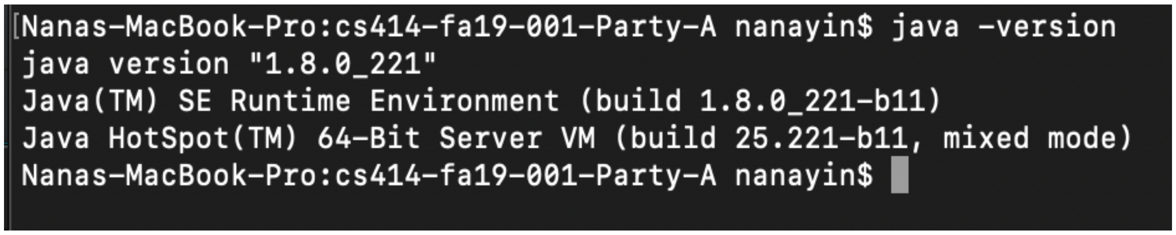
Hnefatafl is a family of 2-player Viking board games, where one player tries to guide a King to a refugee square, while attackers try to prevent this. Right now, we're implementing the popular 11x11 variant.

To develop and test this game, please follow the steps below:

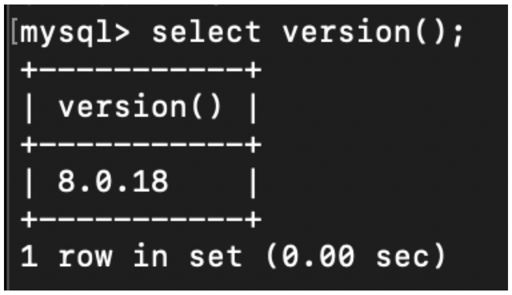
## I. Configure Development Environment

1) Download and install the **JDK 1.8.0_221**



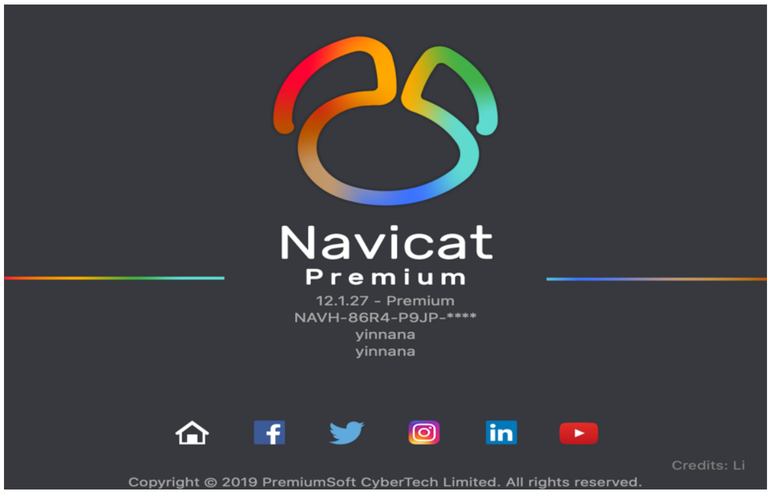
```
[Nanas-MacBook-Pro:cs414-fa19-001-Party-A nanayin$ java -version
java version "1.8.0_221"
Java(TM) SE Runtime Environment (build 1.8.0_221-b11)
Java HotSpot(TM) 64-Bit Server VM (build 25.221-b11, mixed mode)
Nanas-MacBook-Pro:cs414-fa19-001-Party-A nanayin$
```

2) Download and install the database **MYSQL 8.0.18**

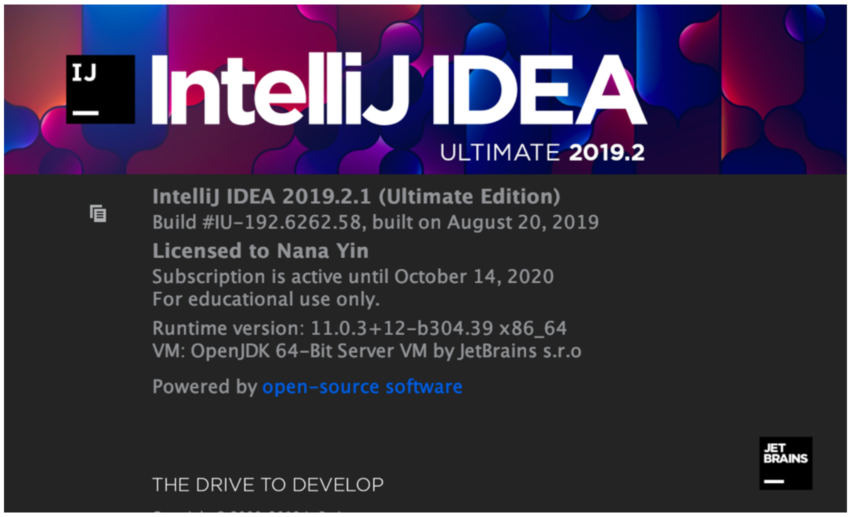


```
[mysql> select version();
+-----------+
| version() |
+-----------+
| 8.0.18    |
+-----------+
1 row in set (0.00 sec)
```

3) Download and install the **Navicat Premium 12.1.27**

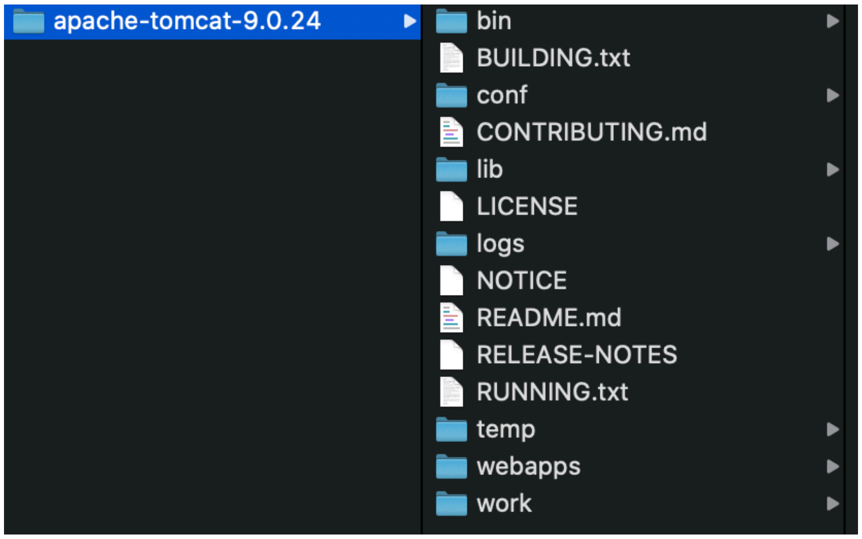


4) Download and install the **IntelliJ IDE 2019.2.1**



IntelliJ IDEA 2019.2.1 (Ultimate Edition)
Build #IU-192.6262.58, built on August 20, 2019
Licensed to Nana Yin
Subscription is active until October 14, 2020
For educational use only.
Runtime version: 11.0.3+12-b304.39 x86_64
VM: OpenJDK 64-Bit Server VM by JetBrains s.r.o
Powered by open-source software

