PROG2240: Java Web Tech

Assignment 3

Winter 2017

Assignment Type: Pair Programming

Due Date: Week 12 (start of class)
Note: Due on the week after the Midterm Exam Week

Before you begin:

- Read and study sample book applications from Chapters 7, 8 and 9.
- Do the **Individual Exercise 7-2 and 7-3** on page 242. Then, do **Individual Exercise 8-1** on page 267 and demo to your partner.
- Print **LastPage_PPLog.pdf**. Date and sign Sections B and C of your **Pair Programming (PP) Experience Log.**
    - **Note: Your team will get a 50% penalty if the PP Log is incomplete or missing.**
- You must have the Java source code (i.e., Book.java) provided in A2.
- Read the *Important Notes* section of A1 and *Additional Requirements* of A2.

Background: In this assignment, you will continue to use the MVC pattern using servlets and JSPs. You will use the servlets with ***action*** pattern for Cart servlet, JSP EL and JSTL to develop the XXYY Computer Programming Club's **Loan Cart** Web application. You will also use the various scope (i.e., page, request, session and application) of EL when accessing attributes.

Additional Requirements:

- Explicitly specify the ***scope*** when accessing attributes using EL (e.g., ***sessionScope***).
- Use <c:url> tag in *href* attribute of an anchor tag (hyperlink).
- Do **not** use <c:import> tag when <jsp:include> is adequate.
- Do **not** use redirect() method when forward() method is appropriate.
- Do **not** use scripting elements (e.g., JSP scriptlet, JSP expression) when JSP EL is available.

Tasks

1. Setup XXYYClub NetBeans project

a. Add Java classes

- Download **A3Files.zip** and copy these two Java classes to the existing **club.business** package.
  - ELoan.java and ECart.java
  - Study all the new code provided
  - Use the methods provided as part of your solution (see next steps).
- Important: Do not modify any of these classes. Also, **do not** use *BookIO class* for A3.

b. Ensure that the JSTL library is available for this application

c. Add a new context parameter to web.xml

- Parameter Name: booksFilePath
- Parameter Value: /WEB-INF/books.txt

Hint: Open web.xml in NetBeans and click General tab

---

2. Modify the Banner JSP page

- Add two new hyperlinks to the XXYYBanner.jsp.
  - eLoan (linked to XXYYLoan servlet -- see Step 3a)
  - eCart (linked to XXYYCart servlet -- see Step 4a)
- For the screen layout of these hyperlinks, refer to the sample screenshot in Step 3.

