

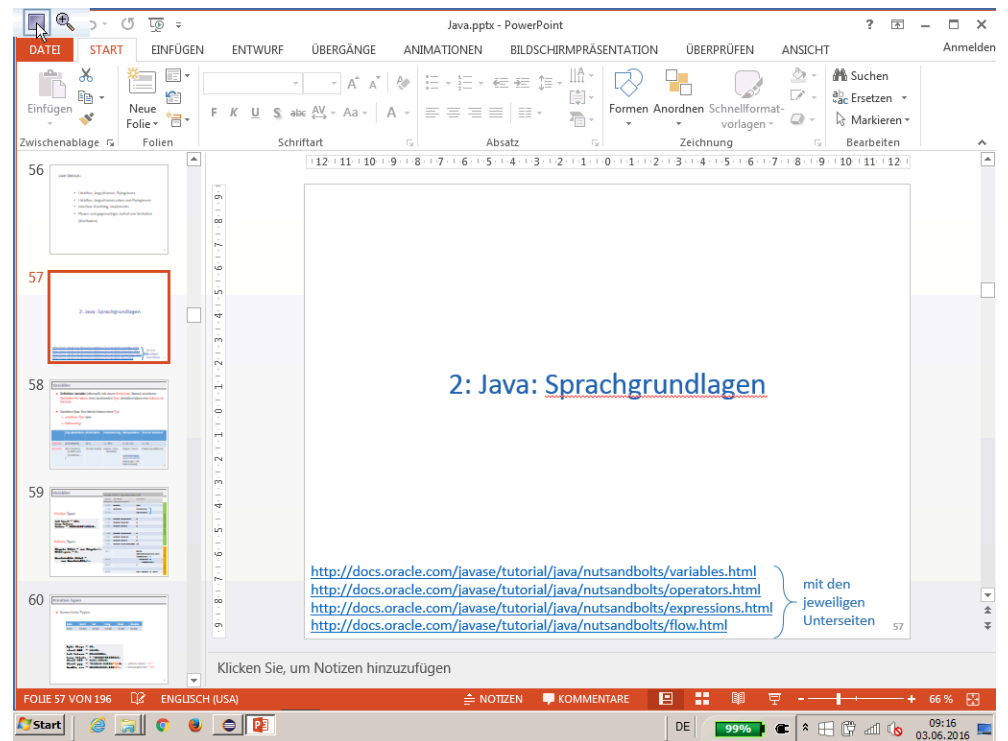
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Duration: 90:35 min

Pages: 90



variablen

- **Definition Variable** (informell): mit einem **Bezeichner** (Name) versehener **Platzhalter für Werte** eines bestimmten **Typs**. Variablen haben eine **Adresse im Speicher**.
- Variablen (bzw. ihre Werte) haben einen **Typ**:
 - primitiver **Typ** oder
 - Referenz**typ**

variablen

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 - Referenz**typ**

	(Typ-)Definition	Deklaration	Instantiierung	Manipulation	Test auf Gleichheit
Primitiv	(vordefiniert)	int a;	a = 117;	a = b + 42;	a == b;
Referenz	class Student { // Fields and // methods ... }	Student heiner;	heiner = new Student();	heiner = horst; <small>je nach Betrachtungsweise auch (Vorsicht!↔ genaue Definition! Siehe Folie 58f):</small> heiner.age = 21; heiner.yawn();	heiner.equals(horst);

58

	(Typ-)Definition	Deklaration	Instantiierung	Manipulation	Test auf Gleichheit
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58

Primitive Typen: Numerische Typen

∈ ℤ				∈ ℚ „≈ ℝ“	
byte	short	int	long	float	double
8 bit	16 bit	32 bit	64 bit	32 bit	64 bit
$[-2^7, 2^7-1]$	$[-2^{15}, 2^{15}-1]$	$[-2^{31}, 2^{31}-1]$	$[-2^{63}, 2^{63}-1]$	$[\pm 1.4 \cdot 10^{-45}, \pm 3.4 \cdot 10^{38}]$	$[\pm 4.9 \cdot 10^{-324}, \pm 1.8 \cdot 10^{308}]$
[-128, 127]	[-32768, 32767]	[-2147483648, 2147483647]	[-9223372036854775808, 9223372036854775807]		

```
byte flags = 63;
short bbb = 10133;
int heiner = 234103234;
long lilalo = -83628735682345;
float fff = 5464.00345;
float ggg = -345545.34534E-12f; = -345545.34534 * 10-12
double sss = 3245343455.555E67; = 3245343455.555 * 1067
```

61

Referenztypen

- Referenztyp-Variablen „zeigt“ auf ein Objekt
- Typ der Variable ist die Klasse des Objekts

```
Bicycle bike1 =
    new Bicycle();
Bicycle bike2 =
    new Bicycle();
```

```
boolean c;
c = bike1.equals(bike2);
// c == true
c = (bike1 == bike2);
// c == false
```

Vereinfachtes Speicher-Modell

Zellnr (Adresse)	Zellname (Variablenname)	Zellinhalt
...
1149	bike1	<1150>
1150	bike1.cadence	0
1151	bike1.speed	0
1152	bike1.gear	1
...
1327	bike2	<1405>
...
1405	bike2.cadence	0
1406	bike2.speed	0
1407	bike2.gear	1
...

65

Operatoren

Operatoren kombinieren (Werte von) Variablen und Literale (Konstanten) und liefern Werte:

Arithmetische Operatoren

+	Addition	<code>1 + 1</code>	<code>d + aaa</code>	<code>cc = b + 1.7d;</code>	<code>int a = 1 + 1;</code>
-	Subtraktion	<code>3 - 7</code>	<code>int b = c - 9;</code>	<code>float f = 10.02f - 23.56f;</code>	
*	Multiplikation	<code>blub = fd * 0.1f;</code>	<code>double d = z * z;</code>		
/	Division	<code>int a = 17 / 9;</code>	<code>// a == 1;</code>		
		<code>float eee = 13.0f / 2.0f;</code>	<code>// ee == 6.5f;</code>		
%	Rest	<code>int a = 17 % 9</code>	<code>// a == 8;</code>		

73

Statements

Statement: Komplette ausführbare Einheit. Endet mit „;“

Expression statements: (sind Expressions die mit ; abgeschlossen wurden)

- Zuweisungen `a = (17 + (3 * 9)) % 3;`
- Zuweisung unter Benutzung von ++ oder -- `+++;`
- Methodenaufrufe `someObject.methodOne();`
- Objekterzeugung `someObject = new SomeClass();`

Deklarationen

```
int a;
SomeClass someObject;
```

Blocks (nächste Folie)

Kontrollfluss-Statements (kommt gleich)

87

Block: Gruppe von Statements eingeschlossen in { } Klammern

```

if (a != b) {                               // begin block
    int c;
    c = a * b;
    System.out.println(c);
}                                           // end block
    
```

88

Kontrollfluss-Statements erlauben es, von der **sequentiellen Abfolge** der Abarbeitung der Statements **abzuweichen**.

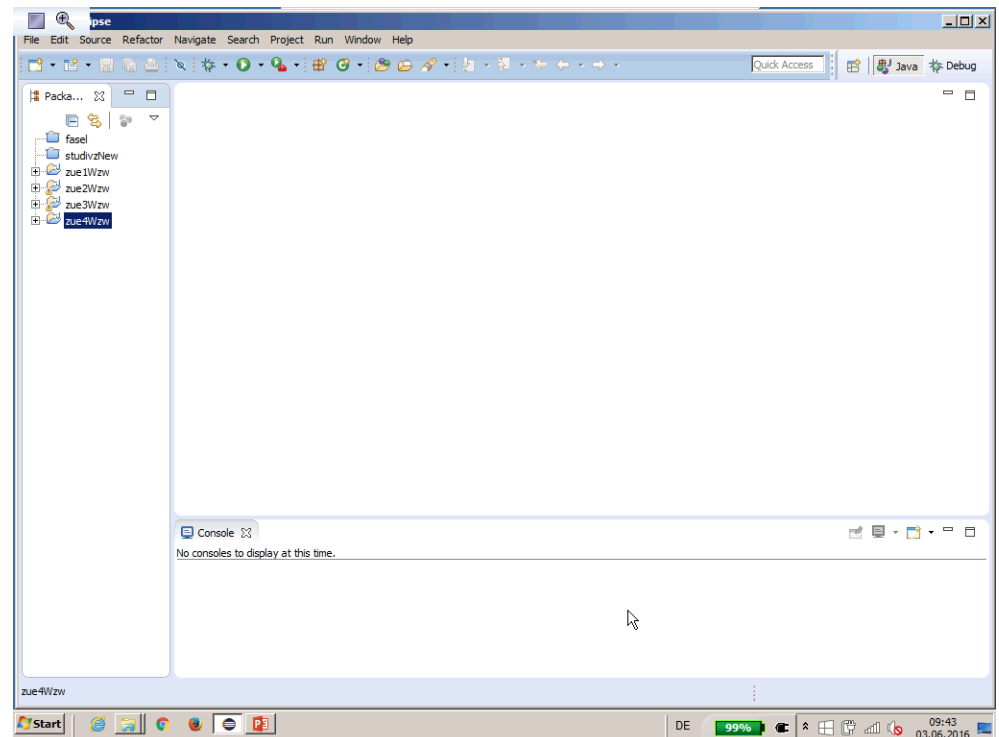
- Bedingte Verzweigungen (conditionals): if, if else, switch
- Schleifen (loops): while, do while, for
- Verzweigungen (branches): break, continue, return

