

Java Fundamentals

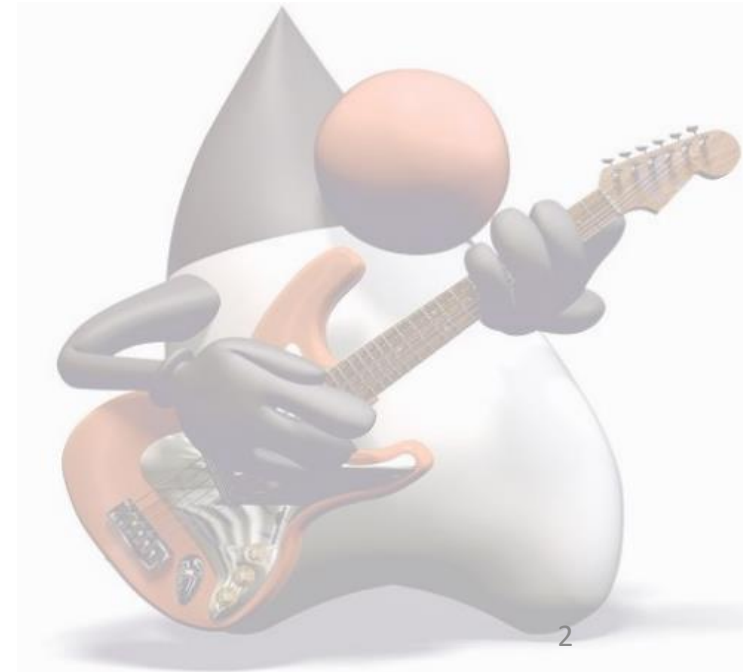
Numbers and Dates



Das Float Problem

```
public void theProblem(){  
    double d1 = 1586.6;  
    double d2 = 708.75;  
  
    System.out.println(d1 + " + " + d2 + " = " + (d1 + d2));  
    System.out.println(d1 + " - " + d2 + " = " + (d1 - d2));  
    System.out.println(d1 + " * " + d2 + " = " + (d1 * d2));  
    System.out.println(d1 + " / " + d2 + " = " + (d1 / d2));  
}
```

```
1586.6 + 708.75 = 2295.35  
1586.6 - 708.75 = 877.8499999999999  
1586.6 * 708.75 = 1124502.75  
1586.6 / 708.75 = 2.2385890652557316
```



Die Alternative: BigDecimal

```
public void solution(){
    BigDecimal bd1 = new BigDecimal("1586.60");
    BigDecimal bd2 = new BigDecimal("708.75");

    BigDecimal bdSubtract = bd1.subtract(bd2);
    //limit scale to 2 digits (else it would change to 4 digits)
    BigDecimal bdMultiply = bd1.multiply(bd2).setScale(2);
    //When dividing you have to define Rounding
    BigDecimal bdDevide = bd1.divide(bd2,RoundingMode.CEILING);
    BigDecimal bdAdd = bd1.add(bd2);

    System.out.println(bd1 + " + " + bd2 + " = " + bdAdd);
    System.out.println(bd1 + " - " + bd2 + " = " + bdSubtract);
    System.out.println(bd1 + " * " + bd2 + " = " + bdMultiply);
    System.out.println(bd1 + " / " + bd2 + " = " + bdDevide);
}
```

```
1586.60 + 708.75 = 2295.35
1586.60 - 708.75 = 877.85
1586.60 * 708.75 = 1124502.75
1586.60 / 708.75 = 2.24
```

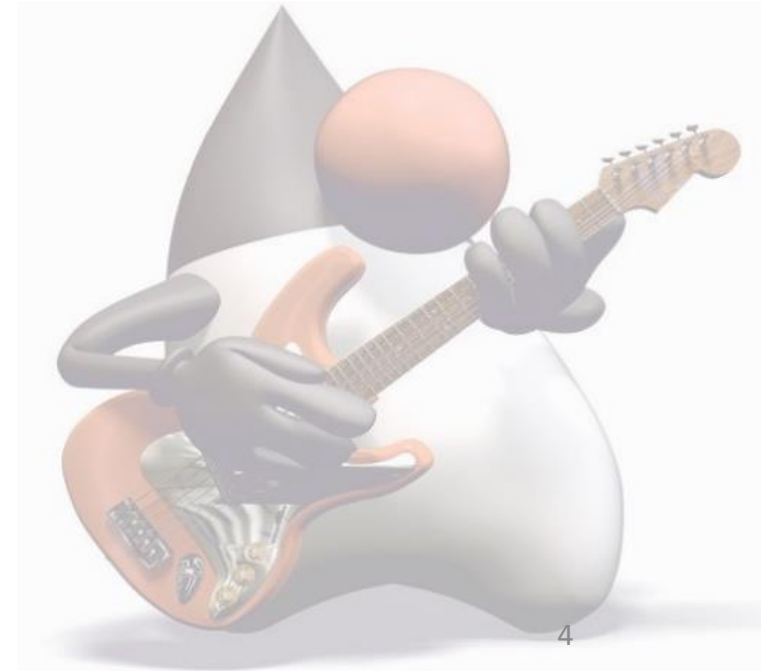


Date

```
public void dateDemo1(){  
    Date date = new Date();  
    System.out.println(date);  
    System.out.println("Milliseconds since 01st January 1970 00:00:00 " +  
                        date.getTime());  
}
```

current Date and time
(ms)

```
Thu Oct 06 06:44:14 CEST 2011  
Milliseconds since 01st January 1970 00:00:00:  
1317876254316
```