---

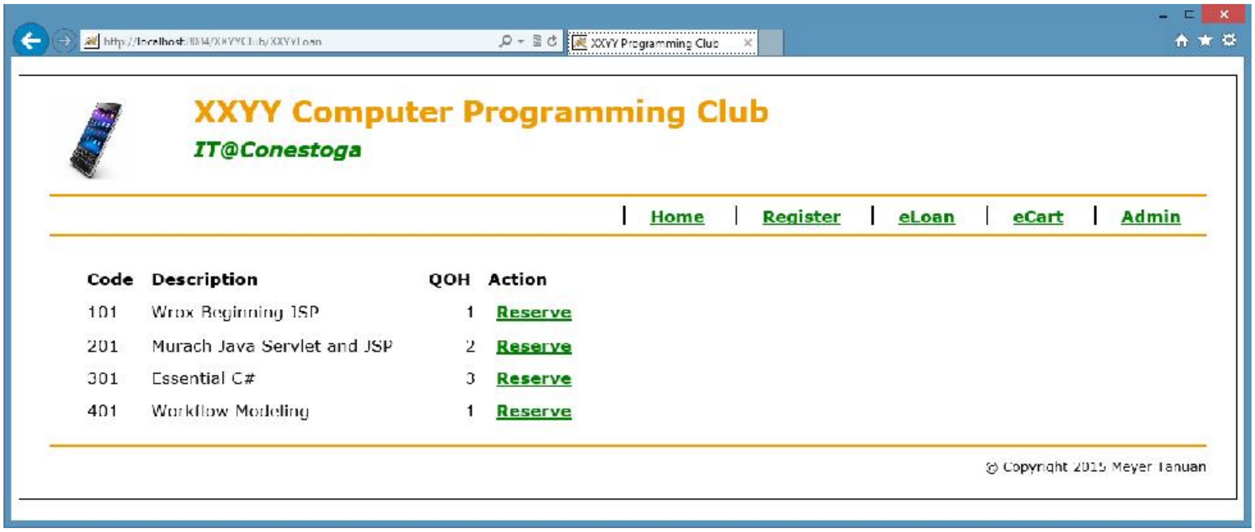
3. Write the eLoan servlet and JSP

a. Add an eLoan servlet

- Under the Java source (i.e., "Source Packages") directory, add a new package: **club.cart**
- Add a servlet named XXYYLoanServlet.java
    - Set URL pattern to /XXYYLoan
- Within the **processRequest()** generated method:
    - Create a new **servlet context** object (i.e., *application* object)
    - Using the booksFilePath context parameter defined in **web.xml**, prepare the full path name of books.txt file
    - Maintain a **loanitems** object to store the ArrayList of **Book** objects available on loan.
    - *Hints*:
        - Create/save the **loanitems** object in the **servlet context** object
        - If **loanitems** stored in the **servlet context** object is null, call the **loadItems(string)** method of **ELoan** class. This will populate **loanitems** object with the list of books from the **books.txt** file.
    - Forward the control to XXYYELoan.jsp page.

b. Add an eLoan JSP page

- Add a JSP page named XXYYELoan.jsp.
- Add the banner and footer pages.
- Using JSTL and EL (not scripting elements), add the code to match the design layout shown below.
- The **eLoan JSP** page shows a list of **loanitems** with the quantity-on-hand (QOH)
- Each time you click the **Reserve** hyperlink, call the XXYYCart servlet with two parameters
    - action: set to "reserve" .
    - code: set to the code selected (e.g., 101).
    - Note: The XXYYCart servlet must require these two parameters to add items to the cart



XXYY Computer Programming Club

IT@Conestoga

Code	Description	QOH	Action
101	Wrox Beginning JSP	1	Reserve
201	Murach Java Servlet and JSP	2	Reserve
301	Essential C#	3	Reserve
401	Workflow Modeling	1	Reserve

© Copyright 2015 Meyer Tanuan

Note: If the **Reserve** link is selected, call the XXYYCart servlet (see next step). When items are reserved (i.e., added to the loan cart), the QOH of that loan item is reduced by 1. If the QOH becomes zero, the Reserve link becomes "N/A" similar to the screen shot shown below (see Step 6, QOH for code 101).