5) Download the apache-tomcat-9.0.24 package



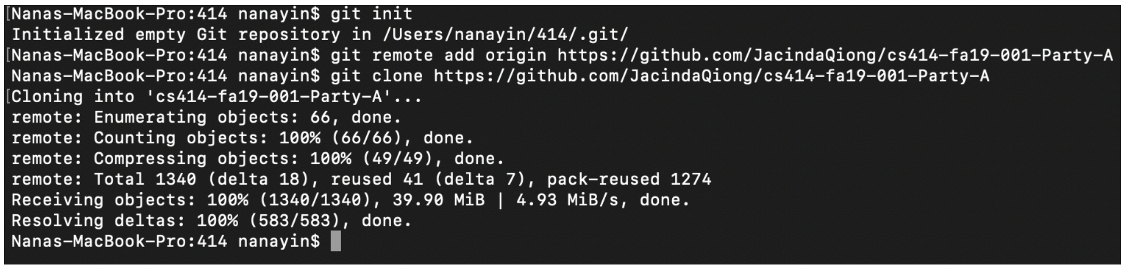
```
apache-tomcat-9.0.24
    bin
    BUILDING.txt
    conf
    CONTRIBUTING.md
    lib
    LICENSE
    logs
    NOTICE
    README.md
    RELEASE-NOTES
    RUNNING.txt
    temp
    webapps
    work
```

## II. Download the source code from Github

https://github.com/JacindaQiong/cs414-fa19-001-Party-A/tree/master/PartyA

Clone our project from Github:

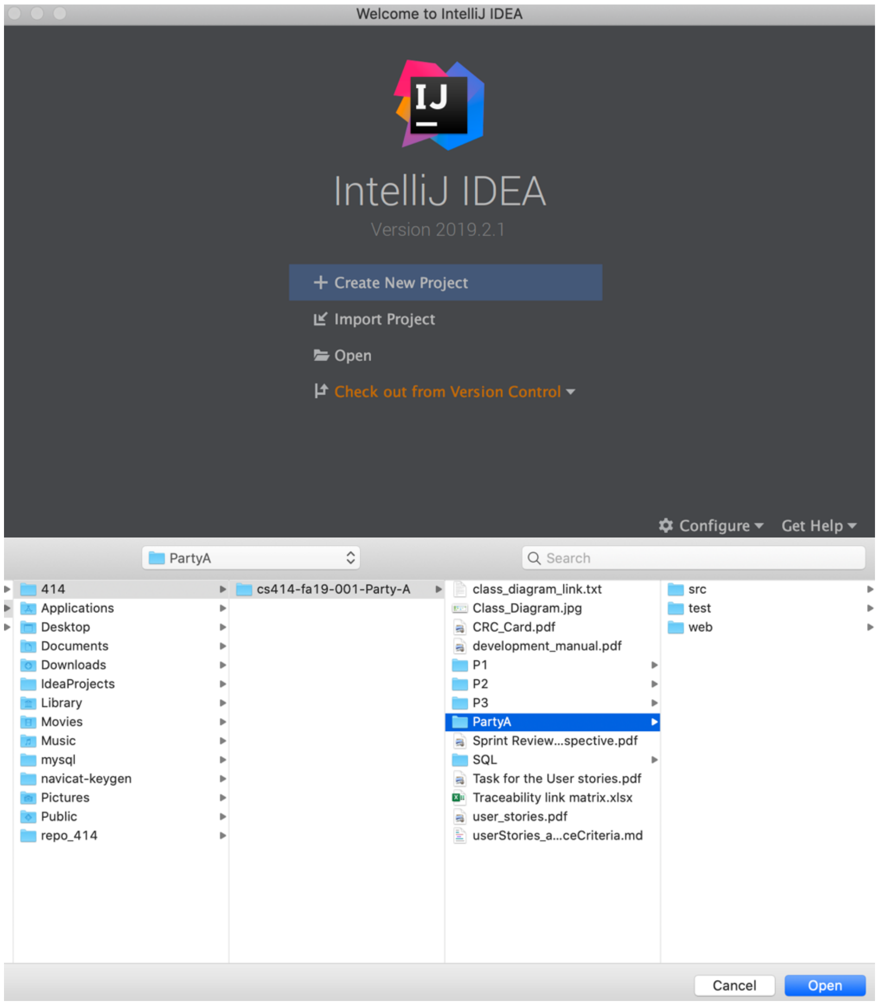
```
$ git init
$ git remote add origin https://github.com/JacindaQiong/cs414-fa19-001-Party-A
$ git clone https://github.com/JacindaQiong/cs414-fa19-001-Party-A
```

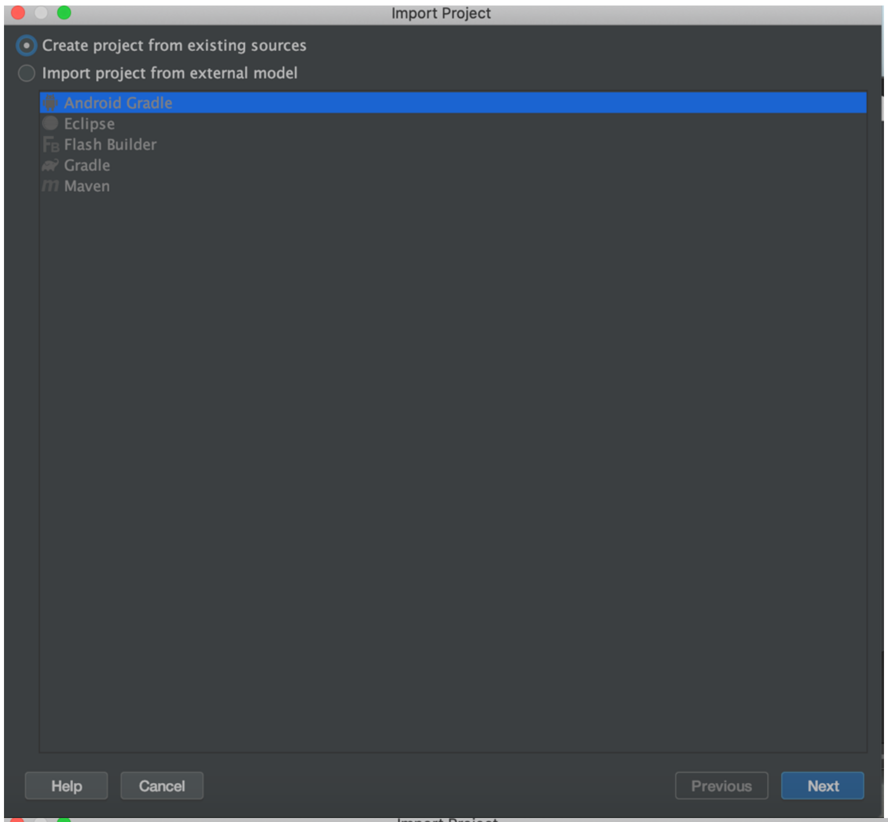


```
[Nanas-MacBook-Pro:414 nanayin$ git init
Initialized empty Git repository in /Users/nanayin/414/.git/
[Nanas-MacBook-Pro:414 nanayin$ git remote add origin https://github.com/JacindaQiong/cs414-fa19-001-Party-A
Nanas-MacBook-Pro:414 nanayin$ git clone https://github.com/JacindaQiong/cs414-fa19-001-Party-A
[Cloning into 'cs414-fa19-001-Party-A'...
remote: Enumerating objects: 66, done.
remote: Counting objects: 100% (66/66), done.
remote: Compressing objects: 100% (49/49), done.
remote: Total 1340 (delta 18), reused 41 (delta 7), pack-reused 1274
Receiving objects: 100% (1340/1340), 39.90 MiB | 4.93 MiB/s, done.
Resolving deltas: 100% (583/583), done.
Nanas-MacBook-Pro:414 nanayin$ 
```

