

Lecture 6

Java Internationalization

Part 2

Reference:

Java-Tutorials/tutorial-2015/index.html

- How to specify cultural symbols in properties file?
- How to create a compound message?

- Formatting Date and Time
- Specifying cultural symbols in properties files
- Compound Message
- Demonstrations

1-Formatting Date and Time

Sample Time Formats

Style	U.S. Locale	German Locale
DEFAULT	7:03:47 AM	7:03:47
SHORT	7:03 AM	07:03
MEDIUM	7:03:47 AM	07:03:07
LONG	7:03:47 AM PDT	07:03:45 PDT
FULL	7:03:47 AM PDT	7:03 Uhr PDT

Sample Date and Time Formats

Style	U.S. Locale	French Locale
DEFAULT	Jun 30, 2009 7:03:47 AM	30 juin 2009 07:03:47
SHORT	6/30/09 7:03 AM	30/06/09 07:03
MEDIUM	Jun 30, 2009 7:03:47 AM	30 juin 2009 07:03:47
LONG	June 30, 2009 7:03:47 AM PDT	30 juin 2009 07:03:47 PDT
FULL	Tuesday, June 30, 2009 7:03:47 AM PDT	mardi 30 juin 2009 07 h 03 PDT

Demo 2: Formatting Date/Time...



```
package demodate;
```

```
import java.text.DateFormat;
import java.util.Date;
import java.util.Locale;
```

```
public class DateTimeFormat {
```

```
    public static void main(String[] args) {
```

```
        Date today = new Date();
```

```
        String timestr, datestr;
```

```
        System.out.println("Date Current: " + today);
```

```
        Locale CurLocale=Locale.getDefault();
```

```
        DateFormat timeformater=DateFormat.getInstance(DateFormat.DEFAULT, CurLocale);
```

```
        timestr=timeformater.format(today);
```

```
        System.out.println("Locale:" + CurLocale + ":" + timestr);
```

```
        System.out.println("-----");
```

```
        Locale Locales[]={Locale.US, Locale.CHINA, Locale.GERMANY, Locale.JAPAN};
```

```
        for(Locale locale:Locales){
```

```
            DateFormat formater=DateFormat.getDateInstance();
```

```
            datestr=formater.format(today);
```

```
            System.out.println("Locale:" + locale + ":" + datestr);
```

```
        }
```

```
    }
```

```
}
```

Notifications	Output - DemoDate (run) ×
run:	
	Date Current: Tue Nov 07 10:41:00 ICT 2017
	Locale:en_US:10:41:00 AM

```
Locale:en_US:November 7, 2017 10:41:00 AM ICT
Locale:zh_CN:2017年11月7日 上午10时41分00秒
Locale:de_DE:7. November 2017 10:41:00 ICT
Locale:ja_JP:2017/11/07 10:41:00 ICT
BUILD SUCCESSFUL (total time: 0 seconds)
```

Enabled Locales for java.util and java.text Functionality



Language	Country	Locale ID
Chinese (Simplified)	China	zh_CN
Danish	Denmark	da_DK
English	Australia	en_AU
English	Canada	en_CA
English	United States	en_US
French	France	fr_FR
Vietnamese	Vietnam	vi_VN

<http://www.oracle.com/technetwork/java/javase/locales-137662.html>

Demo 3: Custom Formatting Date/Time...



```
import java.text.SimpleDateFormat;
import java.util.Date;
import java.util.Locale;

public class Slot19_Demo2_Custom_DatetimeFormat {
    public static void main(String args[]) {
        Date today = new Date();
        String dateStr;
        Locale locales[] = {Locale.US, Locale.CHINA,
            Locale.GERMANY, Locale.FRENCH, new Locale("vi", "VN")};
        SimpleDateFormat sdf;
        for (Locale locale : locales) {
            sdf = new SimpleDateFormat("EEEE d MMMM yy", locale);
            dateStr = sdf.format(today);
            System.out.println(locale + " : " + dateStr);
        }
    }
}
```

Output - I18N (run) ✖

```
run:
en_US : Wednesday 7 October 15
zh_CN : 星期三 7 十月 15
de_DE : Mittwoch 7 Oktober 15
fr : mercredi 7 octobre 15
vi_VN : Thứ tư 7 tháng mười 15
```

Date/Time Symbol...



