Validating User Input Part 2: Advanced Features

JSF 2.2 Version

Basics from Previous Section

- **Example code**

```
<h:inputText value="…" required="true" requiredMessage="…"
             converterMessage="…" validatorMessage="…" id="someId">
    <f:validateBlah …/>
</h:inputText>
<h:message for="someId"/>
```

- **Strategies**
  - Always supply custom error messages
    - Use requiredMessage when required="true"
    - Use converterMessage with non-String bean properties
    - Use validatorMessage when using f:validate*Blah*
  - Use h:panelGrid to keep error messages next to fields
  - Put "See Below" warning at top if form is very long

Topics in This Section

- **Manual validation**
  - Checking in the action controller method
- **Using a custom validator method**
  - <h:input*Blah* … validator="#{someBean.someMethod"/>
- **Localizing (internationalizing) error messages**
  - *blah*Message="#{msgs.messageName}"
- **Using the Apache MyFaces validators**
  - For URLs, email addresses, credit cards, cross-field comparisons
- **Using the Apache MyFaces validators with the PrimeFaces extended GUI components**
  - If using 3rd party libraries anyhow, usually use both

Manual Validation

Overview

- **Big idea**
  - Check for problems in the action controller method
- **Motivation**
  - When you need to compare two fields (main motivation)
  - When validation requires a result computed only in action controller
- **Steps**
  - If any values are missing or invalid
    - Store error messages using FacesContext.addMessage
    - Return null to cause form to be redisplayed
  - If all values are OK
    - Do business logic
    - Return normal navigation string

Detailed Steps

- **Have setter methods take strings**
  - So you are sure the action controller is reached
  - Do explicit conversion to other types in the code
    - Use try/catch blocks to handle illegal data
- **Check values in action controller**
  - If values are valid
    - Return normal outcomes
  - If values are missing or invalid
    - Store error messages using FacesContext.addMessage
    - Return null to cause form to be redisplayed
- **Display error messages in input form**
  - Normally use h:messages to put messages at top of form
    - If messages were stored with an ID, can also use <h:message for="theID"/>. Less common.

Creating Error Messages

- **Basic steps**

```
FacesMessage errorMessage = new FacesMessage("…");
errorMessage.setSeverity(FacesMessage.SEVERITY_ERROR);
```

- **Severity**
  - SEVERITY_ERROR normally used for this type of error message
  - SEVERITY_INFO (default) used for informational messages, as in the dialog box example at the end
  - h:messages has options to use different style sheet names depending on the severity (errorClass, infoClass, etc.)
- **Summary and details**
  - FacesMessage constructor also has options for summary message (default) and detailed message
    - h:messages has options for which to show (showDetail, etc.)

Storing Error Messages

- **Basic steps**

  FacesContext.getCurrentInstance().addMessage(null, errorMessage);

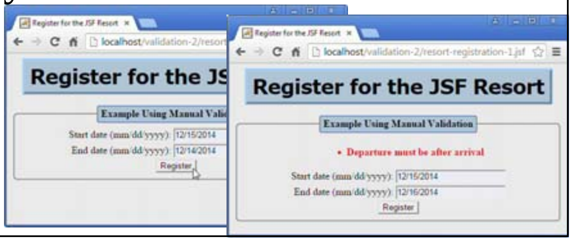
  – null means that it is a global error message, not associated with the ID of any particular field. You always use h:messages to display these general messages.
- **Associating error message with an ID**
  – Instead of null, you can supply a String of the form "formID:fieldID".
    - Since form ID is normally generated automatically, you should use the id attribute of h:form.

Checking if Messages Are Set

- **Normal approach**
  – If at least one error message set, store FacesMessage and return null
  – If no error messages have been set, do business logic and return normal navigation string
- **Option 1: check value of message**
  – See if String has been set
    - Usually used if there is only one potential message
- **Option 2: check length of message list**
  – See if context.getMessageList().size() > 0
    - Usually used if there are several potential messages
    - This is essentially what we did in last tutorial section when we put conditional “Fix Errors Below” warning at top

Manual Validation: Example

- **Idea**
  - Gather checkin and checkout dates for reservation at the world-famous JSF Resort
- **Validation tests**
  - Dates must be supplied
    - Uses required and requiredMessage as done earlier
  - Entries must be legal dates
    - Uses converterMessage with f:convertDateTime
  - Checkin date must be today or later
    - Uses manual validation
  - Checkout day must be after checkin day
    - Uses manual validation


Register for the JSF Resort

Example Using Manual Validation

Start date (mm/dd/yyyy): 12/15/2014
End date (mm/dd/yyyy): 12/14/2014

Register for the JSF Resort

Example Using Manual Validation

• Departure must be after arrival

Start date (mm/dd/yyyy): 12/15/2014
End date (mm/dd/yyyy): 12/16/2014

Register for the JSF Resort
localhost/validation-2/resort-registration-1.jsf
Register

Managed Bean: Properties

```
@ManagedBean
public class ReservationBean1 {
  private Date startDate, endDate;

  public Date getStartDate() {
    if (startDate == null) {
      startDate = new Date();
    }
    return(startDate);
  }

  public void setStartDate(Date startDate) {
    this.startDate = DateUtils.nextDay(startDate);
  }

  public Date getEndDate() {
    if (endDate == null) {
      endDate = DateUtils.nextDay(getStartDate());
    }
    return(endDate);
  }

  public void setEndDate(Date endDate) {
    this.endDate = DateUtils.nextDay(endDate);
  }
```

Mojarra (at least up through 2.2.8) has off-by-1 error in parsing date strings, so add 1 day to incoming dates

Managed Bean: Action Controller

```
public String register() {
  String messageText = null;
  Date today = new Date();
  if (startDate.before(today)) {
    messageText = "Arrival cannot be in the past";
  } else if (!startDate.before(endDate)) {
    messageText = "Departure must be after arrival";
  }
  if (messageText != null) {
    startDate = null;
    endDate = null;
    FacesMessage errorMessage = new FacesMessage(messageText);
    errorMessage.setSeverity(FacesMessage.SEVERITY_ERROR);
    FacesContext.getCurrentInstance().addMessage(null,
                                                  errorMessage);
    return(null);
  } else {
    putReservationInDatabase();
    return("show-dates-1");
  }
}
```

Helper Class: DateUtils

```
public class DateUtils {
  public static String formatDay(Date date) {
    if (date == null) {
      return("");
    } else {
      return(String.format("%tA, %tB %te, %tY",
                           date, date, date, date));
    }
  }

  public static Date nextDay(Date day) {
    long millisPerDay = 24 * 60 * 60 * 1000;
    return(new Date(day.getTime() + millisPerDay));
  }

  public static boolean between(Date testDate,
                                Date startDate,
                                Date endDate) {
    return(testDate.after(startDate) && testDate.before(endDate));
  }
...
}
```

Input Form (resort-registration-1.xhtml)

```
<h:form>
<h:messages styleClass="error"/>
<h:panelGrid columns="2" styleClass="formTable">
  Start date (mm/dd/yyyy):
  <h:inputText value="#{reservationBean1.startDate}"
               required="true"
               requiredMessage="Start date required"
               converterMessage="Illegal date (should be mm/dd/yyyy)">
    <f:convertDateTime pattern="MM/dd/yyyy"/>
  </h:inputText>
  End date (mm/dd/yyyy):
  <h:inputText value="#{reservationBean1.endDate}"
               required="true"
               requiredMessage="End date required"
               converterMessage="Illegal date (should be mm/dd/yyyy)">
     <f:convertDateTime pattern="MM/dd/yyyy"/>
  </h:inputText>
</h:panelGrid>
<h:commandButton value="Register" action="#{reservationBean1.register}"/>
</h:form>
```

The approach of using requiredMessage and converterMessage is covered in first tutorial section. Only when this fails is manual validation attempted.