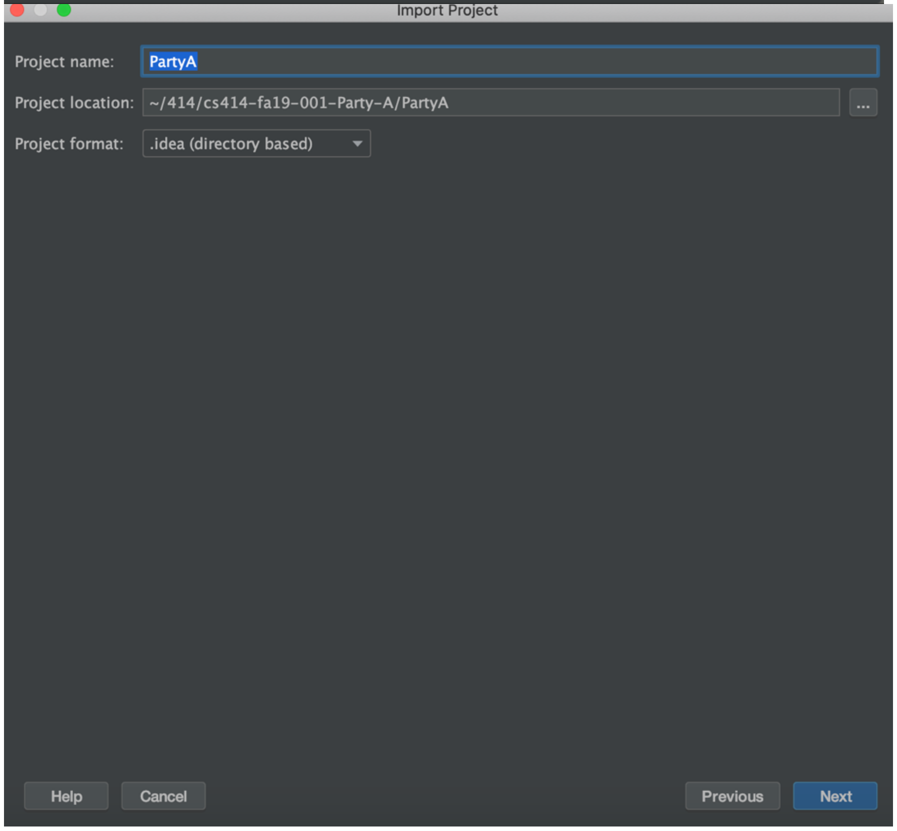
## III. Configure and Deploy the project

1) **Import the project** that we just cloned from gitHub into IDEA:

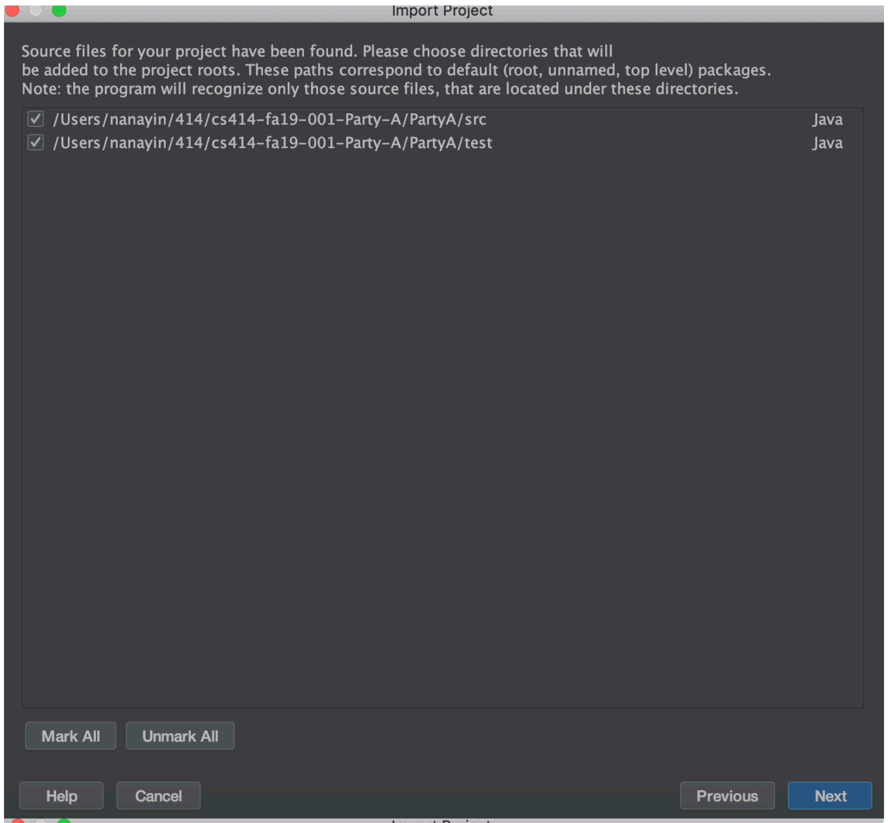




[✓ Create project from existing sources]
Import project from external model



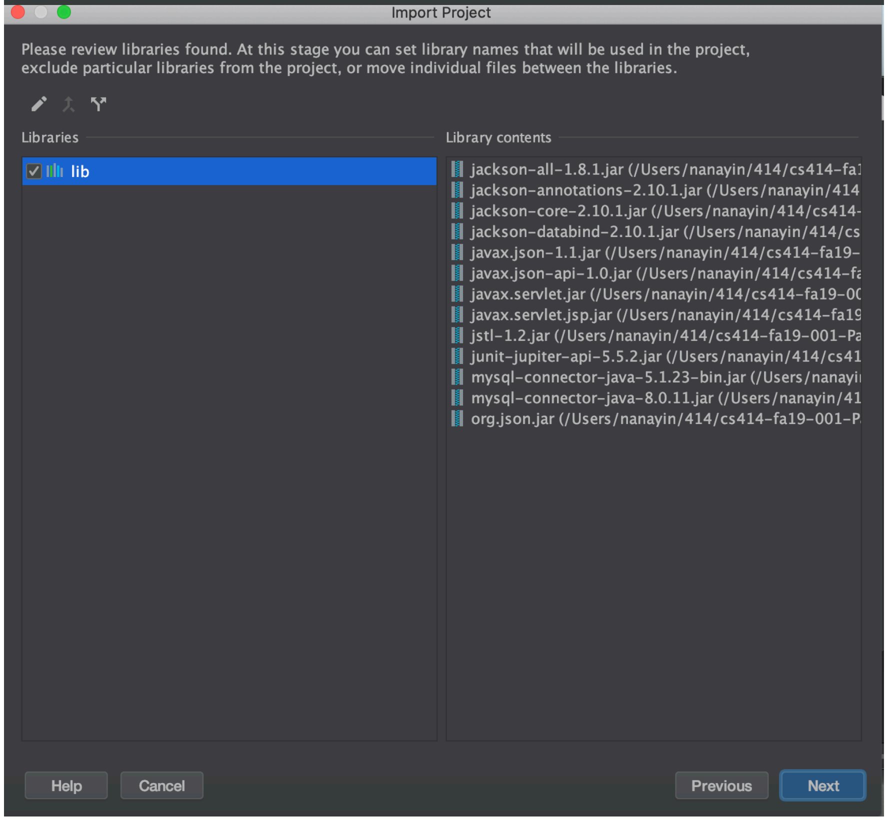
Project name: PartyA
Project location: ~/414/cs414-fa19-001-Party-A/PartyA
Project format: .idea (directory based)



Import Project

Source files for your project have been found. Please choose directories that will
be added to the project roots. These paths correspond to default (root, unnamed, top level) packages.
Note: the program will recognize only those source files, that are located under these directories.

