# Lesson 2 Practical B – Session Tracking

**Objectives:**

- Understand the concept of Session Tracking
- Understand the concept of Request forwarding and Response redirection

**Prerequisites:**

- Completed Practical – Develop Web Application using Eclipse for Java EE
- MyServlet.war is available

## Session Tracking

In this workshop we will explore the behavior of session tracking by modifying our previous practical on MyServlet to include the authentication function to ensure user is login to the system before he can use the bookstore application.

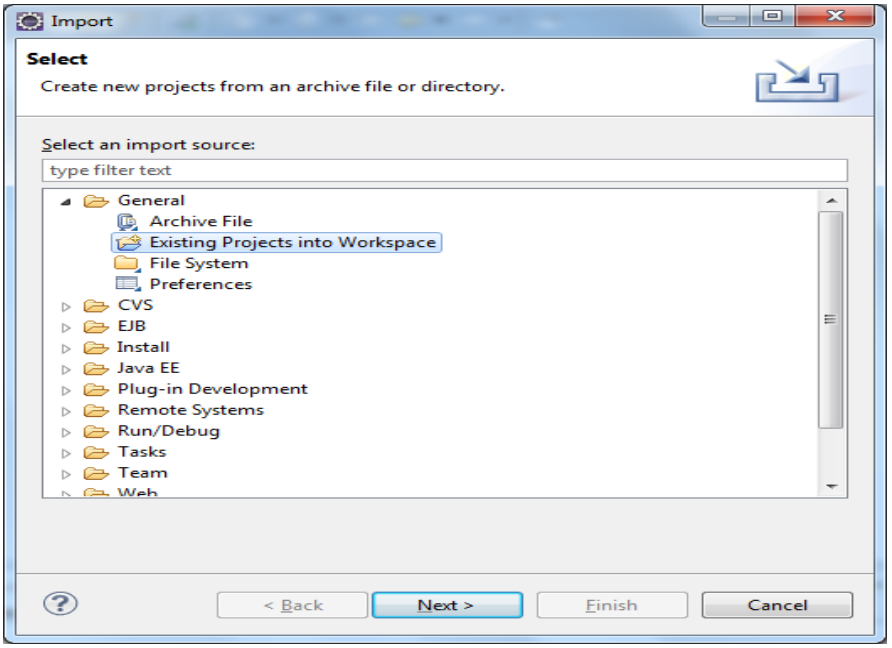
1) Startup Eclipse for Java EE and choose your favourite workspace.

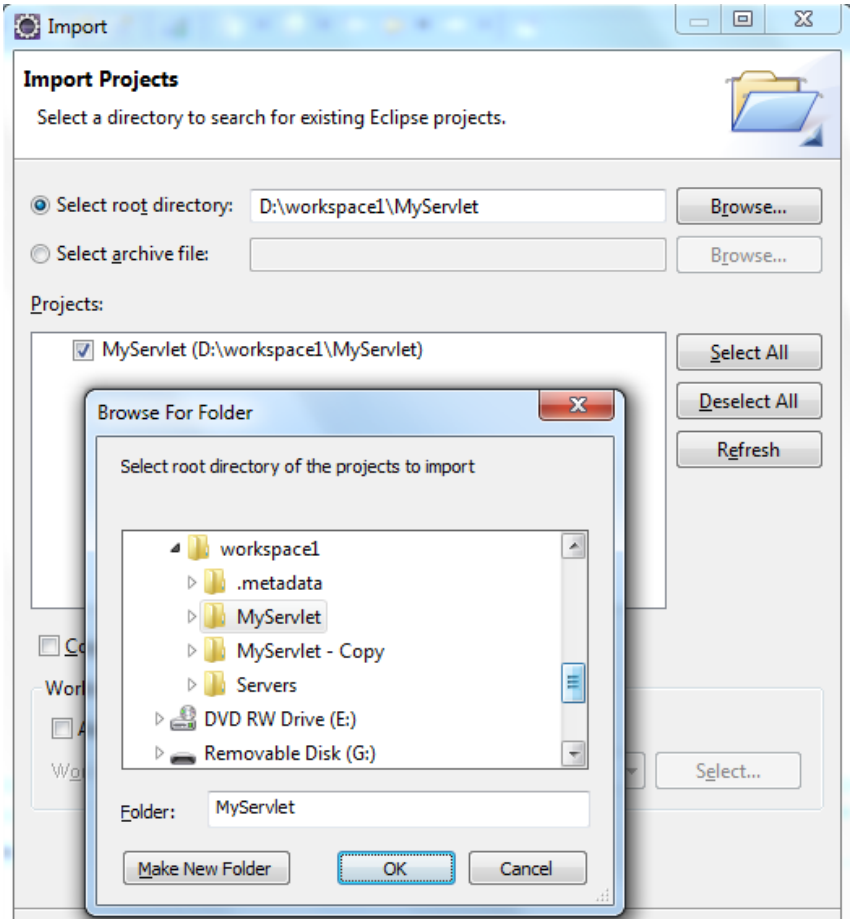
   (i) If project already appears in the workspace. Proceed with the lab.

