



Couchbase Server Developer Training (Java) – Exercise Manual

The Couchbase Server Developer training is designed to give you a complete guide to developing applications using Couchbase Server. This manual is a guide to completing the exercises as part of the course.

- You will need to install the following software on your laptops prior to trying the exercises
 - Web Browser
 - Java 6
 - SSH Client (if planning to use Amazon EC2 or other cloud provider)
 - Tomcat 7 (for the web based exercise)
 - Eclipse (Java EE version with JSP support) or your favorite IDE and the M2E Plugin from **within Eclipse**
<http://download.eclipse.org/technology/m2e/milestones/1.1>
 - Couchbase Java SDK (<http://www.couchbase.com/develop/java/next>)
 - PDF Viewer

Exercise 1a (Installing Couchbase Server)

Couchbase Server bits

Get the appropriate bits from <http://www.couchbase.com/download>




Couchbase

www.couchbase.com/download

Simply select the platform of your choice to get going!

1 Couchbase Server Downloads

2.0.0-dev-preview-4

Operating System	Enterprise Edition Recommended for development and production	Community Edition Courtesy builds
	Why Enterprise?	Why Community?
 64-bit Ubuntu 32-bit Ubuntu Install Instructions	N/A N/A	2.0.0-dev-preview 2.0.0-dev-preview Release Notes
 64-bit Red Hat 32-bit Red Hat Install Instructions	N/A N/A	2.0.0-dev-preview 2.0.0-dev-preview Release Notes
 64-bit Windows	N/A	2.0.0-dev-preview

Install the bits

wget http://packages.couchbase.com/releases/2.0.0-developer-preview-4/couchbase-server-community_x86_64_2.0.0-dev-preview-4.rpm

Couchbase

Couchbase Server Developer Training (Java) – Exercise Manual



```
couchbase — root@ip-10-34-171-12:~ — ssh — 80x24
[root@ip-10-34-171-12 ~]# rpm -i couchbase-server-community_x86_64_2.0.0-dev-pre
view-4.rpm
Starting couchbase-server[ OK ]

You have successfully installed Couchbase Server.
Please browse to http://ip-10-34-171-12:8091/ to configure your server.
Please refer to http://couchbase.com for additional resources.

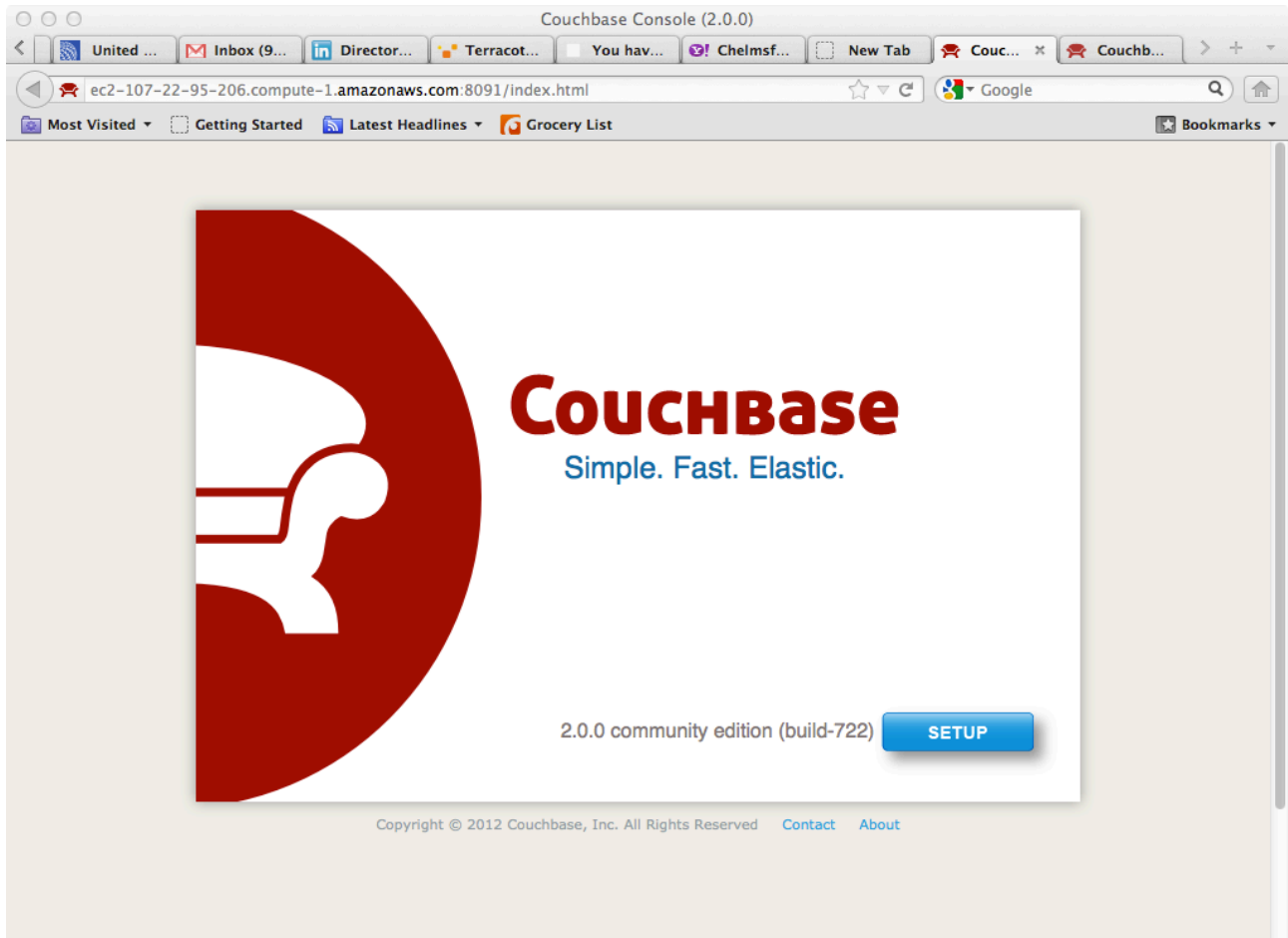
Please note that you have to update your firewall configuration to
allow connections to the following ports: 11211, 11210, 4369,
8091, 8092 and from 21100-to-21299.

By using this software you agree to the End User License Agreement.
See /opt/couchbase/LICENSE.txt.

[root@ip-10-34-171-12 ~]#
[root@ip-10-34-171-12 ~]#
[root@ip-10-34-171-12 ~]#
[root@ip-10-34-171-12 ~]#
[root@ip-10-34-171-12 ~]#
[root@ip-10-34-171-12 ~]#
[root@ip-10-34-171-12 ~]#
[root@ip-10-34-171-12 ~]#
[root@ip-10-34-171-12 ~]#
```

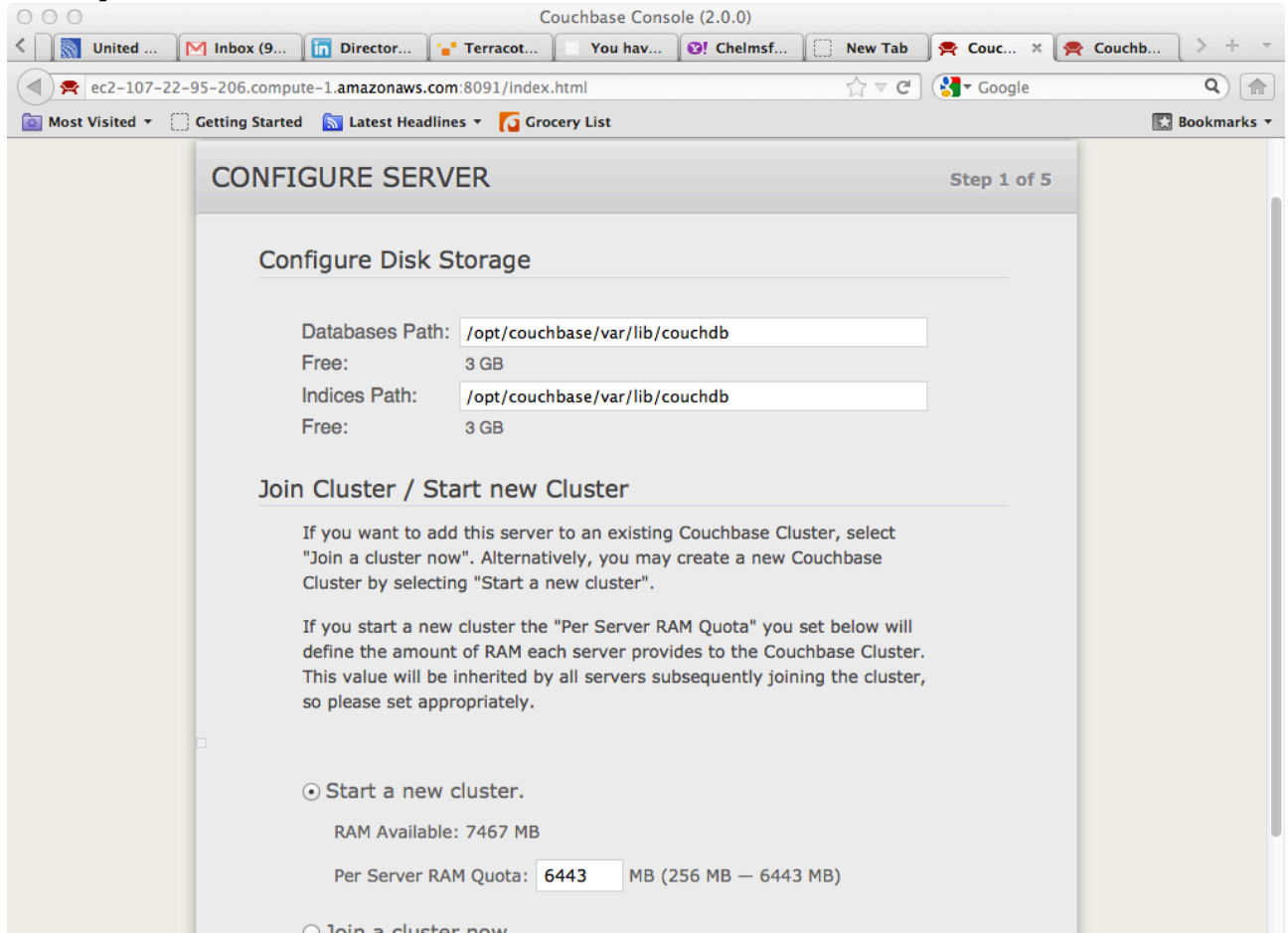
Couchbase

Setup the first bucket



Couchbase

Couchbase Server Developer Training (Java) – Exercise Manual



Couchbase Console (2.0.0)

ec2-107-22-95-206.compute-1.amazonaws.com:8091/index.html

Most Visited Getting Started Latest Headlines Grocery List

CONFIGURE SERVER Step 1 of 5

Configure Disk Storage

Databases Path:

Free: 3 GB

Indices Path:

Free: 3 GB

Join Cluster / Start new Cluster

If you want to add this server to an existing Couchbase Cluster, select "Join a cluster now". Alternatively, you may create a new Couchbase Cluster by selecting "Start a new cluster".