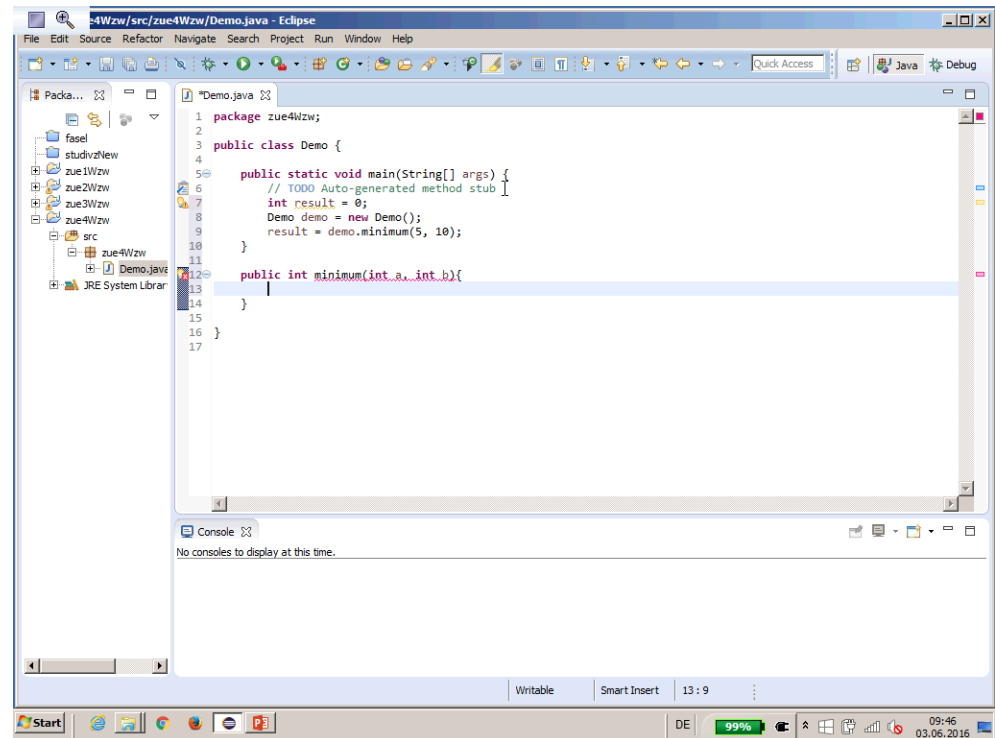
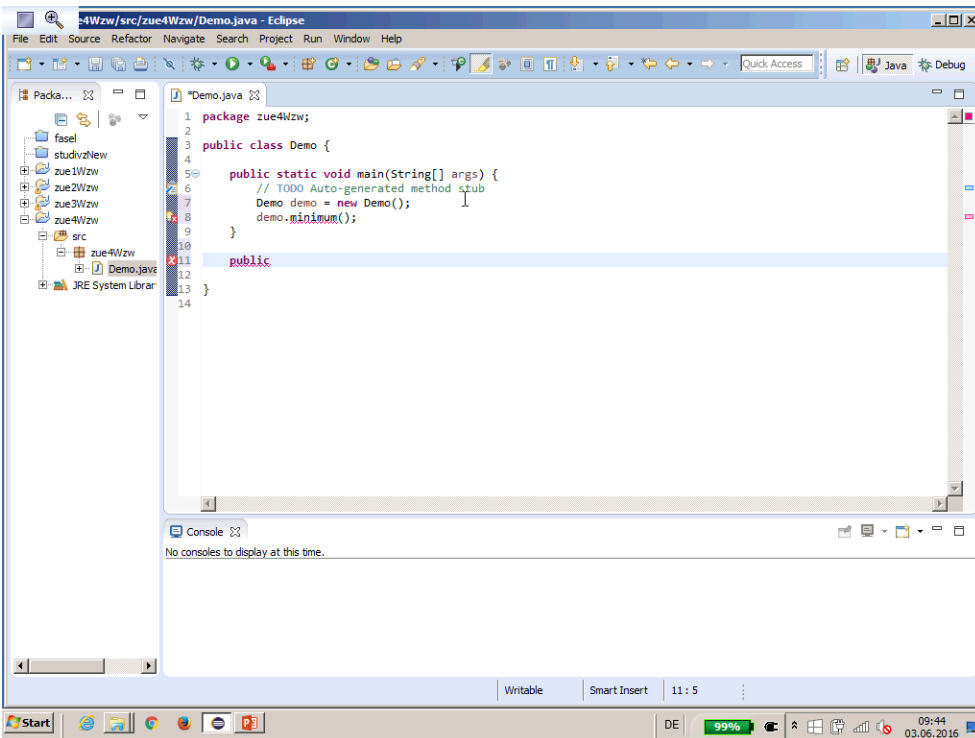
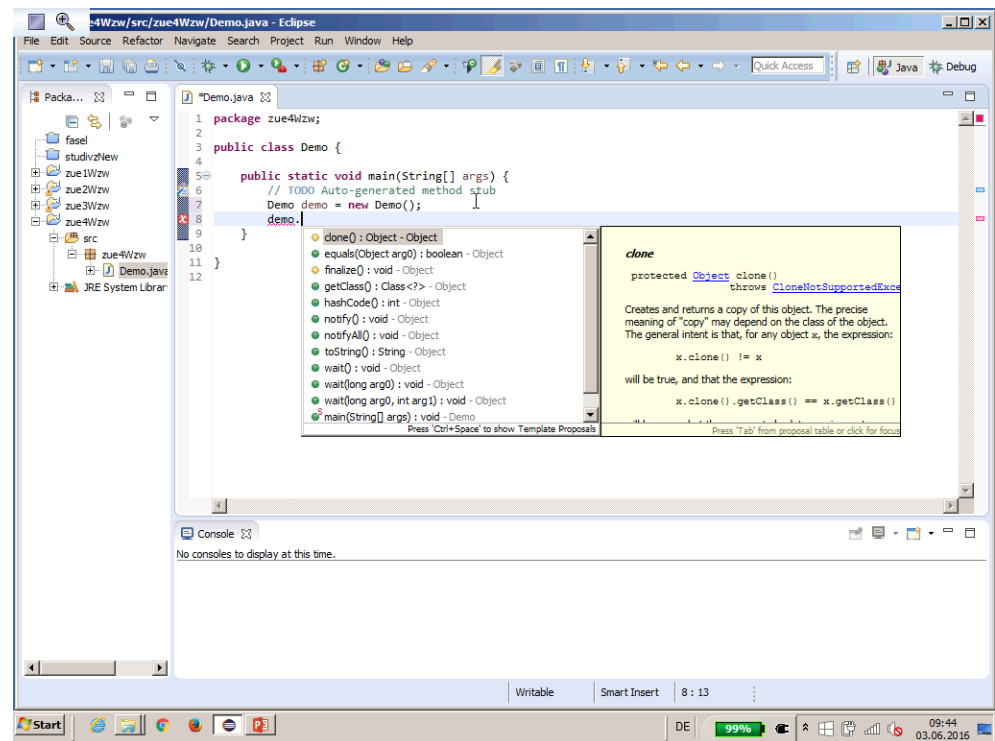
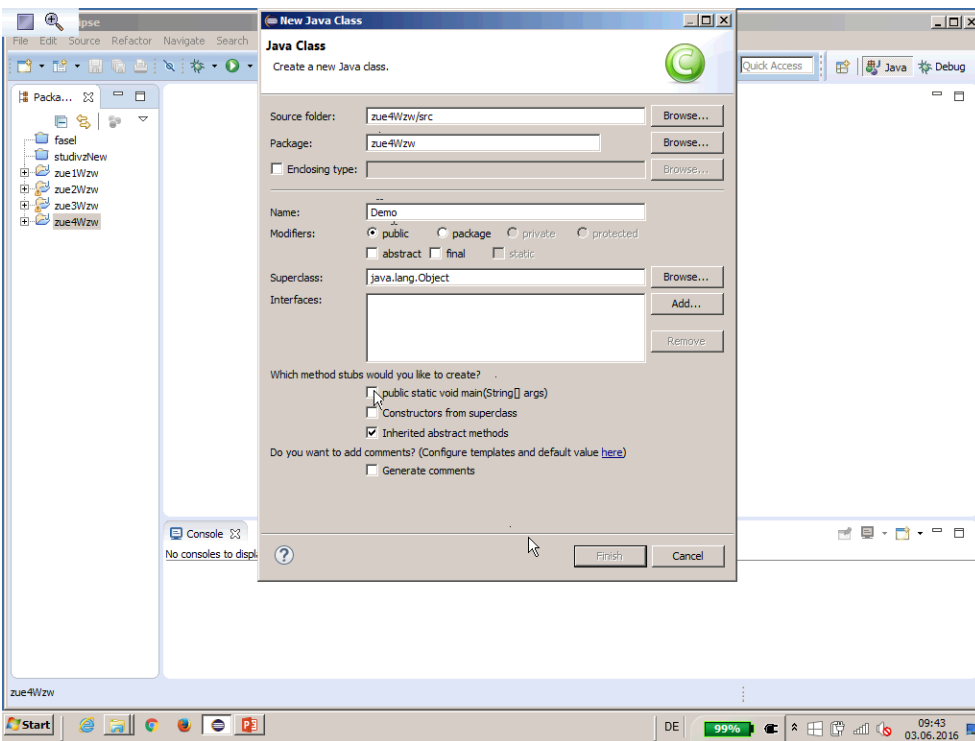
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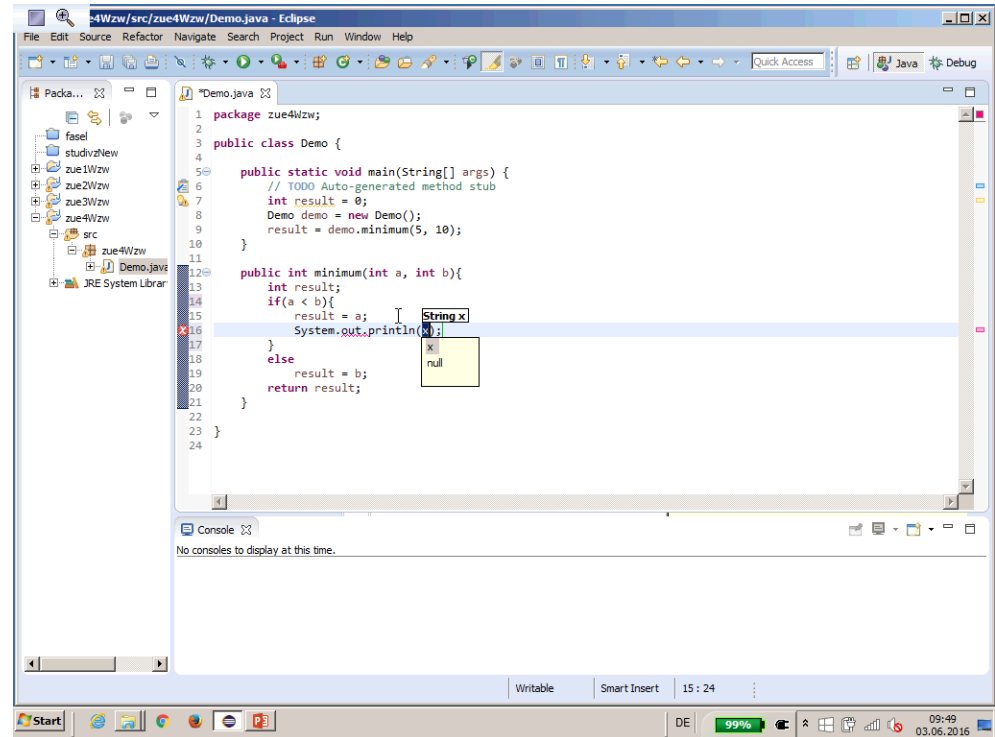
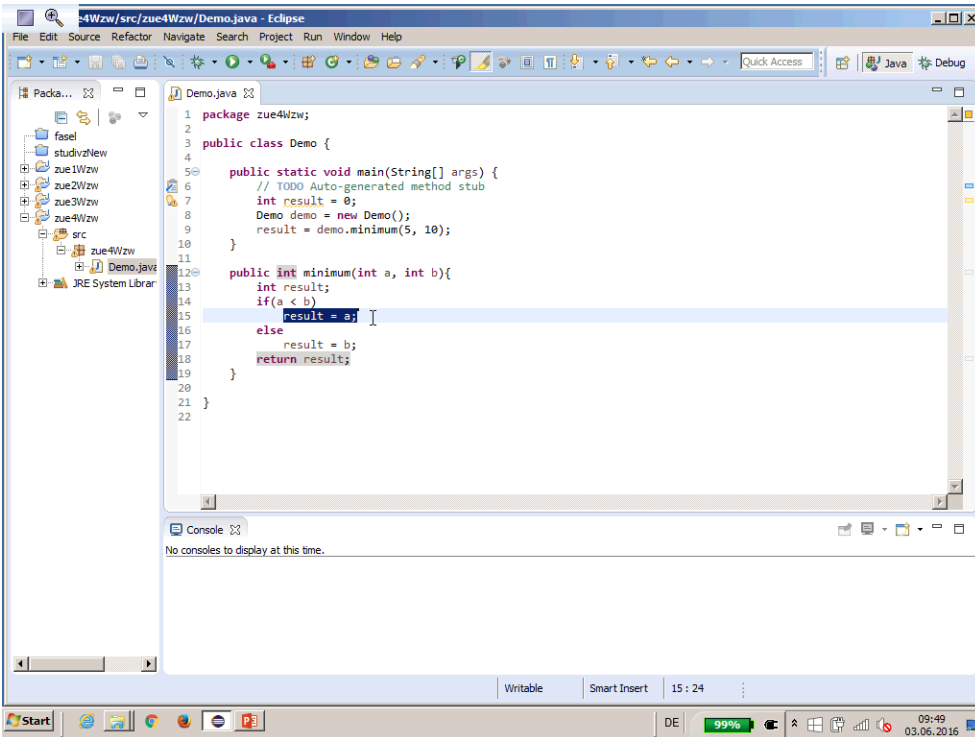
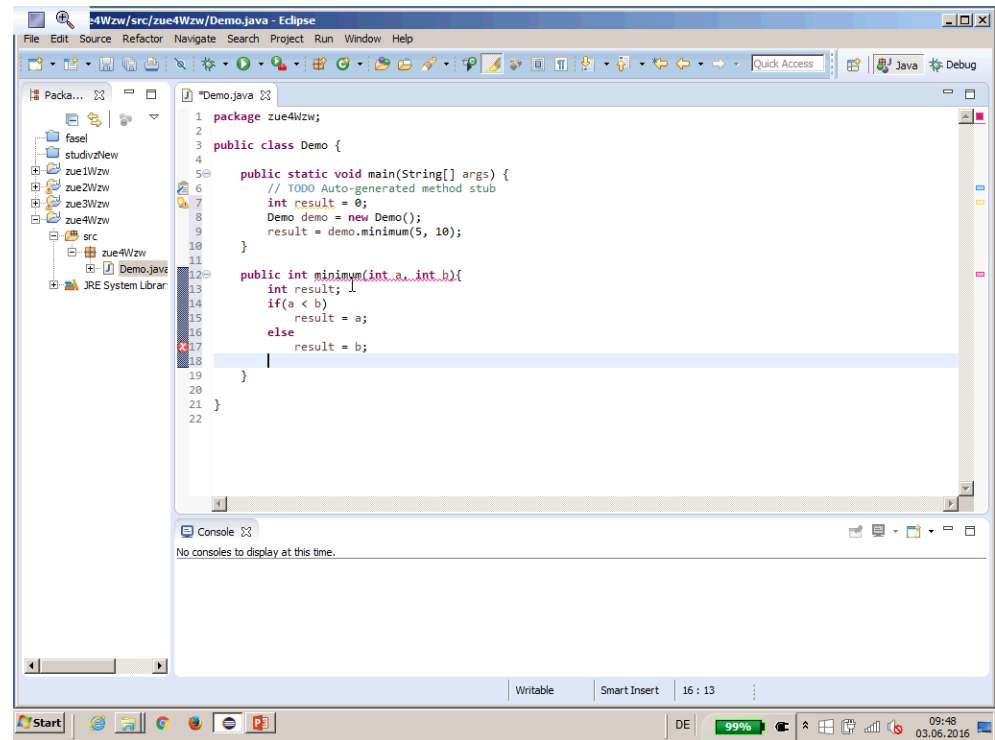
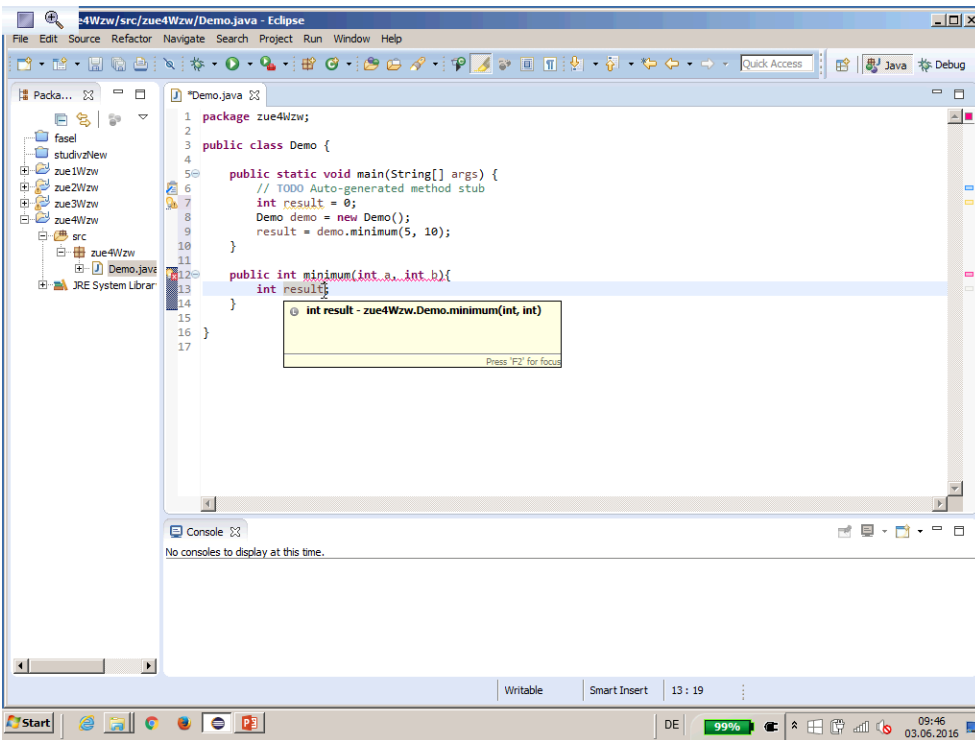
verzweigungen: return break continue

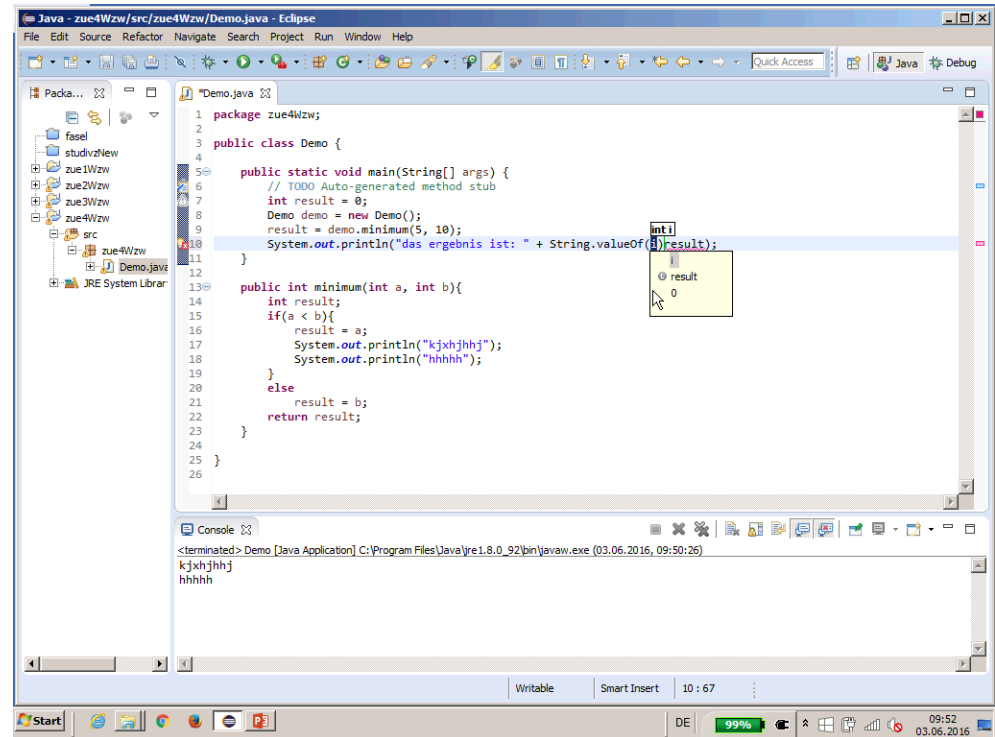
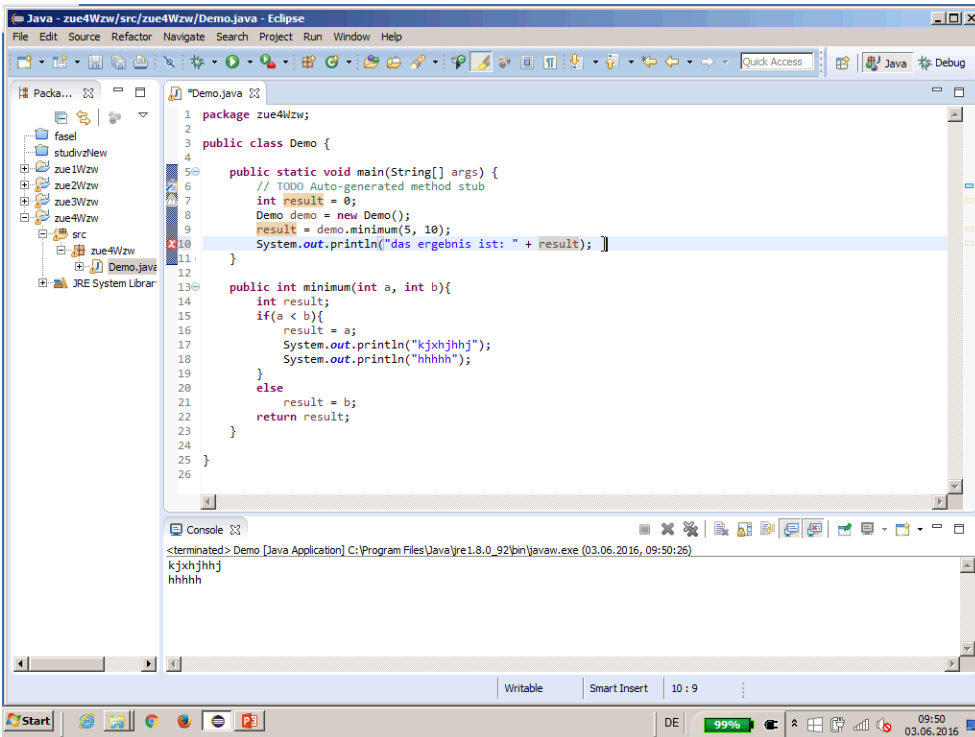
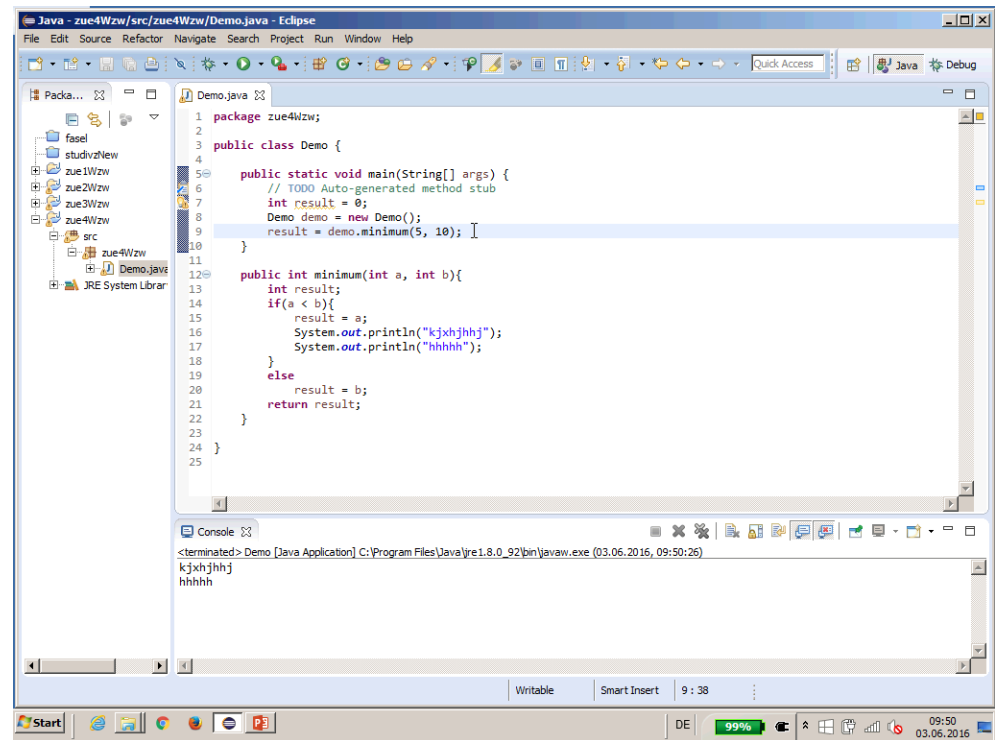
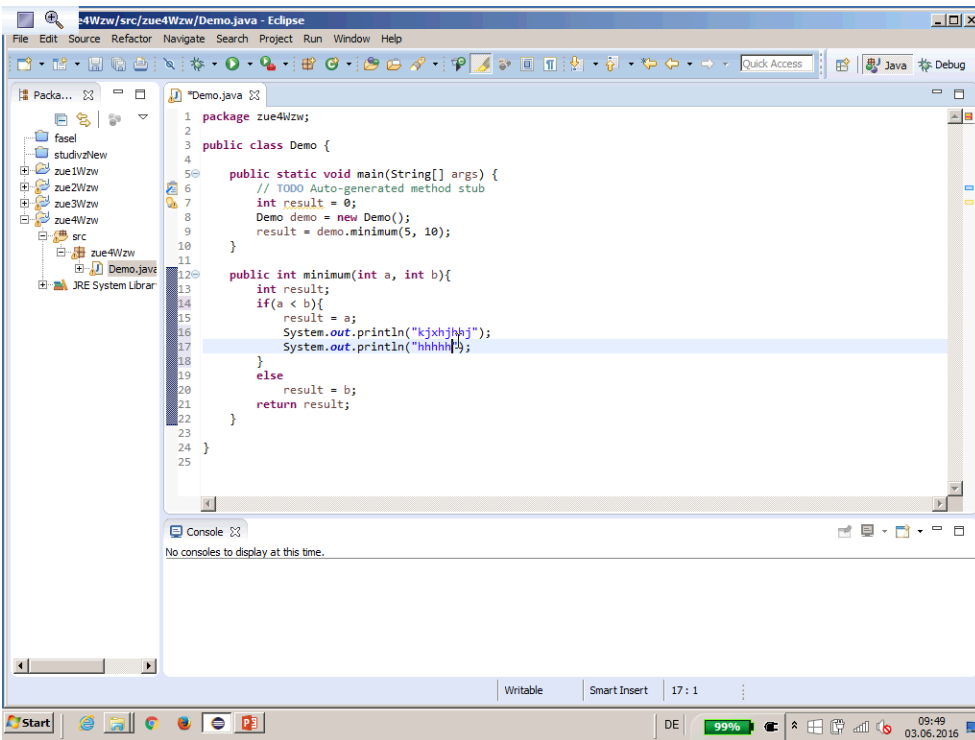
- **return:** **Beende** die gerade ausgeführte Methode und gehe im Kontrollfluss an die Stelle **zurück**, wo sie **aufgerufen** wurde. (Mehr Details folgen gleich)