Symbol	Meaning	Presentation	Example
G	era designator	Text	AD
y	year	Number	2009
M	month in year	Text & Number	July & 07
d	day in month	Number	10
h	hour in am/pm (1-12)	Number	12
H	hour in day (0-23)	Number	0
m	minute in hour	Number	30
s	second in minute	Number	55
S	millisecond	Number	978
E	day in week	Text	Tuesday
D	day in year	Number	189
F	day of week in month	Number	2 (2nd Wed in July)
w	week in year	Number	27
W	week in month	Number	2
a	am/pm marker	Text	PM
k	hour in day (1-24)	Number	24
K	hour in am/pm (0-11)	Number	0
z	time zone	Text	Pacific Standard Time
'	escape for text	Delimiter	(none)
'	single quote	Literal	'

2- Cultural Symbols in Property File

Demo 4: Currency Format



```
import java.text.NumberFormat;
import java.util.Locale;

public class FormatCurrencyDemo {

    public static void main(String args[]) {
        Locale locales[] = {Locale.US, Locale.GERMANY,
            Locale.JAPAN, new Locale("vi", "VN")};

        for (Locale locale : locales) {
            NumberFormat currencyFormatter = NumberFormat.getCurrencyInstance(locale);
            System.out.println(locale + ": " + currencyFormatter.format(200));
        }
    }
}
```

Output - I18N (run) %

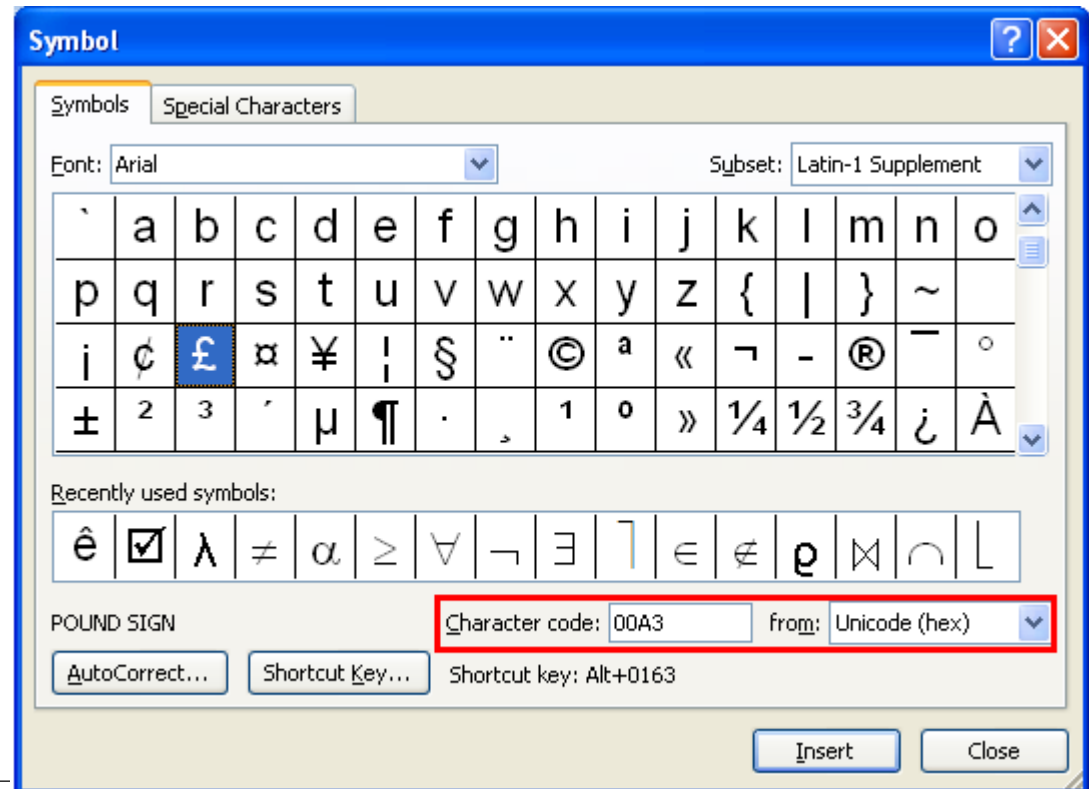
```
run:
en_US: $200.00
de_DE: 200,00 €
ja_JP: ¥200
vi_VN: 200 đ
BUILD SUCCESSFUL (total time: 0 seconds)
```