If you start a new cluster the "Per Server RAM Quota" you set below will define the amount of RAM each server provides to the Couchbase Cluster. This value will be inherited by all servers subsequently joining the cluster, so please set appropriately.

☒ Start a new cluster.

RAM Available: 7467 MB

Per Server RAM Quota: MB (256 MB — 6443 MB)

☐ Join a cluster now.

Settings for Default bucket (slightly lower than available so that you can create a new bucket)

Couchbase

CREATE DEFAULT BUCKET Step 3 of 5

Bucket Settings

Bucket Name: **default**

Bucket Type: ☒ Couchbase
☐ Memcached

Memory Size

Per Node RAM Quota: MB

Cluster quota (6.29 GB)

Other Buckets (0 B) This Bucket (4.88 GB) Free (1.4 GB)

Total bucket size = 5000 MB (5000 MB x 1 node)

Replicas

☒ Enable Number of replica (backup) copies

☒ Index replicas

Back **Next**

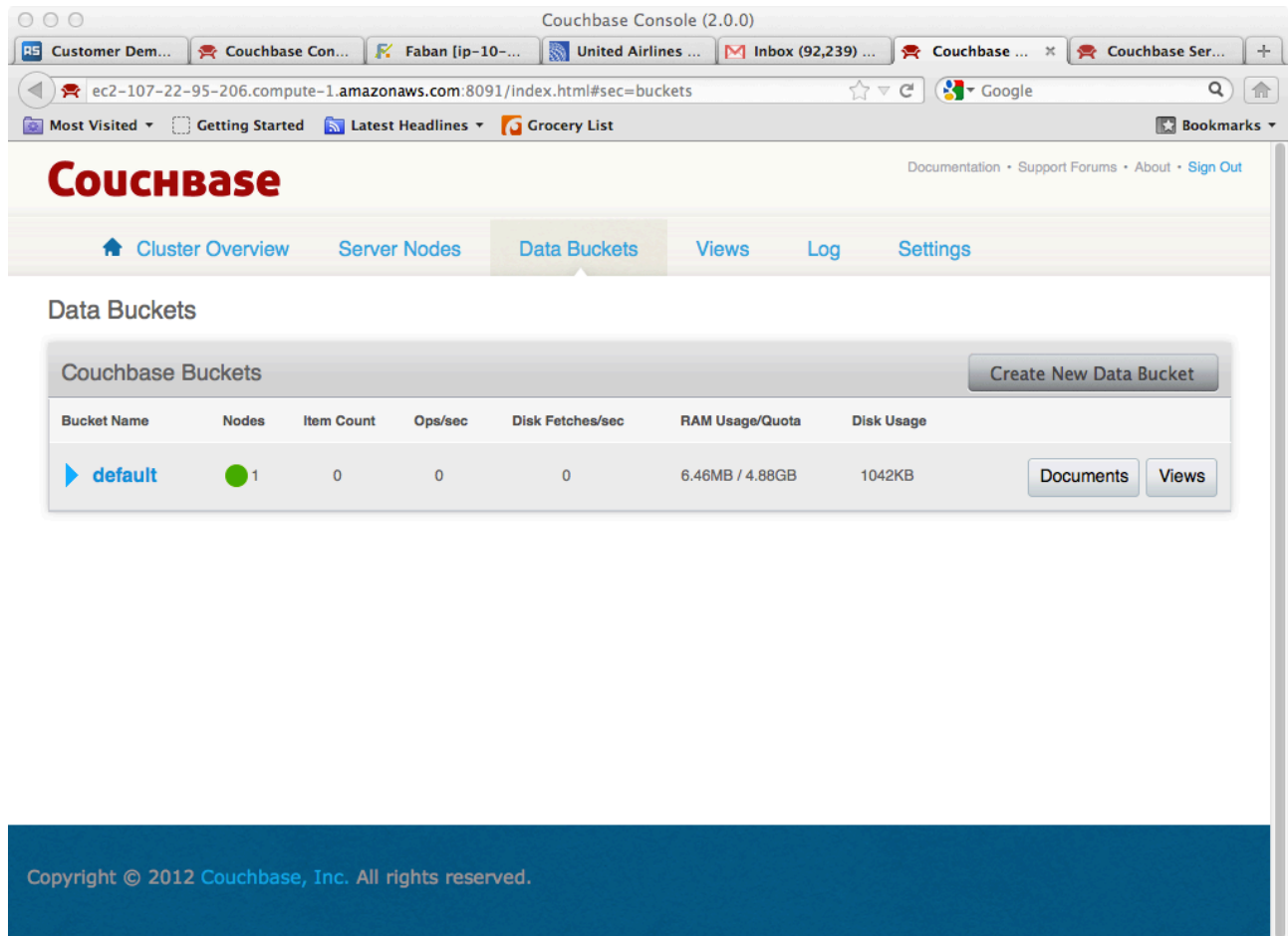
Accept Defaults after that

Couchbase

Couchbase Server Developer Training (Java) – Exercise Manual

Exercise 1b (Creating a new bucket)

Bring up the Admin Console and click on the Data Buckets Tab



The screenshot shows the Couchbase Admin Console (2.0.0) in a web browser. The browser's address bar shows the URL `ec2-107-22-95-206.compute-1.amazonaws.com:8091/index.html#sec=buckets`. The Couchbase logo is at the top left, and navigation links for Cluster Overview, Server Nodes, Data Buckets, Views, Log, and Settings are at the top. The Data Buckets tab is selected. Below the navigation bar, the title "Data Buckets" is displayed. A table titled "Couchbase Buckets" shows the following data:

Bucket Name	Nodes	Item Count	Ops/sec	Disk Fetches/sec	RAM Usage/Quota	Disk Usage
▶ default	1	0	0	0	6.46MB / 4.88GB	1042KB

Buttons for "Documents" and "Views" are located to the right of the table row. A "Create New Data Bucket" button is in the top right corner of the table area. At the bottom of the console, a blue footer bar contains the text: "Copyright © 2012 Couchbase, Inc. All rights reserved."

Create new bucket

Press the Create New Bucket, enter settings or accept default settings

Couchbase

Couchbase Console (2.0.0)

Customer Dem... Couchbase Con... Faban [ip-10-... United Airlines ... Inbox (92,241) ... Couchbase ... Couchbase Ser...

ec2-107-22-95-206.compute-1.amazonaws.com:8091/index.html#sec=buckets

Most Visited Getting Started Latest Headlines Grocery List

Bookmarks

Create Bucket

Bucket Settings

Bucket Name:

Bucket Type: ☒ Couchbase ☐ Memcached

Memory Size

Cluster quota (6.29 GB)

Per Node RAM Quota: MB

Other Buckets (4.88 GB) This Bucket (1.4 GB) Free (0 B)

Total bucket size = 1443 MB (1443 MB x 1 node)

Access Control

☒ Standard port (TCP port 11211. Needs SASL auth.)

Enter password:

☐ Dedicated port (supports ASCII protocol and is auth-less)

Protocol Port:

Replicas

☒ Enable Number of replica (backup) copies

Warning, you do not have enough servers to support this number of replicas.

☒ Index replicas

Couchbase

Couchbase Server Developer Training (Java) – Exercise Manual Exercise 2 (Getting Started)

Unzip the project

Unzip HelloCouchbase.zip in Exercies/Ex2/ directory.

Import the project into Eclipse

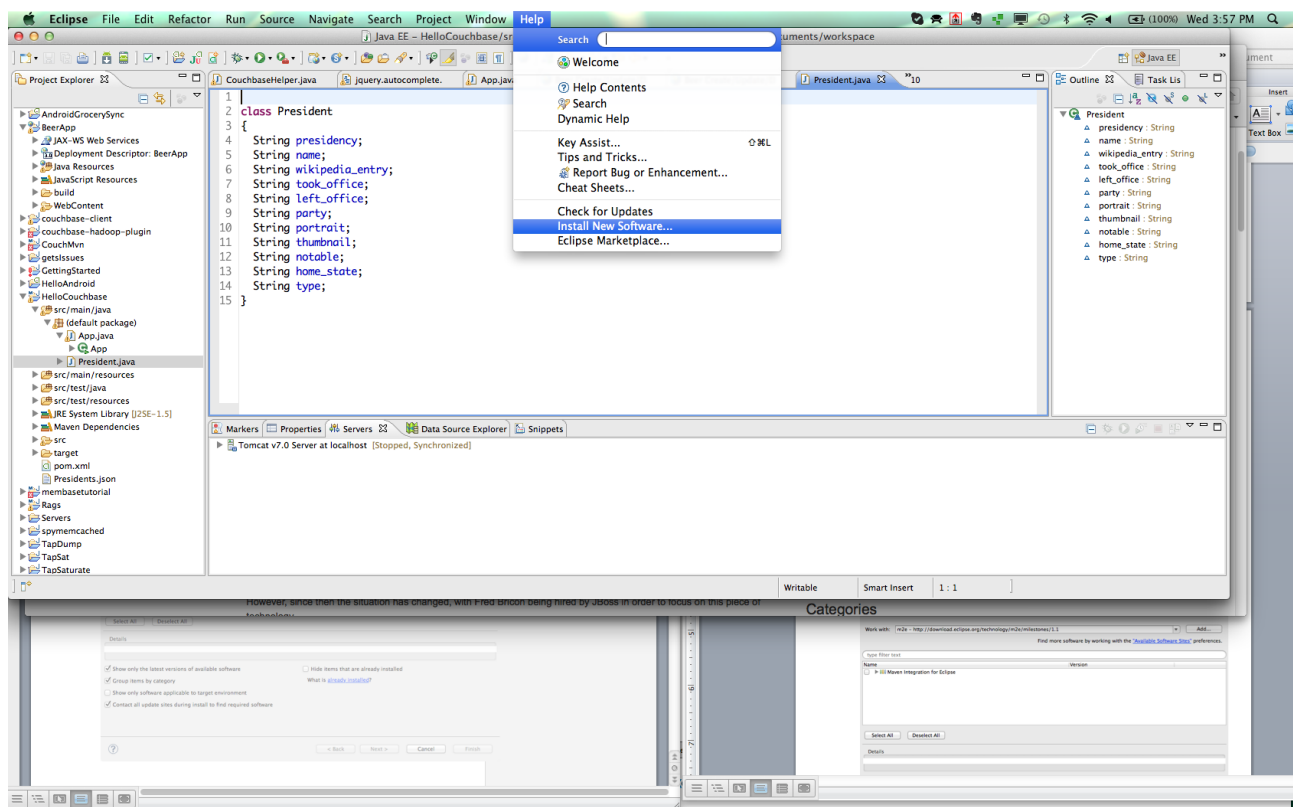
Import/Maven/Existing Maven Projects

If this option is not available you will have to install the Maven to Eclipse (M2E) plugin as below.