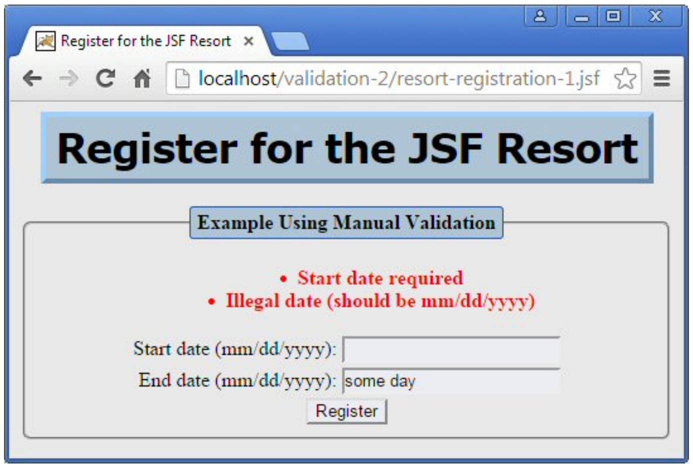
f:convertDateTime converts Dates to Strings on display and Strings to Dates on submission. The format of the pattern is given in JavaDocs for java.text.SimpleDateFormat.

Results Page (show-dates-1.xhtml)

```
...
<h1 class="title">Reservation Confirmed</h1>
<ul>
  <li>Arrival: #{reservationBean1.startDay}</li>
  <li>Departure: #{reservationBean1.endDay}</li>
</ul>
...
```

getStartDay and getEndDay call DateUtils.formatDate.
This is (arguably) easier and more reusable than doing the formatting directly in the results page.

Results: Missing or Malformed Dates


Register for the JSF Resort

localhost/validation-2/resort-registration-1.jsf

Register for the JSF Resort

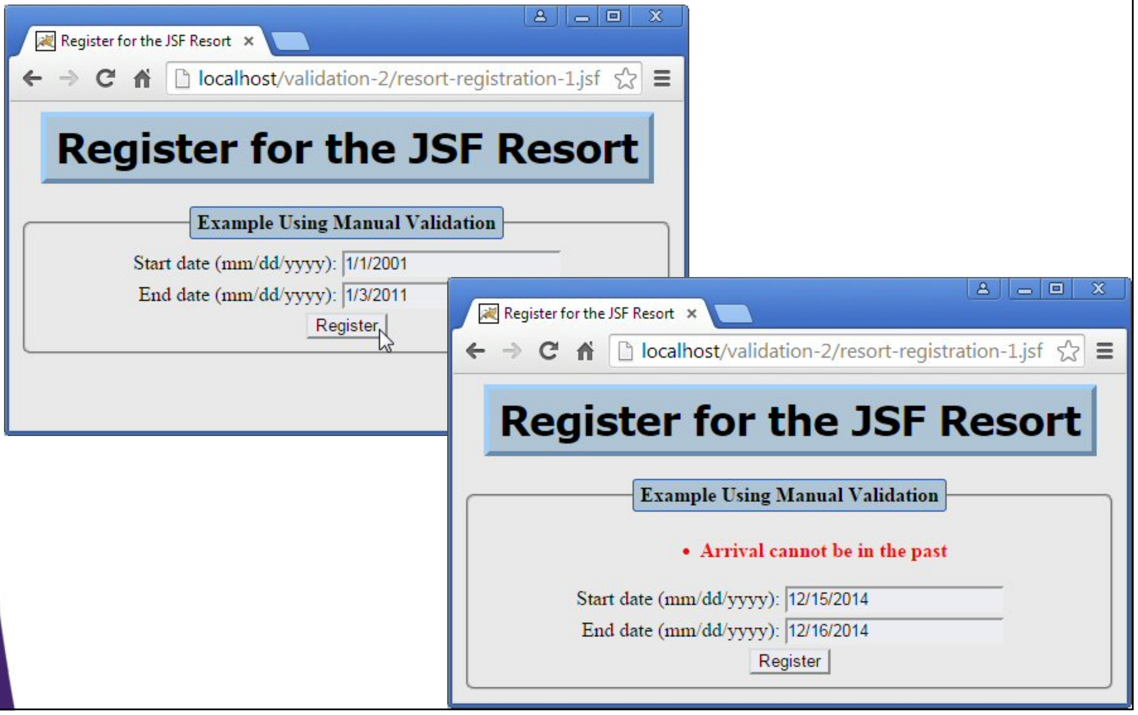
Example Using Manual Validation

- Start date required
- Illegal date (should be mm/dd/yyyy)

Start date (mm/dd/yyyy):

End date (mm/dd/yyyy): some day

Results: Arrival in the Past


Register for the JSF Resort

localhost/validation-2/resort-registration-1.jsf

Register for the JSF Resort

Example Using Manual Validation

Start date (mm/dd/yyyy): 1/1/2001

End date (mm/dd/yyyy): 1/3/2011

Register for the JSF Resort

localhost/validation-2/resort-registration-1.jsf

Register for the JSF Resort

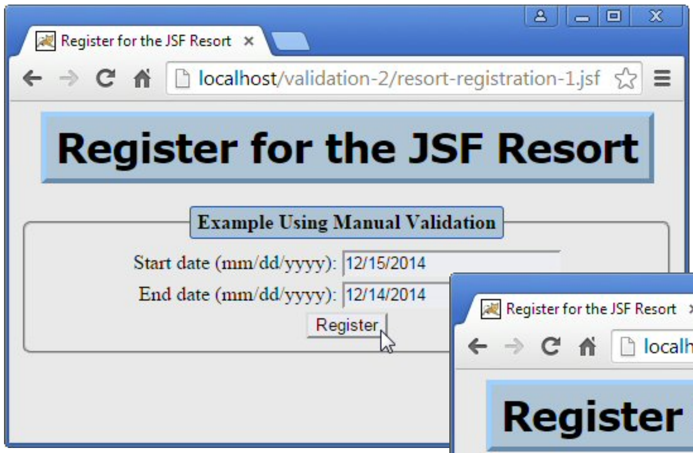
Example Using Manual Validation

- Arrival cannot be in the past

Start date (mm/dd/yyyy): 12/15/2014

End date (mm/dd/yyyy): 12/16/2014

Results: Departure Before Arrival


Register for the JSF Resort

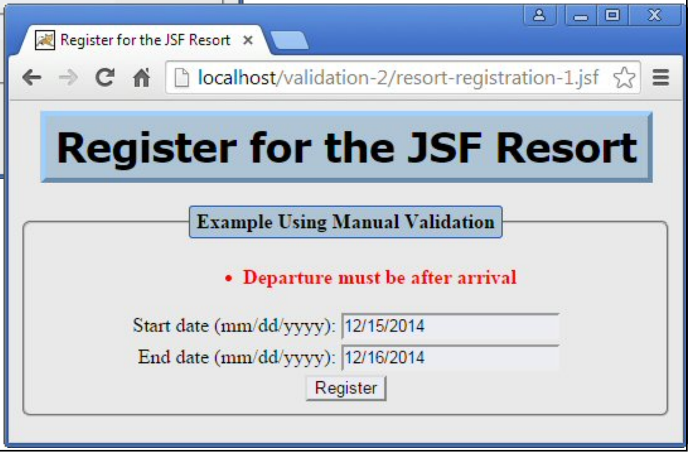
localhost/validation-2/resort-registration-1.jsf

Register for the JSF Resort

Example Using Manual Validation

Start date (mm/dd/yyyy): 12/15/2014

End date (mm/dd/yyyy): 12/14/2014


Register for the JSF Resort

localhost/validation-2/resort-registration-1.jsf

Register for the JSF Resort

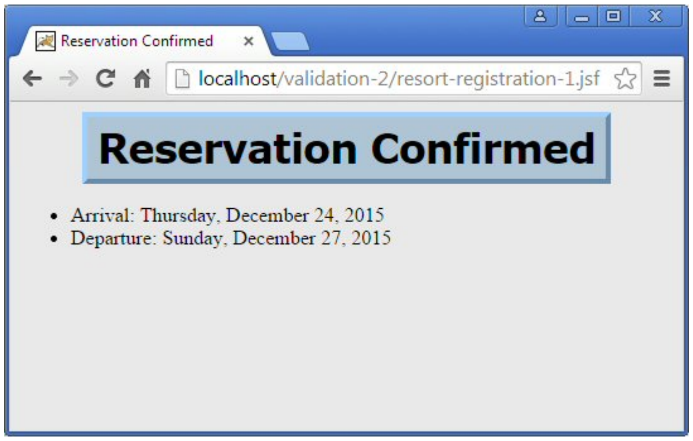
Example Using Manual Validation

- Departure must be after arrival

Start date (mm/dd/yyyy): 12/15/2014

End date (mm/dd/yyyy): 12/16/2014

Results: Good Data


Reservation Confirmed

localhost/validation-2/resort-registration-1.jsf

Reservation Confirmed

- Arrival: Thursday, December 24, 2015
- Departure: Sunday, December 27, 2015

Using Custom Validator Method

Making Custom Checks

- **Checking for missing data**
  – Use builtin required and requiredMessage
- **Checking illegal format of standard types**
  – Use non-String properties and builtin converterMessage
- **Checking ranges and regular expressions**
  – Use f:validate*Blah* and builtin validatorMessage
- **Comparing fields to each other**
  – Use manual validation in action controller method
- **Checking value not covered by f:validate*Blah*, but for single field only**
  – Write custom converter method