2- Cultural Symbols in Property File

- Cultural Symbols: Alphabets, Digits, Currency symbol...
- Use hexadecimal Unicode for particular symbols (`\uXXXX`).
- You can use the function “Insert symbol” of the MS Word to find Unicode of a symbol.

```
AMOUNT_STRING=Montant du Pr\u00Eat ({0}, {1})
RATE_STRING=Taux Annuel (%)
NUM_PERIODS_STRING=Ann\u00Ees
PAYMENT_STRING=Paiement Mensuel
LOCALE=Locale
WINDOW_TITLE=Calculatrice Hypoth\u00Ecaire
```

<https://docs.oracle.com/javase/tutorial/i18n/format/decimalFormat.html>



3- Compound Message



Compound message = string template + embedded data

Example:

Date
Date
Number
String
 |
 |
 |
 |
 At 1:15 on April 13, 1998, we detected 7 spaceships on the planet Mars.

In the message's template, marks must be used. Example:

message_en_US.properties

```
template = At {2,time,short} on {2,date,long}, \
we detected {1,number,integer} spaceships on \
the planet {0}.
planet = Mars
```

The character
'\' is used as a
concatenation

To mix data to the template, an array of objects are used,
number in a mark is the object's index in this array. Syntax
for a mark: { index, type, format}

java.text.MessageFormat



Type	Format	Subformat Created
number	integer	<u>NumberFormat.getIntegerInstance</u> (getLocale())
	currency	<u>NumberFormat.getCurrencyInstance</u> (getLocale())
	percent	<u>NumberFormat.getPercentInstance</u> (getLocale())
date	short	<u>DateFormat.getDateInstance</u> (<u>DateFormat.SHORT</u> , getLocale())
	medium	<u>DateFormat.getDateInstance</u> (<u>DateFormat.DEFAULT</u> , getLocale())
	long	<u>DateFormat.getDateInstance</u> (<u>DateFormat.LONG</u> , getLocale())
	full	<u>DateFormat.getDateInstance</u> (<u>DateFormat.FULL</u> , getLocale())
time	short	<u>DateFormat.getTimeInstance</u> (<u>DateFormat.SHORT</u> , getLocale())
	medium	<u>DateFormat.getTimeInstance</u> (<u>DateFormat.DEFAULT</u> , getLocale())
	long	<u>DateFormat.getTimeInstance</u> (<u>DateFormat.LONG</u> , getLocale())
	full	<u>DateFormat.getTimeInstance</u> (<u>DateFormat.FULL</u> , getLocale())

Compound Message...



```
template = At {2,time,short} on {2,date,long}, \
    we detected {1,number,integer} spaceships on \
    the planet {0}.
```

```
planet = Mars
```

```
// Setup message arguments
```

```
Object[] messageArguments = {
```

```
    resource.getString("planet"),
```