   **OR**

   (ii) Project name (e.g MyServlet) did not appear in the workspace. However the project folder and source codes are located somewhere in the harddrive.

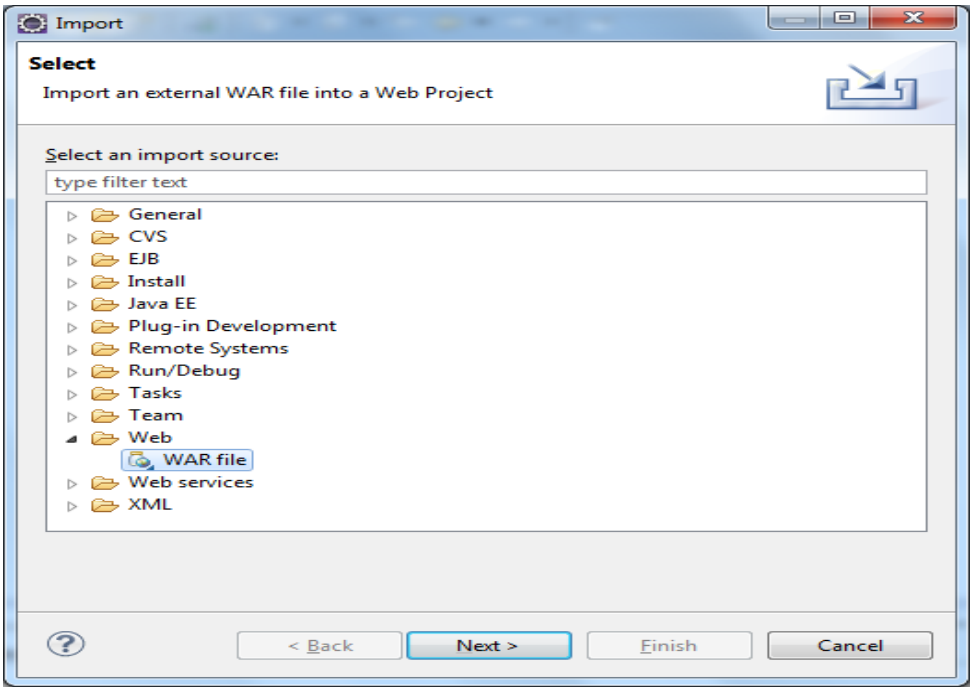
   - Use File → Import
   - Expand General and choose "Existing Projects into Workspace"

