**README**

This lab is not easy for me. At the beginning I got stuck with running Tomcat server which configuring in Intellij. I need to search on google to fix this issue. The second issue was I got stuck with building war package which is using to run the Servlet server on Tomcat. The third issue I got stuck with create jUnit because the Intellij compiler was always complain that org.junit.\* package does not exist, I had to add the dependency Maven file into the pom file. It took me about 8 hours to complete this lab and another 2 hours to do the readings and review questions.

**a) 7 questions from the Deployment Lab**

**1. What is the purpose of the directory structure given on p. 30?**

Web applications use a standard directory structure defined in the J2EE specification. The purpose is using for compiling the servlet.

**2. What is the purpose of the directory structure given on p. 31?**

It’s using for server deployment.

**3. Why do you need to be in the project1 directory for step 5?**

It’s needed to be root in project1 to match arguments “-d classes src/Ch1Servlet.java”

**4. Why is the copying of step 6 necessary?**

Following the tomcat standard directory structure: web.xml and Java class files must be in WEB-INF folder.

**5. Where is the name of the web app defined? Try changing it.**

Name of web app is sub-folder of webapps. We need to change URL to access servlet if we change it.

**6. Why is step 9 necessary? Try changing display text in the servlet. What steps are necessary for your changes to appear in the browser?**

When we change servlet we need to re-compile and re-build the artifacts to copy to classes & resources file to deployment folder then restart tomcat server to reload deployment descriptor and Java class file.

**7. Describe an interesting problem you encountered (if any) and how you solved it.**

There’s an interesting problem I had about “getServletContext().getInitParameter("adminEmail")” it’s always return a null value. I needed to add the configure to web.xml file as below:

<context-param>  
 <param-name>adminEmail</param-name>  
 <param-value>admin@example.com</param-value>  
</context-param>

**b) jUnit test from the MVS Beer project**

@Test  
public void getBrands() {  
  
 BeerExpert be = new BeerExpert();  
 List<String> res = be.getBrands("red");  
 List<String> expected = new ArrayList<String>();  
 expected.add("Red Beer 1");  
 expected.add("Red beeR 2");  
 for(int i=0;i<res.size();++i){  
 *assertEquals*(res.get(i),expected.get(i));  
 }  
  
 List<String> res2 = be.getBrands("light");  
 List<String> expected2 = new ArrayList<String>();  
 expected2.add("HaErBin Beer");  
 expected2.add("YanJin Beer");  
 for(int i=0;i<res2.size();++i){  
 *assertEquals*(res2.get(i),expected2.get(i));  
 }  
}

**c) a comment on something of interest or significance from your work and study today.**

It’s really interesting to build and run a website which hosted in my computer. It was the first time I deploy a web server with Tomcat. I learned a lot in this lab from programming and deployment a web application.