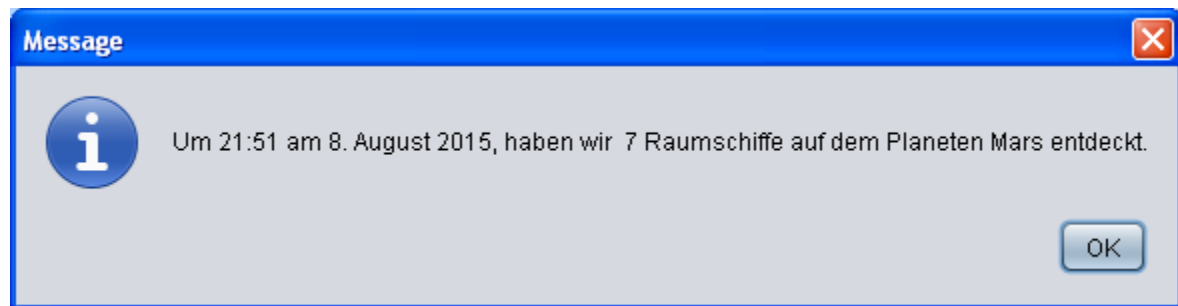
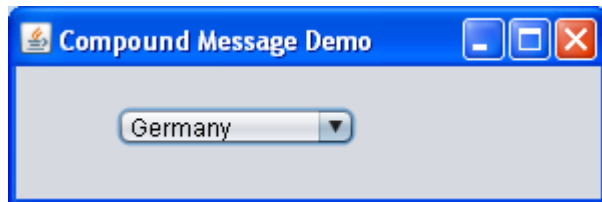
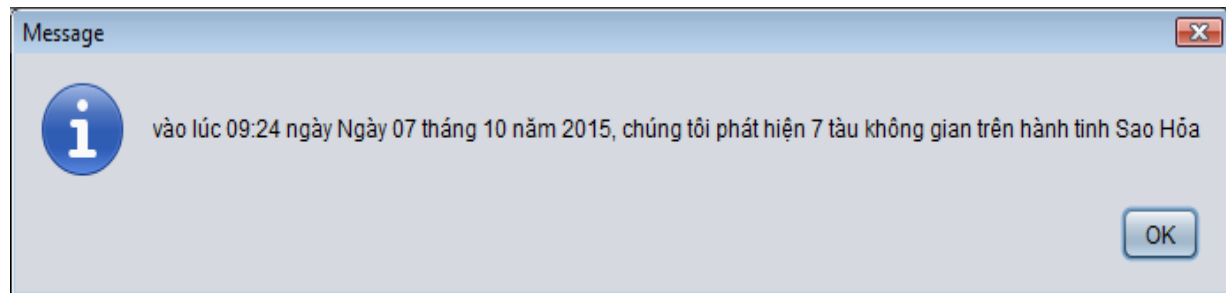
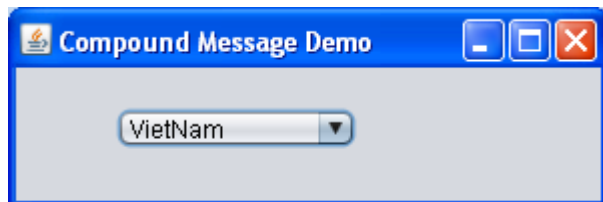
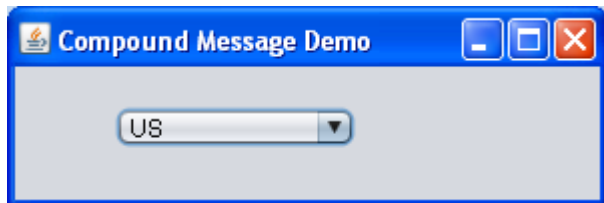
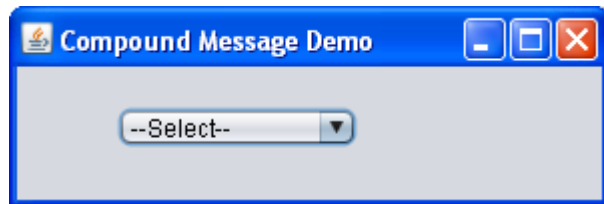
Index=0