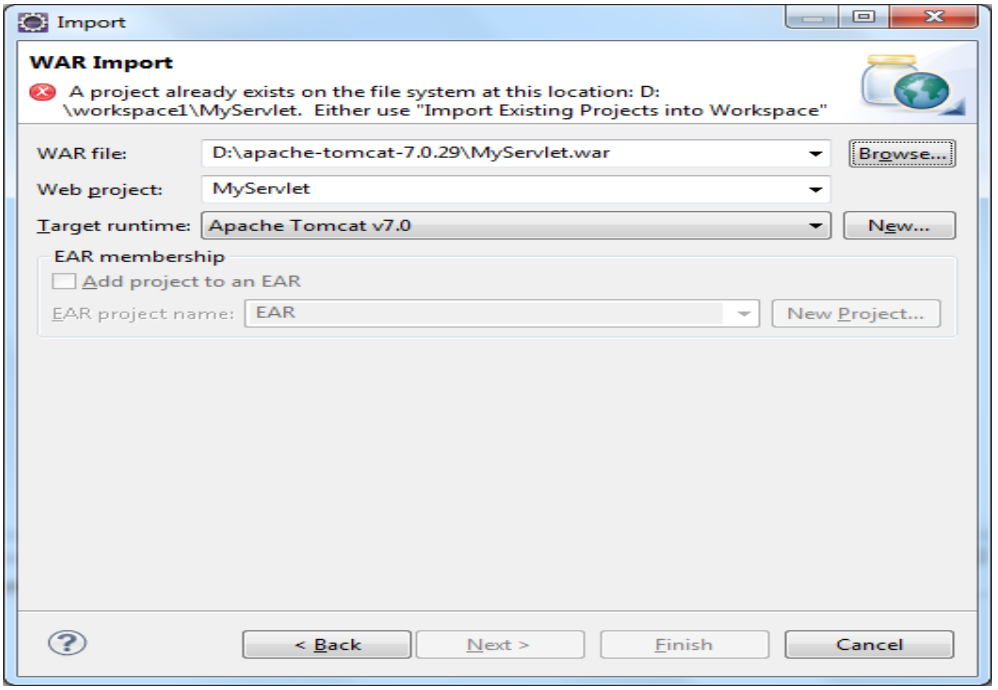





**OR**

(iii) Import the WAR file by right clicking on the **Project Explorer** and browse to **MyServlet.war**. Upon successfully imported the project, you should have all the files loaded into the project explorer.





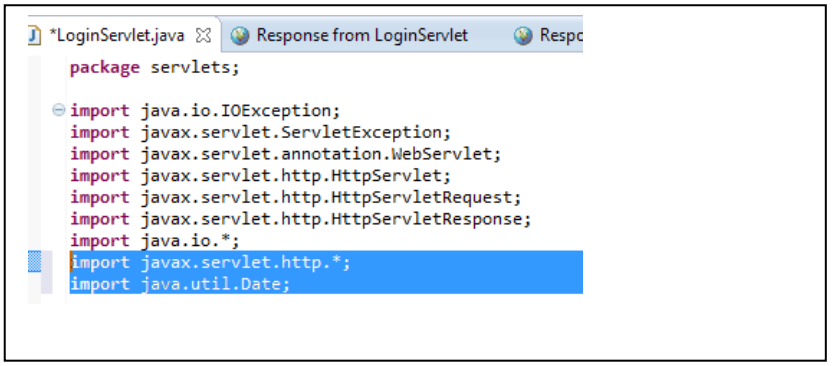

**Task :**

- **Modify LoginServlet.java.**
- **Upon successful authentication, the session data displayed in table format.**

2) Creating a new Session (Local Postback)

(i) Make changes to LoginServlet.java as shown below

```
protected void doGet(HttpServletRequest request, HttpServletResponse response) throws
ServletException, IOException {

	//HTTPSession
	HttpSession session = request.getSession(true);

	//HTTPResponse
	response.setContentType("text/html");
	PrintWriter out = response.getWriter();

	//Referer-Identify the referer
	String referer = request.getHeader("referer");

	// print session info
	 Date created = new Date(session.getCreationTime());
	 Date accessed = new Date(session.getLastAccessedTime());
	 out.println("Session ID " + session.getId());
	 out.println("Created: " + created);
	 out.println("Last Accessed: " + accessed);

	String id = request.getParameter("id");
	String password = request.getParameter("password");

	if (id !="" && password!=""){
		try {
		   //AccountDBAO db = new AccountDBAO();
		   //call DAO to verify login and password with DB in later practical
		       boolean status = true ;
		       if (status) {
				//store the user id value into session
				session.setAttribute("id", id);

				//retrieve user id from session and display
				out.println("<html>");
				out.println("<head>");
				out.println("<title>Response from LoginServlet</title>");
				out.println("</head>");
				out.println("<body>");
				out.println("User id: <h1>" +
					(String)session.getAttribute("id") + "</h1>");
				out.println("</body>");
				out.println("</html>");
				out.close();
		       }
		       else response.sendRedirect(referer);
		}
		catch (Exception e) {

			e.printStackTrace();
		}
	}
```




Add import statements :
***import javax.servlet.http.*;***
***import java.util.Date;***

(ii) Test run your application.