Steps: Outline

- **Java method**
  - Throw ValidatorException with a FacesMessage if validation fails. Do nothing if validation succeeds.
  - Method arguments:
    - FacesContext (the context)
    - UIComponent (the component being validated)
    - Object (the submitted value, but primitives use wrappers)
- **Input form**
  - For input component, specify method name explicitly
    - <h:inputText id="someID" validator="#{someBean.someMethod}"/>
  - Use h:message or h:messages as before
    - <h:message for="someID"/>
- **Warning**
  - Don’t use f:validate*Blah* & custom method on same field

Validator Method: Template

```
public void validateSomeProperty
                     (FacesContext context,
                      UIComponent componentToValidate,
                      Object value)
        throws ValidatorException {
  double submittedValue = (Double)value;
  if (someTestWith(submittedValue)) {
    String messageText = "...";
    FacesMessage errorMessage =
      new FacesMessage(messageText);
    errorMessage.setSeverity(FacesMessage.SEVERITY_ERROR);
    throw new ValidatorException(errorMessage);
  }
}
```

This example assumes the bean property is of type double or Double.
Do similar typecasts for other bean property types.

Do not Mix f:validate*Blah* with Custom Validation Method

- **f:validate*Blah* tag**

```
<h:inputText … validatorMessage="warning">
  <f:validateLength minimum="6"/>
</h:inputText>
```

  - The error message comes from validatorMessage
- **Custom validator method**
  - <h:inputText validator="#{someBean.someMethod}">…
    - The error message comes from someMethod
- **If you have both, validatorMessage wins**
  - And thus the error message from the validatior method is never displayed. So, you cannot use f:validate*Blah* and a custom validation method in the same input element
    - However, the Apache MyFaces validators have planned for this, and let you have multiple validators on the same field without using the validatorMessage attribute. See upcoming slide.

Validator Method: Example

- **Idea**
  - Due to unsanitary conditions, the health department shut down all rooms except 2 and 7. Enforce this.
- **Validator method (validateRoomNumber)**
  - Cast to Integer. Throw exception if value is anything other than 2 or 7..
  - Do nothing if validation passes
- **Input form**

```
<h:inputText ... validator="#{reservationBean2.validateRoomNumber}"/>
```

Managed Bean: Properties and Action Controller

```
@ManagedBean
public class ReservationBean2 extends ReservationBean1 {
  private Integer roomNumber = 2;

  public Integer getRoomNumber() {
    return(roomNumber);
  }

  public void setRoomNumber(Integer roomNumber) {
    this.roomNumber = roomNumber;
  }

  ...

  @Override
  public String register() {
    String result = super.register();
    if (result != null) {
      result = "show-dates-2";
    }
    return(result);
  }
}
```

Managed Bean: Validator Method

```
  public void validateRoomNumber
                              (FacesContext context,
                               UIComponent componentToValidate,
                               Object value)
          throws ValidatorException {
    int roomNumber = (Integer)value;
    if ((roomNumber != 2) && (roomNumber != 7)) {
      String messageText =
        String.format("Room %s temporarily unavailable",
                      roomNumber);
      FacesMessage errorMessage = new FacesMessage(messageText);
      errorMessage.setSeverity(FacesMessage.SEVERITY_ERROR);
      throw new ValidatorException(errorMessage);
    }
  }
```

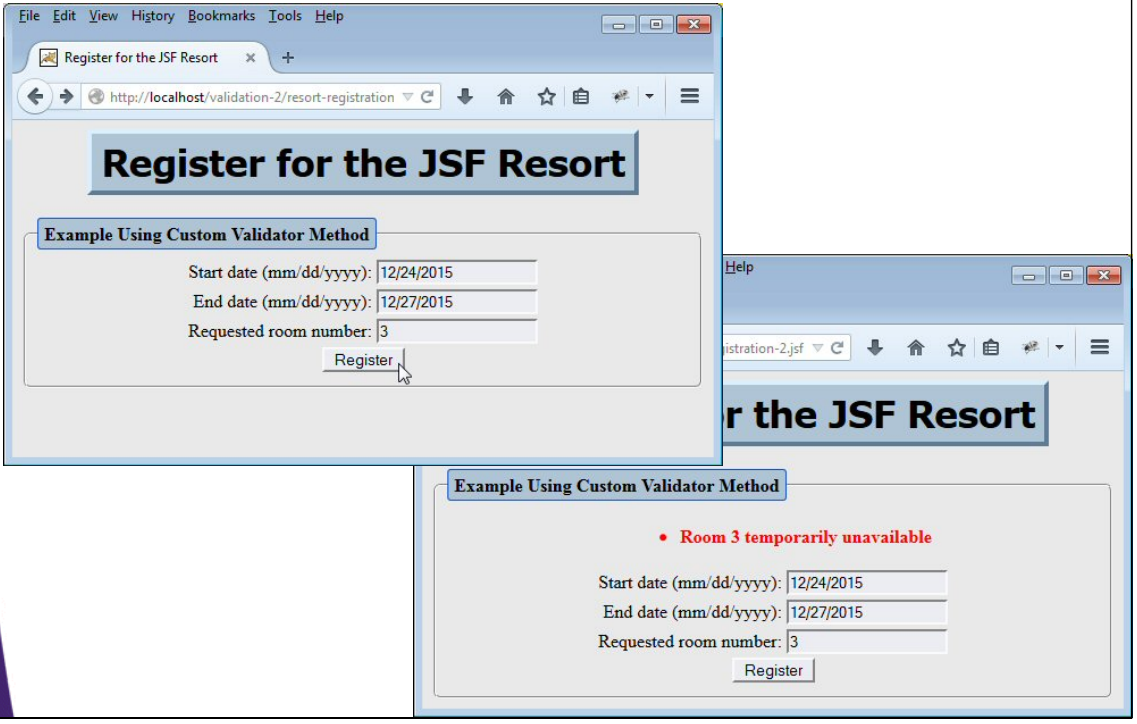
Input Form (resort-registration-2.xhtml)

```
<h:form>
<h:messages styleClass="error"/>
<h:panelGrid columns="2" styleClass="formTable">

  <!-- Same date fields and tests as last example -->

  Requested room number:
  <h:inputText value="#{reservationBean2.roomNumber}"
            required="true"
            requiredMessage="Room number required"
            converterMessage="Illegal room number"
            validator="#{reservationBean2.validateRoomNumber}"/>
</h:panelGrid>
<h:commandButton value="Register"
                 action="#{reservationBean2.register}"/>
</h:form>
```

Results Page (show-dates-2.xhtml)

```
...
<h1 class="title">Reservation Confirmed</h1>
<ul>
  <li>Arrival: #{reservationBean2.startDay}</li>
  <li>Departure: #{reservationBean2.endDay}</li>
  <li>Room number: #{reservationBean2.roomNumber}</li>
</ul>
...
```

Results: Unavailable Room


File Edit View History Bookmarks Tools Help
Register for the JSF Resort
http://localhost/validation-2/resort-registration
Help
istration-2.jsf

Register for the JSF Resort

Example Using Custom Validator Method

Start date (mm/dd/yyyy):	12/24/2015
End date (mm/dd/yyyy):	12/27/2015
Requested room number:	3