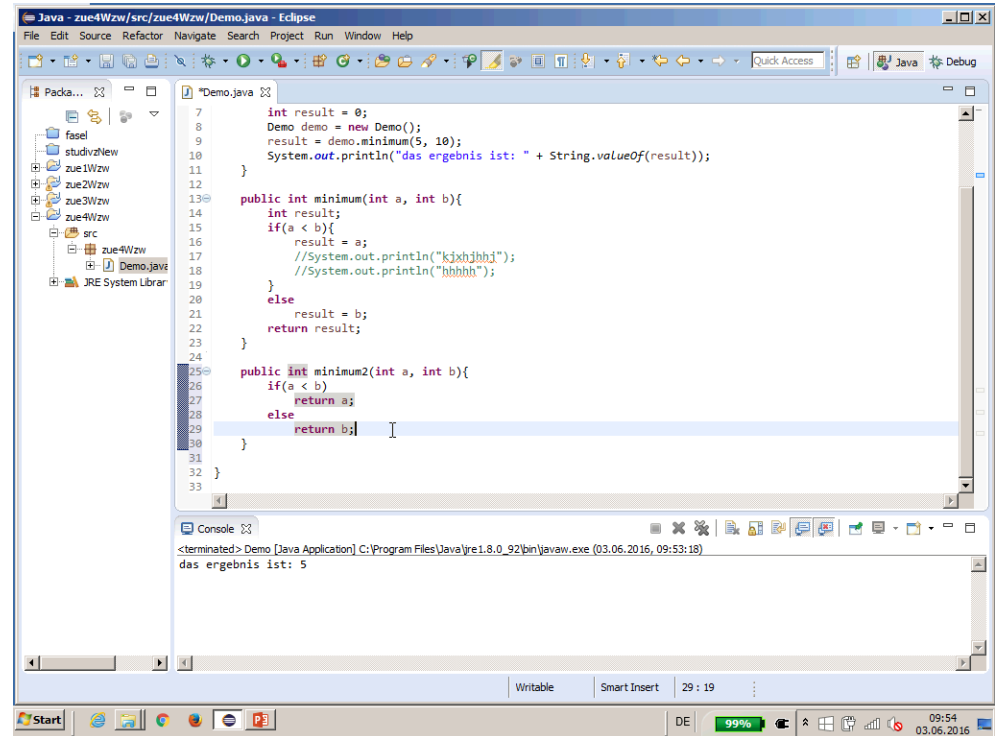
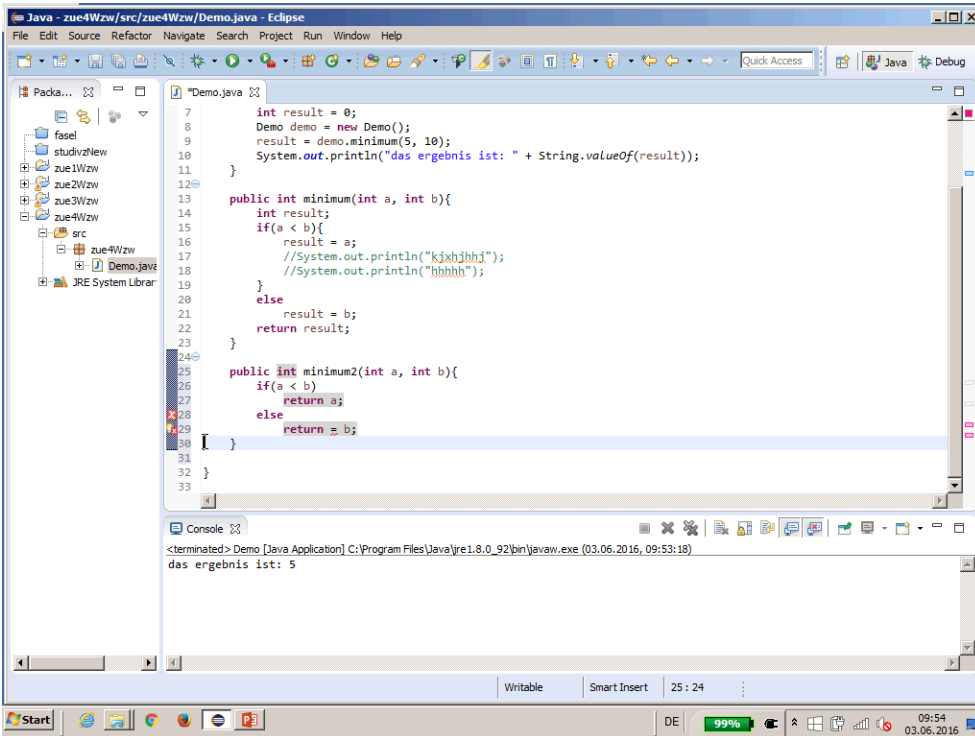
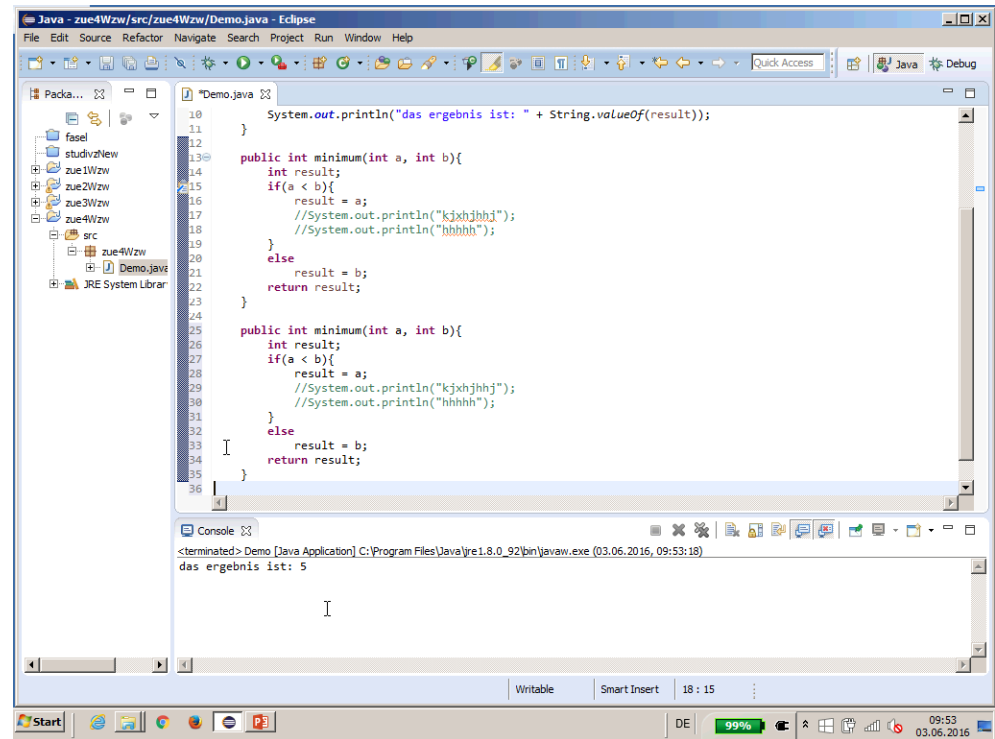
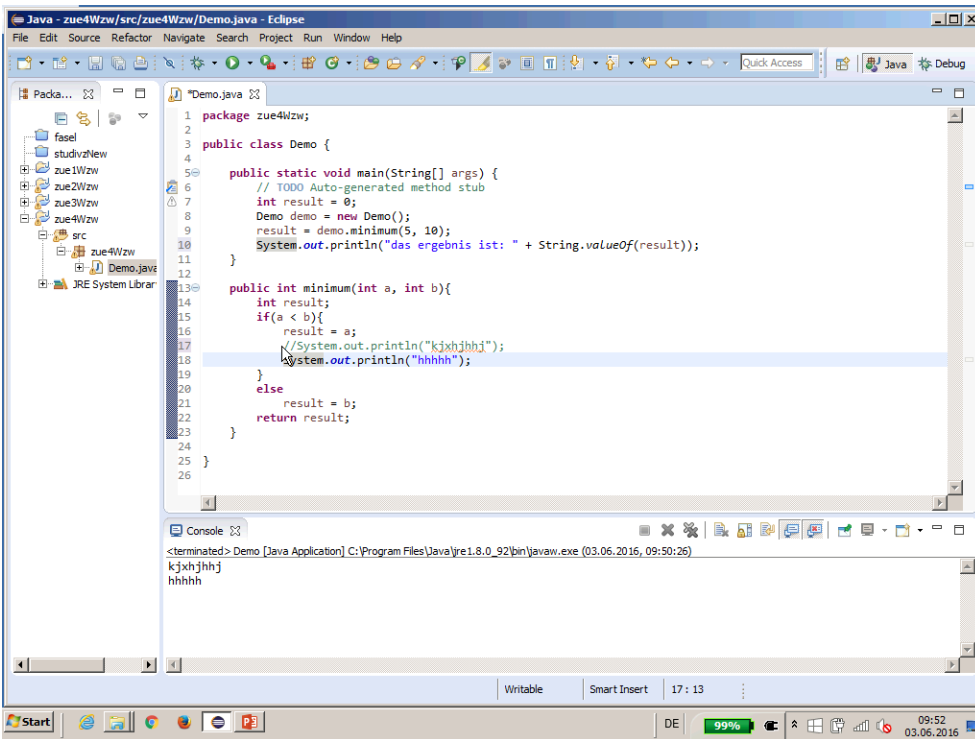
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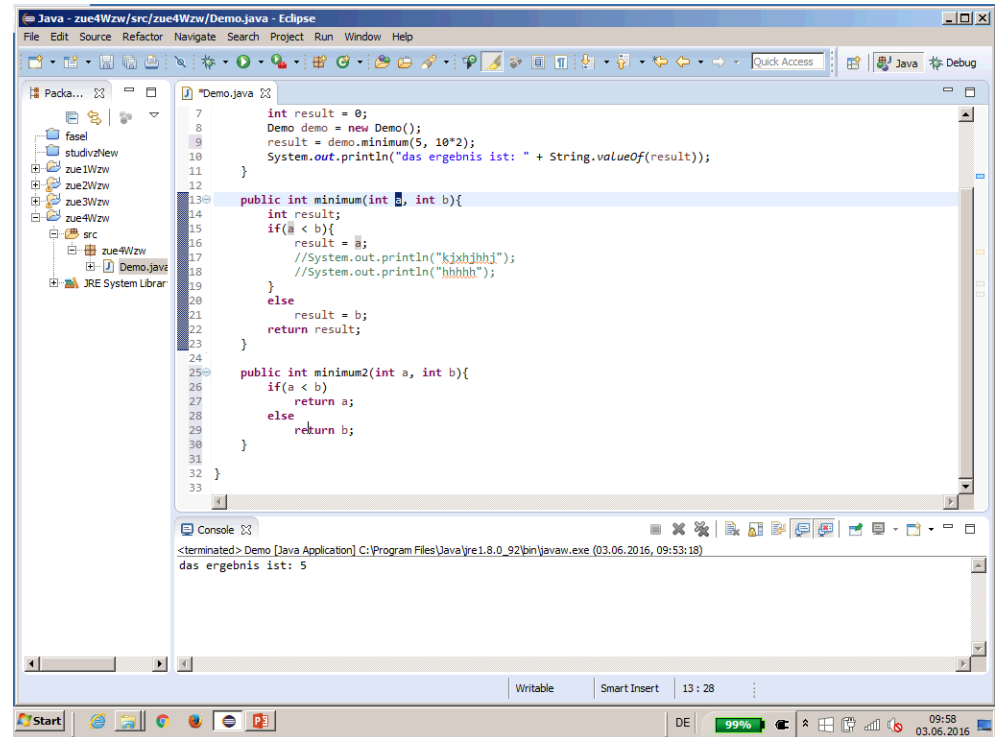
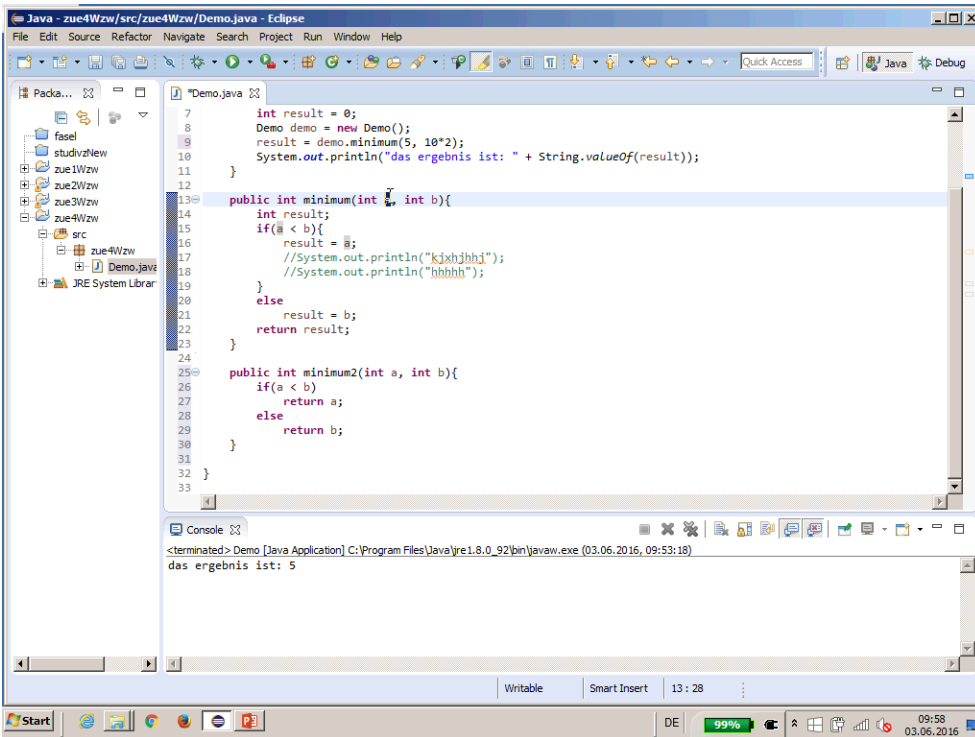
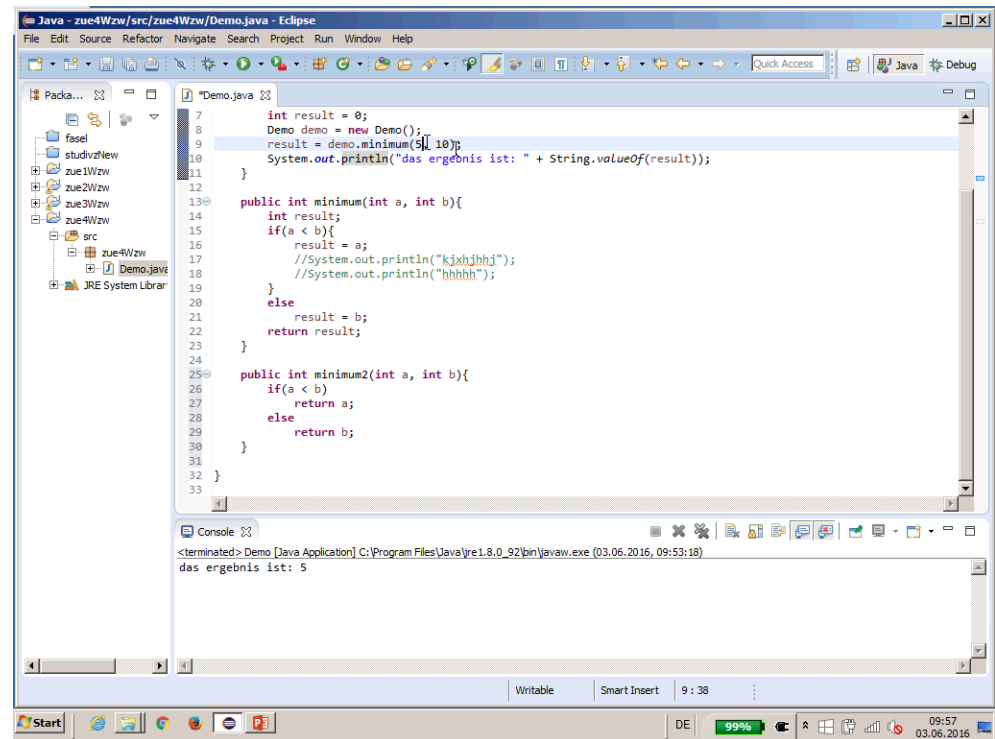
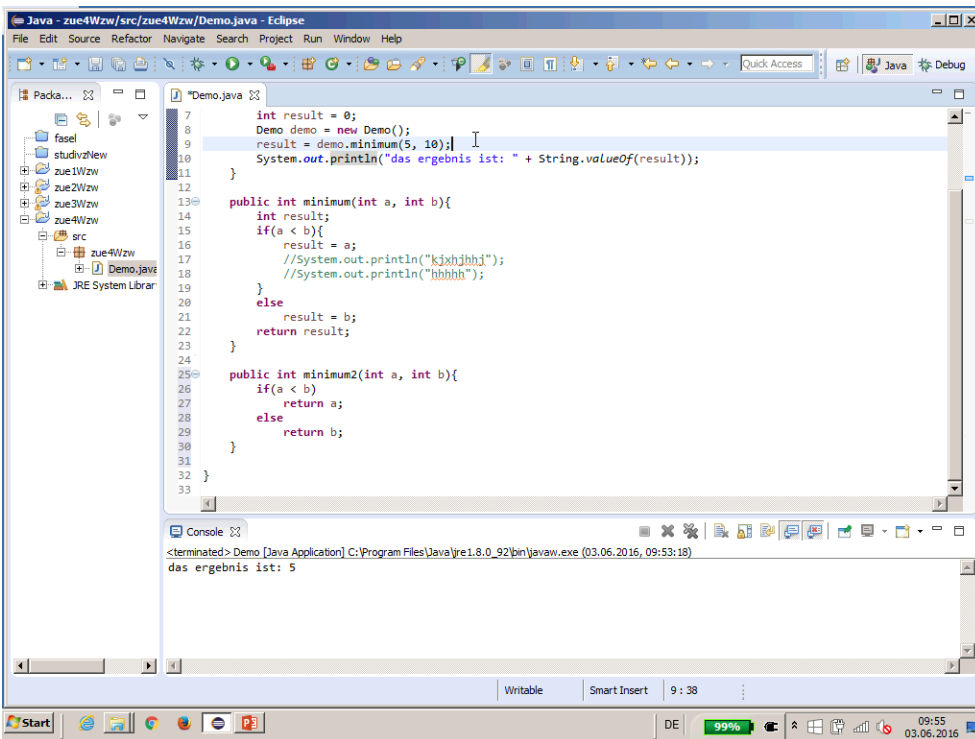