- [✓] /Users/nanayin/414/cs414-fa19-001-Party-A/PartyA/src — Java
- [✓] /Users/nanayin/414/cs414-fa19-001-Party-A/PartyA/test — Java



Import Project

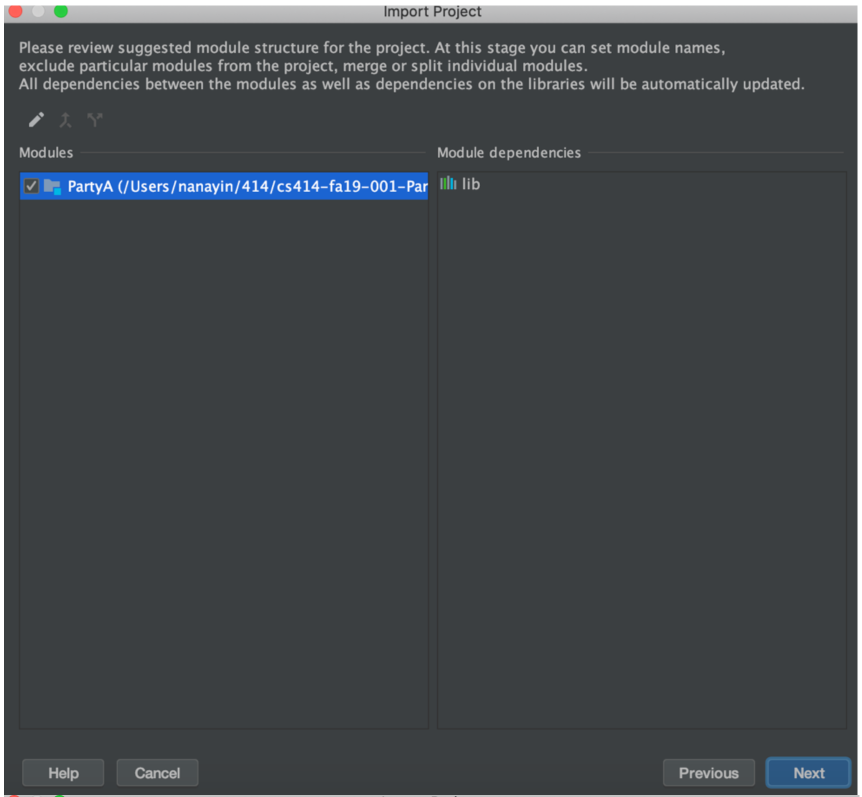
Please review libraries found. At this stage you can set library names that will be used in the project,
exclude particular libraries from the project, or move individual files between the libraries.

Libraries

- [✓] lib

Library contents

```
jackson-all-1.8.1.jar (/Users/nanayin/414/cs414-fa1
jackson-annotations-2.10.1.jar (/Users/nanayin/414
jackson-core-2.10.1.jar (/Users/nanayin/414/cs414-
jackson-databind-2.10.1.jar (/Users/nanayin/414/cs
javax.json-1.1.jar (/Users/nanayin/414/cs414-fa19-
javax.json-api-1.0.jar (/Users/nanayin/414/cs414-fa
javax.servlet.jar (/Users/nanayin/414/cs414-fa19-00
javax.servlet.jsp.jar (/Users/nanayin/414/cs414-fa19
jstl-1.2.jar (/Users/nanayin/414/cs414-fa19-001-Pa
junit-jupiter-api-5.5.2.jar (/Users/nanayin/414/cs41
mysql-connector-java-5.1.23-bin.jar (/Users/nanayi
mysql-connector-java-8.0.11.jar (/Users/nanayin/41
org.json.jar (/Users/nanayin/414/cs414-fa19-001-P
```



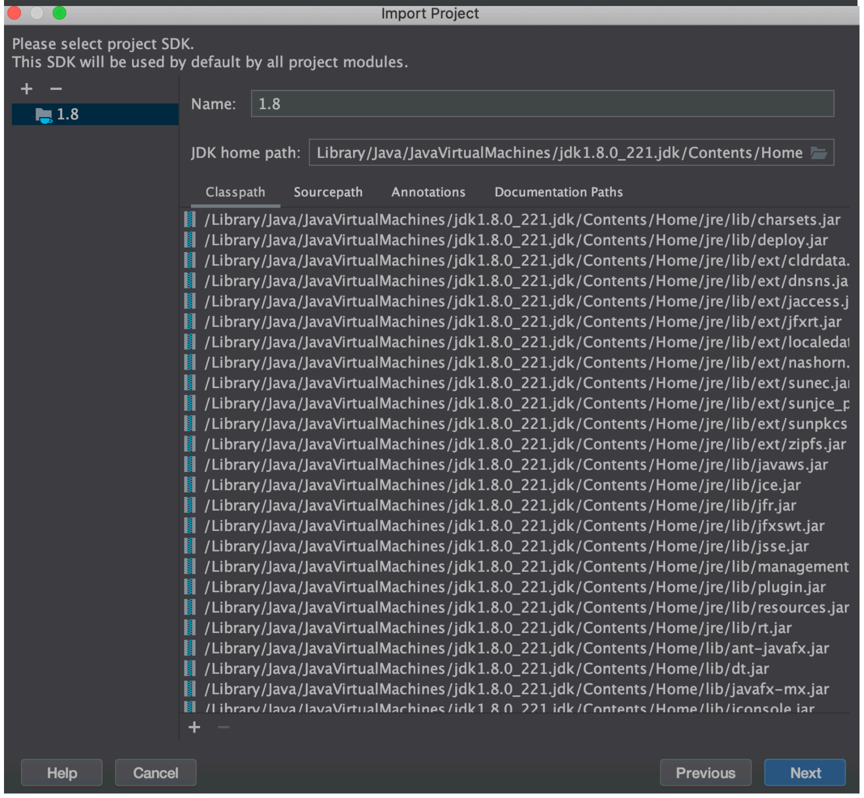
Please review suggested module structure for the project. At this stage you can set module names, exclude particular modules from the project, merge or split individual modules.
All dependencies between the modules as well as dependencies on the libraries will be automatically updated.

Modules

✓ PartyA (/Users/nanayin/414/cs414-fa19-001-Par

Module dependencies

lib



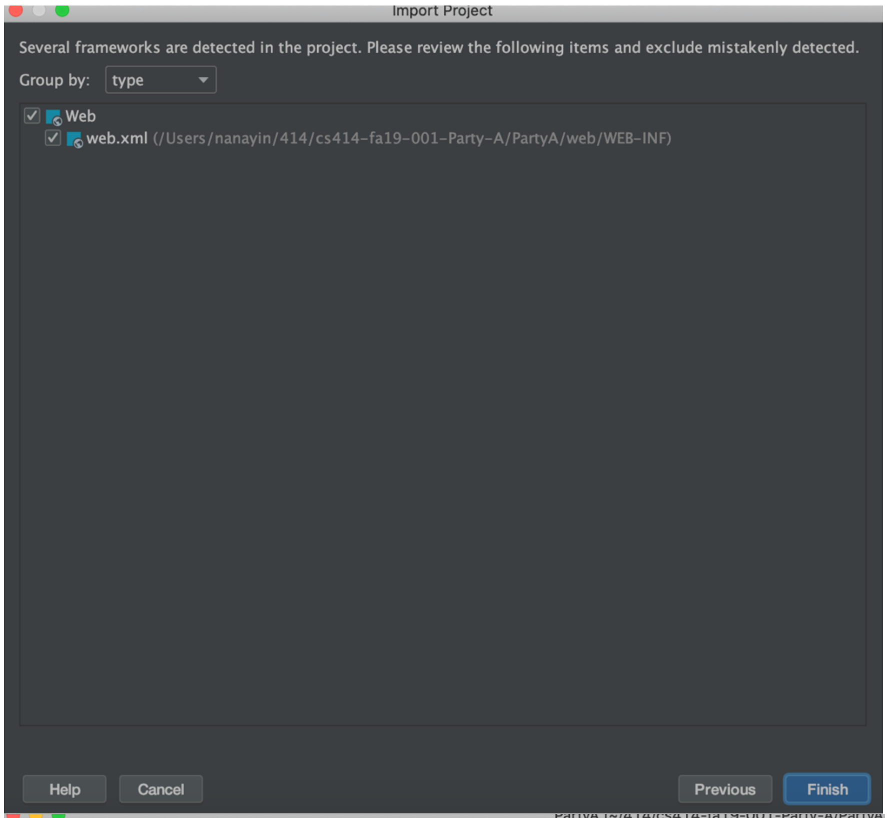
Please select project SDK.
This SDK will be used by default by all project modules.