Register

r the JSF Resort

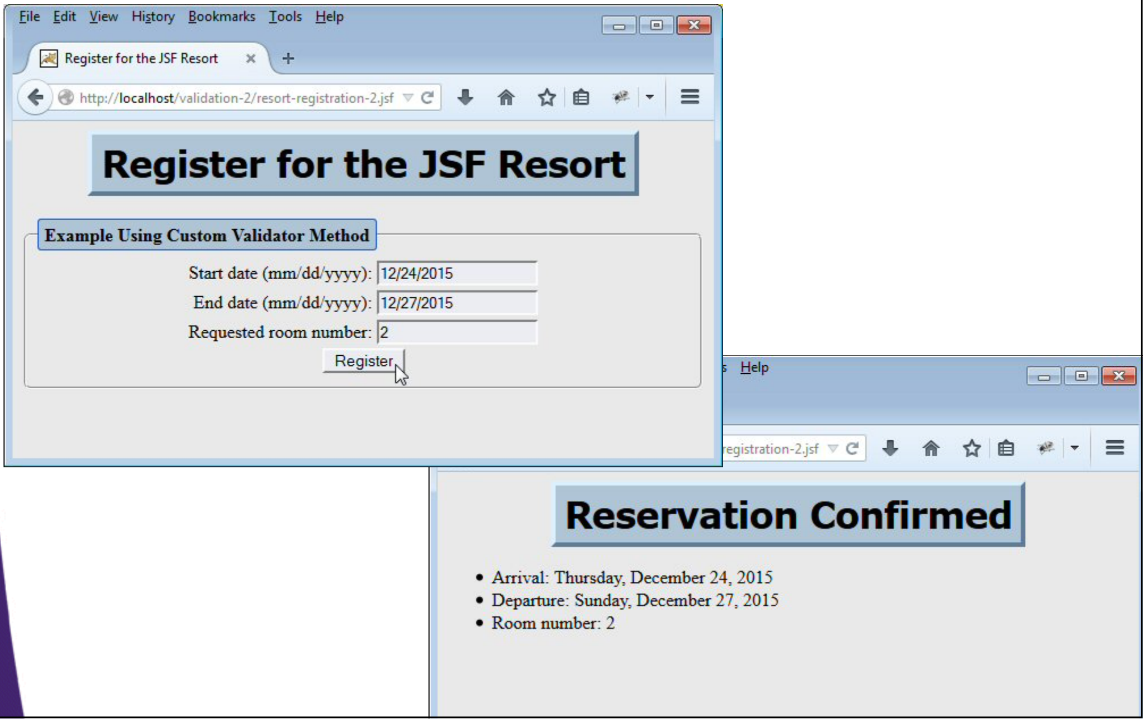
Example Using Custom Validator Method

- Room 3 temporarily unavailable

Start date (mm/dd/yyyy):	12/24/2015
End date (mm/dd/yyyy):	12/27/2015
Requested room number:	3

Register

Results: Available Room


File Edit View History Bookmarks Tools Help
Register for the JSF Resort
http://localhost/validation-2/resort-registration-2.jsf
Help
egistration-2.jsf

Register for the JSF Resort

Example Using Custom Validator Method

Start date (mm/dd/yyyy):	12/24/2015
End date (mm/dd/yyyy):	12/27/2015
Requested room number:	2

Register

Reservation Confirmed

- Arrival: Thursday, December 24, 2015
- Departure: Sunday, December 27, 2015
- Room number: 2

Validator Components vs. Validator Methods

- **Validator components and methods similar**
  - Both let you do custom checks for single field
- **Method**
  - Can access other methods in main backing bean
  - Not easily reusable in forms that use other beans
  - Can have any method name
  - Specified with <h:inputText … validator="…"/>
- **Component**
  - Cannot access methods in backing bean
  - More easily reusable in forms that use other beans
  - Method is named validate (same method signature)
  - Specified with <f:validator validatorId="…"/>

Component Outline

- **Java class**

```
@FacesValidator("someId")
public class SomeValidator implements Validator
    @Override
     public void validate(…) … {
       // Same signature and approach as validator method
     }
}
```

- **Input form**

```
<h:inputText …>
    <f:validator validatorId="someId"/>
</h:inputText>
```

Localizing (Internationalizing) Error Messages

Overview

- **Error messages can come from properties**
  - requiredMessage="#{msgs.someName}“
- **Page can set a Locale**
  - <f:view locale="#{localeBean.currentLocale}">
- **Multiple versions of file can be defined**
  - messages.properties, messages_es.properties, messages_es_MX.properties, messages_jp.properties, etc.
- **Covered in section on properties files**
  - Once you know that the error messages accept EL entries instead of only static strings, *everything* in this example is just an application of the techniques covered in earlier tutorial section on properties and I18N.

Steps for Localizing Validation Messages

- **Create multiple similarly named files**
  – blah.properties, blah_es.properties, blah_es_MX.properties
- **Use f:view and locale attribute**
  – <f:view locale="#{localeBean.currentLocale}">
    - LocaleBean should be session scoped
    - getCurrentLocale returns value user set earlier
- **Declare in faces-config with resource-bundle**
  – base-name gives base file name
    - Version(s) matching Locale will be used automatically
  – var gives scoped variable (Map) that will hold result
- **Refer to name in validation messages**
  – requiredMessage="#{…}", converterMessage="#{…}", etc.

Quick Review of Chained Loading

- **messages.properties**
  – siteName=mysite.example.com
  – buttonLabel=Click here
- **messages_es.properties**
  – buttonLabel=Haga clic aquí
- **messages_fr.properties**
  – buttonLabel=Cliquez ici
- **messages_fr_CA.properties**
  – buttonLabel=Se il vous plaît, cliquez ici

Recall from lecture on properties file that we do not need to repeat entries from earlier files if they do not change. So, siteName is not repeated.

Quick Review: faces-config.xml

```
<?xml version="1.0"?>
<faces-config …>
  <application>
    <resource-bundle>
      <base-name>messages</base-name>
      <var>msgs</var>
    </resource-bundle>
  </application>
</faces-config>
```

Reminder: file is assumed to be in CLASSPATH and have a .properties extension, so “messages” above means src/messages.properties in Eclipse (WEB-INF/classes/messaages.properties at deploy time)

Also recall that we refer to base file name only (messages), not the localized names (messages_es, etc.)

Quick Review: Facelets Page

```
<!DOCTYPE ...>
<html ... xmlns:f="http://xmlns.jcp.org/jsf/core">
<f:view locale="#{localeBean.currentLocale}">
...
#{msgs.siteName}
...
#{msgs.buttonLabel}
...
</f:view></html>
```

Quick Review: If Current Locale is…

- **Spanish (es, es_MX, es_PR, etc.)**
  - siteName is “mysite.example.com”
  - buttonLabel is “Haga clic aquí”
- **Canadian French (fr_CA)**
  - siteName is “mysite.example.com”
  - buttonLabel is “Se il vous plaît, cliquez ici”
- **Any other French (fr, fr_FR, fr_HT, etc.)**
  - siteName is “mysite.example.com”
  - buttonLabel is “Cliquez ici”
- **Anything else**
  - siteName is “mysite.example.com”
  - buttonLabel is “Click here”

Example: Page to Compute Sums

- **Idea**
  - User can enter two numbers
  - Results page shows the sum
  - All text in input form and results page come from properties file.
    - This includes requiredMessage and converterMessage for the two number fields
- **I18N**
  - Page comes up in English by default
  - User can click on Spanish flag to switch Locale to es
    - Input form and results page then come up in Spanish
    - Validation error messages are also in Spanish
    - Bean is session scoped, so choice is retained for later

Example: Main Managed Bean (Backing Bean)

```
@ManagedBean
public class CalculatorBean {
  private int firstNumber, secondNumber;

  public int getFirstNumber() { return(firstNumber); }

  public void setFirstNumber(int firstNumber) {
    this.firstNumber = firstNumber;
  }

  public int getSecondNumber() { return(secondNumber); }

  public void setSecondNumber(int secondNumber) {
    this.secondNumber = secondNumber;
  }

  public int getSum() { return(firstNumber + secondNumber); }

  public String computeSum() {
    return("show-sum");
  }
```

Example: Locale Bean

```
@ManagedBean
@SessionScoped
public class LocaleBean implements Serializable {
  private final static Locale ENGLISH = new Locale("en");
  private final static Locale SPANISH = new Locale("es");
  private Locale currentLocale=ENGLISH;

  public Locale getCurrentLocale() {
    return(currentLocale);
  }

  public String setEnglish() {
    currentLocale=ENGLISH;
    return null;
  }

  public String setSpanish() {
    currentLocale=SPANISH;
    return null;
  }
}
```

Example: Properties Files

- src/messages.properties

```
inputPageTitle=Calculator
legend=I18N Example
num1Prompt=First number:
num2Prompt=Second number:
numRequiredMessage=Number required
numConverterMessage=Must be whole number
buttonLabel=Compute Sum
resultPageTitle=Sum
```