Install M2E plugin (if not already installed)

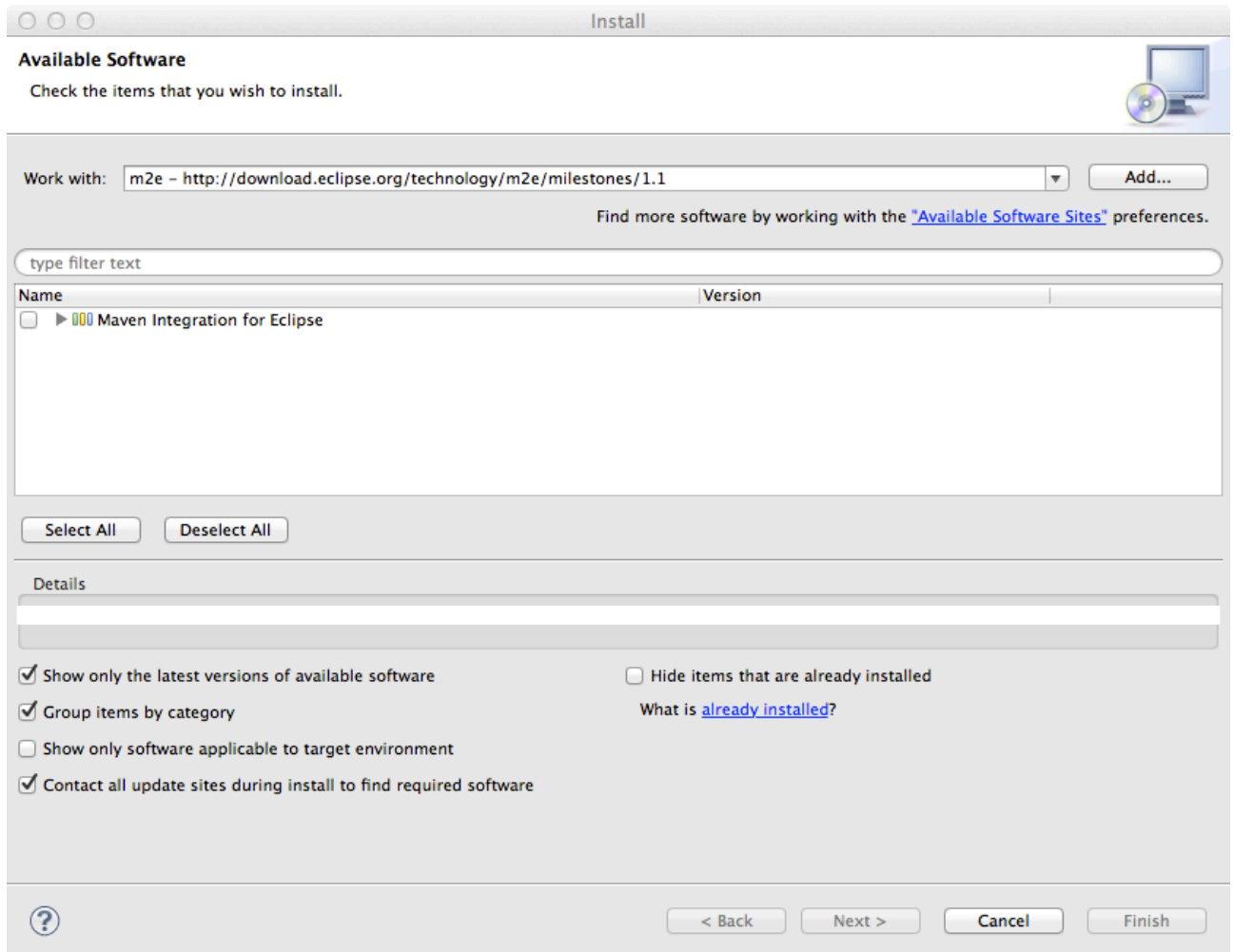
The M2E plugin is available for download within eclipse from

<http://download.eclipse.org/technology/m2e/milestones/1.1>

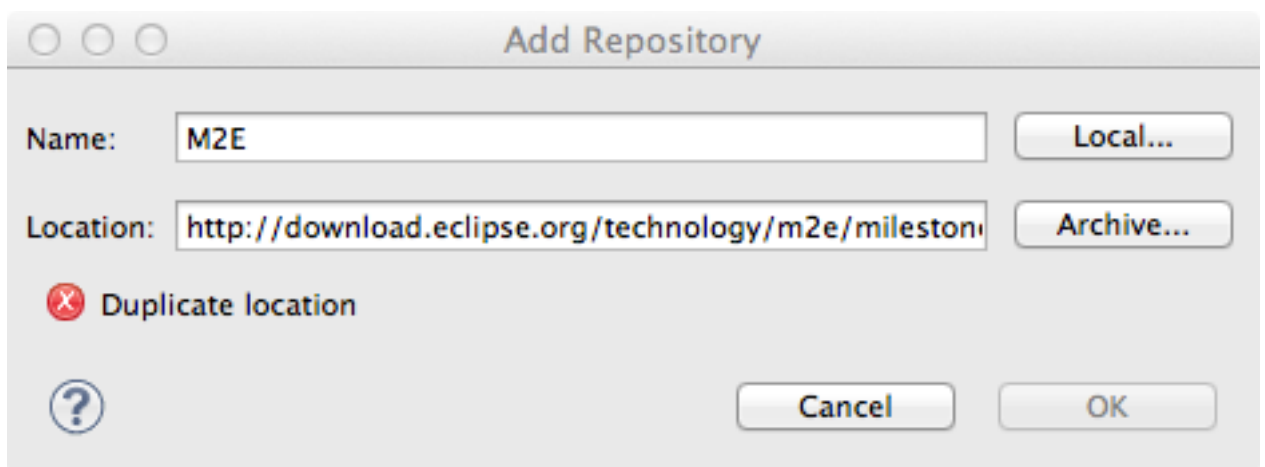


Click on Add...

Couchbase



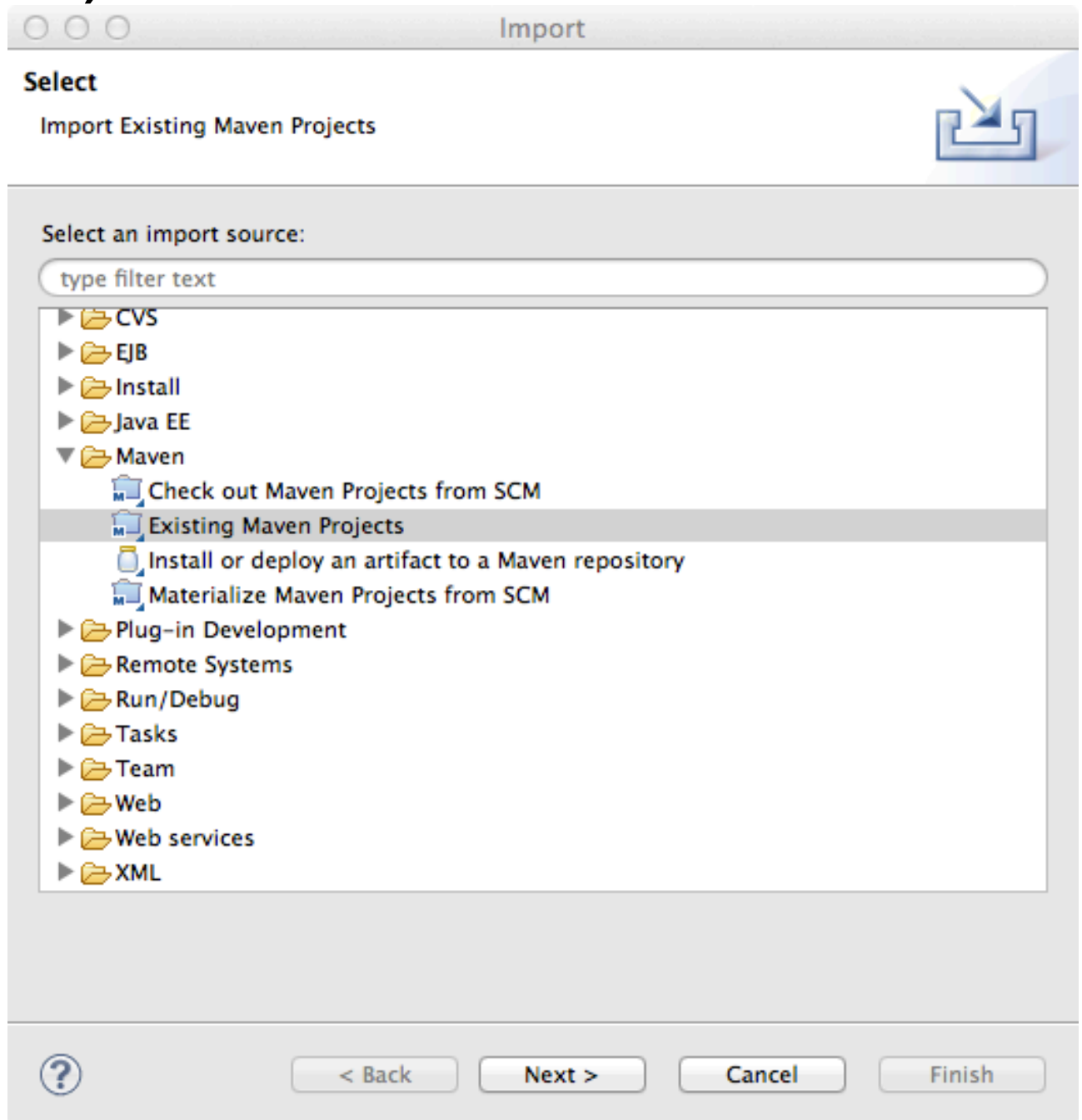
Providing the Location as
<http://download.eclipse.org/technology/m2e/milestones/1.1>