1.8

Name: 1.8

JDK home path: Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home

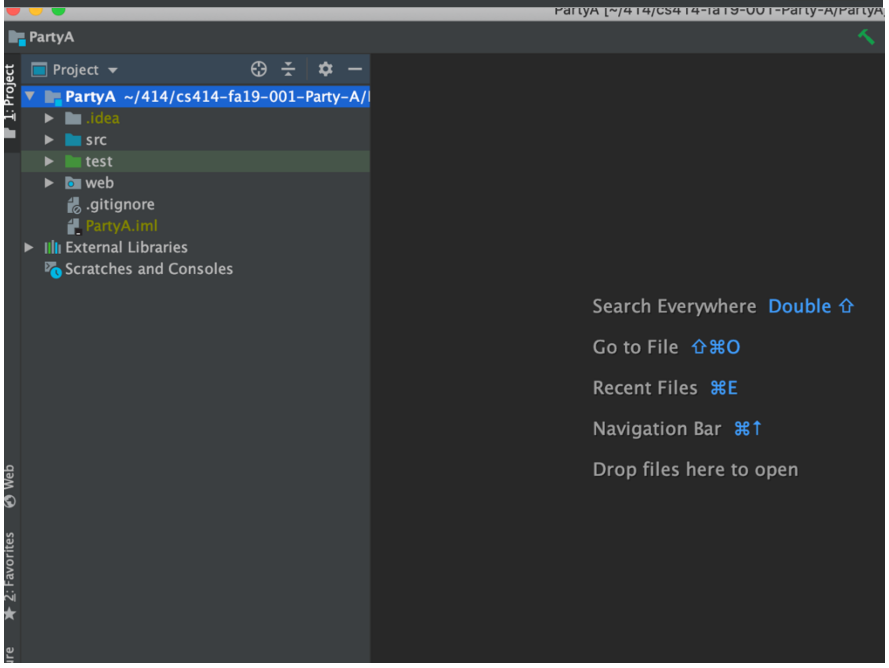
```
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/charsets.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/deploy.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/cldrdata.
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/dnsns.ja
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/jaccess.j
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/jfxrt.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/localedat
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/nashorn.
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/sunec.ja
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/sunjce_p
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/sunpkcs
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/zipfs.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/javaws.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/jce.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/jfr.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/jfxswt.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/jsse.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/management
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/plugin.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/resources.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/rt.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/lib/ant-javafx.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/lib/dt.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/lib/javafx-mx.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/lib/jconsole.jar
```


Import Project

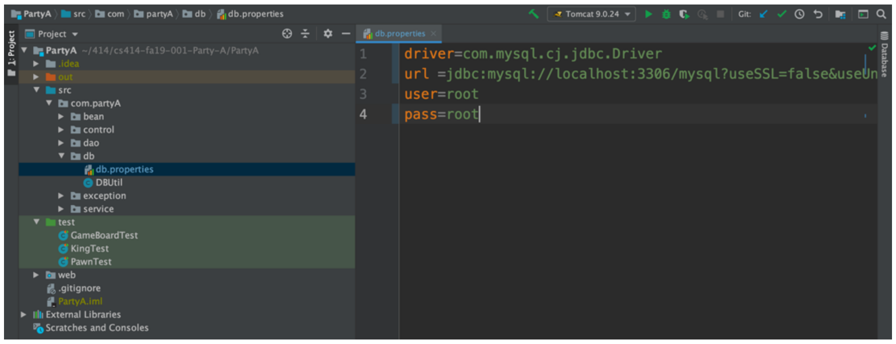
Several frameworks are detected in the project. Please review the following items and exclude mistakenly detected.

Group by: type

- [x] Web
  - [x] web.xml (/Users/nanayin/414/cs414-fa19-001-Party-A/PartyA/web/WEB-INF)


```
PartyA  ~/414/cs414-fa19-001-Party-A/
  .idea
  src
  test
  web
  .gitignore
  PartyA.iml
External Libraries
Scratches and Consoles
```

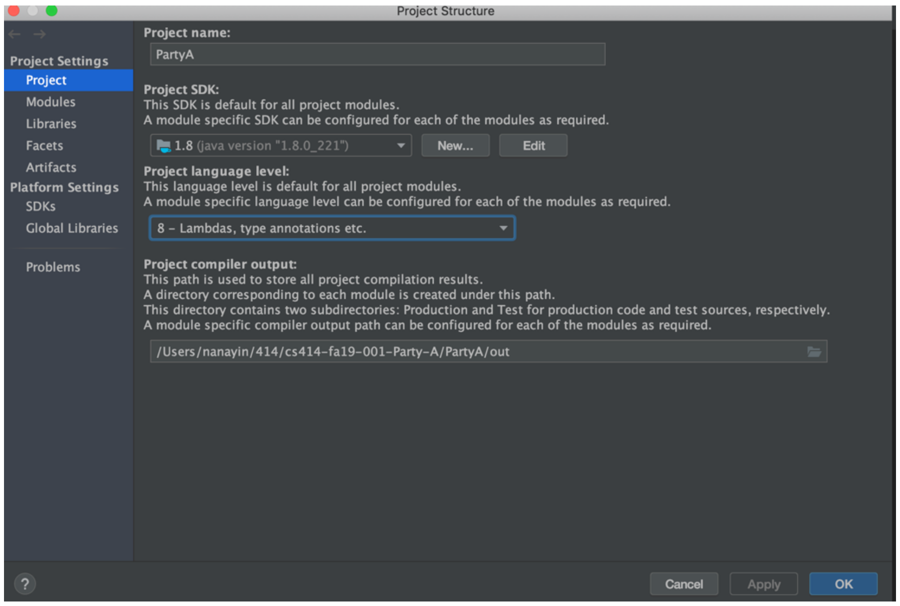
## 2) Change database connection information(db.properties)



```
driver=com.mysql.cj.jdbc.Driver
url =jdbc:mysql://localhost:3306/mysql?useSSL=false&useUn
user=root
pass=root
```

3) Configure the project:

Select the JDK we just installed:

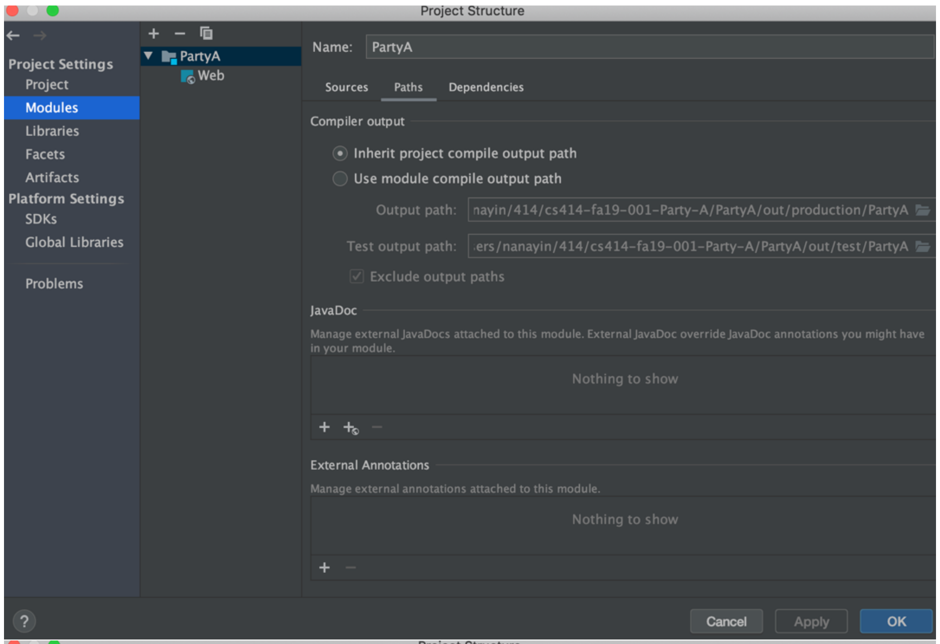


**Project name:** PartyA

**Project SDK:**
This SDK is default for all project modules.
A module specific SDK can be configured for each of the modules as required.
1.8 (java version "1.8.0_221")

**Project language level:**
This language level is default for all project modules.
A module specific language level can be configured for each of the modules as required.
8 - Lambdas, type annotations etc.