- src/messages_es.properties

```
inputPageTitle=Calculadora
legend=Ejemplo de I18N
num1Prompt=Primero número:
num2Prompt=Segundo número:
numRequiredMessage=Número requerido
numConverterMessage=Debe ser número entero
buttonLabel=Calcula Suma
resultPageTitle=Suma
```

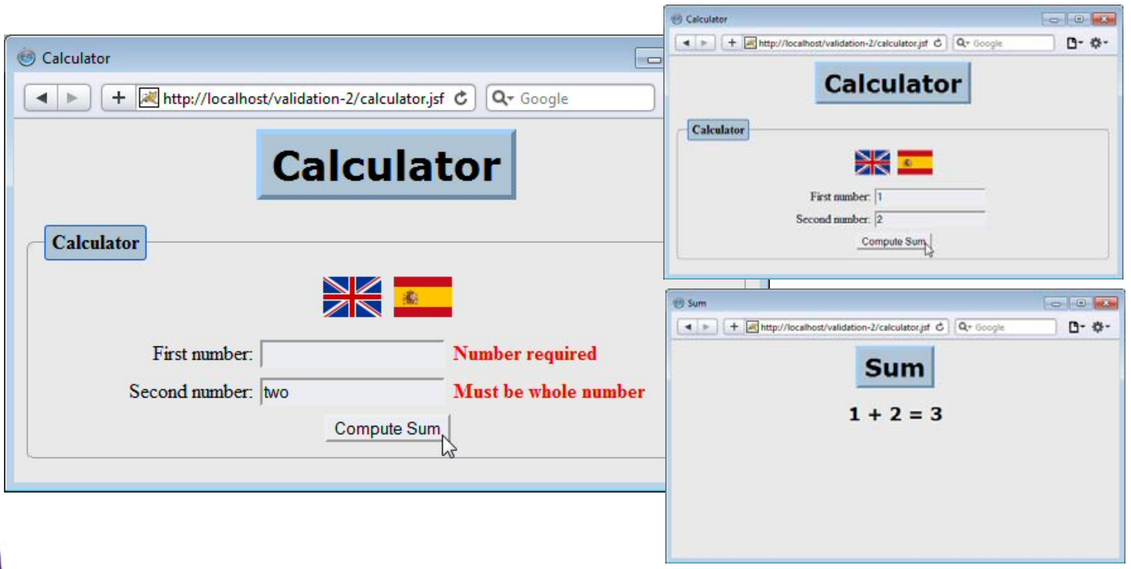
Example: Input Form (calculator.xhtml)

```
...
<f:view locale="#{localeBean.currentLocale}">...
<h:form>
 <h:commandLink action="#{localeBean.setEnglish}">
    <img src="images/en_flag.png"/>
  </h:commandLink>&nbsp;
  <h:commandLink action="#{localeBean.setSpanish}">
    <img src="images/es_flag.png"/>
  </h:commandLink>
<h:panelGrid columns="3" styleClass="formTable">
  #{msgs.num1Prompt}
  <h:inputText value="#{calculatorBean.firstNumber}"
               required="true"
               requiredMessage="#{msgs.numRequiredMessage}"
               converterMessage="#{msgs.numConverterMessage}"
               id="num1"/>
  <h:message for="num1"/>
  ...
  ...
</f:view></html>
```

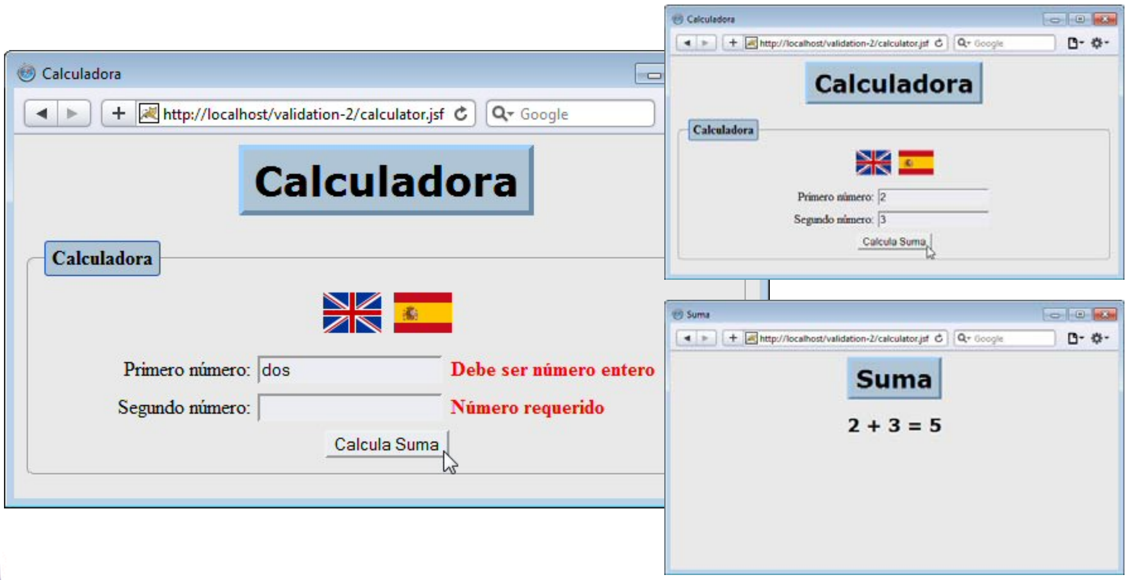
Example: Results Page (show-sum.xhtml)

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
  "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml"
      xmlns:f="http://xmlns.jcp.org/jsf/core"
      xmlns:h="http://xmlns.jcp.org/jsf/html">
<f:view locale="#{localeBean.currentLocale}">
<h:head><title>#{msgs.resultPageTitle}</title>
<link href="./css/styles.css" rel="stylesheet" type="text/css"/>
</h:head>
<h:body>
<h1 class="title">#{msgs.resultPageTitle}</h1>
<h2>#{calculatorBean.firstNumber}
+ #{calculatorBean.secondNumber}
= #{calculatorBean.sum}</h2>
</h:body></f:view></html>
```

Results: English



Results: Spanish


Calculadora

http://localhost/validation-2/calculator.jsf

Calculadora

Calculadora

Primero número: dos Debe ser número entero

Segundo número: Número requerido

Calcula Suma

Primero número: 2

Segundo número: 3

Calcula Suma

Suma

2 + 3 = 5

Using the Apache MyFaces Extended Validators

Overview

- **Standard JSF**
  - Validators easy to use
  - Easy to write your own validator methods
  - Very sparse set of builtin validators
- **PrimeFaces**
  - Zillions of great-looking GUI components
  - No additional validators
- **Apache MyFaces Commons Validators**
  - Additional validators based on Apache Commons
    - Validates URLs, email addresses, credit card numbers, and does cross-field validation (eliminating the need for most manual validation!)

Apache MyFaces Commons Validators

- **Documentation**
  - Tag documentation
    - http://myfaces.apache.org/commons20/myfaces-validators20/tagdoc.html
  - Latest Apache Commons validation code
    - http://commons.apache.org/proper/commons-validator/
- **Downloads**
    - http://myfaces.apache.org/myfaces-commons/download.html
- **Many JAR files needed**
    - http://myfaces.apache.org/commons20/myfaces-validators20/dependencies.html
  - This list is a bit hard to follow, and sadly you need many separate JAR files: commons-beanutils-*xyz*.jar, commons-collections-*xy*.jar, commons-digester-*xy*.jar, commons-logging-*xy*.jar, commons-validator-*xy*.jar, myfaces-commons-utils-*xyz*.jar, myfaces-validators-*xyz*.jar, oro-*xyz*.jar, xml-apis-*xyz*.jar

Most Useful New Validators and Their Most Common Attributes

- **mcv:validateCompareTo**
  - for: id of the field to compare this field to
  - operator: one of a list of possible comparison operators
- **mcv:validateCreditCard**
  - Usually used without attributes, but you can restrict the type of credit cards accepted
    - For practicing with this validator, use 4111111111111111
- **mcv:validateEmail**
  - Usually used without attributes
- **mcv:validateUrl**
  - Usually used without attributes
- **Specifying the error message**
  - Use validatorMessage of h:input*Blah* unless you have multiple validators on the same field, in which case use message of mcv:validate*Blah*. See next slide.

The message Attribute

- **Normal usage**
  - Use validatorMessage attribute to give error message