---

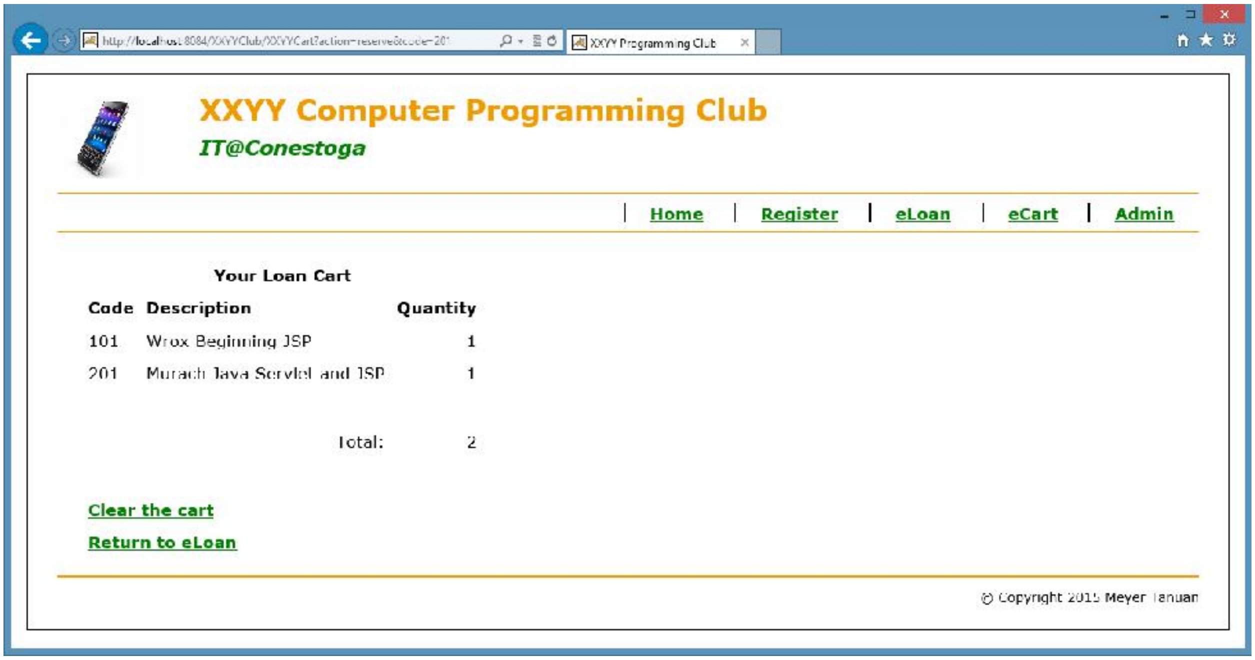
4. Write the eCart servlet and JSP

a. Add the eCart servlet

- Under the **club.cart** package, add a servlet named XXYYCartServlet.java
  - Set URL pattern to /XXYYCart
- Within the **processRequest()** generated method:
  - Access the **loanitems** object stored in the servlet context.
  - Create/save a loan **cart** object (instantiated from **ECart** class) in the **session** object
  - If action is "**reserve**":
    - Using the "**code**" parameter, get details of the loan item (i.e., Book object) by calling the **findItem**(ArrayList, String) method of **ELoan** class.
    - Call the **addItem(**Book**)** method of the loan **cart** object
    - Reduce the loan item's QOH by 1
    - *Hint:* Call the **subtractFromQOH**(ArrayList, String, int) method of the **ELoan** class.
  - Forward the control to XXYYECart.jsp page

b. Add the eCart JSP page

- Add a JSP page named XXYYECart.jsp.
- This page will display all the loan items added to the **cart**.
- Add the banner and footer pages.
- Using JSTL and EL (not scripting elements), add the code to match the design layout including the title shown below.
    - Show total quantity in the cart (i.e., reserved).
    - *Hint:* Use the <c:set> JSTL tag to declare a variable.
    - Quantity column should be aligned to the right.
- Sample screen shot when Reserve link is selected for both code 101 and code 201:



http://localhost:8084/XXYYClub/XXYYCart?action=reserve&code=201
XXYY Programming Club

XXYY Computer Programming Club

IT@Conestoga

| Home | Register | eLoan | eCart | Admin

Your Loan Cart

Code	Description	Quantity
101	Wrox Beginning JSP	1
201	Murach Java Servlet and JSP	1
	Total:	2

Clear the cart

Return to eLoan

© Copyright 2015 Meyer Tanuan

---

5. Write the ClearCart servlet

- Under the **club.cart** package, add a servlet named XXYYClearCartServlet.java
    - Set URL pattern to /XXYYClearCart
- Within the **processRequest()** generated method:
    - Create/save a loan **cart** object (instantiated from **ECart** class) in the **session** object, *as appropriate*.
    - Use the **getItems()** method of the **cart** object to access the list of cart items

- Add back the quantity reserved from each cart item to the loan items QOH.
    - *Hint:* Call the **addToQOH**(String, int) method in the **ELoan** class.
- Invalidate the **session** object
    - Note: This will delete the current session ID and start with an empty cart
- Forward the control to XYYECart.jsp