Import/Maven/Existing Maven Projects

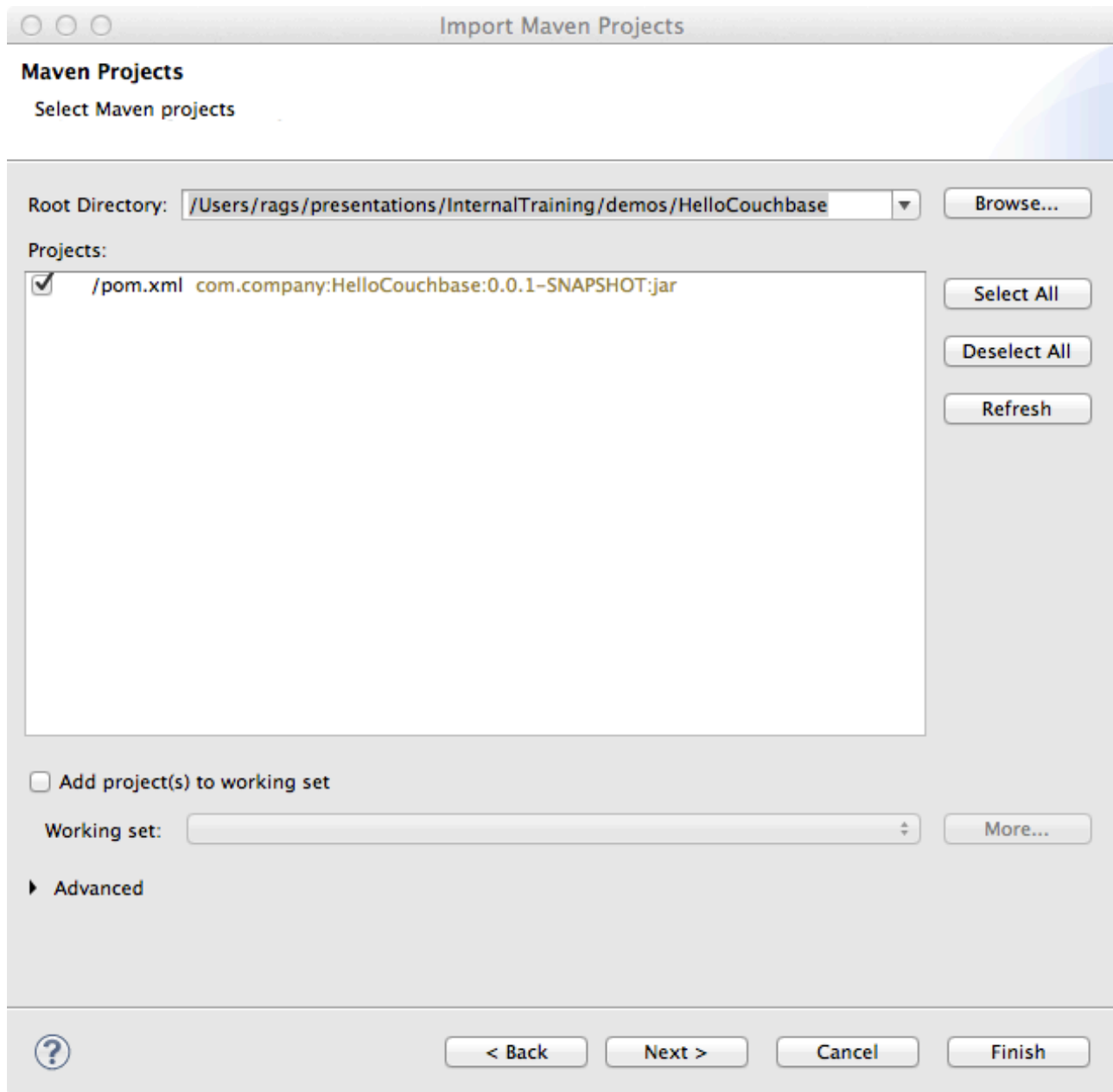
Couchbase

Couchbase Server Developer Training (Java) – Exercise Manual



Point to the respective directory (LAB_ROOT/Exercises/Ex2) and import and Hit Finish

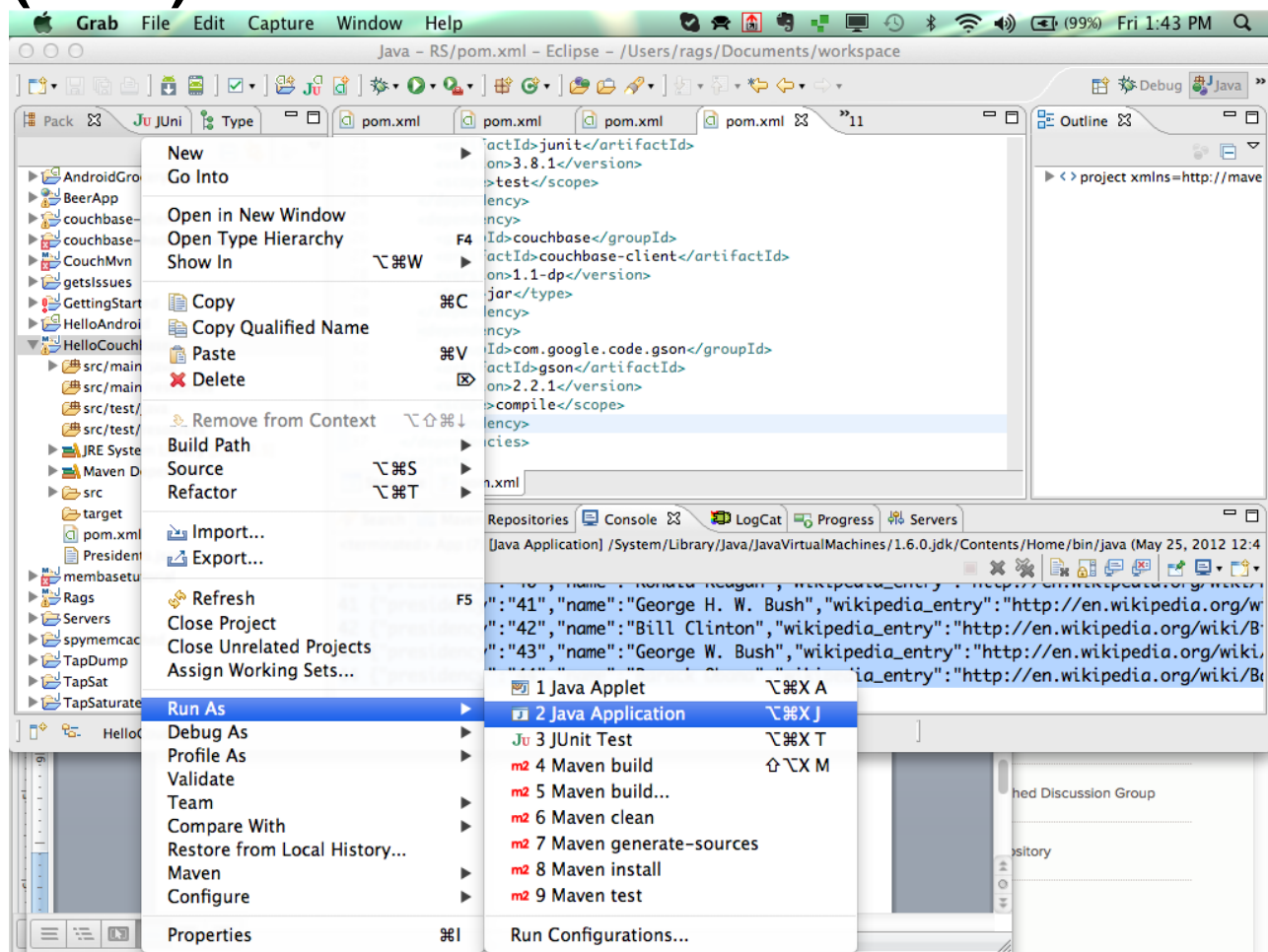
Couchbase



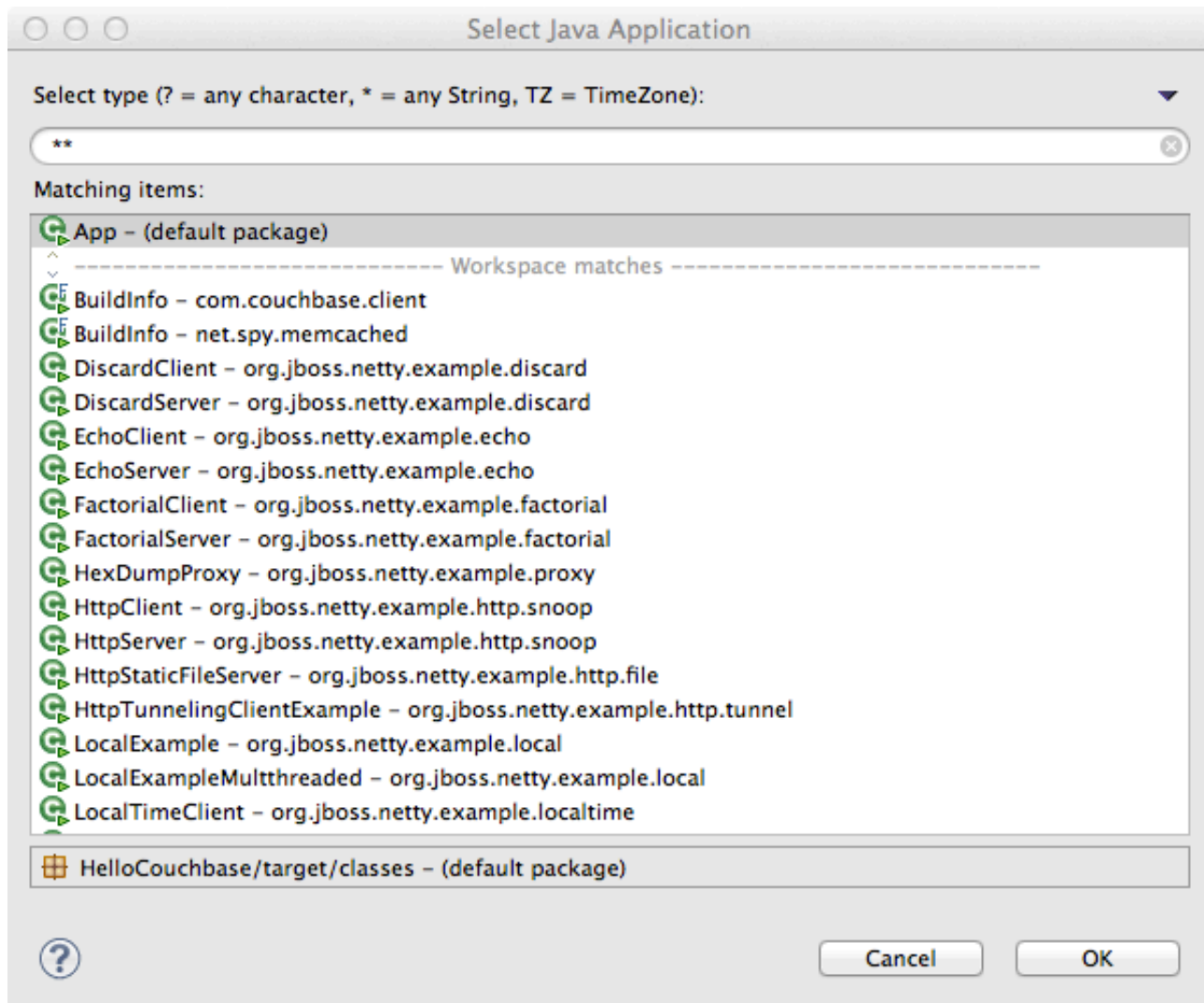
Now run the Maven project and you see an output that is highlighted below.