```
<h:inputText ... validatorMessage="Malformed Email Address">
    <mcv:validateEmail/>
</h:inputText>
```

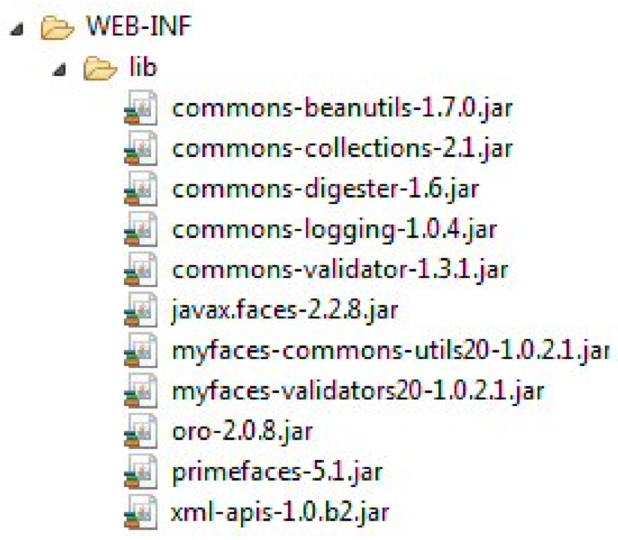
- **Usage when multiple validators on same field (e.g., two email entries must match)**
  - Use message attribute of MyFaces tag for error message

```
<h:inputText ... >
    <mcv:validateEmail message="Malformed Email Address"/>
    <mcv:validateCompareTo operator="eq" forId="email1"
                              message="Two email entries must match"/>
</h:inputText>
```

Example: Page to Report Website Errors

- **Idea**
  - Let users report mistakes on commercial Web site. Reward verified reports with $10.
- **Fields and validation tests**
  - Name for crediting report on Web site
    - Non-empty
  - URL that has the problem
    - Non-empty. Legal URL.
  - Email address to which to send verification
    - Non-empty. Legal email address.
  - Credit card number that will get $10 (entry 1)
    - Non-empty. Legal credit card number.
  - Credit card number (repeated)
    - Non-empty. Matches previous entry.
  - Report description
    - Non-empty.

Example: JAR Files Loaded



```
WEB-INF
  lib
    commons-beanutils-1.7.0.jar
    commons-collections-2.1.jar
    commons-digester-1.6.jar
    commons-logging-1.0.4.jar
    commons-validator-1.3.1.jar
    javax.faces-2.2.8.jar
    myfaces-commons-utils20-1.0.2.1.jar
    myfaces-validators20-1.0.2.1.jar
    oro-2.0.8.jar
    primefaces-5.1.jar
    xml-apis-1.0.b2.jar
```

The PrimeFaces JAR is not used in this example, but is used in the next example (which also uses the extended validators).

Example: Managed Bean

```
@ManagedBean
public class ErrorReportBean1 {
  private String name, emailAddress, url, problemDescription,
                 cardNumber="", cardNumberConfirmation;

  // Getters and setters for all fields

  public String getAbbreviatedCardNumber() {
    // Returns last four digits of card number
  }

  public String sendReport() {
    storeReportInDatabase();
    return("report-confirmation");
  }
}
```

Example: Input Form (bug-report-1.xhtml) Part 1

```
<!DOCTYPE html ...>
<html xmlns="http://www.w3.org/1999/xhtml"
  xmlns:f="http://xmlns.jcp.org/jsf/core"
  xmlns:h="http://xmlns.jcp.org/jsf/html"
  xmlns:mcv="http://myfaces.apache.org/commons/validators"
  ...>
```

Example: Input Form (bug-report-1.xhtml) Part 2

```
<h:form>
<h:panelGrid columns="3" styleClass="formTable">
  Name or nickname:
  <h:inputText value="#{errorReportBean1.name}"
               required="true"
               requiredMessage=
                 "Name required (for crediting report)"
               id="name"/>
  <h:message for="name"/>

  URL containing the problem:
  <h:inputText value="#{errorReportBean1.url}"
               required="true"
               requiredMessage=
                 "URL required (page that has error)"
               validatorMessage="Invalid URL"
               id="url">
    <mcv:validateUrl/>
  </h:inputText>
  <h:message for="url"/>
```

Example: Input Form (bug-report-1.xhtml) Part 3

```
  Email address:
  <h:inputText value="#{errorReportBean1.emailAddress}"
               required="true"
               requiredMessage=
                 "Email address required (for confirmation)"
               validatorMessage="Invalid email address"
               id="email">
    <mcv:validateEmail/>
  </h:inputText>
  <h:message for="email"/>
```

Example: Input Form (bug-report-1.xhtml) Part 4

```
Credit card number:
<h:inputSecret value="#{errorReportBean1.cardNumber}"
               required="true"
               requiredMessage=
                 "Credit card required (for $10 'thank you')"
               validatorMessage="Invalid credit card number"
               id="card1">
  <mcv:validateCreditCard/>
</h:inputSecret>
<h:message for="card1"/>
Reenter card number:
<h:inputSecret value="#{errorReportBean1.cardNumberConfirmation}"
               required="true"
               requiredMessage=
                 "Credit card required (for $10 'thank you')"
               id="card2">
  <mcv:validateCreditCard message="Invalid credit card number"/>
  <mcv:validateCompareTo operator="eq" forId="card1"
                         message="Must match first card entry"/>
</h:inputSecret>
<h:message for="card2"/>
```

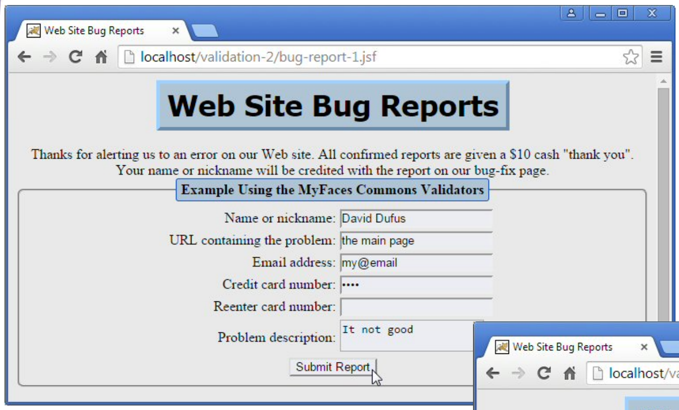
Example: Input Form (bug-report-1.xhtml) Part 5

```
  Problem description:
  <h:inputTextarea
value="#{errorReportBean1.problemDescription}"
                   required="true"
                   requiredMessage=
                     "At least brief description required"
                   id="description"/>
  <h:message for="description"/>
</h:panelGrid>
  <h:commandButton value="Submit Report"
                   action="#{errorReportBean1.sendReport}"/>
</h:form>
```

Example: Results Page (report-confirmation.xhtml)

