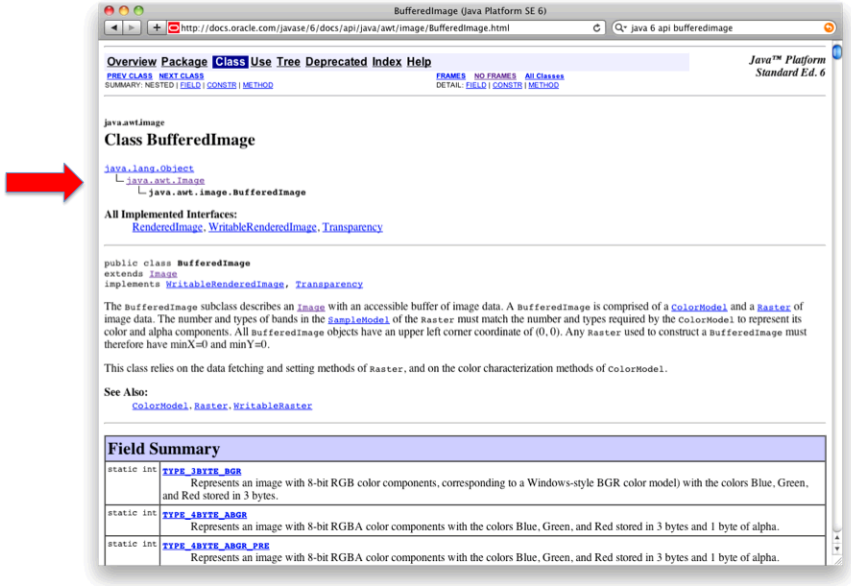
Example Task

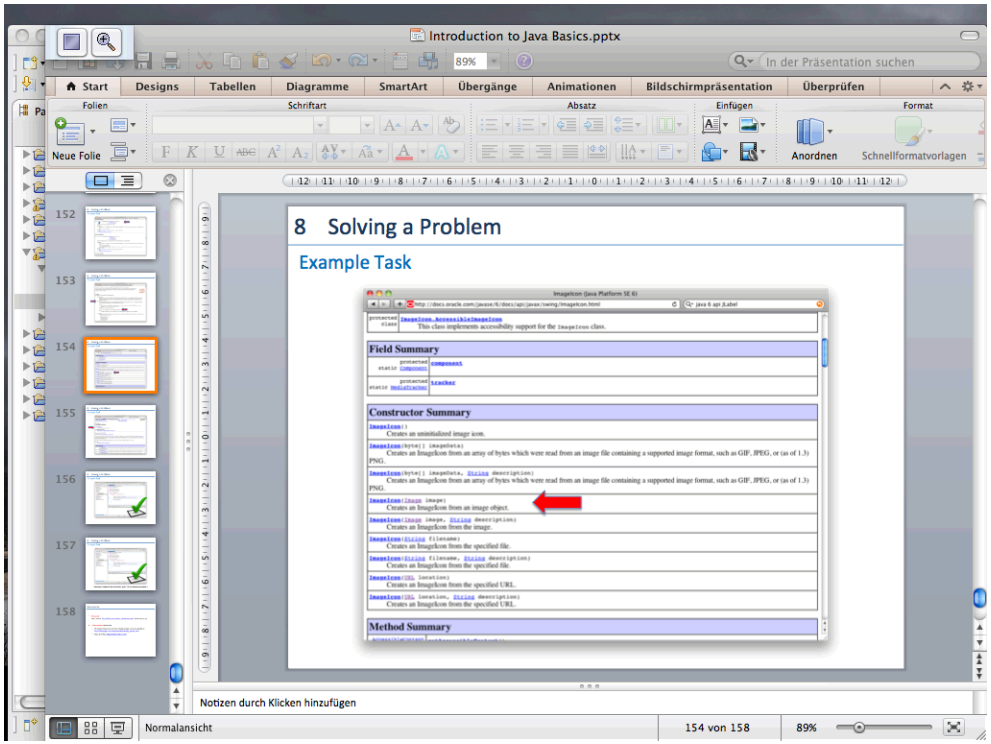




8 Solving a Problem

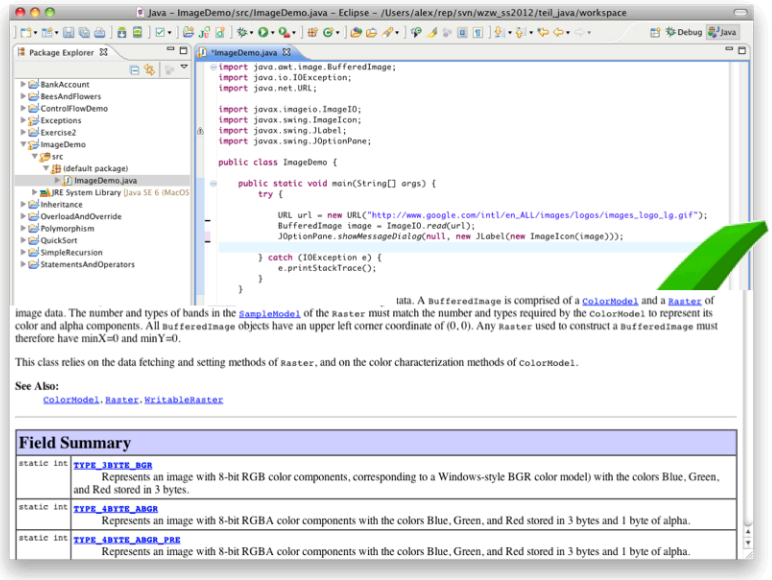
Example Task

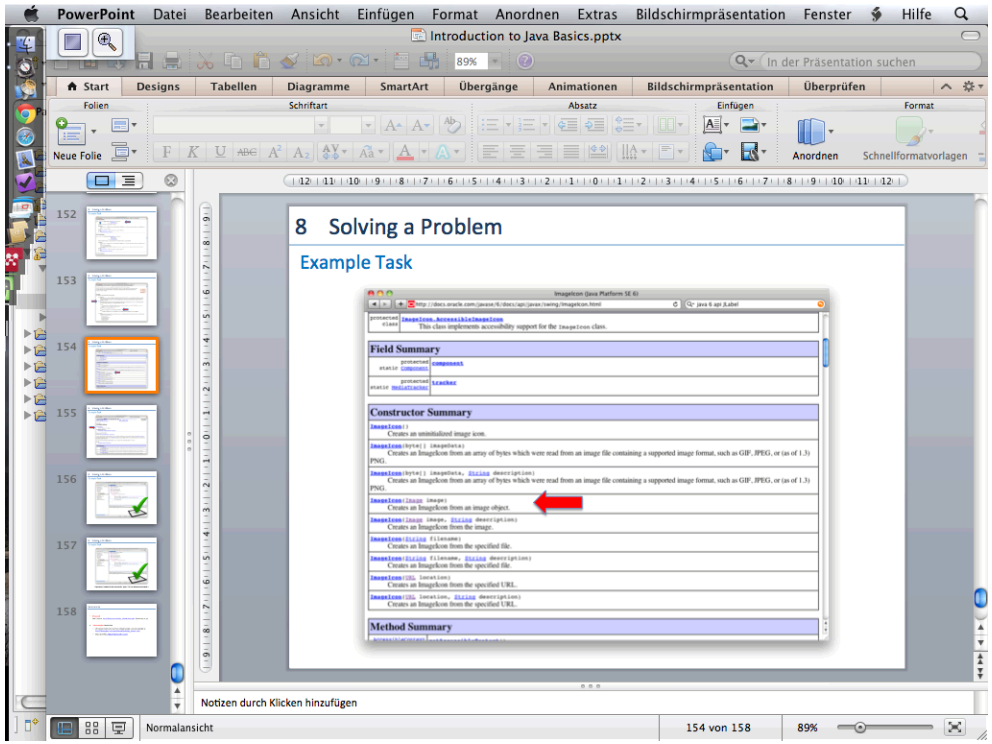


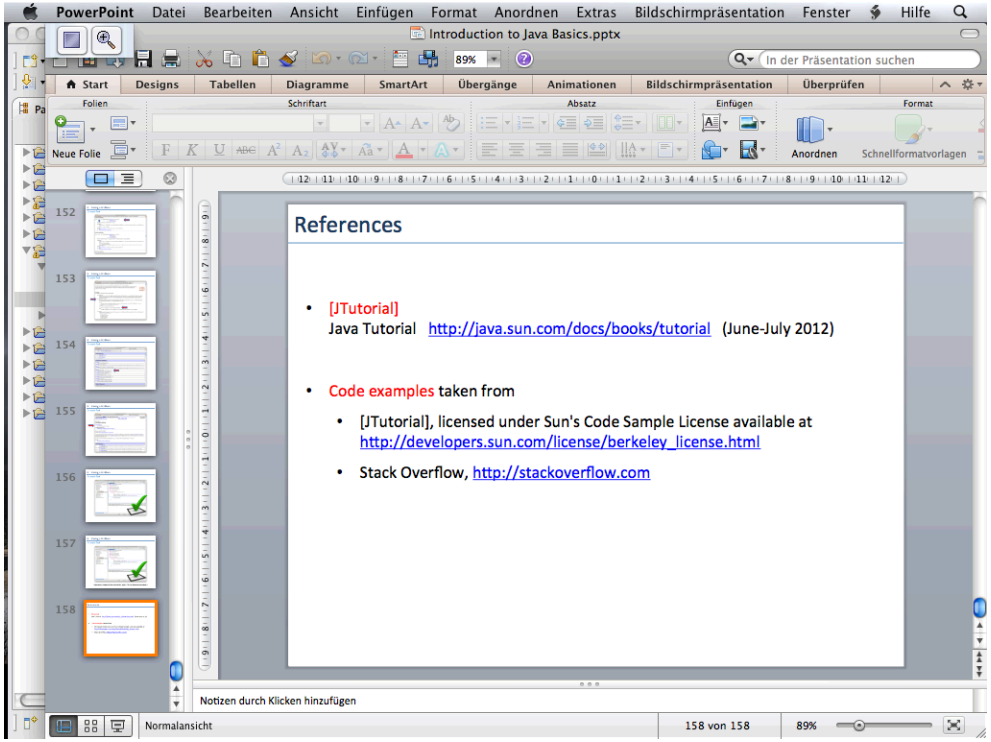


8 Solving a Problem

Example Task






PowerPoint Datei Bearbeiten Ansicht Einfügen Format Anordnen Extras Bildschirmpräsentation Fenster Hilfe
Introduction to Java Basics.pptx
In der Präsentation suchen
Start Designs Tabellen Diagramme SmartArt Übergänge Animationen Bildschirmpräsentation Überprüfen
Neue Folie
Anordnen
Schnellformatvorlagen
References
[JTutorial]
Java Tutorial http://java.sun.com/docs/books/tutorial (June-July 2012)
Code examples taken from
[JTutorial], licensed under Sun's Code Sample License available at http://developers.sun.com/license/berkeley_license.html
Stack Overflow, http://stackoverflow.com
Notizen durch Klicken hinzufügen
Normalansicht
158 von 158
89%