**Project compiler output:**
This path is used to store all project compilation results.
A directory corresponding to each module is created under this path.
This directory contains two subdirectories: Production and Test for production code and test sources, respectively.
A module specific compiler output path can be configured for each of the modules as required.
/Users/nanayin/414/cs414-fa19-001-Party-A/PartyA/out



Name: PartyA

Compiler output

● Inherit project compile output path

○ Use module compile output path

Output path: nayin/414/cs414-fa19-001-Party-A/PartyA/out/production/PartyA

Test output path: ers/nanayin/414/cs414-fa19-001-Party-A/PartyA/out/test/PartyA

✓ Exclude output paths

JavaDoc

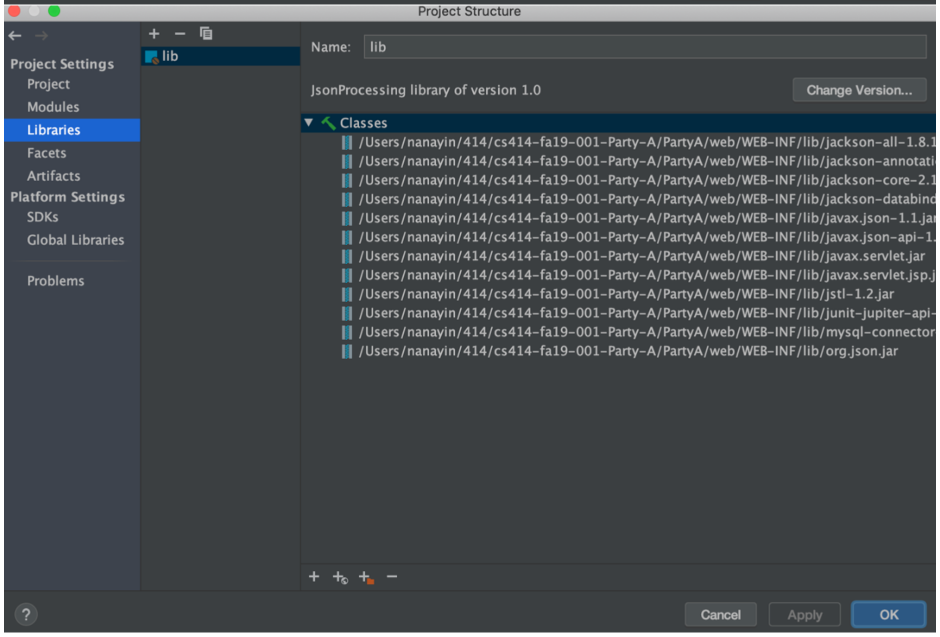
Manage external JavaDocs attached to this module. External JavaDoc override JavaDoc annotations you might have in your module.

Nothing to show

External Annotations

Manage external annotations attached to this module.