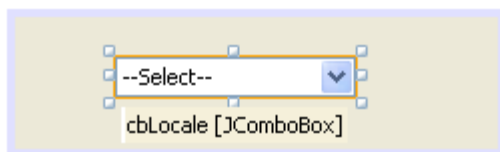
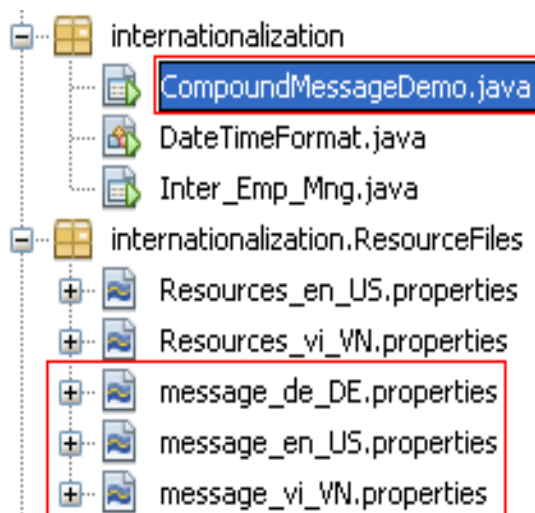
```
    new Integer(7),
```

Index=1

```
    new Date() };
```

Index=2





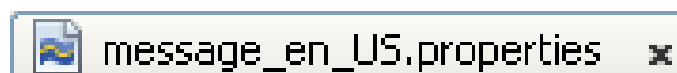
Model

--Select--

US

VietNam

Germany



```
template = At {2,time,short} on {2,date,long}, \
we detected {1,number,integer} spaceships on \
the planet {0}.
planet = Mars
```



```
template = Um {2,time,short} am {2,date,long}, \
haben wir {1,number,integer} Raumschiffe \
auf dem Planeten {0} entdeckt.
planet = Mars
```



```
template = Vào lúc {2,time,short} ngày {2,date,long}, \
chúng tôi phát hiện {1,number,integer} tàu không gian trên \
hành tinh {0}.
planet = Sao Hỏa
```

CompoundMessageDemo.java x

```
import java.util.Date;
import java.util.Locale; // for getting locale information
import java.util.ResourceBundle; // for accessing file.properties
import java.text.MessageFormat; // for format compound message
import javax.swing.JOptionPane;

public class CompoundMessageDemo extends javax.swing.JFrame {
    String base = "internationalization.ResourceFiles/message";
    ResourceBundle resource;

    /** Creates new form CompoundMessageDemo ...3 lines */
    public CompoundMessageDemo() {
        initComponents();
        this.setSize(300,100);
    }
}
```



```
private void cbLocaleActionPerformed(java.awt.event.ActionEvent evt) {
    // TODO add your handling code here:
    Locale curLocale=null;
    int index = cbLocale.getSelectedIndex();
    if (index==1)curLocale = new Locale("en", "US");
    if (index==2)curLocale = new Locale("vn", "VN");
    if (index==3)curLocale = new Locale("de", "DE");
    resource = ResourceBundle.getBundle(base, curLocale);
    // Setup message array of arguments
    Object[] messageArguments = {
        resource.getString("planet"),
        new Integer(7),
        new Date()};
    // Create formatter
    MessageFormat formatter = new MessageFormat("");
    formatter.setLocale(curLocale);
    //Format the Message Using the Pattern and the Arguments
    formatter.applyPattern(resource.getString("template"));
    String output = formatter.format(messageArguments);
    // Output message
    JOptionPane.showMessageDialog(this, output);
}
```

- Formatting Date and Time
- Specifying cultural symbols in properties files
- Compound Message

Thank You