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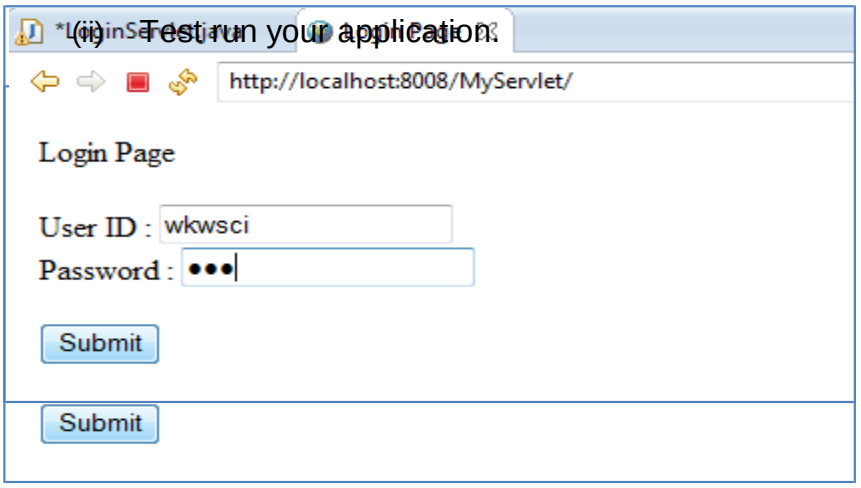
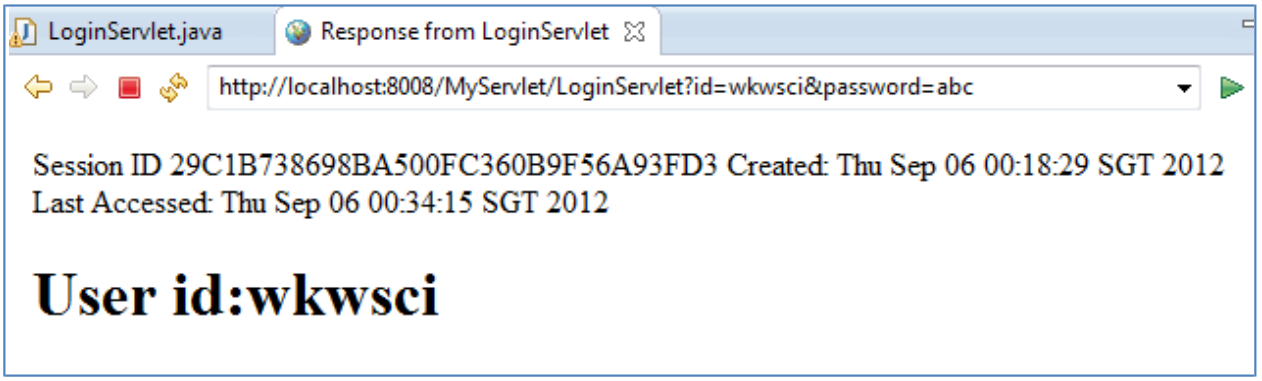
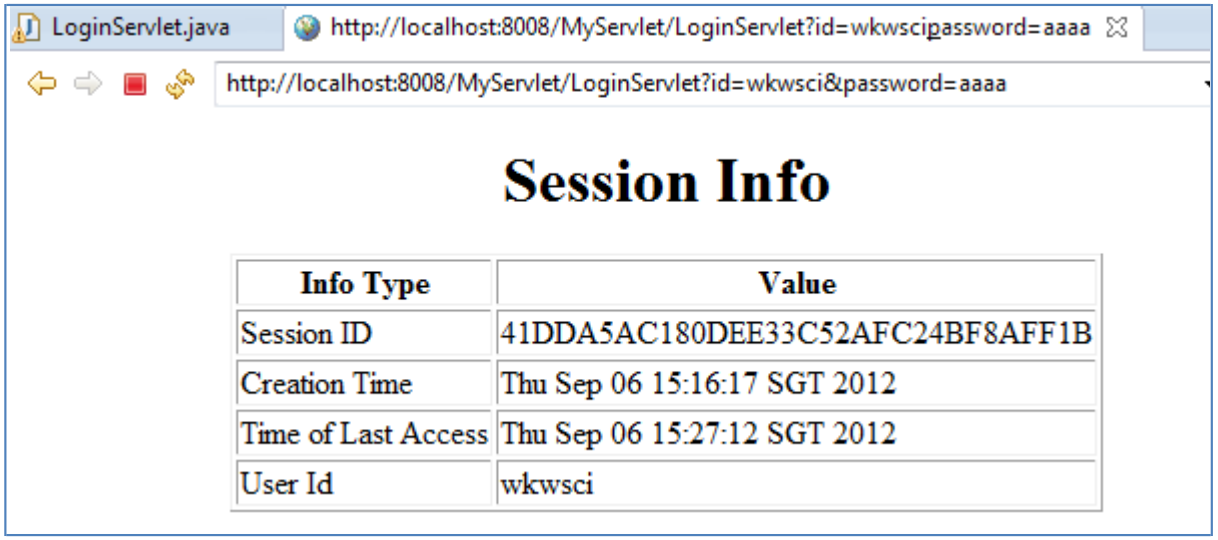