Couchbase

Couchbase Server Developer Training (Java) – Exercise Manual



Couchbase



The entire output is included below.

run:

```
2012-05-29 13:25:27.334 INFO com.couchbase.client.CouchbaseConnection: Added
{QA sa=/127.0.0.1:11210, #Rops=0, #Wops=0, #iq=0, topRop=null, topWop=null,
toWrite=0, interested=0} to connect queue

2012-05-29 13:25:27.353 INFO com.couchbase.client.CouchbaseConnection:
Connection state changed for sun.nio.ch.SelectionKeyImpl@57d2fc36

2012-05-29 13:25:27.380 INFO com.couchbase.client.CouchbaseConnection: Added
localhost/127.0.0.1:11210 to connect queue

2012-05-29 13:25:27.382 INFO com.couchbase.client.CouchbaseClient: viewmode set
to development mode

2012-05-29 13:25:27.386 INFO com.couchbase.client.ViewConnection: Added
localhost/127.0.0.1:8092 to connect queue

1 {"presidency":"1","name":"George
Washington","wikipedia_entry":"http://en.wikipedia.org/wiki/George_Washington","
took_office":"1789","left_office":"1797","party":"Independent","portrait":"Georg
eWashington.jpg","thumbnail":"thmb_GeorgeWashington.jpg","home_state":"Virginia"
,"type":"president"}

2 {"presidency":"2","name":"John
Adams","wikipedia_entry":"http://en.wikipedia.org/wiki/John_Adams","took_office
```

Copyright 2012 - Couchbase, Inc.

Couchbase

Couchbase Server Developer Training (Java) – Exercise Manual

...

```
43 {"presidency":"43","name":"George W.
Bush","wikipedia_entry":"http://en.wikipedia.org/wiki/George_W._Bush","took_offi
ce":"2001","left_office":"2009","party":"Republican
","portrait":"George_W_Bush.jpg","thumbnail":"thmb_George_W_Bush.jpg","notable":
"9/11","home_state":"Texas","type":"president"}

44 {"presidency":"44","name":"Barack
Obama","wikipedia_entry":"http://en.wikipedia.org/wiki/Barack_Obama","took_offic
e":"2009","left_office":"2013","party":"Democratic","portrait":"Barack_Obama.jpg
","thumbnail":"thmb_Barack_Obama.jpg","notable":"Health
care","home_state":"Illinois","type":"president"}

BUILD SUCCESSFUL (total time: 1 second)
```

You can use this project for running subsequent exercises or to use the Java client library.

If you do not want to use Eclipse or you just want to use Couchbase from the command line, follow the steps outlined in

<http://www.couchbase.com/docs/couchbase-sdk-java-1.1/hello-world.html>

for this and the subsequent programs.

The JAR files are available in the JARs subdirectory.

For example (please substitute the JARS directory):

```
javac -cp LAB_ROOT/JARs/couchbase-client-1.1-
dp.jar:LAB_ROOT/JARs/spymemcached-2.8.1.jar:
LAB_ROOT/JARs/gson-2.1.jar HelloCouchbase.java President.java
```

```
java -cp .:LAB_ROOT/JARs/couchbase-client-1.1-
dp.jar:LAB_ROOT/JARs/spymemcached-2.8.1-
SNAPSHOT.jar:LAB_ROOT/JARs/jettison-
1.1.jar:LAB_ROOT/JARs/httpcore-4.1.1.jar:LAB_ROOT/JARs/commons-
codec-1.5.jar:LAB_ROOT/JARs/httpcore-nio-
4.1.1.jar:LAB_ROOT/JARs/netty-3.3.1.Final.jar:
LAB_ROOT/JARs/gson-2.1.jar HelloCouchbase
```

Exercises 3-10

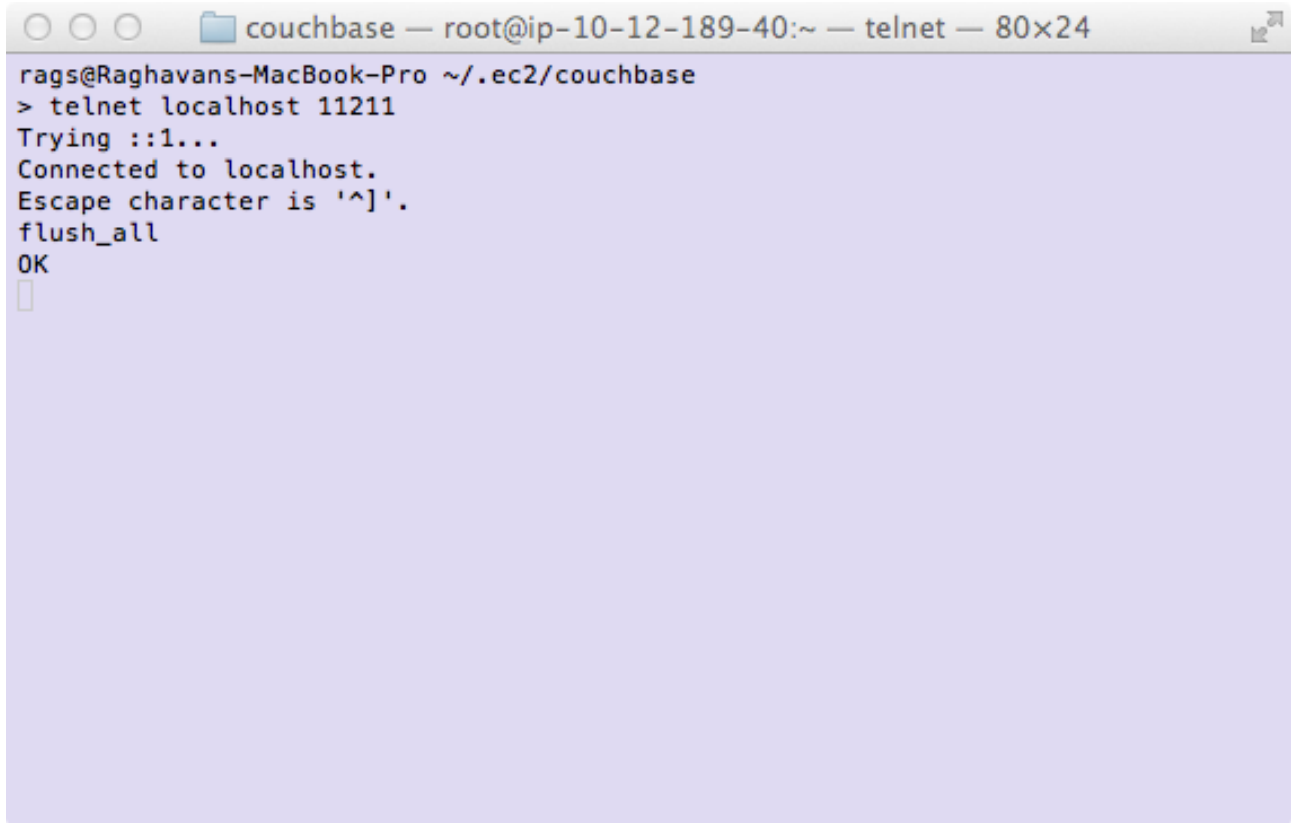
Use the project that was used for the earlier exercise and add or “cut and paste” the code from the respective sub-directory in Exercises sub-directory to the project.

As an example, for exercise 3, replace the code in App.java with NoOptimize.java which is contained in the Ex3 sub-directory of Exercises.

Copyright 2012 - Couchbase, Inc.

Couchbase

Cleaning out all data on the server (use with caution)

A terminal window titled 'couchbase — root@ip-10-12-189-40:~ — telnet — 80x24'. The prompt is 'rags@Raghavans-MacBook-Pro ~/.ec2/couchbase'. The user enters '> telnet localhost 11211'. The output shows 'Trying ::1...', 'Connected to localhost.', 'Escape character is '^]'.', and the command 'flush_all' is entered. The response 'OK' is shown, followed by a cursor.

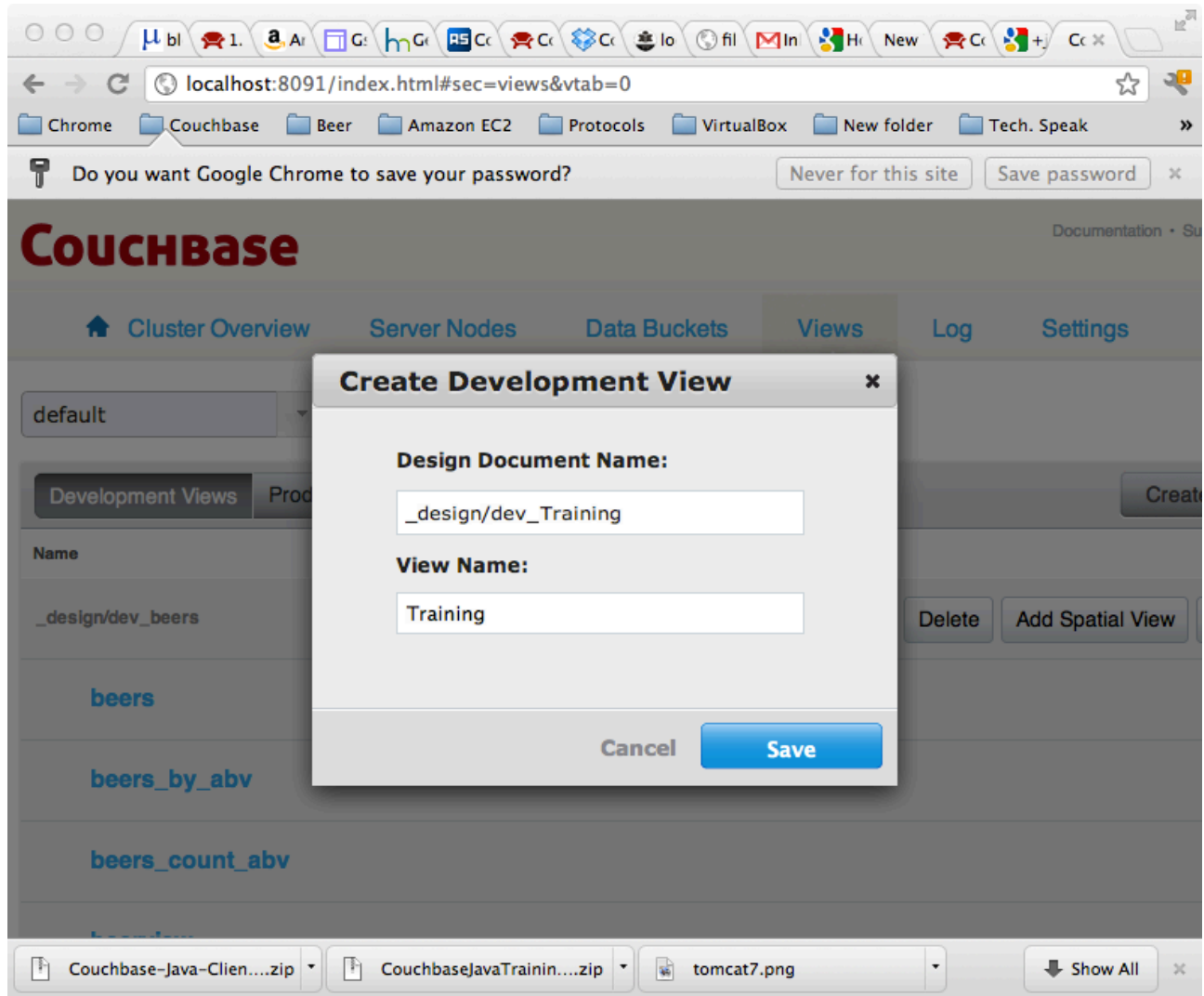
```
couchbase — root@ip-10-12-189-40:~ — telnet — 80x24
rags@Raghavans-MacBook-Pro ~/.ec2/couchbase
> telnet localhost 11211
Trying ::1...
Connected to localhost.
Escape character is '^]'.
flush_all
OK
█
```