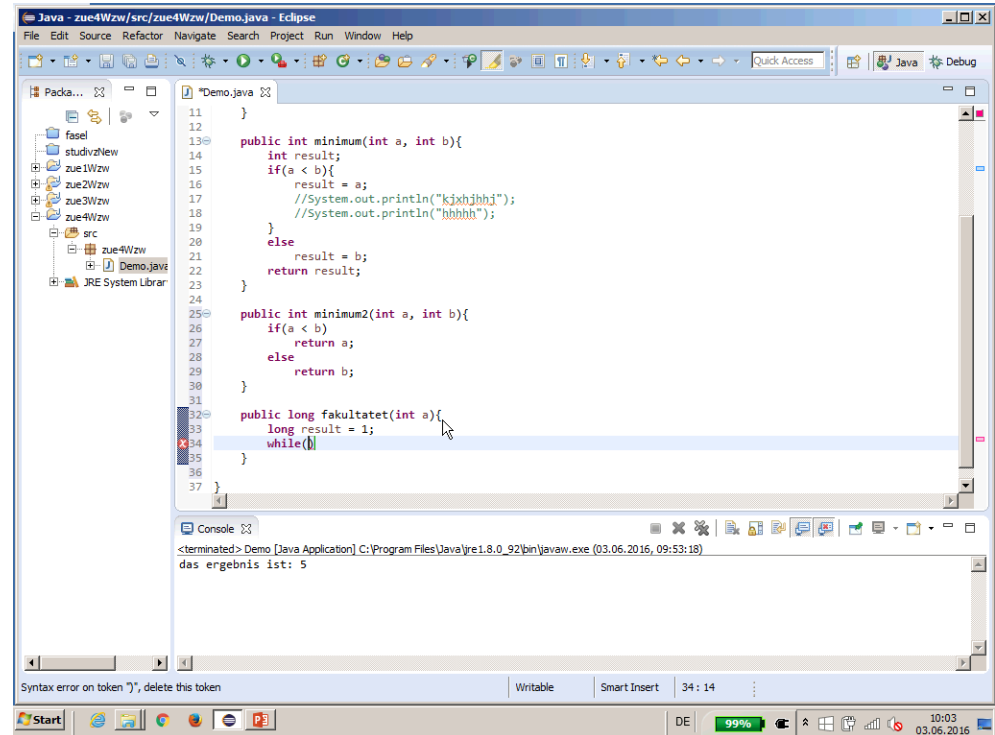
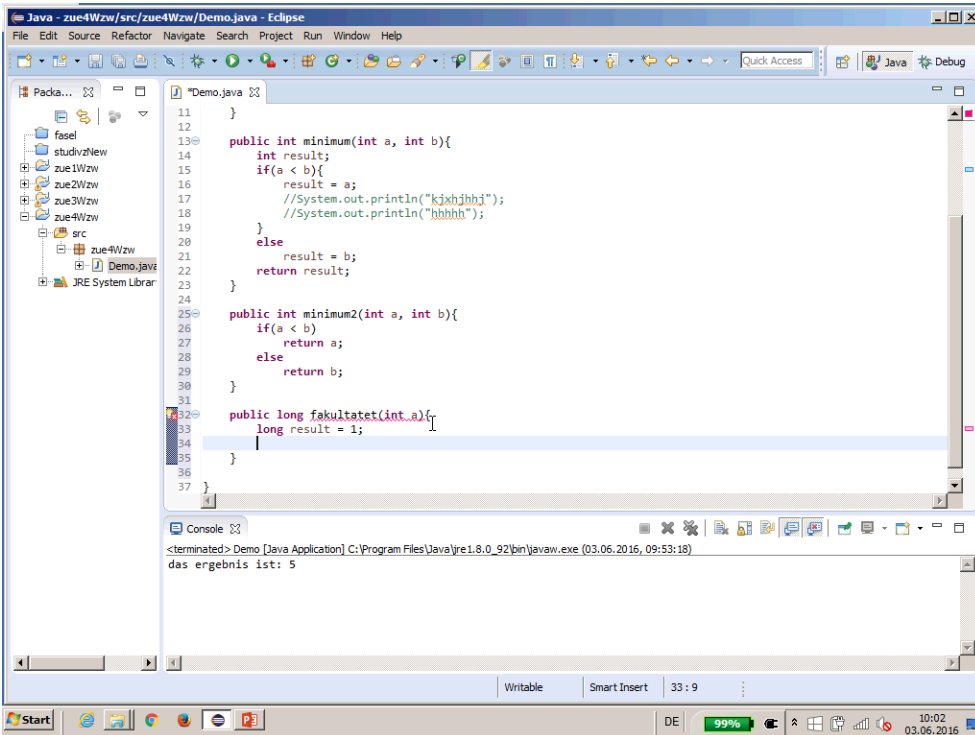
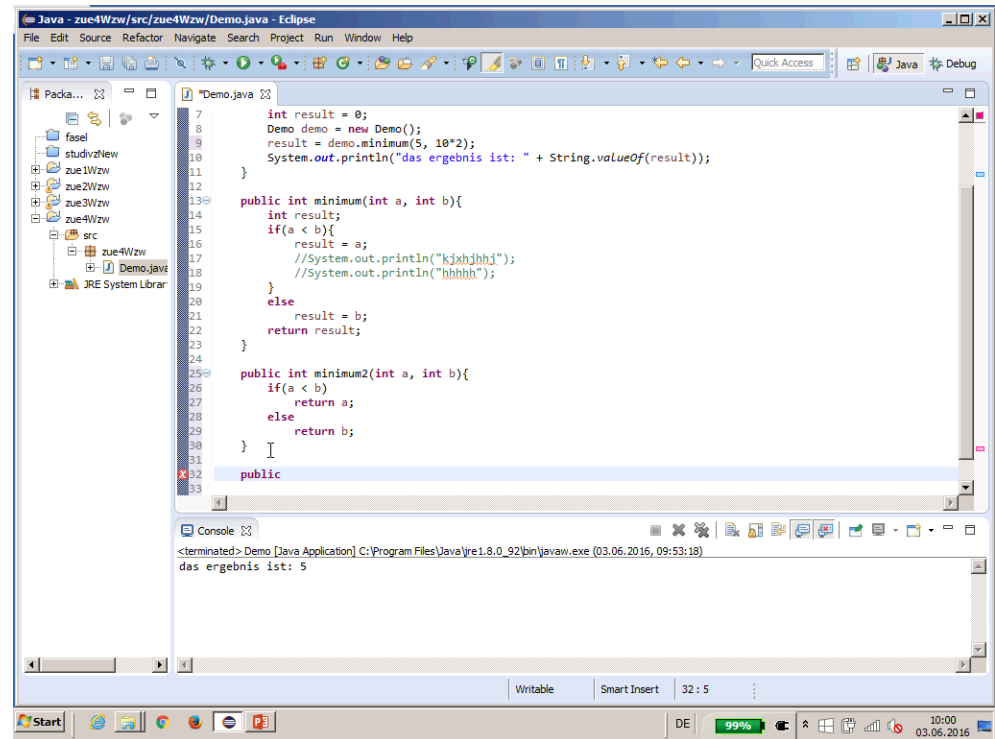
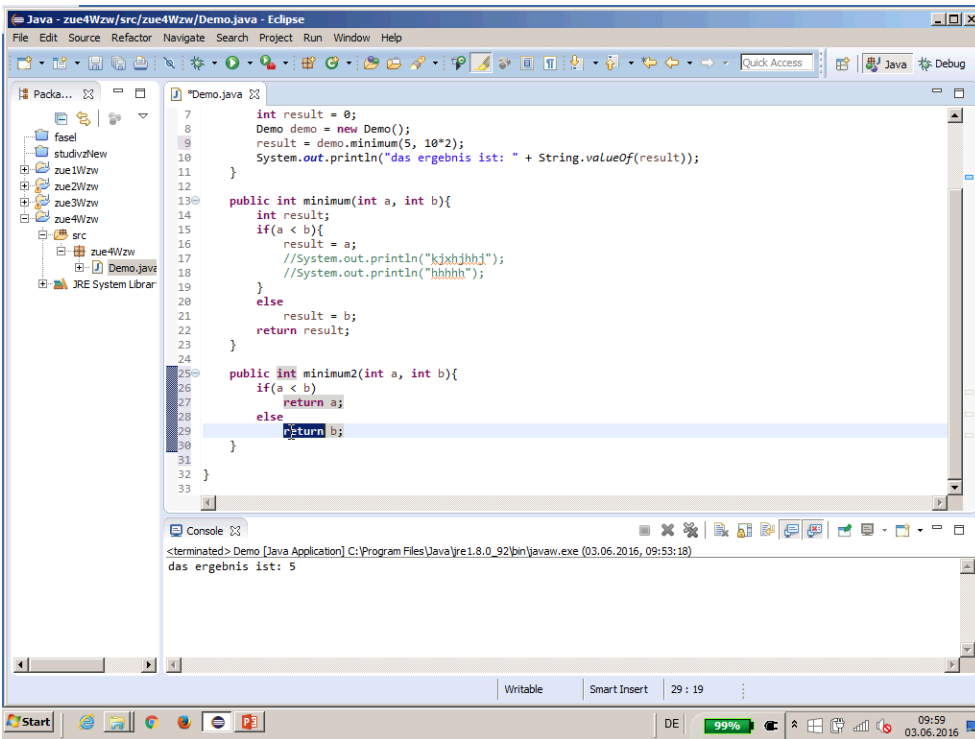










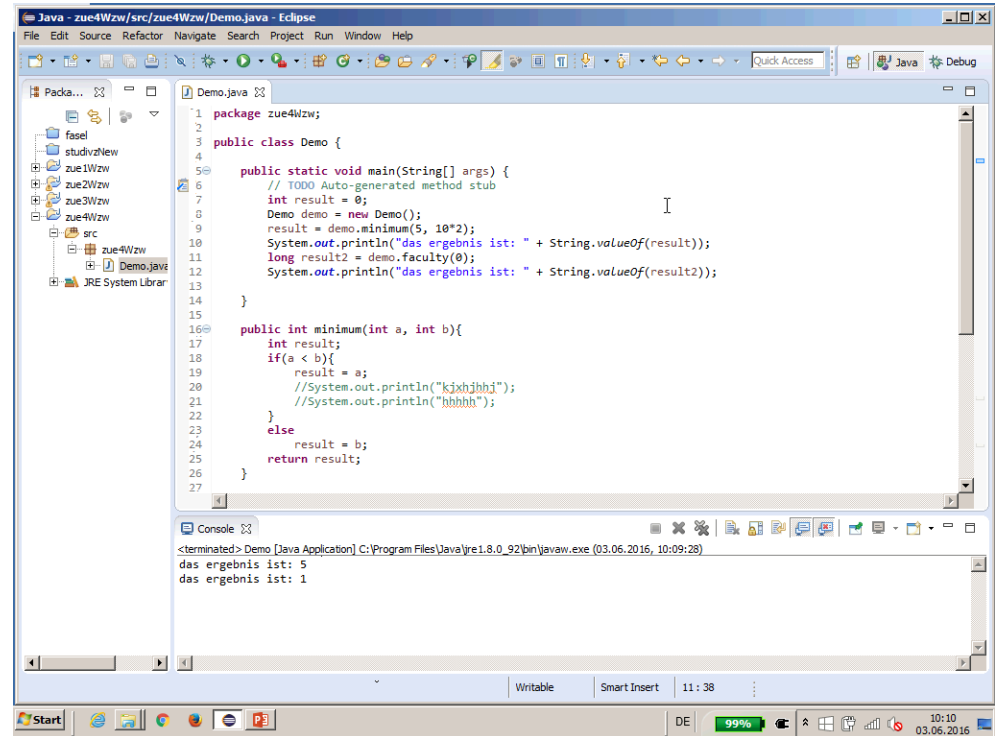
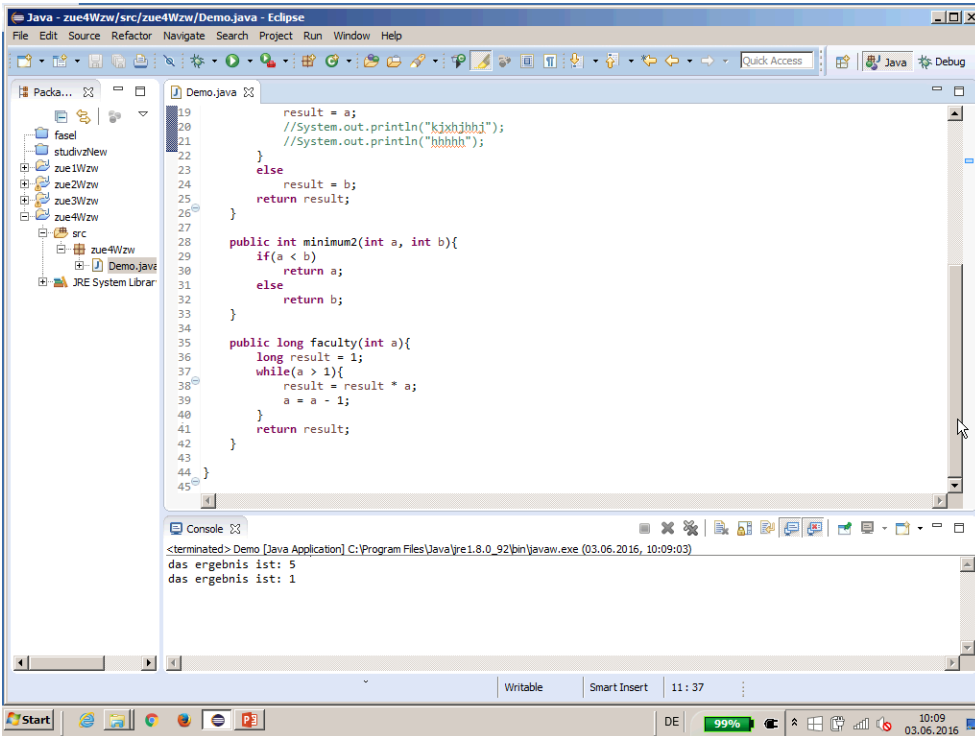
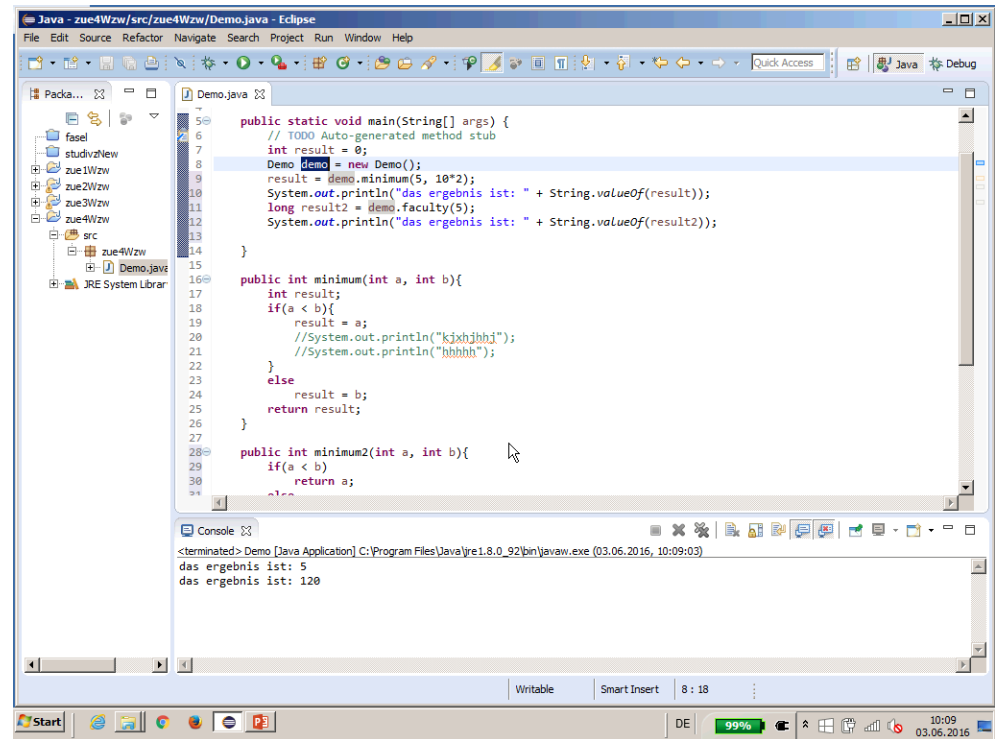
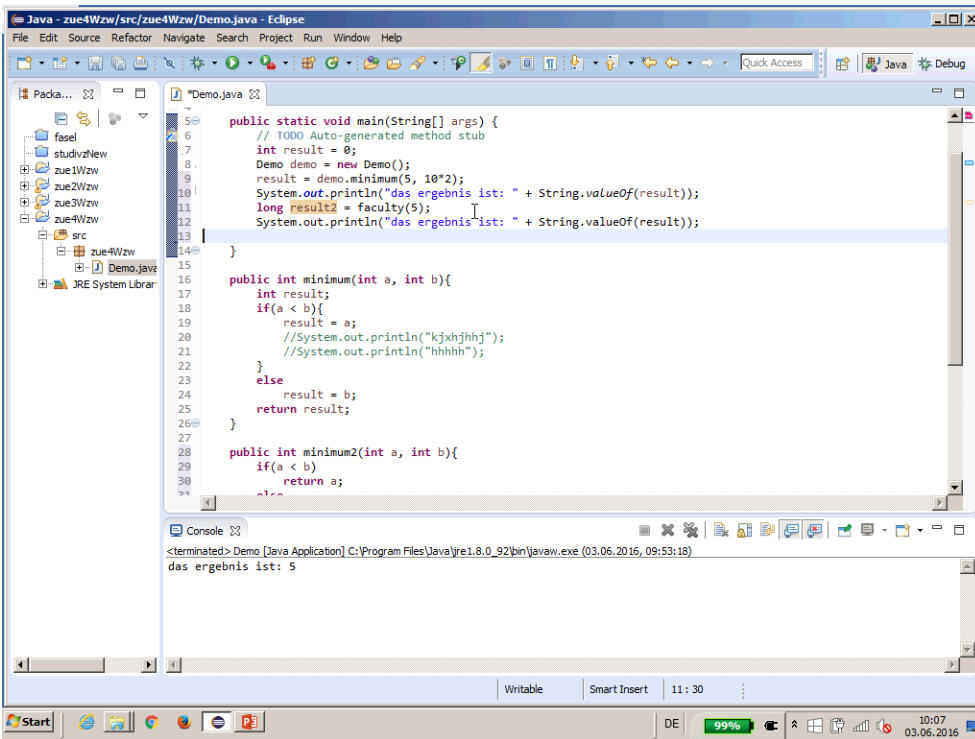