Konvertieren von Strings in Dates

```
public void dateDemo2() throws ParseException{  
    SimpleDateFormat format = new SimpleDateFormat("dd.MM.yyyy  
hh:mm");  
  
    Date date = format.parse("01.11.1969 06:35");  
    System.out.println(date);  
}
```

Ergebnis: Sat Nov 01 06:35:00 CET 1969

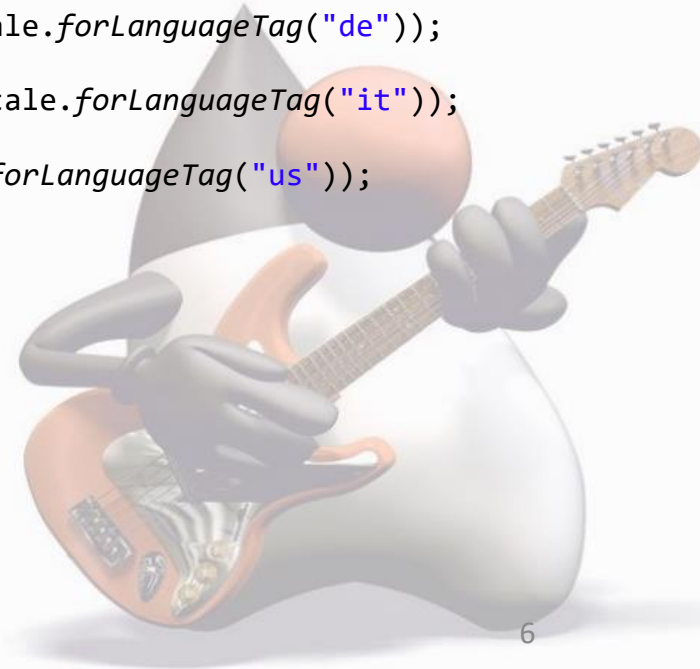


Konvertierung von Date zu String

```
public void dateDemo3() throws ParseException{
    SimpleDateFormat format = new SimpleDateFormat("dd.MM.yyyy hh:mm");
    Date date = format.parse("01.11.1969 06:35");

    //Format for the current Locale (operating system)
    DateFormat currentFormat = DateFormat.getDateInstance(DateFormat.SHORT, Locale.getDefault());
    //Slovak
    DateFormat slovakFormat = DateFormat.getDateInstance(DateFormat.SHORT, Locale.forLanguageTag("sk"));
    //German
    DateFormat germanFormat = DateFormat.getDateInstance(DateFormat.SHORT, Locale.forLanguageTag("de"));
    //Italian
    DateFormat italianFormat = DateFormat.getDateInstance(DateFormat.SHORT, Locale.forLanguageTag("it"));
    //Italian
    DateFormat usFormat = DateFormat.getDateInstance(DateFormat.SHORT, Locale.forLanguageTag("us"));

    System.out.println("Custom date: " + format.format(date));
    System.out.println("Default date: " + currentFormat.format(date));
    System.out.println("Slovak date:" + slovakFormat.format(date));
    System.out.println("German date:" + germanFormat.format(date));
    System.out.println("Italian date:" + italianFormat.format(date));
    System.out.println("US date:" + usFormat.format(date));
}
```



Datums Arithmetik

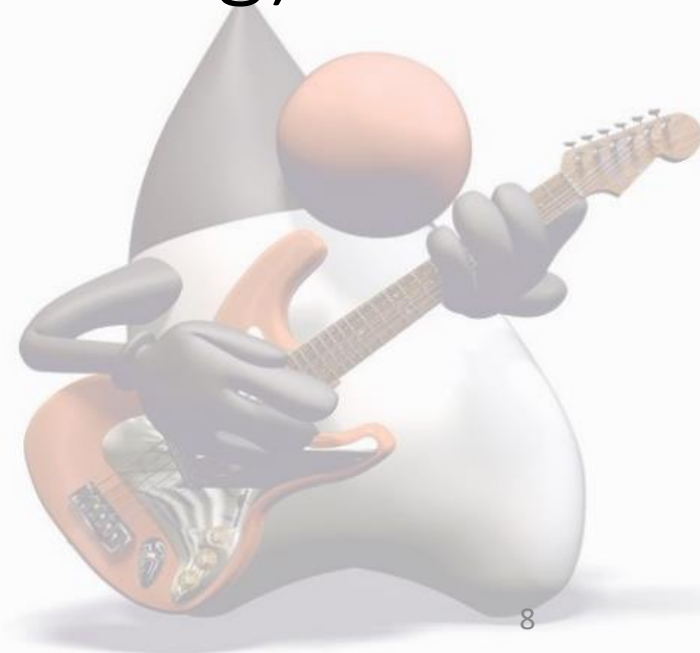
```
public void dateDemo4() throws ParseException{
    SimpleDateFormat format = new SimpleDateFormat("dd.MM.yyyy");
    Date date = format.parse("18.11.2007");
    Calendar cal = Calendar.getInstance(TimeZone.getTimeZone("GMT+01:00"));
    cal.setTime(date);
    cal.add(Calendar.DAY_OF_MONTH, 15);
    System.out.println(format.format(cal.getTime()));
}
```

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Seit Java 8 gibt es ein neues, sehr leistungsfähiges
DateTime API

(siehe Java 8 New Features dieser Schulung)



Übung 6

- Schreibe eine Klasse die
 1. Ein Datum von der Konsole liest
 2. Eine Tagesanzahl von der Konsole liest
 3. Subtrahiere die Tagesanzahl von diesem Datum
 4. Gib das Ergebnis aus

Hinweis: Versucht man eine negative Zahl einen Calendar zu addieren wird diese Tagesanzahl subtrahiert.

Ändern sie die Account Klasse so, dass sie statt einem Float einen BigDecimal verwendet.