(iii) When user click on the "Submit" button, servlet will display an output similar to the one shown below.



(iv) Make changes to LoginServlet.java such that the output produced by the servlet can be organized in a table format. See sample output screen shown below. (See Appendix A for code sample)



## Request forwarding and response redirection

In a typical web application, there are bound to be more than one servlet. There may be cases where you might want to transfer control from one servlet to another servlet or JSP to perform more processing or display a confirmation message on the screen.

There are TWO ways of doing this : either the request can be forwarded or the response can be redirected to another servlet or page. In this section, we will learn both examples.

I. Request Forwarding

If user login is successful, **forward** the request to another servlet "MainScreenServlet" to display the session info in a table.

JSP → LoginServlet →(if login is successful) → MainScreenServlet

II. Response Redirect

If user login is NOT successful, **redirect** the request back to LoginServlet or other pages (JSP with error message etc)

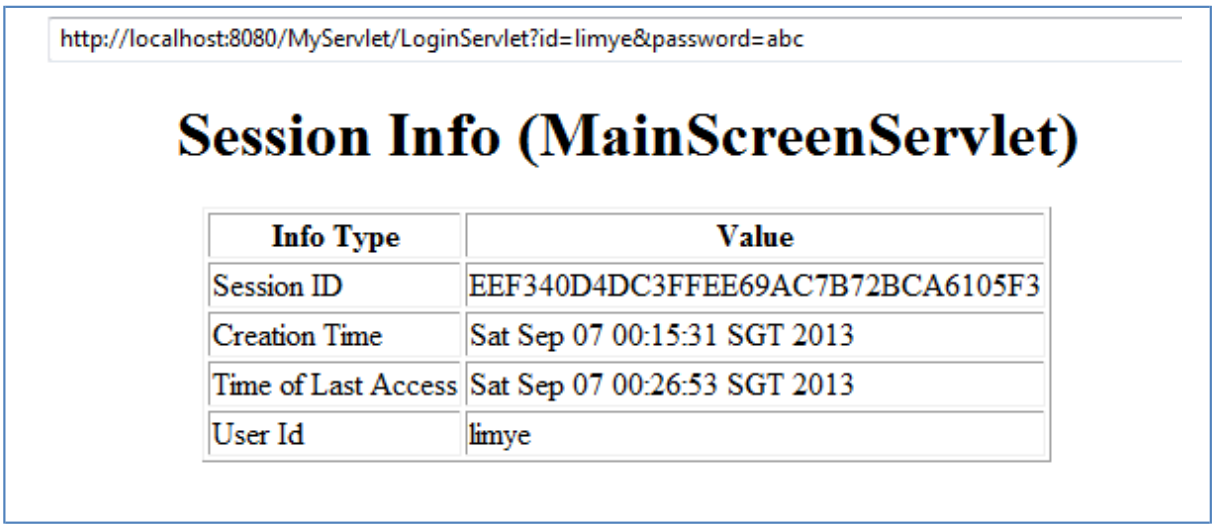
JSP → LoginServlet →(login attempt is unsuccessful) → LoginServlet (other resources)

Task :

- Modify LoginServlet.java to effect the change.
- Create a new servlet and name it "MainScreenServlet".
- Transfer parts of the codes from LoginServlet to MainScreenServlet to produce the same output as in Q2.
- Add codes into the doGet(..) method of the "MainScreenServlet".
- See Appendix A for sample HTML codes to create a table of data.