```
...
<h1 class="title">Report Summary</h1>
<p>Here is the data you sent:</p>
<ul>
  <li>Name: #{errorReportBean1.name}</li>
  <li>URL: #{errorReportBean1.url}</li>
  <li>Email address: #{errorReportBean1.emailAddress}</li>
  <li>Credit card number:
      <i>xxxx</i>-#{errorReportBean1.abbreviatedCardNumber}</li>
  <li>Problem description:
      <i>#{errorReportBean1.problemDescription}</i></li>
</ul>
<p>A $10 thank you will be credited to your card upon
confirmation of the issue.</p>
...
```

Results: Bad Data 1

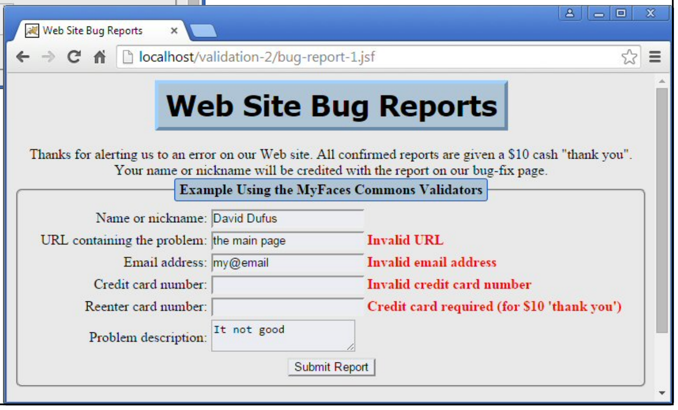


Web Site Bug Reports

Thanks for alerting us to an error on our Web site. All confirmed reports are given a $10 cash "thank you". Your name or nickname will be credited with the report on our bug-fix page.

Example Using the MyFaces Commons Validators

Name or nickname:	David Dufus
URL containing the problem:	the main page
Email address:	my@email
Credit card number:	••••
Reenter card number:	
Problem description:	It not good



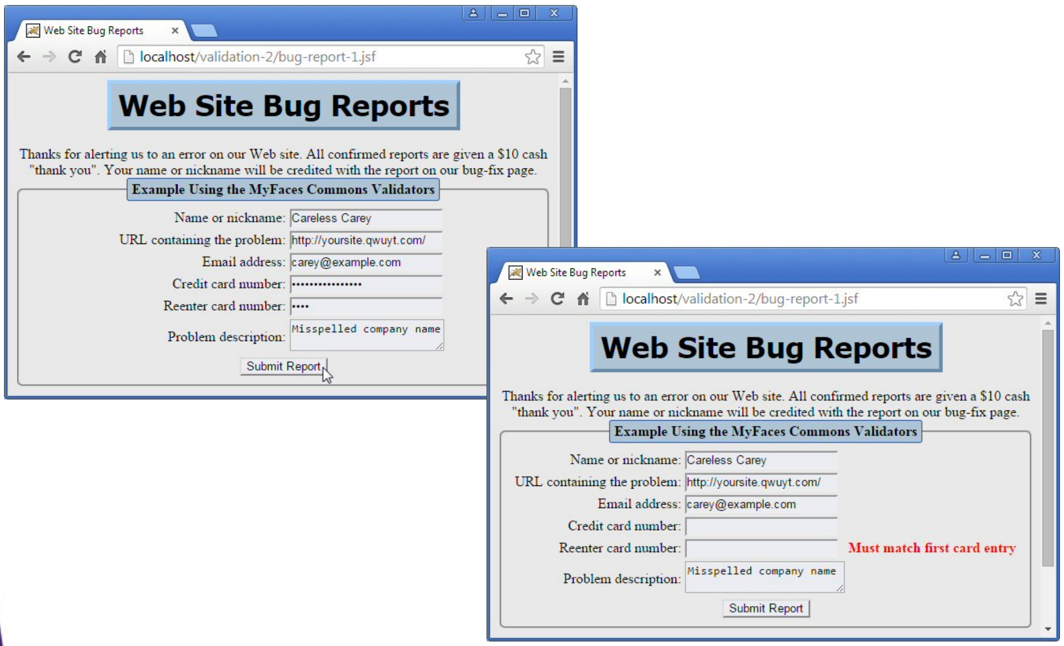
Web Site Bug Reports

Thanks for alerting us to an error on our Web site. All confirmed reports are given a $10 cash "thank you". Your name or nickname will be credited with the report on our bug-fix page.

Example Using the MyFaces Commons Validators

Name or nickname:	David Dufus	
URL containing the problem:	the main page	Invalid URL
Email address:	my@email	Invalid email address
Credit card number:		Invalid credit card number
Reenter card number:		Credit card required (for $10 'thank you')
Problem description:	It not good	

Results: Bad Data 2



Web Site Bug Reports

localhost/validation-2/bug-report-1.jsf

Web Site Bug Reports

Thanks for alerting us to an error on our Web site. All confirmed reports are given a $10 cash "thank you". Your name or nickname will be credited with the report on our bug-fix page.

Example Using the MyFaces Commons Validators

Name or nickname:	Careless Carey
URL containing the problem:	http://yoursite.qwuyt.com/
Email address:	carey@example.com
Credit card number:	••••••••••••••••
Reenter card number:	••••
Problem description:	Misspelled company name

Submit Report

Web Site Bug Reports

localhost/validation-2/bug-report-1.jsf

Web Site Bug Reports

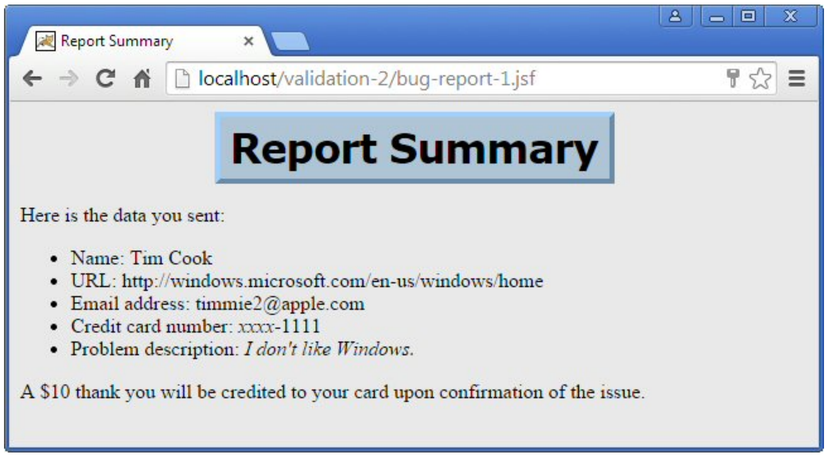
Thanks for alerting us to an error on our Web site. All confirmed reports are given a $10 cash "thank you". Your name or nickname will be credited with the report on our bug-fix page.

Example Using the MyFaces Commons Validators

Name or nickname:	Careless Carey	
URL containing the problem:	http://yoursite.qwuyt.com/	
Email address:	carey@example.com	
Credit card number:		
Reenter card number:		**Must match first card entry**
Problem description:	Misspelled company name	

Submit Report

Results: Good Data



Report Summary

localhost/validation-2/bug-report-1.jsf

Report Summary

Here is the data you sent:

- Name: Tim Cook
- URL: http://windows.microsoft.com/en-us/windows/home
- Email address: timmie2@apple.com
- Credit card number: xxxx-1111
- Problem description: *I don't like Windows.*

A $10 thank you will be credited to your card upon confirmation of the issue.

Using the Apache MyFaces Extended Validators with PrimeFaces

Overview

- **Big ideas**
  - Using third-party validators does not interfere in any way with using a third-party GUI components that were developed by a different organization
  - Most people that use one (validators) also use the other (GUIs). PrimeFaces is arguably the most popular choice.
- **Example**
  - Previous example will be redone with PrimeFaces, just to show the look. *Little or no explanation is provided.*
    - But all techniques and components used are covered in the tutorial sections on PrimeFaces
- **Tutorial sections on PrimeFaces**
  - http://www.coreservlets.com/JSF-Tutorial/primefaces/

Example: Managed Bean

```
@ManagedBean
public class ErrorReportBean2 extends ErrorReportBean1 {
  @Override
  public String sendReport() {
    super.sendReport();
    String confirmationMessage = String.format(
        "%s (%s) reported \"%s\" for %s. On confirmation " +
        "of problem, $10 will be credited to xxxx-%s.",
         getName(), getEmailAddress(), getProblemDescription(),
         getUrl(), getAbbreviatedCardNumber());
    FacesContext context = FacesContext.getCurrentInstance();
    FacesMessage fMessage = new FacesMessage(confirmationMessage);
    context.addMessage(null, fMessage);
    return(null);
  }
}
```

The idea is that the main page will always pop up a dialog box with p:messages as the body of the dialog box. If there was a validation error, the text in the dialog box will be in the "error" color and will show the validation messages, and the action controller method will never be called. If validation passes, then this method will be called, the text in the dialog box will be in the "info" color and will show the above text.

Example: Input Form (bug-report-2.xhtml) Part 1

```
<h:form>
<h:panelGrid columns="2" styleClass="formTable">
  Name or nickname:
  <p:inputText value="#{errorReportBean2.name}"
          required="true"
          requiredMessage="Name required (for crediting report)"
          id="name"/>

  URL containing the problem:
  <p:inputText value="#{errorReportBean2.url}"
          required="true"
          requiredMessage="URL required (page that has error)"
          validatorMessage="Invalid URL"
          id="url">
    <mcv:validateUrl/>
  </p:inputText>
```

Example: Input Form (bug-report-2.xhtml) Part 2

```
Email address:
<p:inputText value="#{errorReportBean2.emailAddress}"
             required="true"
             requiredMessage=
               "Email address required (for confirmation)"
             validatorMessage="Invalid email address"
             id="email">
  <mcv:validateEmail/>
</p:inputText>