Couchbase

Couchbase Server Developer Training (Java) – Exercise Manual

Looking at JSON data on the server

Create any view or use an existing view



Click on the view to modify it and you will be able to view the data by providing the key

Couchbase

The screenshot shows the Couchbase web interface in a browser. The address bar displays `localhost:8091/index.html#sec=views&viewsDDocId=_design%2Fdev_Training&viewsViewNam...`. The Couchbase logo is at the top left, and navigation links include Cluster Overview, Server Nodes, Data Buckets, Views (selected), Log, and Settings. Below the navigation bar, there's a breadcrumb trail: `default > Views > _design/dev_Training/_view/Training`. The main content area is divided into two sections: 'SAMPLE DOCUMENT' and 'VIEW CODE'. The 'SAMPLE DOCUMENT' section shows a document with key '1' and a JSON body containing information about George Washington. The 'VIEW CODE' section shows a 'Map' function with a dropdown menu for file uploads.

Couchbase Documentation • Su

Cluster Overview Server Nodes Data Buckets **Views** Log Settings

default > **Views** > _design/dev_Training/_view/Training

SAMPLE DOCUMENT 1 Lookup Id Preview

```
{
  "_id": "1",
  "_rev": "1-00037edad87bbd9a0000012500000000",
  "$flags": 0,
  "$expiration": 0,
  "presidency": "1",
  "name": "George Washington",
  "wikipedia_entry": "http://en.wikipedia.org/wiki/George_Washington",
  "took_office": "1789",
  "left_office": "1797",
  "party": "Independent",
  "portrait": "GeorgeWashington.jpg",
  "thumbnail": "thmb_GeorgeWashington.jpg",
  "home_state": "Virginia",
  "type": "president"
}
```

VIEW CODE

Map Reduce (built in: _coun

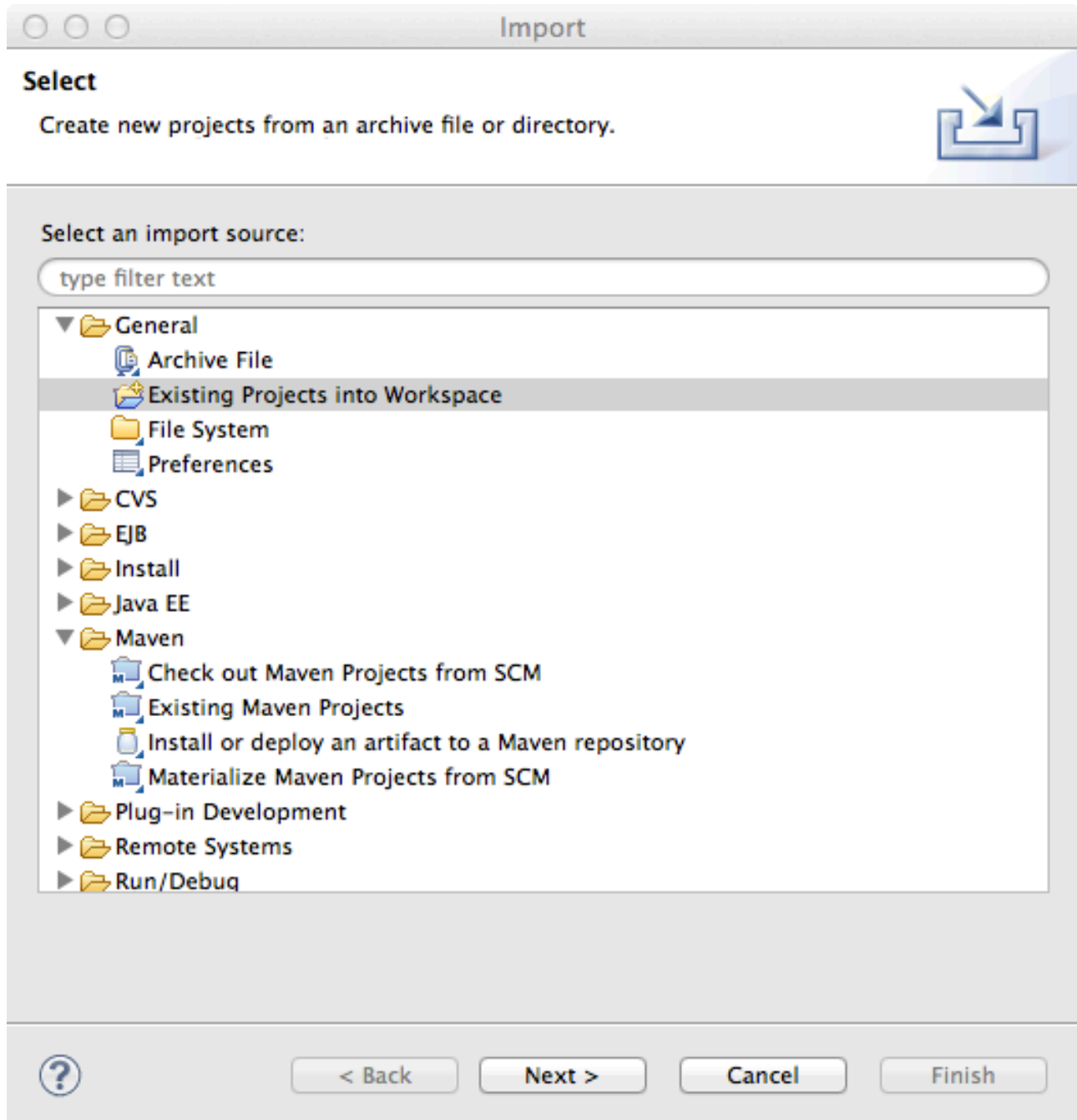
Couchbase-Java-Clie....zip CouchbaseJavaTrainin....zip tomcat7.png Show All

Couchbase

Couchbase Server Developer Training (Java) – Exercise Manual

Exercise 11 (Web-based app)

Import the Project into Eclipse



Copy the Couchbase JARs for Tomcat usage

Copy the Couchbase JARs available in the JARs subdirectory to the lib subdirectory of the Tomcat 7 installation. Example

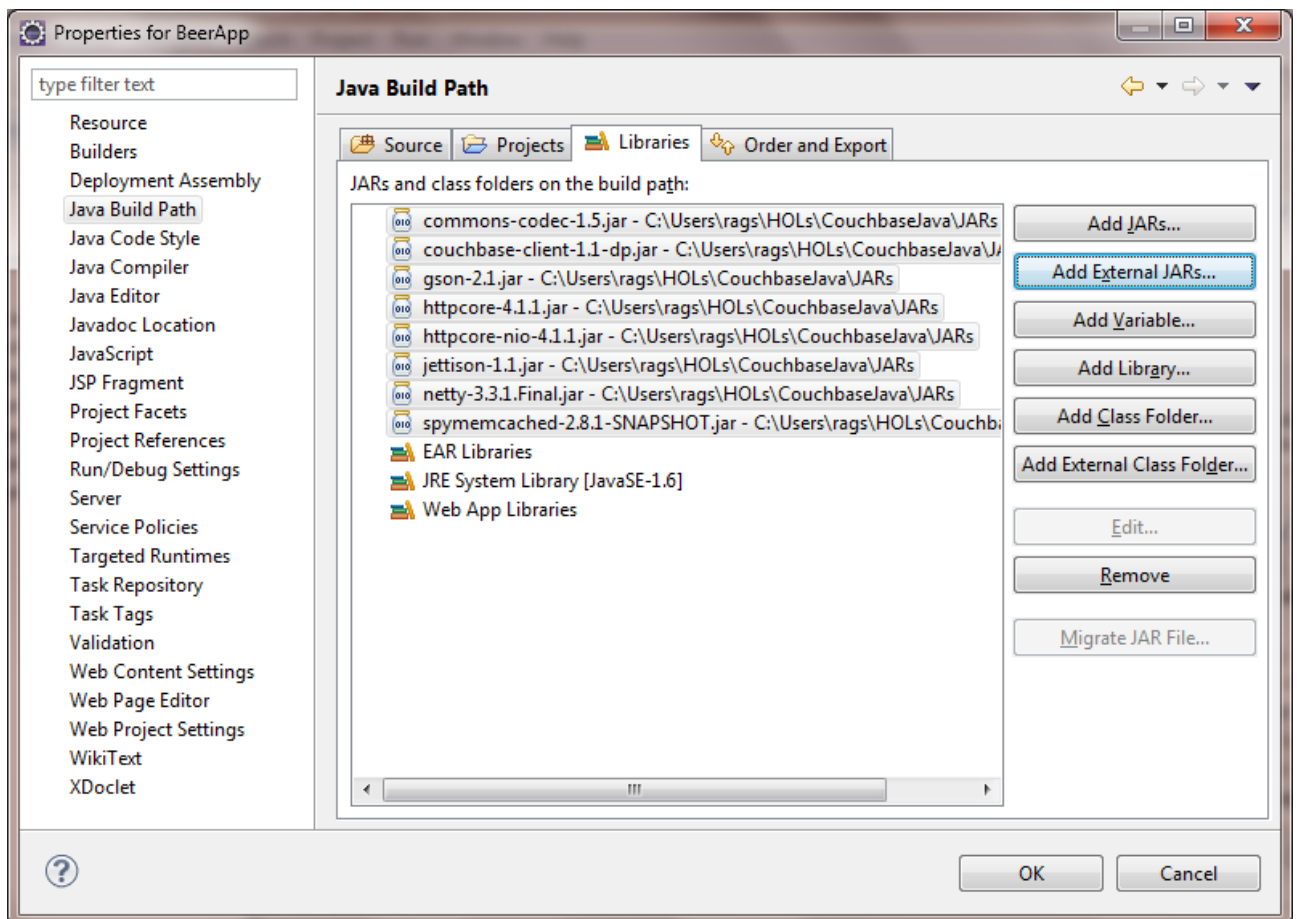
Copyright 2012 - Couchbase, Inc.