***~ LoginServlet.java ~***

```
protected void doGet(HttpServletRequest request, HttpServletResponse response) throws
ServletException, IOException {

	//HTTPSession
	HttpSession session = request.getSession(true);

	response.setContentType("text/html");
	PrintWriter out = response.getWriter();

	//Referer-Identify the referer
	//String referer = request.getHeader("referer");

	String id = request.getParameter("id");
	String password = request.getParameter("password");

	 out.println("**************** LoginServlet ******************");
	if (id !="" && password!=""){
		try {
			//AccountDBAO db = new AccountDBAO();
			boolean status = true ;
			if (status) {
				//store the user id value into session
				session.setAttribute("id", id);
				request.getRequestDispatcher("MainScreenServlet").
				forward(request,response);
			}
			else response.sendRedirect(referer);
		}
		catch (Exception e) {
			e.printStackTrace();
		}
	}
}
```



Optional

Task :

- Modify LoginServlet.java to effect the change.
- Modify LoginServlet.java to effect the change.
- Replace the code
- **request.getRequestDispatcher("MainScreenServlet").forward(request,response)**
- to
- **request.getRequestDispatcher("MainScreenServlet").include(request,response)**
- Re-Run your application.
- Any difference to the output?

## Conclusion

In this workshop, you learn the concept of Session tracking, and how this can be used to capture the user information and display a user information (e.g user id) subsequently after the user has logged in. It's important to understand the concept of session tracking so that you are able to keep track of client state in your web application.

Note :Request based getRequestDispatcher() method can be used for referring local servlets within single webapp whereas ServletContext based getRequestDispatcher() method can used of referring servlets from other web applications deployed on **SAME** server

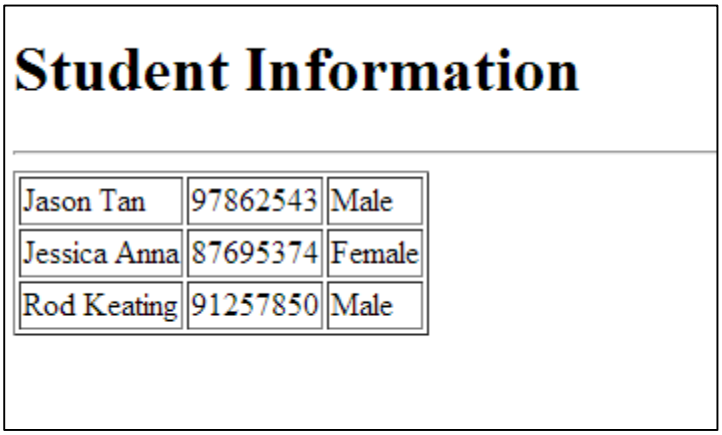
Appendix A - Sample codes to print table with data

HTML in JAVA codes : Displaying a Table with data

```
//Java libraries references
import java.io.*;
import java.util.Date;

 //HTML in JAVA code – Displaying a table with data
out.println("<HTML><BODY>" +
          "<H1 ALIGN=\"CENTER\"> Session Info </H1>" +
          "<TABLE BORDER=1 ALIGN=\"CENTER\">" +
          "<TR>" +
          "<TH>Info Type<TH>Value" +
          "<TR>" +
          "  <TD>Session ID" +
          "  <TD>" + session.getId() +
          "<TR>" +
          "  <TD>Creation Time" +
          "  <TD>" + new Date(session.getCreationTime())  +
          "<TR>" +
          "  <TD>Time of Last Access" +
          "  <TD>" + new Date(session.getLastAccessedTime())  +
          "<TR>" +
          "  <TD>User Id" +
          "  <TD>" + session.getAttribute("id")  +
          "</TR>"+
          "</TABLE>" +
          "</BODY></HTML>");
```

Sample HTML table

```
<!DOCTYPE html>
<html>
<body>

<h1>Student Information</h1>
<hr>

	<table border="1">

		<tr>
			<td>Jason Tan</td>
			<td>97862543</td>
			<td>Male</td>
		</tr>
		<tr>
			<td>Jessica Anna</td>
			<td>87695374</td>
			<td>Female</td>
		</tr>
		<tr>
			<td>Rod Keating</td>
			<td>91257850</td>
			<td>Male</td>
		</tr>

	</table>

</body>
</html>
```



# Student Information

| | | |
|---|---|---|
| Jason Tan | 97862543 | Male |
| Jessica Anna | 87695374 | Female |
| Rod Keating | 91257850 | Male |