Credit card number:
<p:password value="#{errorReportBean2.cardNumber}"
            required="true"
            requiredMessage=
              "Credit card required (for $10 'thank you')"
            validatorMessage="Invalid credit card number"
            id="card1">
  <mcv:validateCreditCard/>
</p:password>
```

Example: Input Form (bug-report-2.xhtml) Part 3

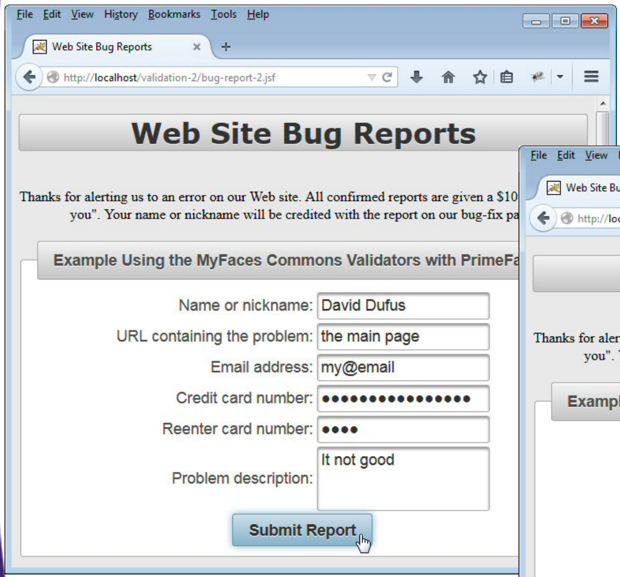
```
Reenter card number:
<p:password value="#{errorReportBean2.cardNumberConfirmation}"
            required="true"
            requiredMessage=
              "Second credit card required (to confirm match)"
            validatorMessage=
              "The two credit card numbers must match"
            id="card2">
  <mcv:validateCompareTo operator="eq" forId="card1"/>
</p:password>

Problem description:
<p:inputTextarea value="#{errorReportBean2.problemDescription}"
                 required="true"
                 requiredMessage=
                   "At least brief problem description required"
                id="description"/>
</h:panelGrid>
```

Example: Input Form (bug-report-2.xhtml) Part 4

```
</h:panelGrid>
  <p:commandButton value="Submit Report"
                   action="#{errorReportBean2.sendReport}"
                   process="@form"
                   update="messages"
                   onsuccess="PF('dlg').show()"/>

<p:dialog header="Report Summary" widgetVar="dlg">
  <p:messages id="messages"/>
</p:dialog>

</h:form>
```

The button uses Ajax, since that is the default for PrimeFaces buttons. If validation fails, the action controller method (sendReport) is never called, so the text shown by p:messages gives the validation errors. If validation passes, then the action controller method (sendReport) is called, so the text shown by p:messages is the informational text set in sendReport.

Results: Bad Data

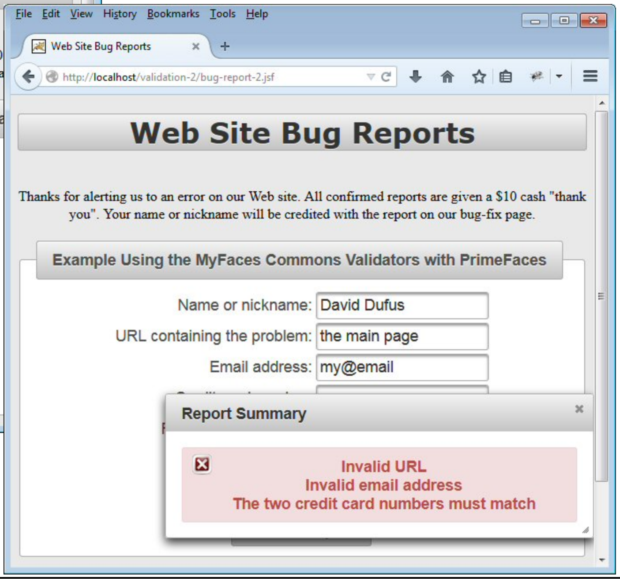

Web Site Bug Reports

Thanks for alerting us to an error on our Web site. All confirmed reports are given a $10 ... you". Your name or nickname will be credited with the report on our bug-fix pa...

Example Using the MyFaces Commons Validators with PrimeFa...

Name or nickname:	David Dufus
URL containing the problem:	the main page
Email address:	my@email
Credit card number:	●●●●●●●●●●●●●●●●
Reenter card number:	●●●●
Problem description:	It not good

Submit Report


Web Site Bug Reports

Thanks for alerting us to an error on our Web site. All confirmed reports are given a $10 cash "thank you". Your name or nickname will be credited with the report on our bug-fix page.

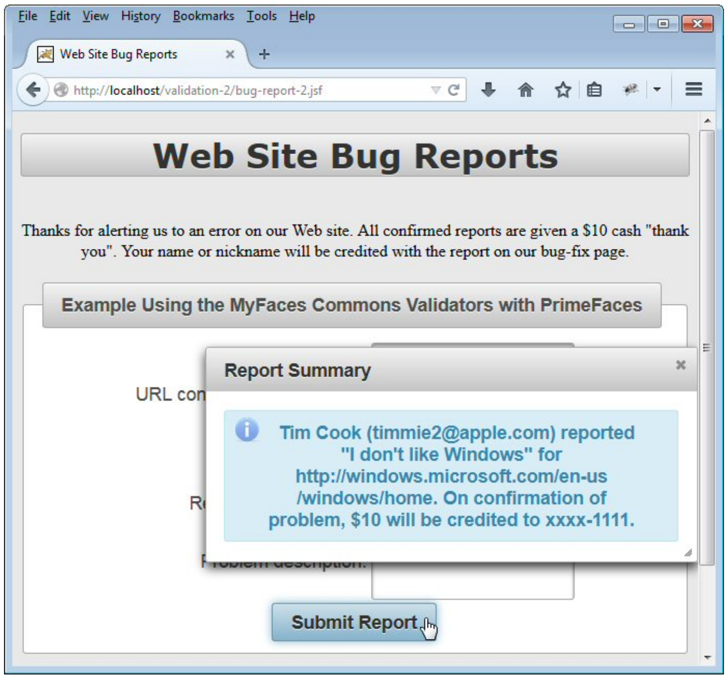
Example Using the MyFaces Commons Validators with PrimeFaces

Name or nickname:	David Dufus
URL containing the problem:	the main page
Email address:	my@email

Report Summary

Invalid URL
Invalid email address
The two credit card numbers must match

Results: Good Data


File Edit View History Bookmarks Tools Help
Web Site Bug Reports
http://localhost/validation-2/bug-report-2.jsf

Web Site Bug Reports

Thanks for alerting us to an error on our Web site. All confirmed reports are given a $10 cash "thank you". Your name or nickname will be credited with the report on our bug-fix page.

Example Using the MyFaces Commons Validators with PrimeFaces

Report Summary

Tim Cook (timmie2@apple.com) reported "I don't like Windows" for http://windows.microsoft.com/en-us/windows/home. On confirmation of problem, $10 will be credited to xxxx-1111.

Wrap-Up

Summary

- **Manual validation (in action controller method)**
  - For comparing *two or more* fields to each other

```
FacesMessage errorMessage = new FacesMessage("…");
errorMessage.setSeverity(FacesMessage.SEVERITY_ERROR);
FacesContext.getCurrentInstance().addMessage(null, errorMessage);
return(null);
```

Use "formId:fieldId" instead of null above if you want error message next to the field.

- **Using a custom validator method**
  - For checking *single* field for something not done with f:validate*Blah*
    - <h:input*Blah* … validator="#{someBean.someMethod"/>
- **Localizing (internationalizing) error messages**
  - *blah*Message="#{msgs.messageName}"
- **Using the Apache MyFaces Commons validators**
  - For URLs, email addresses, credit cards, cross-field comparisons
  - Typically used with PrimeFaces as well

Questions?

More info:
http://www.coreservlets.com/JSF-Tutorial/jsf2/ – JSF 2.2 tutorial
http://www.coreservlets.com/JSF-Tutorial/primefaces/ – PrimeFaces tutorial
http://courses.coreservlets.com/jsf-training.html – Customized JSF and PrimeFaces training courses
http://coreservlets.com/ – JSF 2, PrimeFaces, Java 7 or 8, Ajax, jQuery, Hadoop, RESTful Web Services, Android, HTML5, Spring, Hibernate, Servlets, JSP, GWT, and other Java EE training