CSE 3461

Ch 10 - Internationalization

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• Globalization ... involves externalizing any information that is culture or language dependent. Externalizing information moves it out of the code and into resources. After the information is moved into resources, culture specialists can localize the interface by modifying those resources rather than modifying the code.

Internationalization vs Localization vs Globalization

- Internationalization
 - the process of designing a software application so that it can be adapted to various languages and regions without engineering changes.
- Localization
 - the process of adapting internationalized software for a specific region or language by adding locale-specific components and translating text.

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• Globalization = Internationalization + Localization

Culturally Dependent Data

Messages Labels on GUI components Online help Sounds Colors Graphics Icons Dates Times Numbers Currencies Measurements Phone numbers Honorifics and personal titles Postal addresses Page layouts

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Mechanisms for Globalization

- 1. Locale-dependent strings
 - multilingual support
 - sorting
- 2. Locale-independent string processing
 - string analysis
- 3. Numbers and Currencies
- 4. Dates and Times

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Locales

- Language + Country
- Eg.
 - French_Belgian fr_BE
 - French_Canadian fr_CA
 - French_Swiss fr_CH
 - French_Luxembourg fr_LU
 - French_Monaco fr_MC
 - French_France fr_FR
- *<locale listing app>*

1. Locale-Dependent Strings

- I18NSample
- this is an example of "canned" translation

<section-header><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item>

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2. Locale-Independent String Processing

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- Character types
 - can be used with getter Character.getType(ch)
 - Character.LOWERCASE_LETTER
 - Character.UPPERCASE_LETTER
 - Character.MATH_SYMBOL
 - Character.CONNECTOR_PUNCTUATION

2. Locale-Independent String Processing

- use Unicode compliant tests
 eg., in Java, the services of Character class
- not compliant:

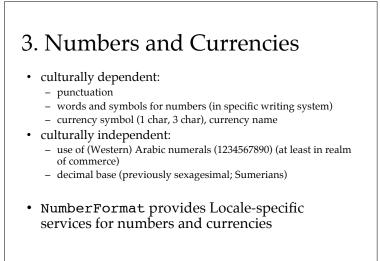
char ch; ...

(ch >= 'A' && ch <= 'Z')

recall that char is an unsigned int, e.g., 'A' is 65

• the Character.isLetter method returns true if the character is a letter in Chinese, German, Arabic, or another language.

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4. Dates and Times

- dates are implicit in time
- culturally dependent:
 - am/pm signifier
 - 12 vs 24 hr format
 - punctuation
 - names of months and days
 - definition of workweek
- culturally independent:
 - need for different formats, such as short, medium, and long formats
- DateFormat provides Locale-specific services
- DateFormattingExample
 http://download.oracle.com/javase/tutorial/i18n/format/dateintro.html