---

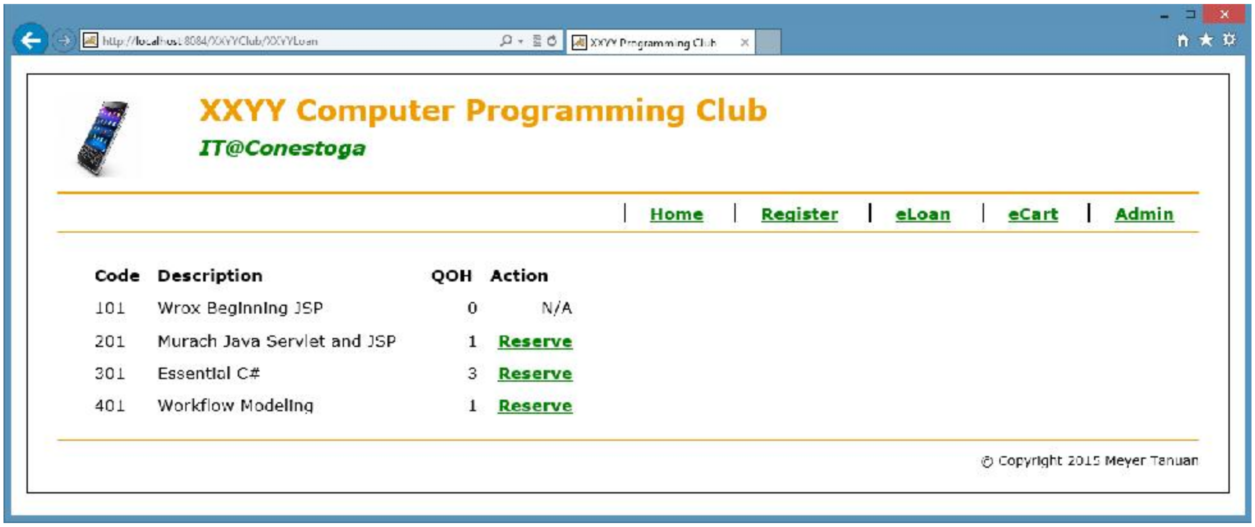
6. Continue to Test the Loan Cart Web Application

Important Note: If you encounter any errors/issues during testing, you must modify your code to resolve all the errors/issues.

Before you begin: Set the Web browser to disable the use of cookies.

a. After adding code 101 and code 201 to the cart, click the **Return to eLoan** link

- Result:
    - Wrox Beginning JSP book has been reserved and QOH is zero. Action column is shown as "N/A".
    - Murach Java Servlet and JSP book has been reserved and QOH is 1.