Couchbase

```
cp /Users/rags/HOLs/CouchbaseJava/JARS/*  
/Users/rags/bin/apache-tomcat-7.0.27
```

Set the Couchbase JARs for Eclipse project usage

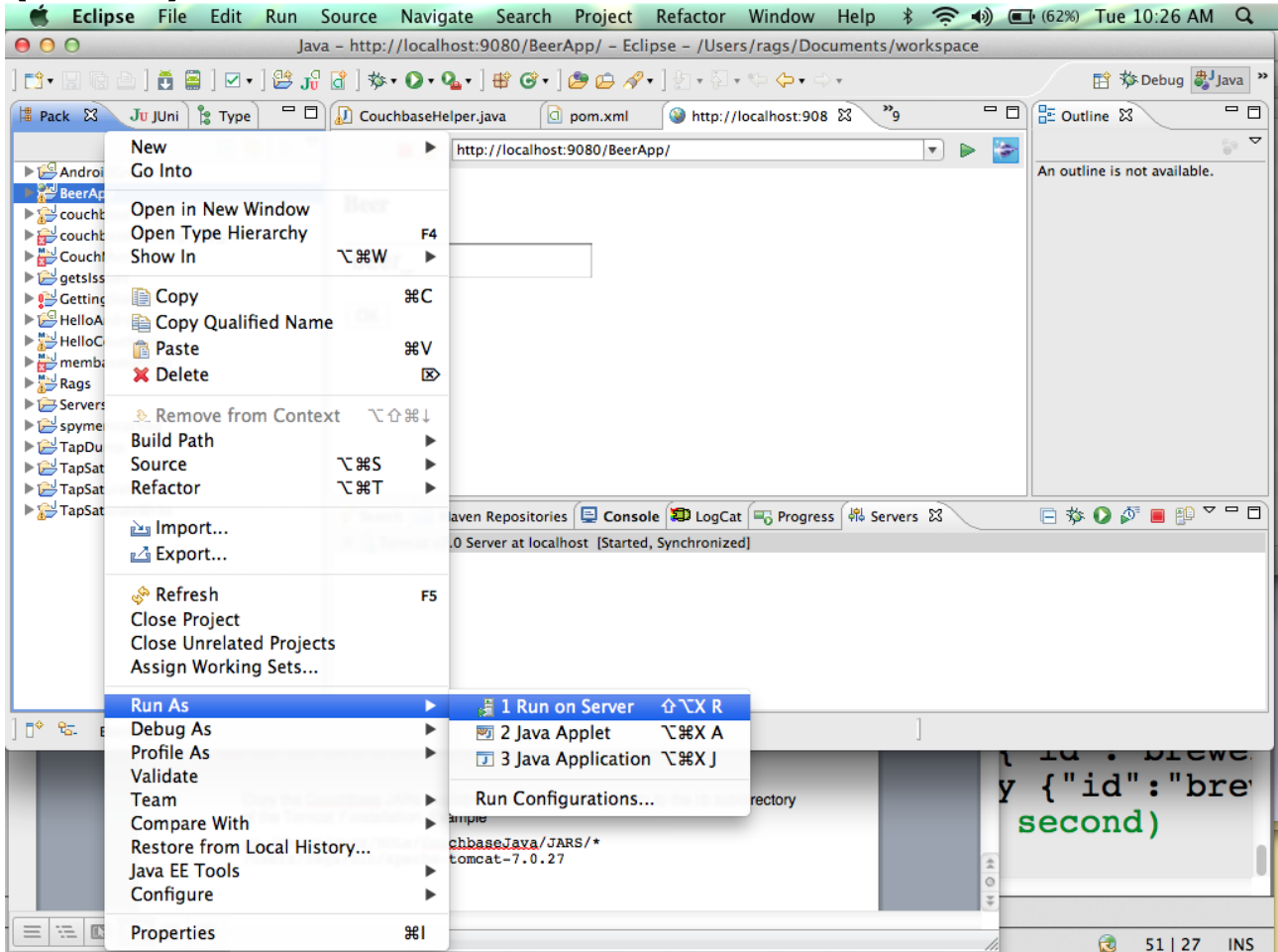
File/Properties/Java build path/Libraries



Open the project and run on server

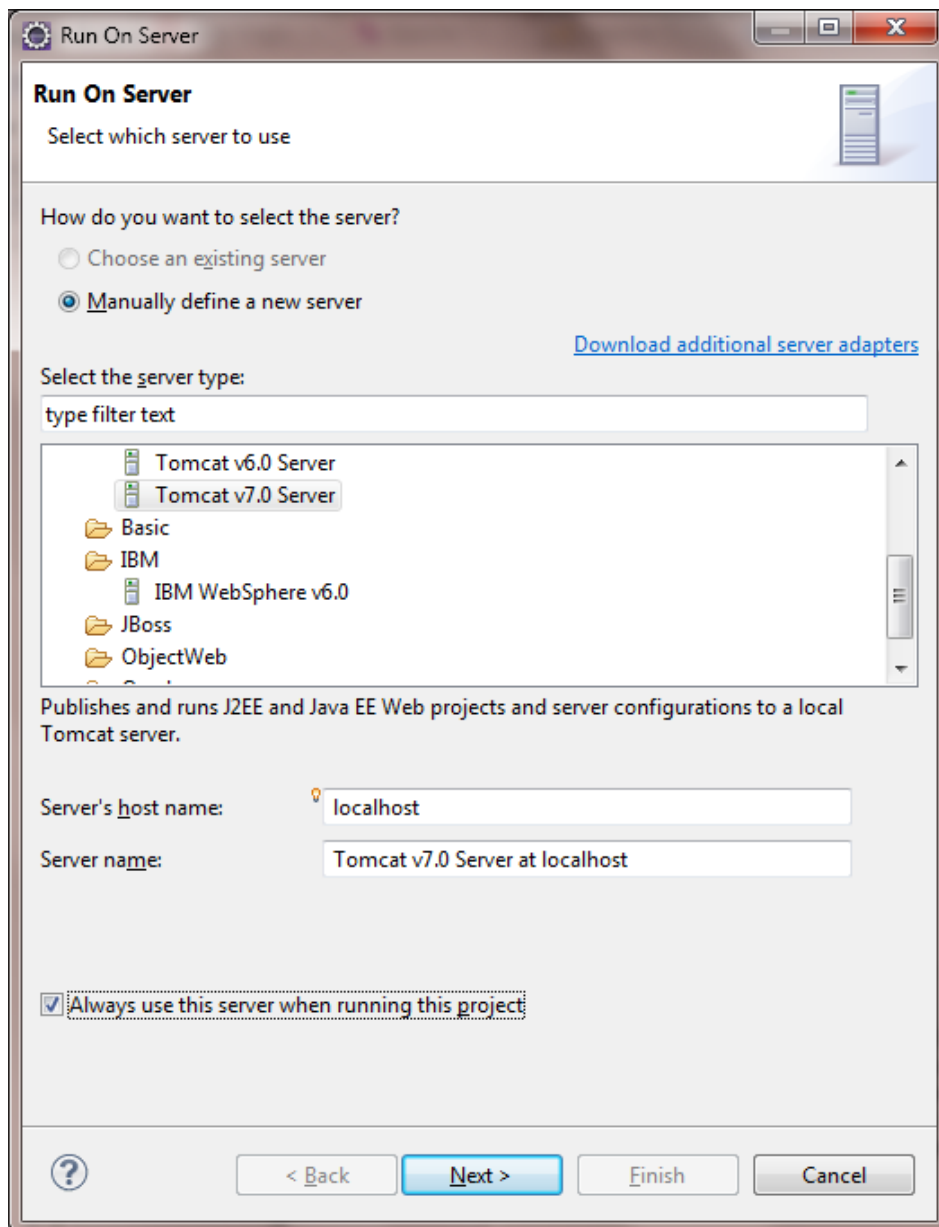
Couchbase

Couchbase Server Developer Training (Java) – Exercise Manual



Set Tomcat 7 as the default server as below.

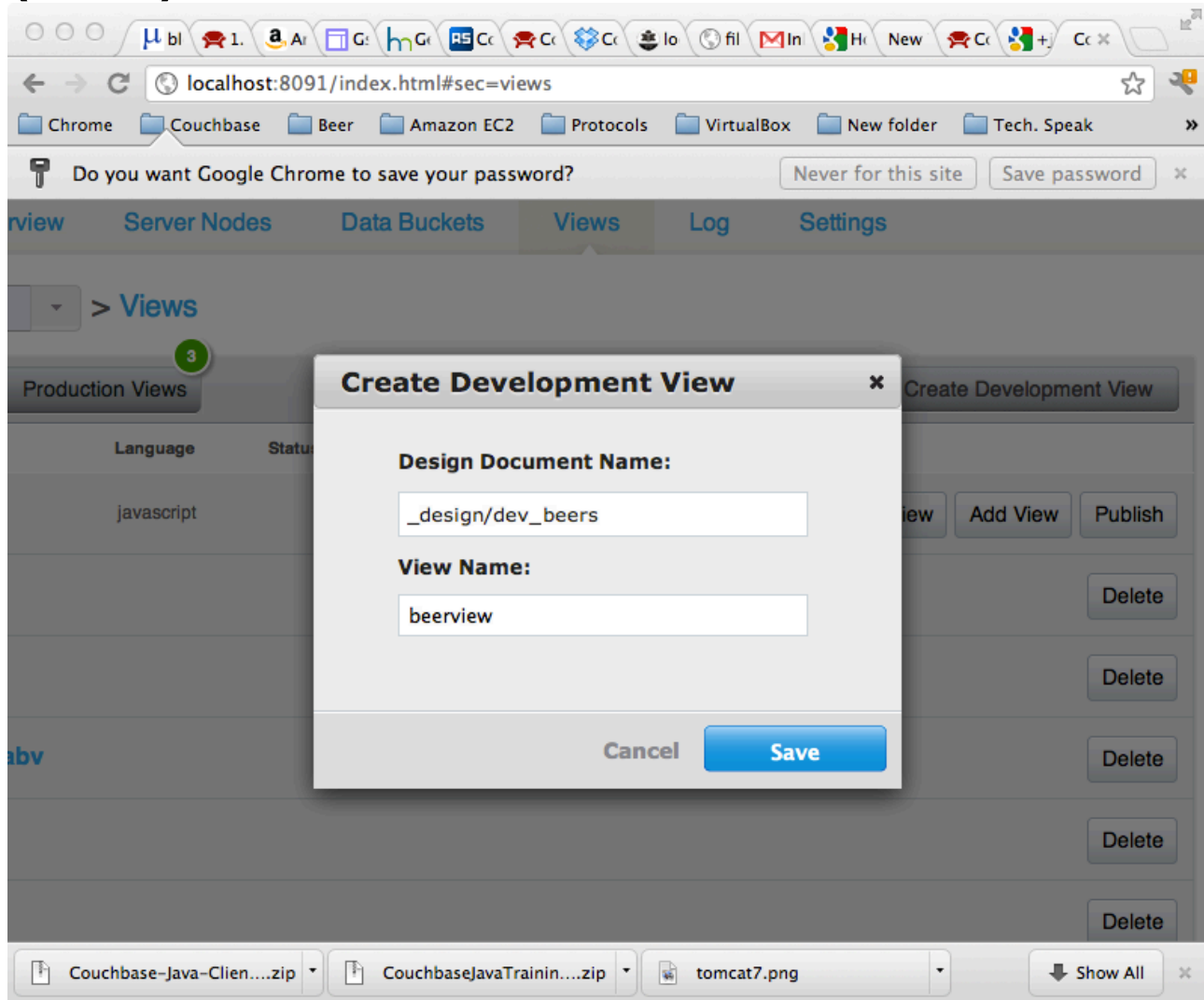
Couchbase



Create the 2 views that is used by the Couchbasehelper class and promote it to production as below.