Nothing to show

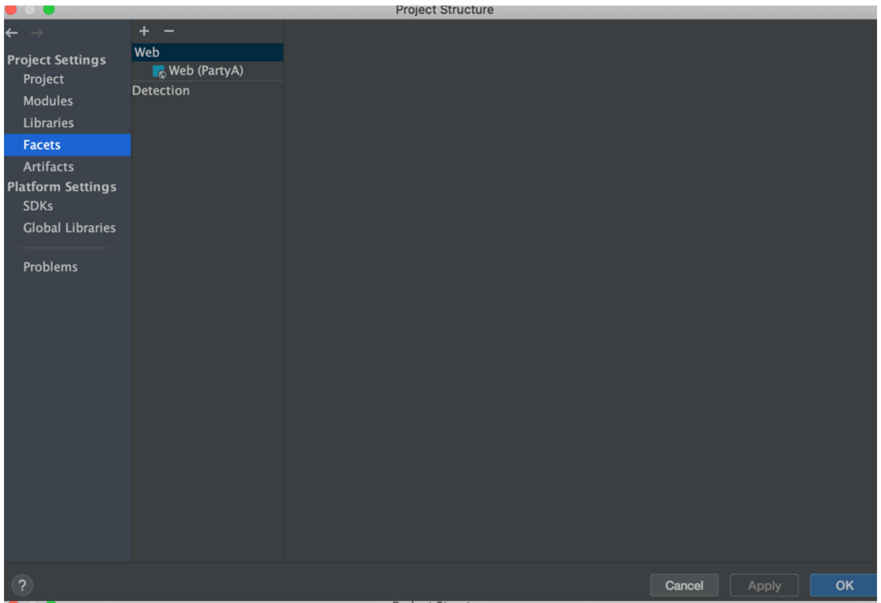


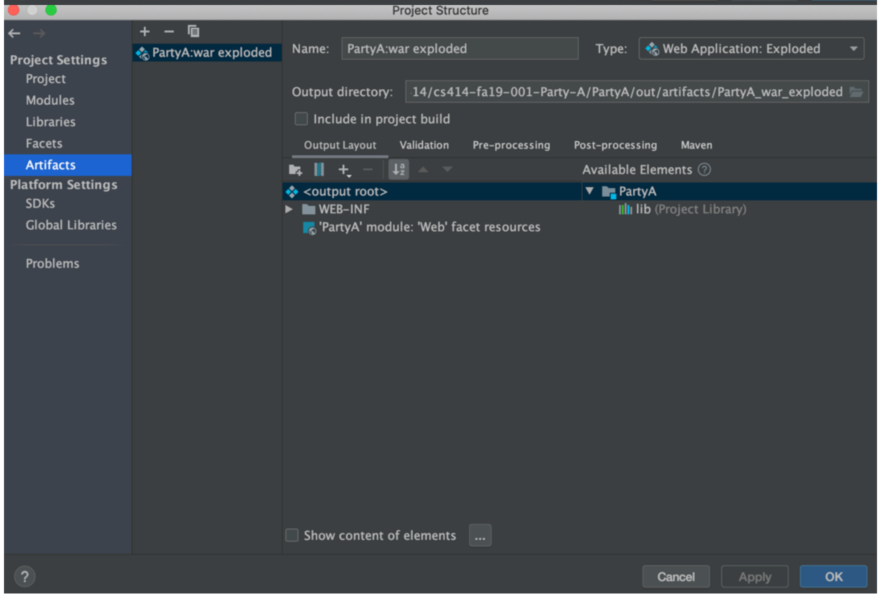
Name: lib

JsonProcessing library of version 1.0

Classes

```
/Users/nanayin/414/cs414-fa19-001-Party-A/PartyA/web/WEB-INF/lib/jackson-all-1.8.1
/Users/nanayin/414/cs414-fa19-001-Party-A/PartyA/web/WEB-INF/lib/jackson-annotati
/Users/nanayin/414/cs414-fa19-001-Party-A/PartyA/web/WEB-INF/lib/jackson-core-2.1
/Users/nanayin/414/cs414-fa19-001-Party-A/PartyA/web/WEB-INF/lib/jackson-databind
/Users/nanayin/414/cs414-fa19-001-Party-A/PartyA/web/WEB-INF/lib/javax.json-1.1.jar
/Users/nanayin/414/cs414-fa19-001-Party-A/PartyA/web/WEB-INF/lib/javax.json-api-1.
/Users/nanayin/414/cs414-fa19-001-Party-A/PartyA/web/WEB-INF/lib/javax.servlet.jar
/Users/nanayin/414/cs414-fa19-001-Party-A/PartyA/web/WEB-INF/lib/javax.servlet.jsp.j
/Users/nanayin/414/cs414-fa19-001-Party-A/PartyA/web/WEB-INF/lib/jstl-1.2.jar
/Users/nanayin/414/cs414-fa19-001-Party-A/PartyA/web/WEB-INF/lib/junit-jupiter-api-
/Users/nanayin/414/cs414-fa19-001-Party-A/PartyA/web/WEB-INF/lib/mysql-connector
/Users/nanayin/414/cs414-fa19-001-Party-A/PartyA/web/WEB-INF/lib/org.json.jar
```





PartyA:war exploded

Name: PartyA:war exploded
Type: Web Application: Exploded

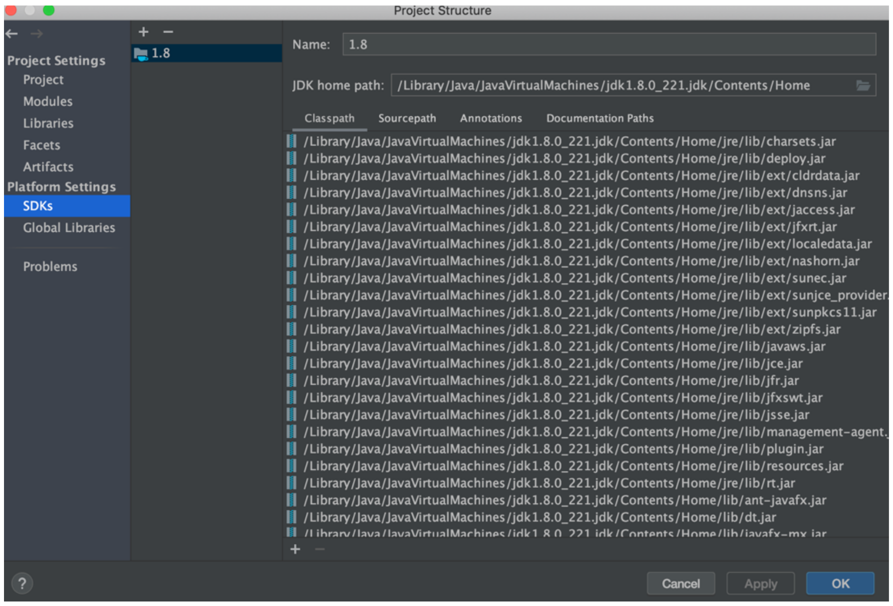
Output directory: 14/cs414-fa19-001-Party-A/PartyA/out/artifacts/PartyA_war_exploded

Include in project build

<output root>
WEB-INF
'PartyA' module: 'Web' facet resources

PartyA
lib (Project Library)

Show content of elements



Project Structure

Project Settings
- Project
- Modules
- Libraries
- Facets
- Artifacts

Platform Settings
- SDKs
- Global Libraries

Problems

1.8

Name: 1.8

JDK home path: /Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home

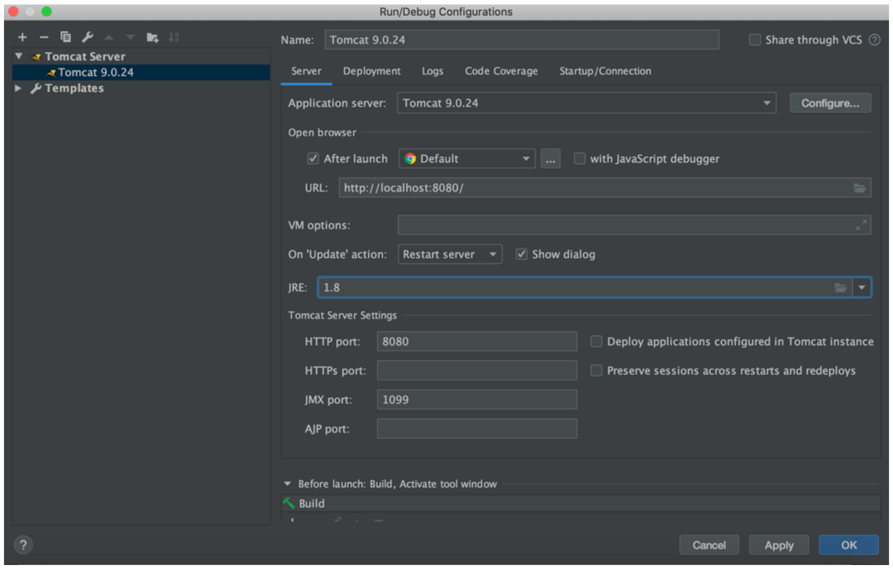
Classpath | Sourcepath | Annotations | Documentation Paths

```
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/charsets.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/deploy.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/cldrdata.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/dnsns.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/jaccess.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/jfxrt.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/localedata.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/nashorn.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/sunec.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/sunjce_provider.
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/sunpkcs11.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/ext/zipfs.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/javaws.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/jce.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/jfr.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/jfxswt.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/jsse.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/management-agent.
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/plugin.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/resources.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/jre/lib/rt.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/lib/ant-javafx.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/lib/dt.jar
/Library/Java/JavaVirtualMachines/jdk1.8.0_221.jdk/Contents/Home/lib/javafx-mx.jar
```

Cancel | Apply | OK

4) Configure the tomcat server:

Choose the tomcat we just downloaded:



Run/Debug Configurations

- Tomcat Server
  - Tomcat 9.0.24
- Templates

Name: Tomcat 9.0.24 ☐ Share through VCS

Server | Deployment | Logs | Code Coverage | Startup/Connection

Application server: Tomcat 9.0.24 Configure...

Open browser

✓ After launch Default ... ☐ with JavaScript debugger

URL: http://localhost:8080/

VM options:

On 'Update' action: Restart server ✓ Show dialog

JRE: 1.8

Tomcat Server Settings

HTTP port: 8080 ☐ Deploy applications configured in Tomcat instance

HTTPs port: ☐ Preserve sessions across restarts and redeploys

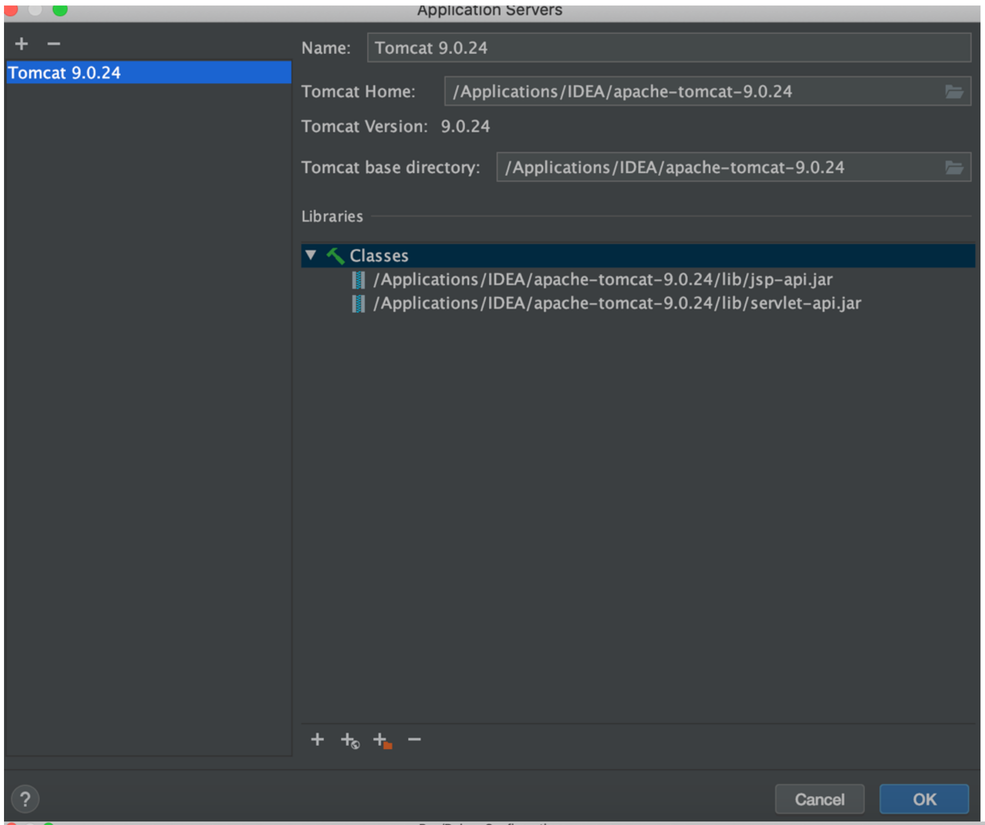
JMX port: 1099

AJP port:

Before launch: Build, Activate tool window

Build

Cancel | Apply | OK



Tomcat 9.0.24

Name: Tomcat 9.0.24

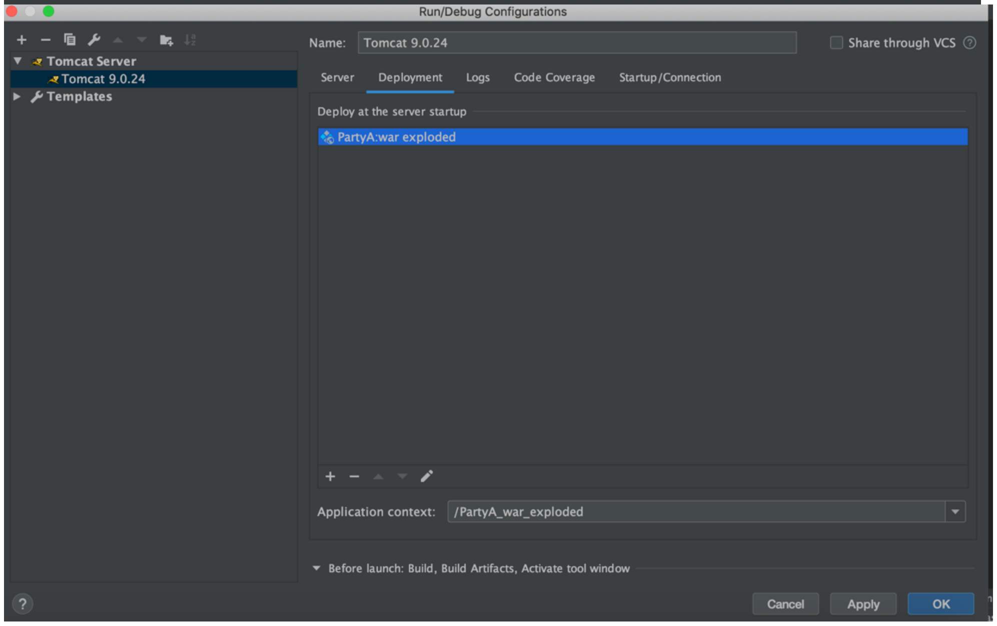
Tomcat Home: /Applications/IDEA/apache-tomcat-9.0.24

Tomcat Version: 9.0.24

Tomcat base directory: /Applications/IDEA/apache-tomcat-9.0.24

Libraries

Classes
/Applications/IDEA/apache-tomcat-9.0.24/lib/jsp-api.jar
/Applications/IDEA/apache-tomcat-9.0.24/lib/servlet-api.jar



Tomcat Server
Tomcat 9.0.24
Templates

Name: Tomcat 9.0.24

Share through VCS

Deploy at the server startup

PartyA:war exploded

Application context: /PartyA_war_exploded

Before launch: Build, Build Artifacts, Activate tool window

# IV. Test the whole process

**STEP 1: Download the JDK**

The first thing we need to do is prepare our PC to develop the game using **Java**.
Install a software package called the **Java Development Kit** (**JDK**), which allows us to develop in

Java.

**STEP 2: Set Up a Development Environment**
If you downloaded the JDK with the NetBeans IDE, start NetBeans, and begin programming.

You can also program using a simple text editor, and compile and run from the command line. Many text editors now come with the ability to run and compile Java files, but you may need to tell the program where javac.exe and java.exe reside on your computer. Once, your IDE or text editor is set up, you can begin programming.

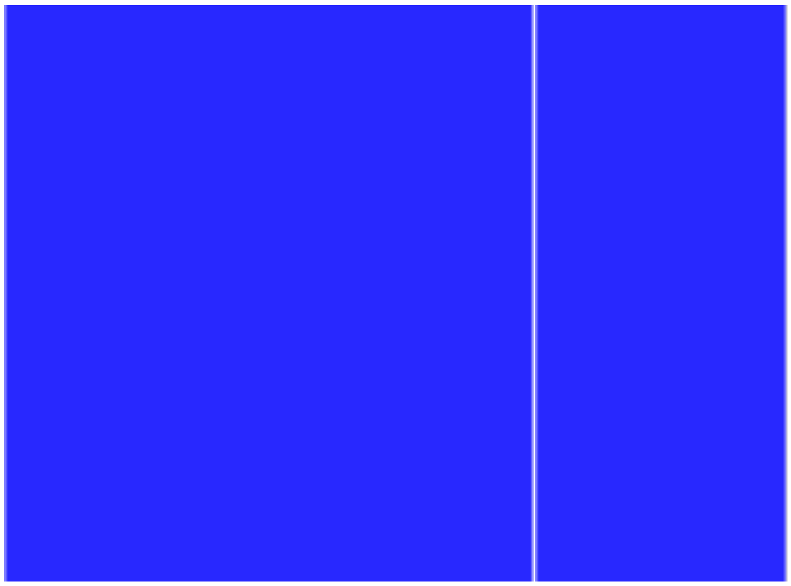
**STEP 3*:* Application**

1. Use IntelliJ IDEA software to clone code from Github https://github.com/JacindaQiong/cs414- fa19-001-Party-A Project name: PartyA Database name: SQL
2. Opening the Navicat of MySQL, add the game_invitaion.sql, game_user.sql and game_match.sql into that application

3.Compile the login.java application with the java command and run it with the java command. To run the tests:

1. Eclipse provides a couple of ways to run individual test methods, one from within the editor itself and another from the JUnit view.
2. For example, this is a simple code to run the testcases: `publicclassSomeTest`

```
{ @Test
publicvoidtestMethod1() {...} @Test
publicvoidtestMethod2() {...} }
```
4.Add a testing logic (3 A's)



**Arrange:** consists of a few lines of code that are used to declare and initialize the objects we need in our test.
**Act:** is usually a few lines of code where we perform the actions, whether it is some calculation or modify the state of our objects.

**Assert:** usually consists of a single line of code where we verify that the outcome of the **Act** part was made successfully.

Testing improves the quality of the code and it makes the development process more Agile.