XXYY Computer Programming Club

IT@Conestoga

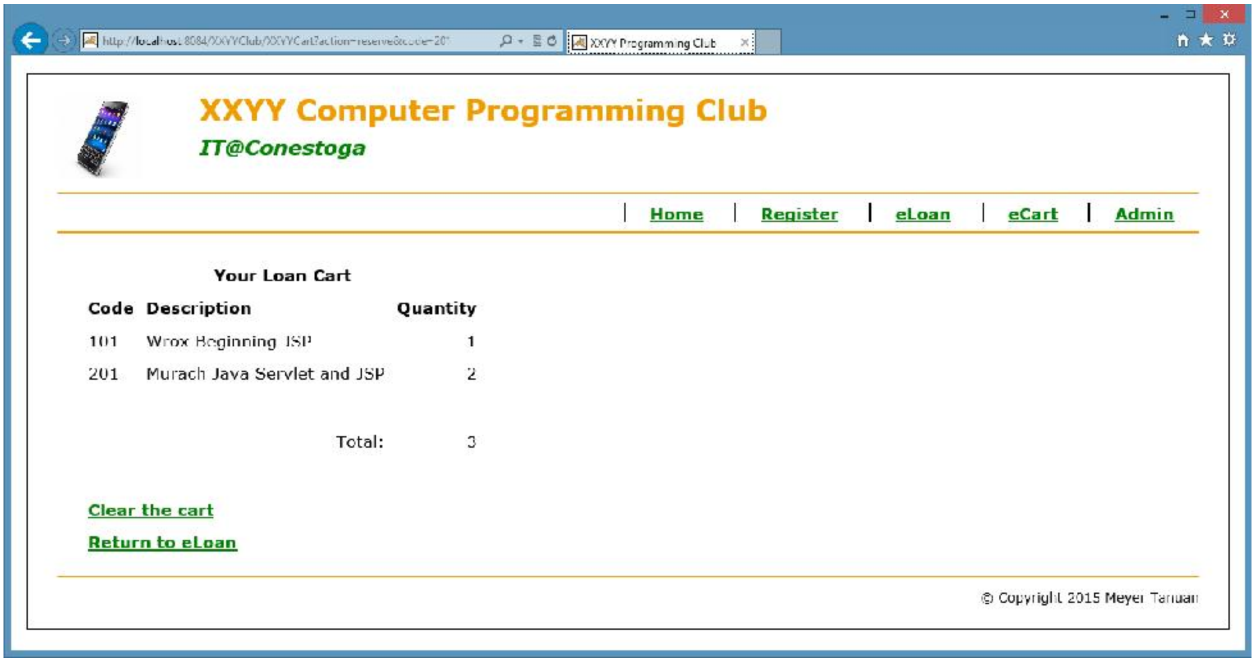
| Home | Register | eLoan | eCart | Admin

Code	Description	QOH	Action
101	Wrox Beginning JSP	0	N/A
201	Murach Java Servlet and JSP	1	Reserve
301	Essential C#	3	Reserve
401	Workflow Modeling	1	Reserve

© Copyright 2015 Meyer Tanuan

b. Click **Reserve** link for code 201 again.

- Result: The **Cart** is displayed with a total quantity of 3 books in the cart.


http://localhost:8084/XXYYClub/XXYYCart?action=reserve&code=20
XXYY Programming Club

XXYY Computer Programming Club

IT@Conestoga

| Home | Register | eLoan | eCart | Admin

Your Loan Cart

Code	Description	Quantity
101	Wrox Beginning JSP	1
201	Murach Java Servlet and JSP	2
	Total:	3

Clear the cart

Return to eLoan

© Copyright 2015 Meyer Tanuan

c. Click the **Clear the Cart** link

- Result: All cart items are removed from the **cart** object. The QOH of the loan items list must be updated accordingly.

d. Click the **Return to eLoan** link

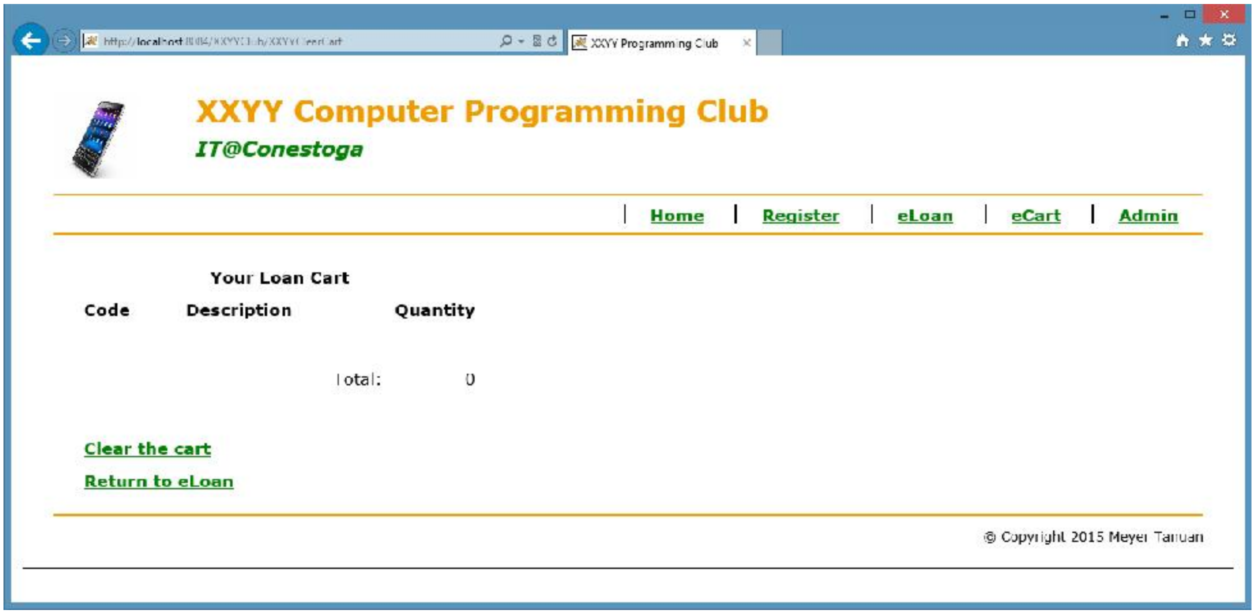
- Result: All items are now available to be reserved with QOH shown in sample screen shot of Task 3.