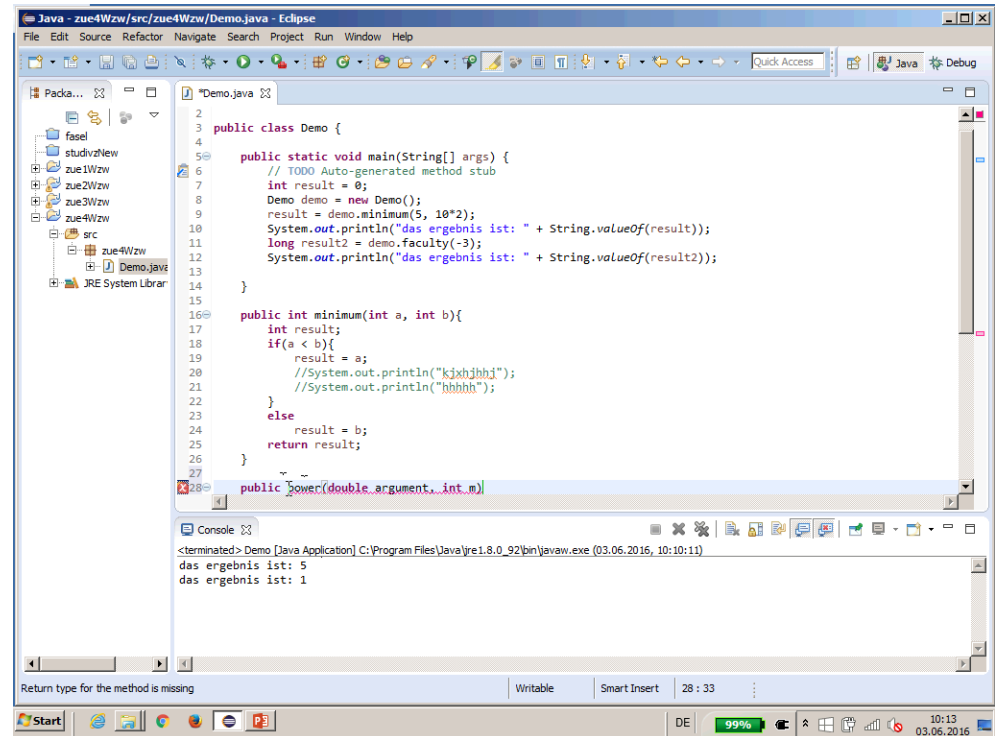
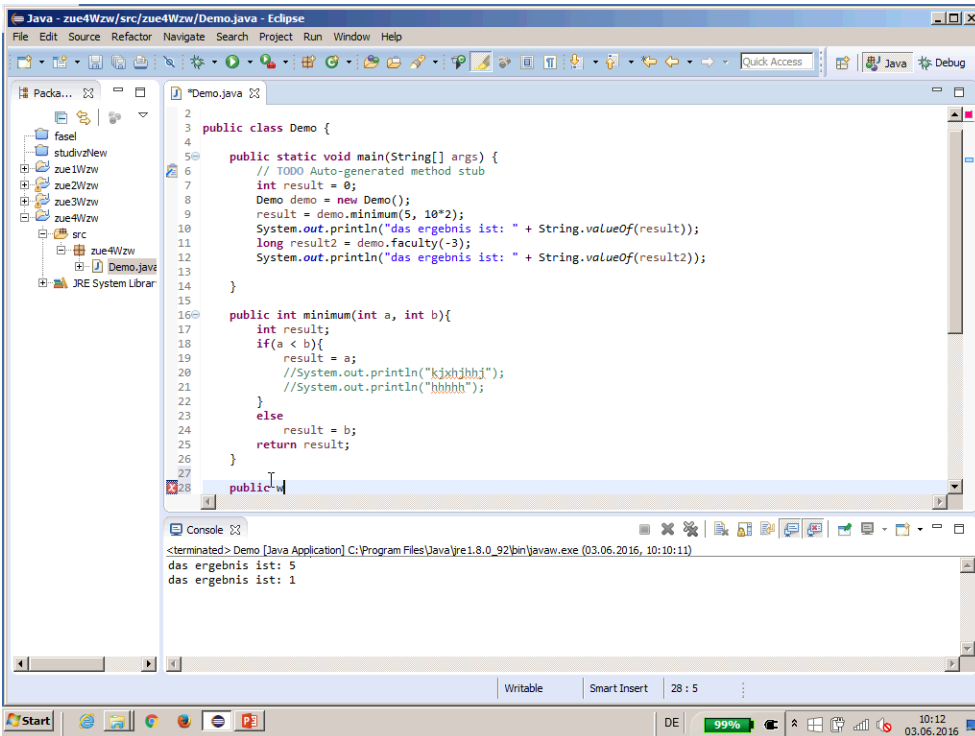
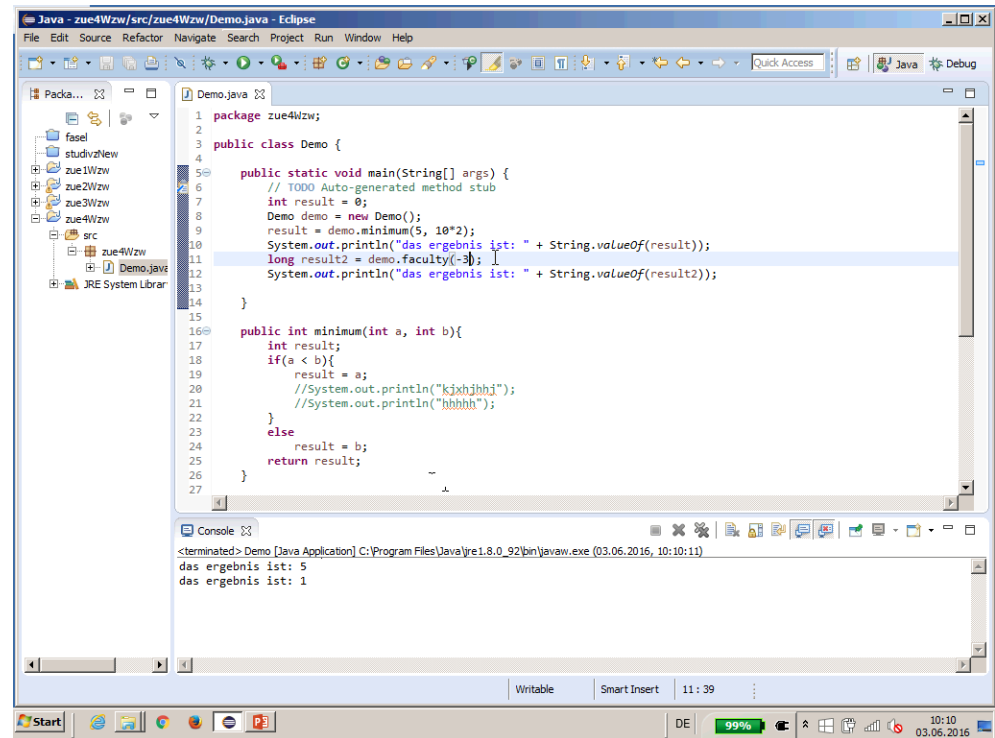
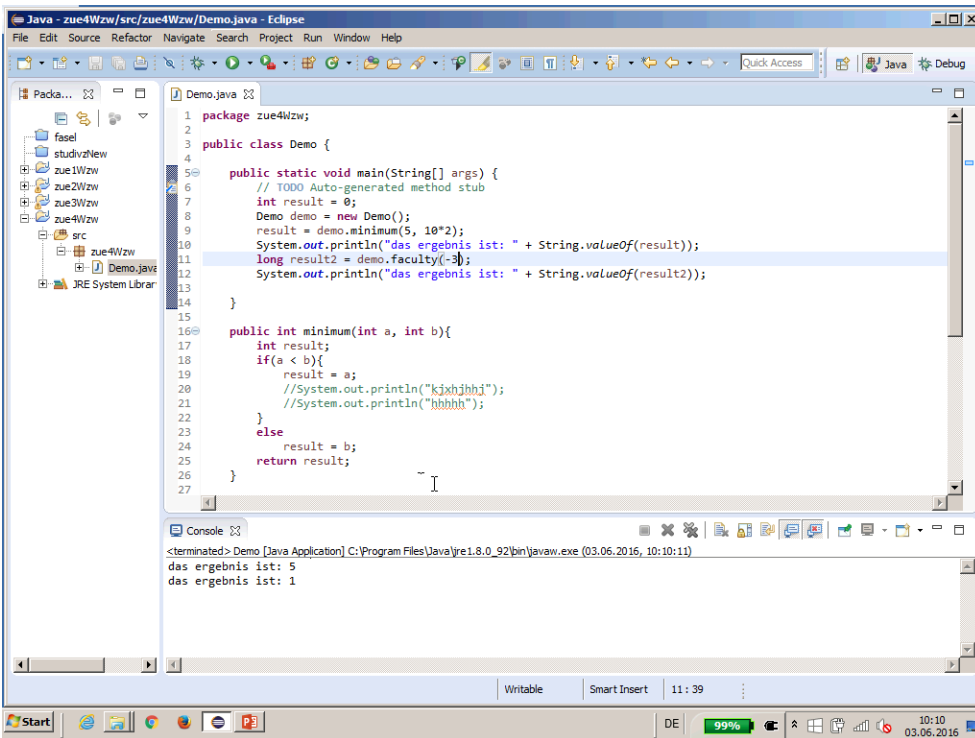
```
Java - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Packa... Demo.java
12
13     if(a < b){
14         result = a;
15         //System.out.println("kjxhjhhj");
16         //System.out.println("hhhhh");
17     }
18     else
19         result = b;
20     return result;
21
22     public int minimum2(int a, int b){
23         if(a < b)
24             return a;
25         else
26             return b;
27     }
28
29     public long fakultatet(int a){
30         long result = 1;
31         while(a > 1){
32             result = result * a;
33             a = a - 1;
34         }
35     }
36
37
38
Console
<terminated> Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 09:53:18)
das ergebnis ist: 5
Writeable Smart Insert 35 : 32
```

```
Java - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Packa... Demo.java
4
5     public static void main(String[] args) {
6         // TODO Auto-generated method stub
7         int result = 0;
8         Demo demo = new Demo();
9         result = demo.minimum(5, 10*2);
10        System.out.println("das ergebnis ist: " + String.valueOf(result));
11    }
12
13    public int minimum(int a, int b){
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15        if(a < b){
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17            //System.out.println("kjxhjhhj");
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28        else
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30    }
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Console
<terminated> Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 09:53:18)
das ergebnis ist: 5
Writeable Smart Insert 38 : 23
```

```
Java - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Packa... Demo.java
11     long result 2 = fakultaet;
12
13
14     public int minimum(int a, int b){
15         int result;
16         if(a < b){
17             result = a;
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35         while(a > 1){
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37             a = a - 1;
38         }
39     }
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<terminated> Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 09:53:18)
das ergebnis ist: 5
Writeable Smart Insert 11 : 9
```

```
Java - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Packa... Demo.java
10     public static void main(String[] args) {
11         // TODO Auto-generated method stub
12         int result = 0;
13         Demo demo = new Demo();
14         result = demo.minimum(5, 10*2);
15         System.out.println("das ergebnis ist: " + String.valueOf(result));
16         long result 2 = fakultaet;
17     }
18
19     public int minimum(int a, int b){
20         int result;
21         if(a < b){
22             result = a;
23             //System.out.println("kjxhjhhj");
24             //System.out.println("hhhhh");
25         }
26         else
27             result = b;
28         return result;
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Console
<terminated> Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 09:53:18)
das ergebnis ist: 5
Writeable Smart Insert 11 : 9
```





```
14 }
15
16 public int minimum(int a, int b){
17     int result;
18     if(a < b){
19         result = a;
20         //System.out.println("kjxhjhhj");
21         //System.out.println("hhhhhh");
22     }
23     else
24         result = b;
25     return result;
26 }
27
28 public double power(double argument, int m)
29
30 public int minimum2(int a, int b){
31     if(a < b)
32         return a;
33     else
34         return b;
35 }
36
37 public long faculty(int a){
38     long result = 1;
39     while(a > 1){
40         result = result * a;
```

Console
<terminated> Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:10:11)
das ergebnis ist: 5
das ergebnis ist: 1

```
14 }
15
16 public int minimum(int a, int b){
17     int result;
18     if(a < b){
19         result = a;
20         //System.out.println("kjxhjhhj");
21         //System.out.println("hhhhhh");
22     }
23     else
24         result = b;
25     return result;
26 }
27
28 public double power(double argument, int m){
29     double result = 1;
30 }
31
32
33 public int minimum2(int a, int b){
34     if(a < b)
35         return a;
36     else
37         return b;
38 }
39
40 public long faculty(int a){
```

Console
<terminated> Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:10:11)
das ergebnis ist: 5
das ergebnis ist: 1

```
14 }
15
16 public int minimum(int a, int b){
17     int result;
18     if(a < b){
19         result = a;
20         //System.out.println("kjxhjhhj");
21         //System.out.println("hhhhhh");
22     }
23     else
24         result = b;
25     return result;
26 }
27
28 public double power(double argument, int m){
29     double result = 1;
30     for(int i=1; i<=m; i++){
31         result = result * argument;
32     }
33 }
34
35 public int minimum2(int a, int b){
36     if(a < b)
37         return a;
38     else
39         return b;
40 }
```

Console
<terminated> Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:10:11)
das ergebnis ist: 5
das ergebnis ist: 1

```
14 }
15
16 public int minimum(int a, int b){
17     int result;
18     if(a < b){
19         result = a;
20         //System.out.println("kjxhjhhj");
21         //System.out.println("hhhhhh");
22     }
23     else
24         result = b;
25     return result;
26 }
27
28 public double power(double argument, int m){
29     double result = 1;
30     for(int i=0; i<=m; i++){
31         result = result * argument;
32     }
33     return result;
34 }
35
36 public int minimum2(int a, int b){
37     if(a < b)
38         return a;
39     else
40         return b;
```

Console
<terminated> Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:10:11)
das ergebnis ist: 5
das ergebnis ist: 1

```
1 package zue4Wzw;
2
3 public class Demo {
4
5     public static void main(String[] args) {
6         // TODO Auto-generated method stub
7         int result = 0;
8         Demo demo = new Demo();
9         result = demo.minimum(5, 10*2);
10        System.out.println("das ergebnis ist: " + String.valueOf(result));
11        //long result2 = demo.faculty(-3);
12        System.out.println("das ergebnis ist: " + String.valueOf(result2));
13    }
14
15    public int minimum(int a, int b){
16        int result;
17        if(a < b){
18            result = a;
19            //System.out.println("kjxhjhhj");
20            //System.out.println("hhhhh");
21        }
22        else
23            result = b;
24        return result;
25    }
26
27 }
```

Console: <terminated> Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:10:11)
das ergebnis ist: 5
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```
1 package zue4Wzw;
2
3 public class Demo {
4
5     public static void main(String[] args) {
6         // TODO Auto-generated method stub
7         int result = 0;
8         Demo demo = new Demo();
9         result = demo.minimum(5, 10*2);
10        System.out.println("das ergebnis ist: " + String.valueOf(result));
11        //long result2 = demo.faculty(-3);
12        double result2 = demo.power(2.0d, 3);
13        System.out.println("das ergebnis ist: " + String.valueOf(result2));
14    }
15
16    public int minimum(int a, int b){
17        int result;
18        if(a < b){
19            result = a;
20            //System.out.println("kjxhjhhj");
21            //System.out.println("hhhhh");
22        }
23        else
24            result = b;
25        return result;
26    }
27 }
```

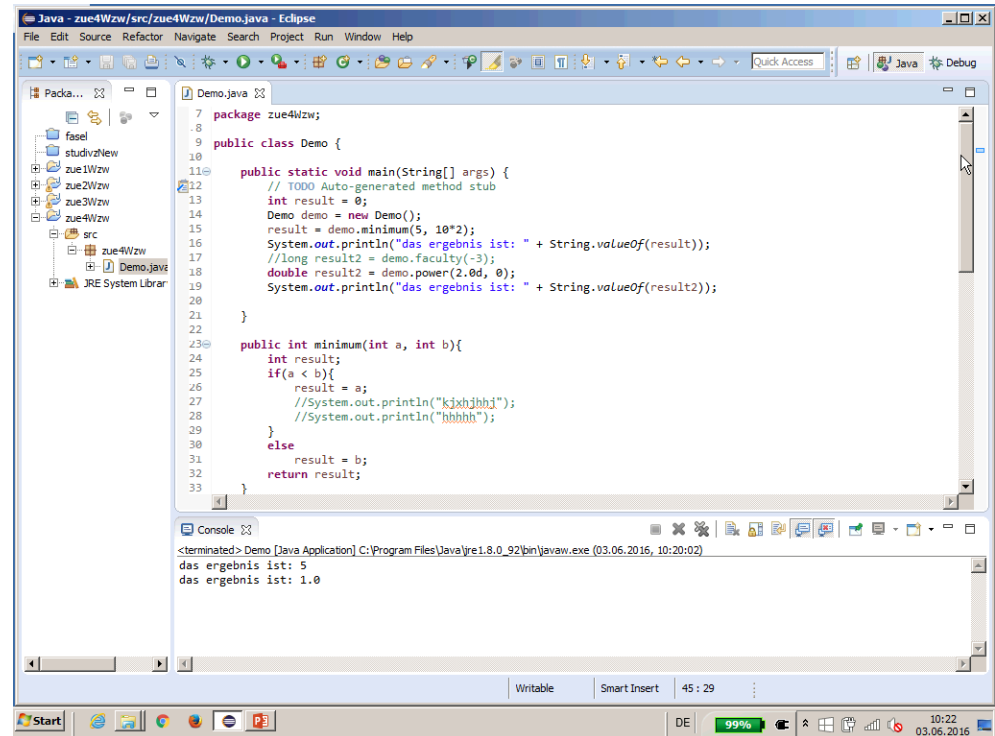
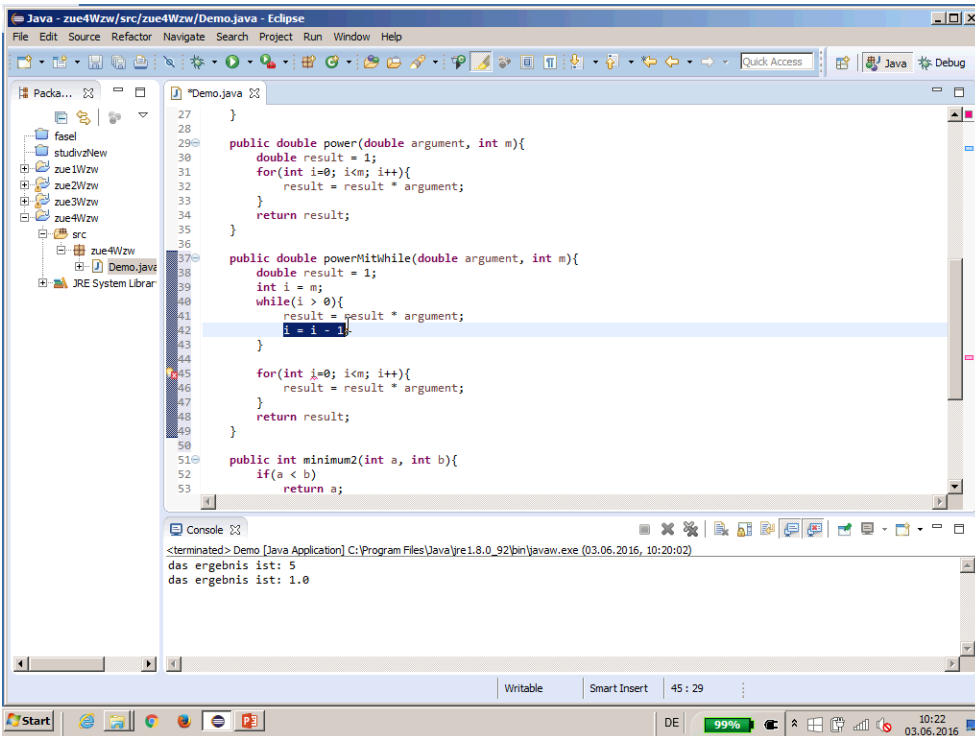
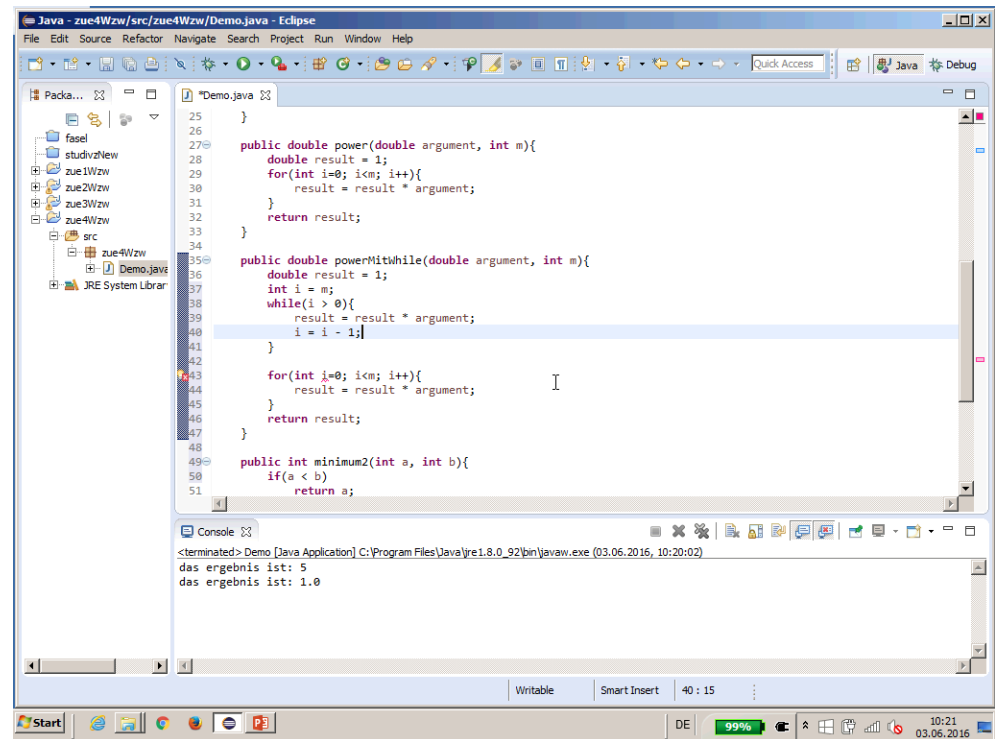
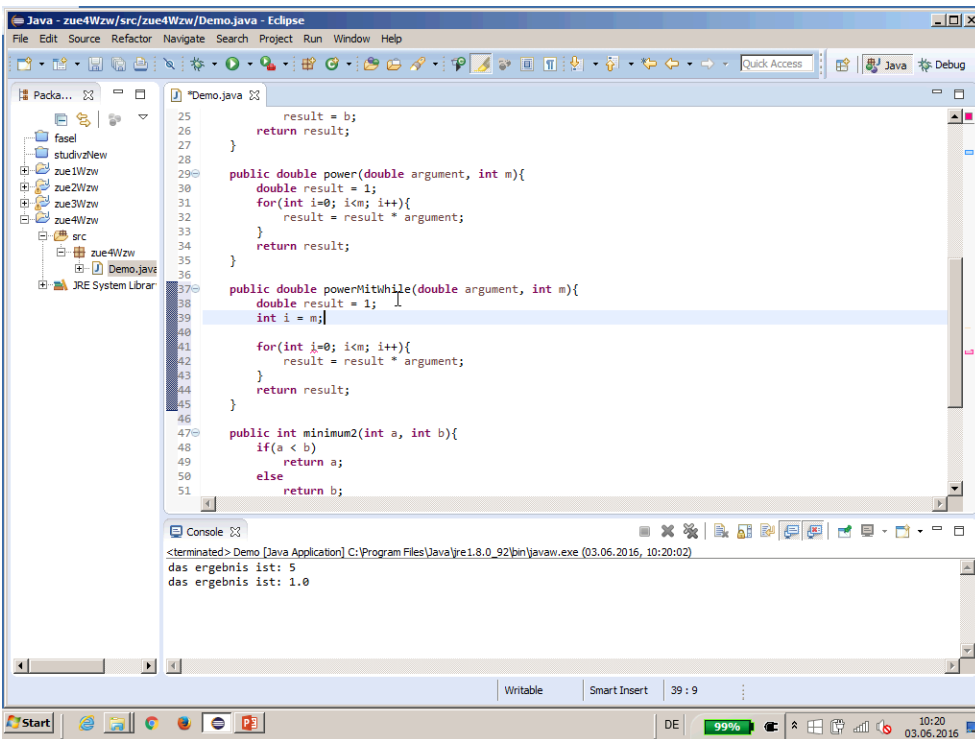
Console: <terminated> Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:19:44)
das ergebnis ist: 5
das ergebnis ist: 8.0

```
25         result = b;
26         return result;
27     }
28
29     public double power(double argument, int m){
30         double result = 1;
31         for(int i=0; i<m; i++){
32             result = result * argument;
33         }
34         return result;
35     }
36
37     public double powerMitWhile(double argument, int m){
38         double result = 1;
39
40         for(int i=0; i<m; i++){
41             result = result * argument;
42         }
43         return result;
44     }
45
46     public int minimum2(int a, int b){
47         if(a < b)
48             return a;
49         else
50             return b;
51     }
```

Console: <terminated> Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:20:02)
das ergebnis ist: 5
das ergebnis ist: 1.0

```
25         result = b;
26         return result;
27     }
28
29     public double power(double argument, int m){
30         double result = 1;
31         for(int i=0; i<m; i++){
32             result = result * argument;
33         }
34         return result;
35     }
36
37     public double powerMitWhile(double argument, int m){
38         double result = 1;
39
40         for(int i=0; i<m; i++){
41             result = result * argument;
42         }
43         return result;
44     }
45
46     public int minimum2(int a, int b){
47         if(a < b)
48             return a;
49         else
50             return b;
51     }
```

Console: <terminated> Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:20:02)
das ergebnis ist: 5
das ergebnis ist: 1.0



```

Java - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Packa... Demo.java
1 package zue4Wzw;
2
3 public class Demo {
4
5     public static void main(String[] args) {
6         // TODO Auto-generated method stub
7         int result = 0;
8         Demo demo = new Demo();
9         result = demo.minimum(5, 10*2);
10        System.out.println("das ergebnis ist: " + String.valueOf(result));
11        //long result2 = demo.faculty(-3);
12        double result2 = demo.powerMitWhile(2.0d, 3);
13        System.out.println("das ergebnis ist: " + String.valueOf(result2));
14    }
15
16
17    public int minimum(int a, int b){
18        int result;
19        if(a < b){
20            result = a;
21            //System.out.println("kjxhjhhj");
22            //System.out.println("hhhhh");
23        }
24        else
25            result = b;
26        return result;
27    }
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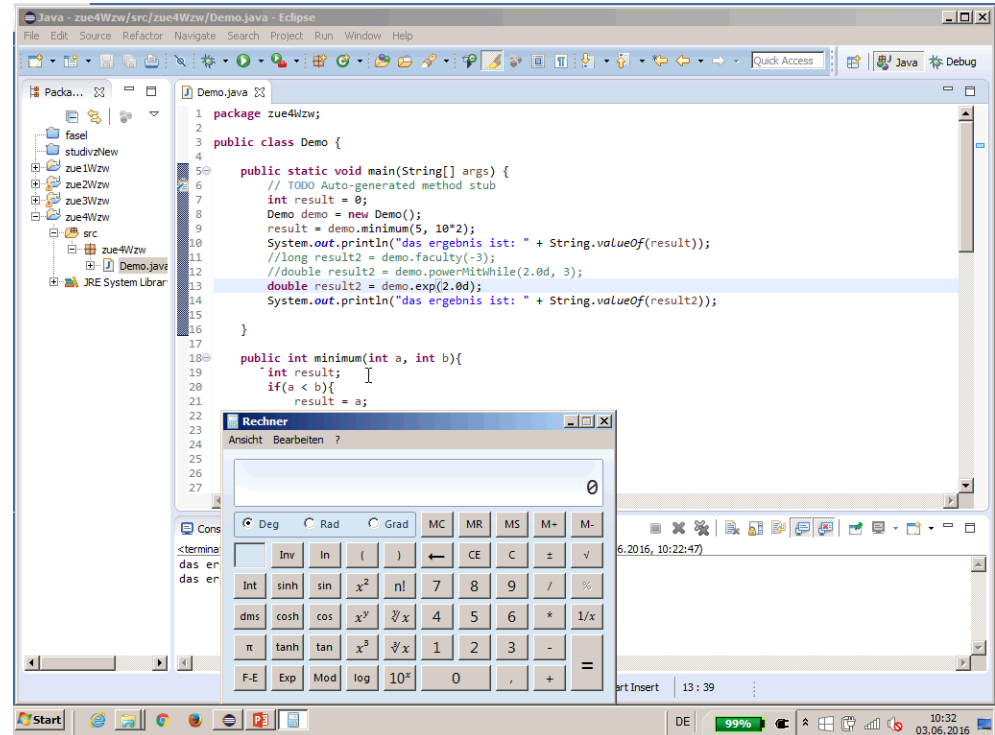
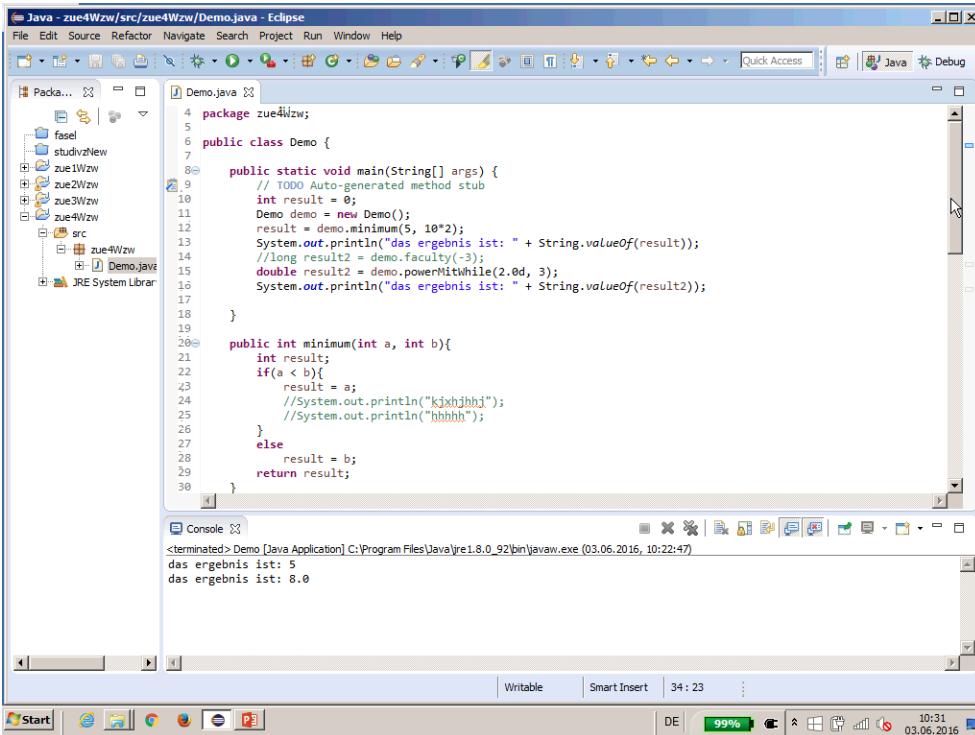
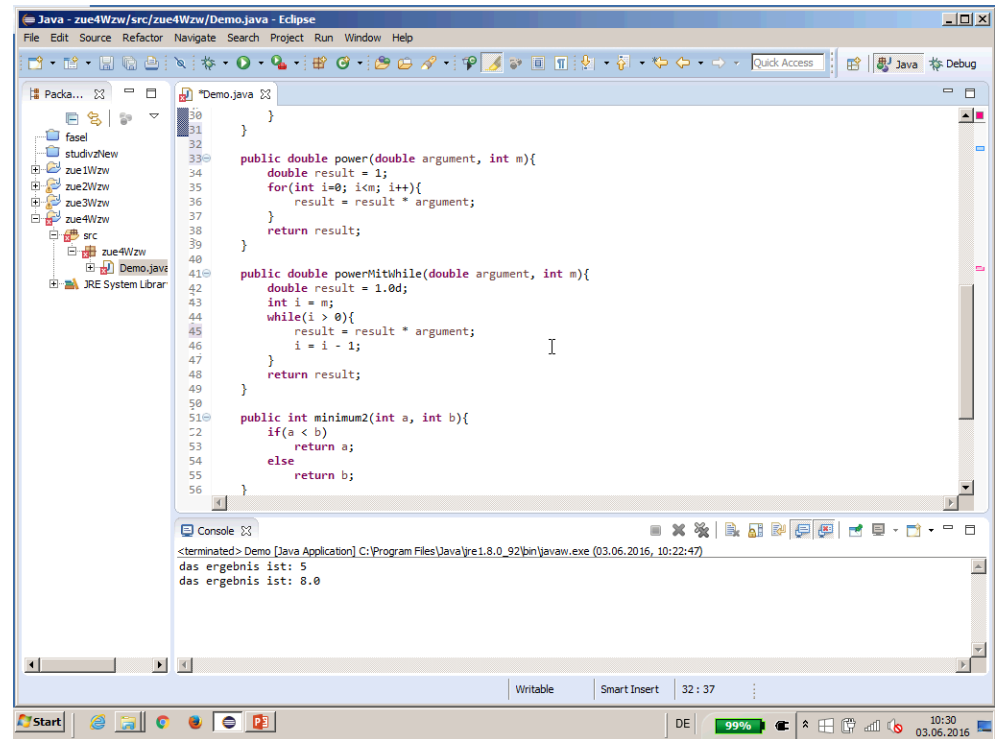
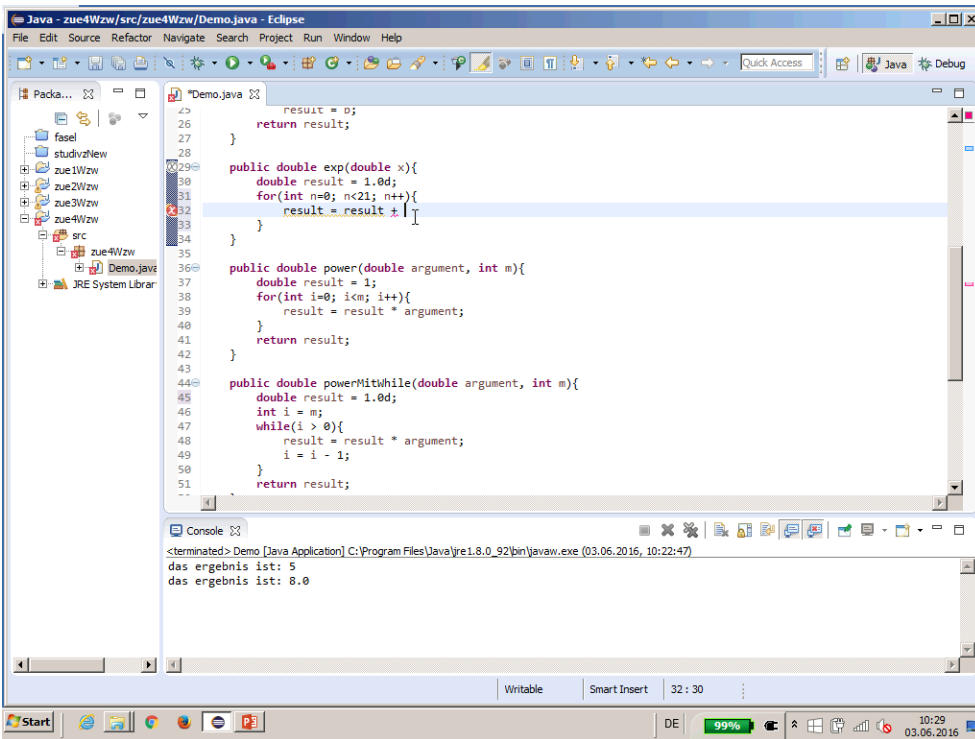