e. Testing an Empty Cart

- From the **Banner JSP** page, click on the **eCart** link.
  - Result: Empty Cart (see sample screenshot below)
- From the **eCart** page, click on **Clear the Cart** link.
  - Result: Empty Cart (see sample screenshot below)

f. Build your own negative test cases

- Build and exercise your own negative test cases (e.g., On the Web browser, directly enter a URL to execute Cart servlet without the **action** parameter).



http://localhost:8084/XXYYClub/XXYYLoanCart
XXYY Programming Club
XXYY Computer Programming Club
IT@Conestoga
| Home | Register | eLoan | eCart | Admin

Your Loan Cart

Code	Description	Quantity
	Total:	0

Clear the cart

Return to eLoan

© Copyright 2015 Meyer Tanuan

---

7. Testing Multiple Sessions

While the first **session** (i.e., Web browser) is still open, start another Web browser session.

- Start | All Programs | Internet Explorer (or FireFox)
- Run the **eLoan** page.
  - E.g., http://localhost:8084/XXYYClub/XXYYLoan
- In the second session, click Reserve link
- **Result:**
  - The QOH must show the loan items that are still available. Loan items reserved by the first (previous) session cannot be reserved by the second (new) session.
  - The cart items in the first session are different from the cart items in the second session. This demonstrates the use of the **session** implicit object.

Tip: To reset all the QOH to the original quantities, undeploy the /XXYYClub application **or** ***restart*** the Tomcat server.

---

8. Demo your eLoan Web Application

- Print and submit sample screen shots (similar to the five screen shots above) of your running application.
- Be ready to demo all the features of your assignment solution. Use the above testing steps only as a starting point.
  - E.g., Test when cookies are disabled.

Assignment Submissions

Important: You must submit your printouts (Cover Page, screenshots, PP Log) and upload your solution (XXYYClub.zip). Do not print your code.

Sequence	Item
1	A printout of the A3_CoverPage.pdf (a total of 3 pages) with all the relevant sections filled in.
2	A printout of 5 sample screenshots similar to the above screenshots (with the **title** displayed). The screenshots should be large enough for marking (Use Alt-PrtSc to copy and paste screenshot to MS Word, one screenshot per page).
3	A printout of the LastPage_PPLog.pdf with all the relevant sections filled in.
4	Zip and upload your assignment solution XXYYClub.zip (where XXYY is your team initials in upper case letters) to your appropriate section's **A3_Dropbox** on **eConestoga**. Upload using the **driver's** eConestoga login. **Note:** This zip file must be ready to run on NetBeans 8.1 without modifications when unzipped to C:\murach in any Doon IT Lab. *Otherwise you will get 5% penalty per upload-related error.*
5	Demo your assignment solution **on or before** the due date. Both pair programming team members must be present to demo your assignment. The instructor will randomly decide who will demo your solution. *The instructor will also randomly ask any member to demo their individual exercises solution.*