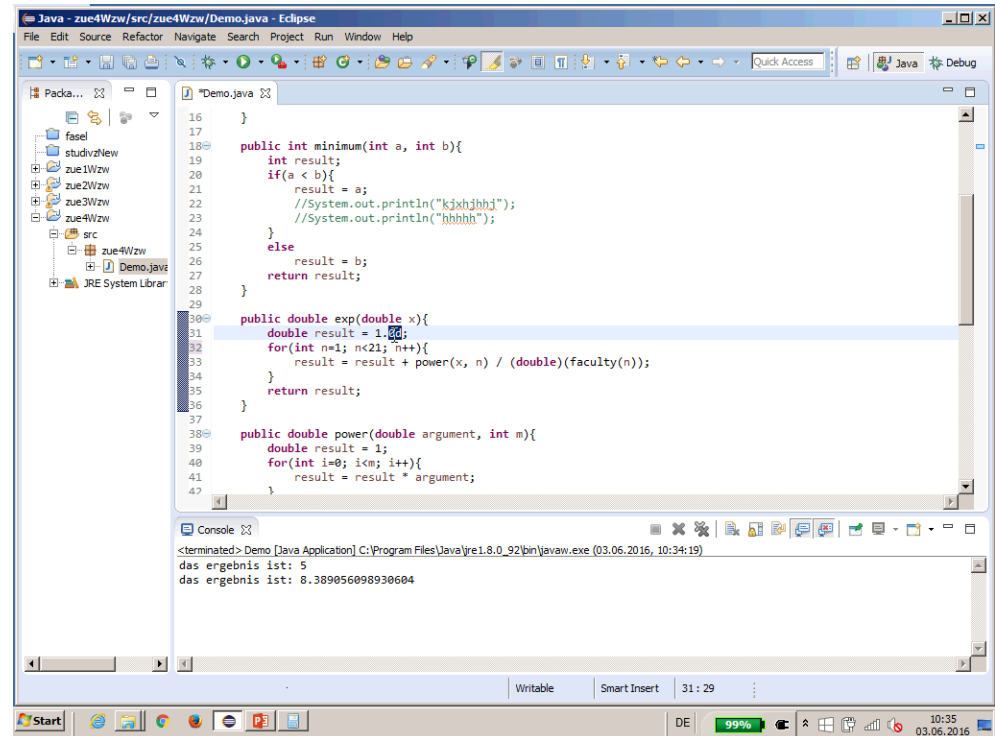
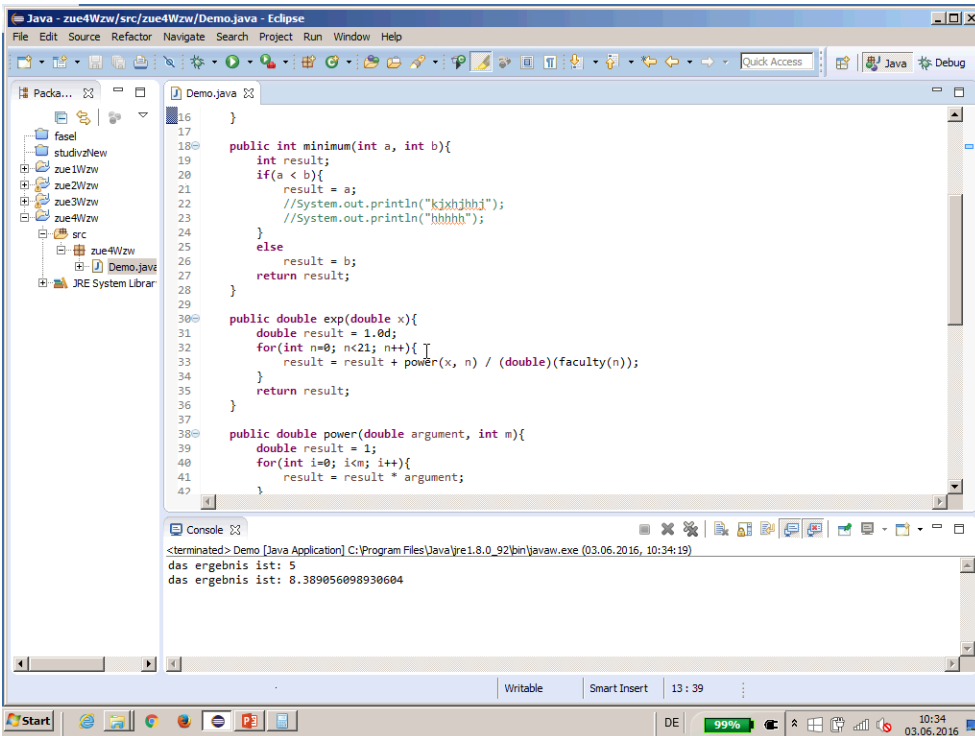
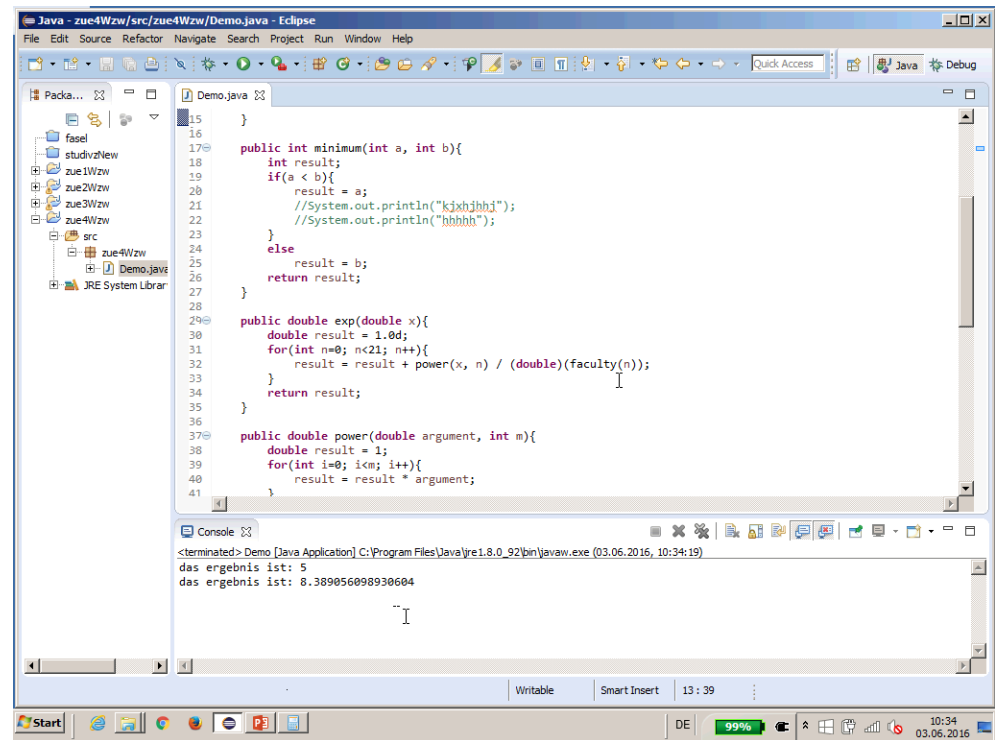
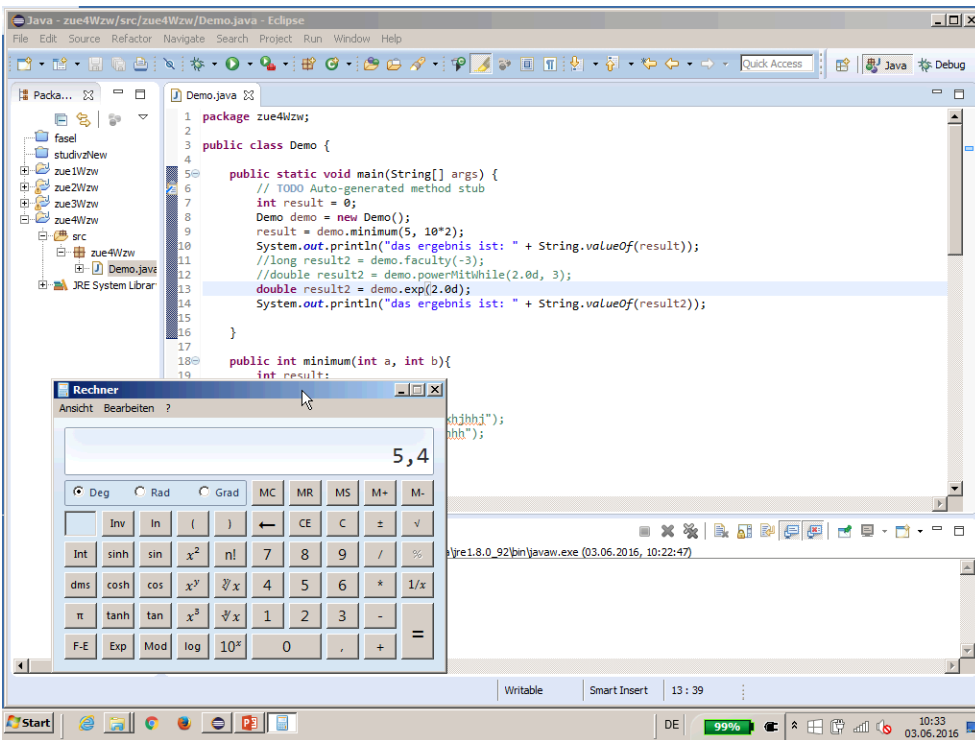
```
Java - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Packa...
src
  zue4Wzw
    Demo.java
  JRE System Librar
Demo.java
  26 result = 0;
  27 return result;
  28 }
  29 public double exp(double x){
  30 double result = 1.0d;
  31 }
  32 }
  33 public double power(double argument, int m){
  34 double result = 1;
  35 for(int i=0; i<m; i++){
  36 result = result * argument;
  37 }
  38 return result;
  39 }
  40 }
  41 public double powerMitWhile(double argument, int m){
  42 double result = (double)1;
  43 int i = m;
  44 while(i > 0){
  45 result = result * argument;
  46 i = i - 1;
  47 }
  48 return result;
  49 }
  50 }
  51 public int minimum2(int a, int b){
  52 }
  53 }
Console
<terminated> Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:22:47)
das ergebnis ist: 5
das ergebnis ist: 8.0
Writeable Smart Insert 42 : 26
```

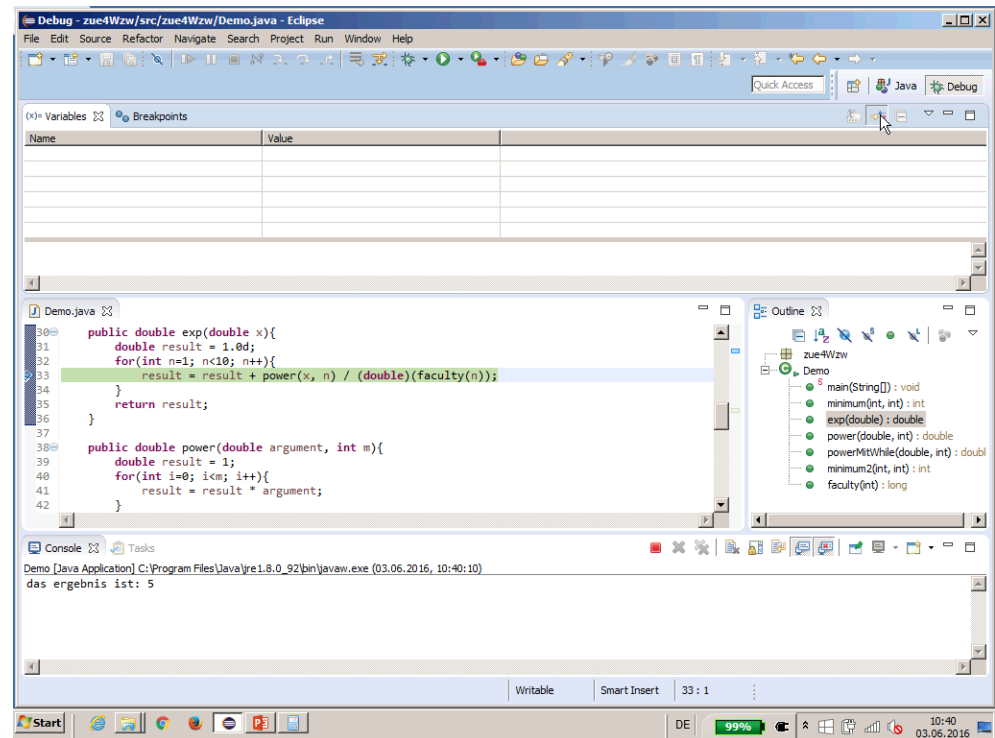
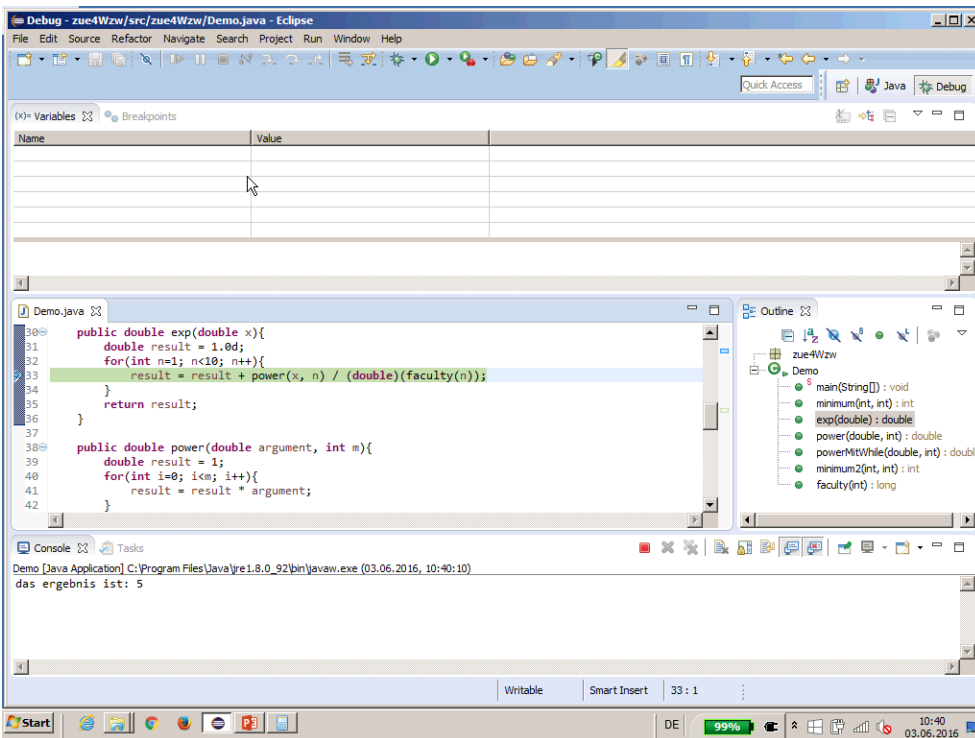
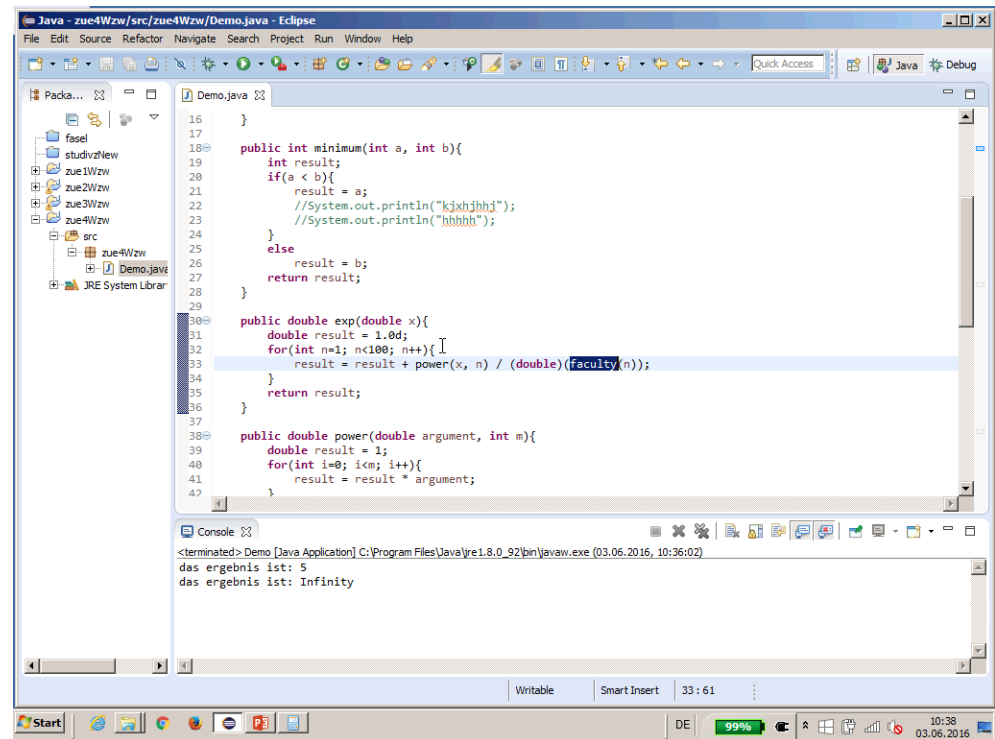
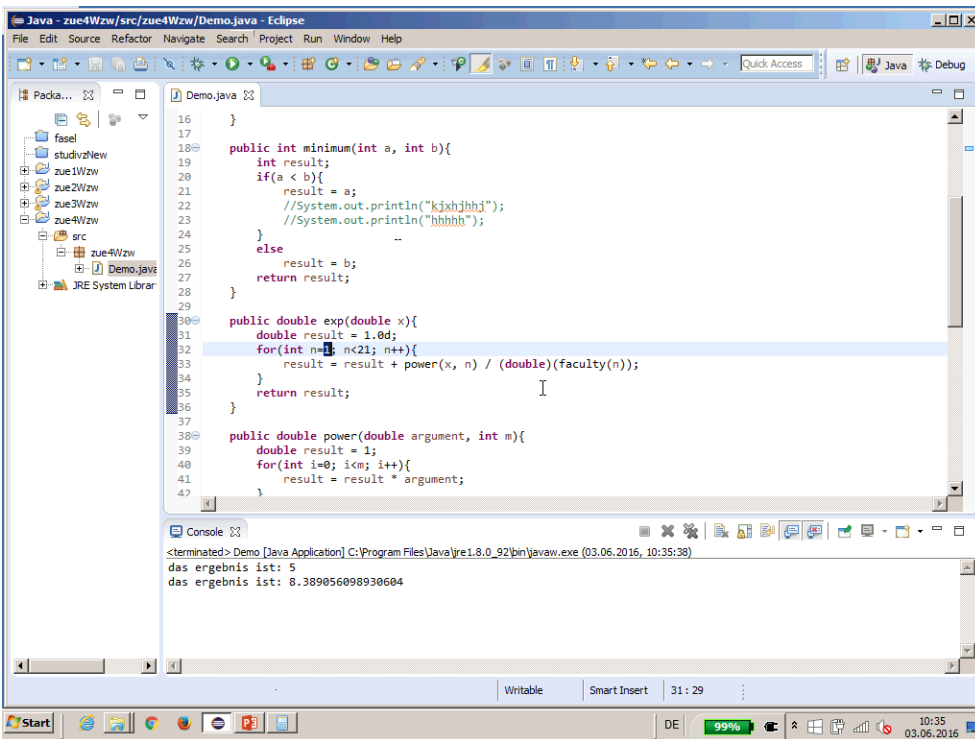
```
Java - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Packa...
src
  zue4Wzw
    Demo.java
  JRE System Librar
Demo.java
  26 result = 0;
  27 return result;
  28 }
  29 public double exp(double x){
  30 double result = 1.0d;
  31 }
  32 }
  33 public double power(double argument, int m){
  34 double result = 1;
  35 for(int i=0; i<m; i++){
  36 result = result * argument;
  37 }
  38 return result;
  39 }
  40 }
  41 public double powerMitWhile(double argument, int m){
  42 double result = 1.0d;
  43 int i = m;
  44 while(i > 0){
  45 result = result * argument;
  46 i = i - 1;
  47 }
  48 return result;
  49 }
  50 }
  51 public int minimum2(int a, int b){
  52 }
  53 }
Console
<terminated> Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:22:47)
das ergebnis ist: 5
das ergebnis ist: 8.0
Writeable Smart Insert 42 : 34
```

```
Java - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Packa...
src
  zue4Wzw
    Demo.java
  JRE System Librar
Demo.java
  26 result = 0;
  27 return result;
  28 }
  29 public double exp(double x){
  30 double result = 1.0d;
  31 for(int i=0; i<21; i++){
  32 }
  33 }
  34 }
  35 public double power(double argument, int m){
  36 double result = 1;
  37 for(int i=0; i<m; i++){
  38 result = result * argument;
  39 }
  40 return result;
  41 }
  42 }
  43 public double powerMitWhile(double argument, int m){
  44 double result = 1.0d;
  45 int i = m;
  46 while(i > 0){
  47 result = result * argument;
  48 i = i - 1;
  49 }
  50 return result;
  51 }
  52 }
  53 public int minimum2(int a, int b){
  54 }
  55 }
Console
<terminated> Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:22:47)
das ergebnis ist: 5
das ergebnis ist: 8.0
Writeable Smart Insert 31 : 12
```

```
Java - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Packa...
src
  zue4Wzw
    Demo.java
  JRE System Librar
Demo.java
  26 result = 0;
  27 return result;
  28 }
  29 public double exp(double x){
  30 double result = 1.0d;
  31 for(int i=0; i<21; i++){
  32 result = result +
  33 }
  34 }
  35 }
  36 public double power(double argument, int m){
  37 double result = 1;
  38 for(int i=0; i<m; i++){
  39 result = result * argument;
  40 }
  41 return result;
  42 }
  43 }
  44 public double powerMitWhile(double argument, int m){
  45 double result = 1.0d;
  46 int i = m;
  47 while(i > 0){
  48 result = result * argument;
  49 i = i - 1;
  50 }
  51 return result;
  52 }
  53 }
  54 public int minimum2(int a, int b){
  55 }
  56 }
Console
<terminated> Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:22:47)
das ergebnis ist: 5
das ergebnis ist: 8.0
Writeable Smart Insert 32 : 30
```







Debug - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse

File Edit Source Refactor Navigate Search Project Run Window Help

Quick Access Java Debug

Debug

Demo [Java Application]

- zue4Wzw.Demo at localhost:49387
 - Thread [main] (Suspended (breakpoint at line 33 in Demo))
 - Demo.exp(double) line: 33
 - Demo.main(String[]) line: 13

C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)

Variables

Name	Value
this	Demo (d=16)
x	2.0
result	1.0
n	1

Demo.java

```

11 //long result2 = demo.faculty(-3);
12 //double result2 = demo.powerMitWhile(2.0d, 3);
13 double result2 = demo.exp(2.0d);
14 System.out.println("das ergebnis ist: " + String.valueOf(result2));
15
16 }
17
18 public int minimum(int a, int b){
19     int result;
20     if(a < b){
21         result = a;
22         //System.out.println("kjxjhj");
23         //System.out.println("hhhh");

```

Console

Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)

das ergebnis ist: 5

Start DE 99% 10:40 03.06.2016

Debug - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse

File Edit Source Refactor Navigate Search Project Run Window Help

Quick Access Java Debug

Debug

Demo [Java Application]

- zue4Wzw.Demo at localhost:49387
 - Thread [main] (Suspended (breakpoint at line 33 in Demo))
 - Demo.exp(double) line: 33
 - Demo.main(String[]) line: 13

C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)

Variables

Name	Value
this	Demo (d=16)
x	2.0
result	1.0
n	1

Demo.java

```

3 public class Demo {
4
5     public static void main(String[] args) {
6         // TODO Auto-generated method stub
7         int result = 0;
8         Demo demo = new Demo();
9         result = demo.minimum(5, 10*2);
10        System.out.println("das ergebnis ist: " + String.valueOf(result));
11        //long result2 = demo.faculty(-3);
12        //double result2 = demo.powerMitWhile(2.0d, 3);
13        double result2 = demo.exp(2.0d);
14        System.out.println("das ergebnis ist: " + String.valueOf(result2));
15    }

```

Console

Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)

das ergebnis ist: 5

Start DE 99% 10:40 03.06.2016

Debug - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse

File Edit Source Refactor Navigate Search Project Run Window Help

Quick Access Java Debug

Debug

Demo [Java Application]

- zue4Wzw.Demo at localhost:49387
 - Thread [main] (Suspended (breakpoint at line 33 in Demo))
 - Demo.exp(double) line: 33
 - Demo.main(String[]) line: 13

C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)

Variables

Name	Value
this	Demo (d=16)
x	2.0
result	1.0
n	1

Demo.java

```

28 }
29
30 public double exp(double x){
31     double result = 1.0d;
32     for(int n=1; n<10; n++){
33         result = result + power(x, n) / (double)(faculty(n));
34     }
35     return result;
36 }
37
38 public double power(double argument, int m){
39     double result = 1;
40     for(int i=0; i<m; i++){

```

Console

Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)

das ergebnis ist: 5

Start DE 99% 10:41 03.06.2016

Debug - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse

File Edit Source Refactor Navigate Search Project Run Window Help

Quick Access Java Debug

Debug

Demo [Java Application]

- zue4Wzw.Demo at localhost:49387
 - Thread [main] (Suspended (breakpoint at line 33 in Demo))
 - Demo.exp(double) line: 33
 - Demo.main(String[]) line: 13

C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)

Variables

Name	Value
this	Demo (d=16)
x	2.0
result	3.0
n	2

Demo.java

```

28 }
29
30 public double exp(double x){
31     double result = 1.0d;
32     for(int n=1; n<10; n++){
33         result = result + power(x, n) / (double)(faculty(n));
34     }
35     return result;
36 }
37
38 public double power(double argument, int m){
39     double result = 1;
40     for(int i=0; i<m; i++){

```

Console

Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)

das ergebnis ist: 5

Start DE 99% 10:41 03.06.2016

Debug - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse

File Edit Source Refactor Navigate Search Project Run Window Help

Quick Access Java Debug

Debug [Demo [Java Application]]

- zue4Wzw.Demo at localhost:49387
 - Thread [main] (Suspended)
 - Demo.power(double, int) line: 39
 - Demo.exp(double) line: 33
 - Demo.main(String[]) line: 13

C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)

Variables

Name	Value
this	Demo (d=16)
argument	2.0
m	2
result	2.0
i	0

```

34 }
35 return result;
36 }
37
38 public double power(double argument, int m){
39     double result = 1;
40     for(int i=0; i<m; i++){
41         result = result * argument;
42     }
43     return result;
44 }
45
46 public double powerMitwhile(double argument, int m){

```

Console

Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)
das ergebnis ist: 5

10:43 03.06.2016

Debug - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse

File Edit Source Refactor Navigate Search Project Run Window Help

Quick Access Java Debug

Debug [Demo [Java Application]]

- zue4Wzw.Demo at localhost:49387
 - Thread [main] (Suspended (breakpoint at line 33 in Demo))
 - Demo.exp(double) line: 33
 - Demo.main(String[]) line: 13

C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)

Variables

Name	Value
this	Demo (d=16)
x	2.0
result	5.0
n	2

```

29
30 public double exp(double x){
31     double result = 1.0d;
32     for(int n=1; n<10; n++){
33         result = result + power(x, n) / (double)(faculty(n));
34     }
35     return result;
36 }
37
38 public double power(double argument, int m){
39     double result = 1;
40     for(int i=0; i<m; i++){
41         result = result * argument;

```

Console

Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)
das ergebnis ist: 5

10:43 03.06.2016

Debug - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse

File Edit Source Refactor Navigate Search Project Run Window Help

Quick Access Java Debug

Debug [Demo [Java Application]]

- zue4Wzw.Demo at localhost:49387
 - Thread [main] (Suspended)
 - Demo.power(double, int) line: 39
 - Demo.exp(double) line: 33
 - Demo.main(String[]) line: 13

C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)

Variables

Name	Value
this	Demo (d=16)
argument	2.0
m	3

```

36 }
37
38 public double power(double argument, int m){
39     double result = 1;
40     for(int i=0; i<m; i++){
41         result = result * argument;
42     }
43     return result;
44 }
45
46 public double powerMitwhile(double argument, int m){
47     double result = 1.0d;
48     int i = m;

```

Console

Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)
das ergebnis ist: 5

10:43 03.06.2016

Debug - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse

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Quick Access Java Debug

Debug [Demo [Java Application]]

- zue4Wzw.Demo at localhost:49387
 - Thread [main] (Suspended)
 - Demo.power(double, int) line: 40
 - Demo.exp(double) line: 33
 - Demo.main(String[]) line: 13

C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)

Variables

Name	Value
this	Demo (d=16)
argument	2.0
m	3
result	8.0

```

36 }
37
38 public double power(double argument, int m){
39     double result = 1;
40     for(int i=0; i<m; i++){
41         result = result * argument;
42     }
43     return result;
44 }
45
46 public double powerMitwhile(double argument, int m){
47     double result = 1.0d;
48     int i = m;

```

Console

Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)
das ergebnis ist: 5

10:44 03.06.2016

Debug - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse

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Quick Access Java Debug

Debug

- Demo [Java Application]
 - zue4Wzw.Demo at localhost:49387
 - Thread [main] (Suspended)
 - Demo.faculty(int) line: 64
 - Demo.exp(double) line: 33
 - Demo.main(String[]) line: 13

C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)

Variables

Name	Value
this	Demo (d=16)
a	3

Demo.java

```

61 }
62 }
63 public long faculty(int a){
64     long result = 1;
65     while(a > 1){
66         result = result * a;
67         a = a - 1;
68     }
69     return result;
70 }
71 }
72 }
73 }
  
```

Console

Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)
das ergebnis ist: 5

Start DE 99% 10:44 03.06.2016

Debug - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse

File Edit Source Refactor Navigate Search Project Run Window Help

Quick Access Java Debug

Debug

- Demo [Java Application]
 - zue4Wzw.Demo at localhost:49387
 - Thread [main] (Suspended)
 - Demo.exp(double) line: 33
 - Demo.main(String[]) line: 13

C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)

Variables

Name	Value
this	Demo (d=16)
x	2.0
result	5.0
n	3

Demo.java

```

28 }
29 }
30 public double exp(double x){
31     double result = 1.0d;
32     for(int n=1; n<10; n++){
33         result = result + power(x, n) / (double)(faculty(n));
34     }
35     return result;
36 }
37 }
38 public double power(double argument, int m){
39     double result = 1;
40     for(int i=0; i<m; i++){
  
```

Console

Demo [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (03.06.2016, 10:40:44)
das ergebnis ist: 5

Start DE 99% 10:44 03.06.2016

Debug - zue4Wzw/src/zue4Wzw/Demo.java - Eclipse

File Edit Source Refactor Navigate Search Project Run Window Help

Quick Access Java Debug

Debug

- Demo [Java Application]
 - zue4Wzw.Demo at localhost:49387
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Variables

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```

Console

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Start DE 99% 10:44 03.06.2016