Couchbase

Couchbase Server Developer Training (Java) – Exercise Manual



Provide the Map function and save

Couchbase

localhost:8091/index.html#sec=views&vtab=0&viewsDDocId=_design%2Fdev_beers&viewsVie...

Do you want Google Chrome to save your password? Never for this site Save password

Couchbase

Documentation • Su

Cluster Overview Server Nodes Data Buckets **Views** Log Settings

default > Views > _design/dev_beers/_view/beerview

SAMPLE DOCUMENT 8 Lookup Id Preview

A document with that ID does not exist

VIEW CODE

Map

```
function (doc) {  
  2 if (doc.type == "beer") {  
  3   emit(doc._id, [doc._id]);  
  4 }  
}
```

Reduce (built in: _count)

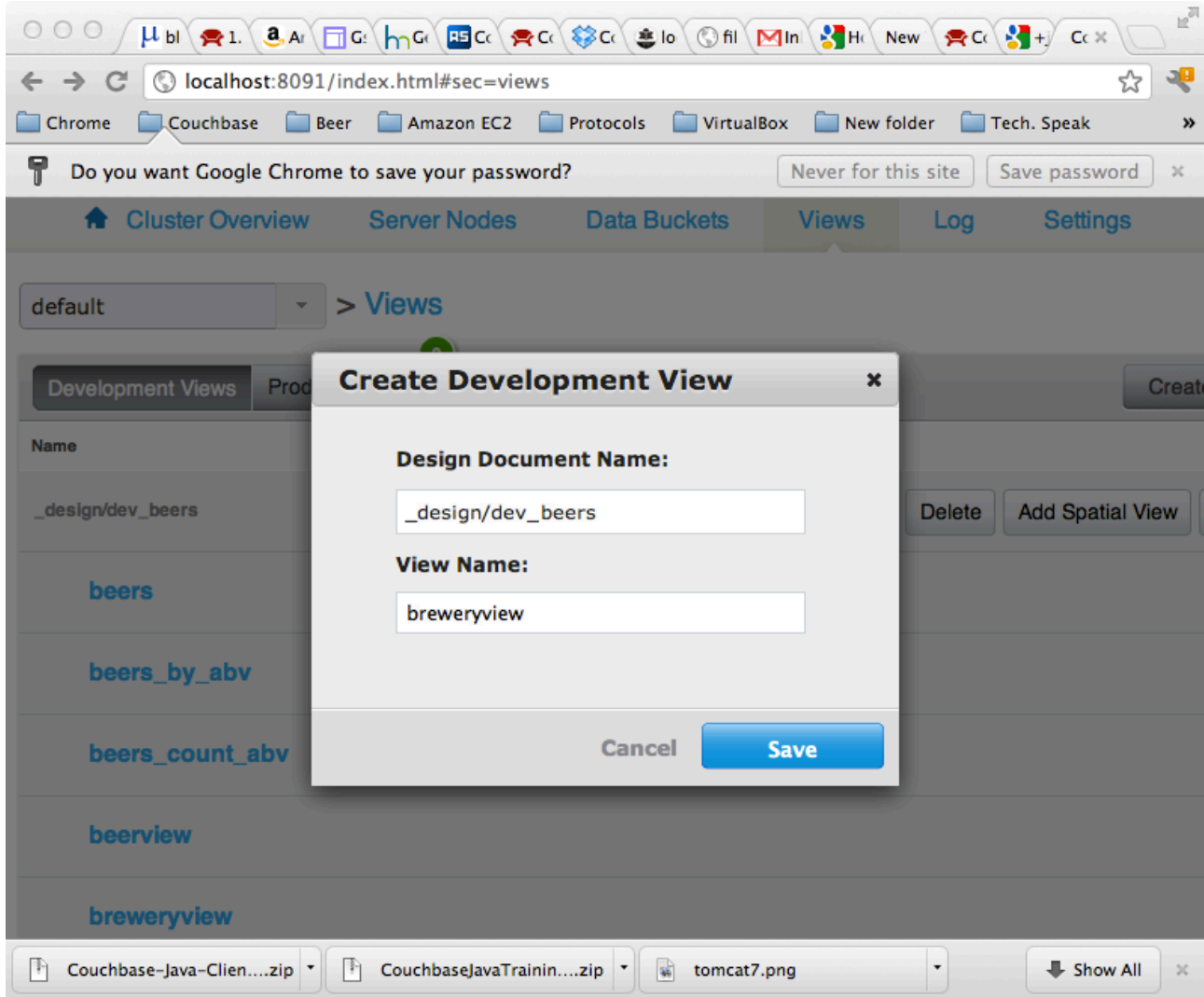
1

Couchbase-Java-Clie....zip CouchbaseJavaTrainin....zip tomcat7.png Show All

Similarly, create a view breweryview

Couchbase

Couchbase Server Developer Training (Java) – Exercise Manual



Couchbase

localhost:8091/index.html#sec=views&viewsDDocId=_design%2Fdev_beers&viewsViewName=...

Do you want Google Chrome to save your password? Never for this site Save password

SAMPLE DOCUMENT 8 Lookup Id Preview

A document with that ID does not exist

VIEW CODE

Map

```
function (doc) {  
  2 if (doc.type == "brewery") {  
  3   emit(doc._id, [doc._id]);  
  4 }  
}
```

Reduce (built in: _count)

1

Filter Results ?connection_timeout=60000&limit=10&skip=0

Development Time Subset Full Cluster Data Set

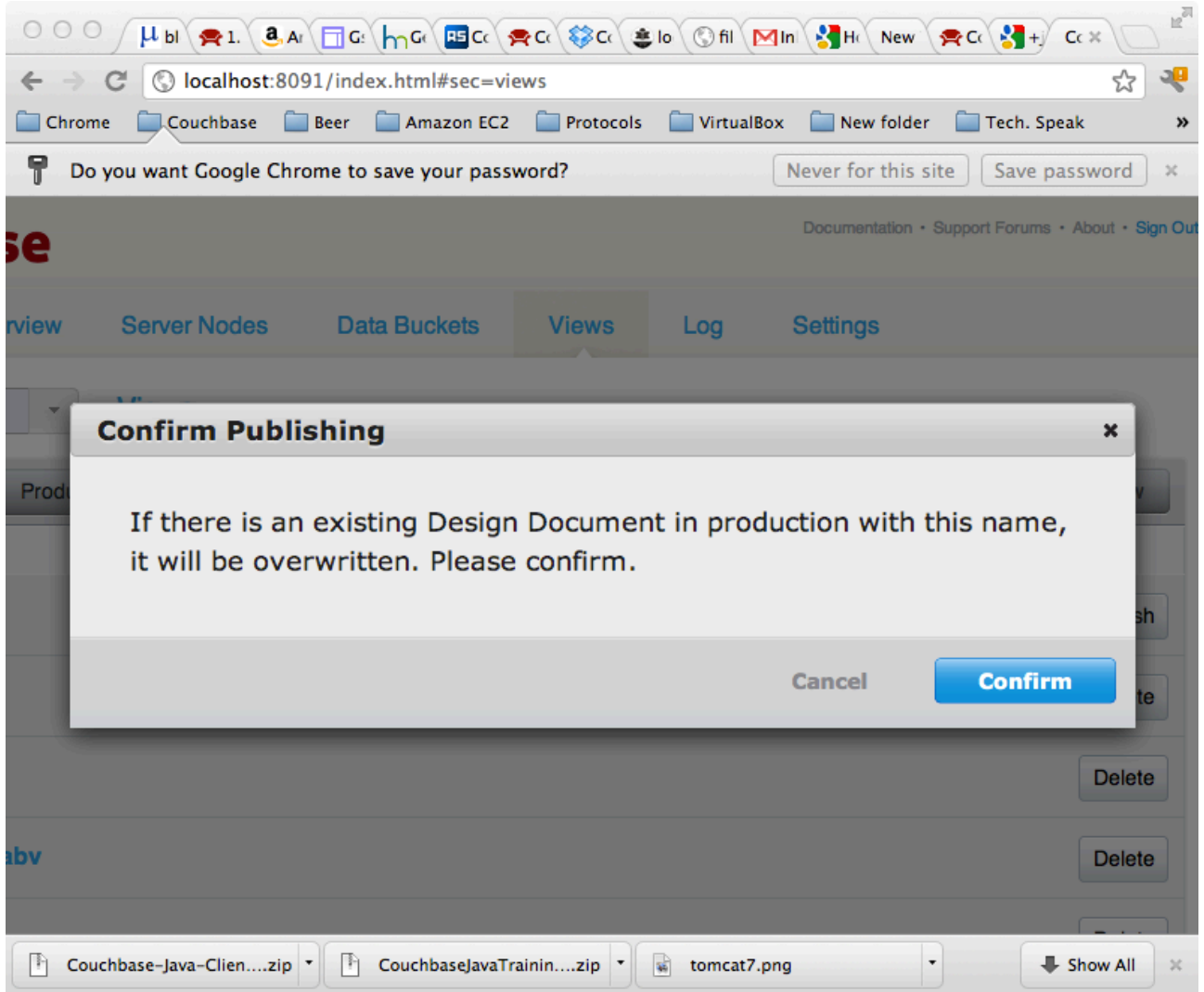
Key	Value
Couchbase-Java-Client.zip	CouchbaseJavaTrainin.zip
tomcat7.png	

Show All

Promote to production

Couchbase

Couchbase Server Developer Training (Java) – Exercise Manual



If AutoComplete does not work, try to create a **Dynamic Web project** which should enable the Java EE perspective. The project works without AutoComplete, but, has better usability with the Autocomplete.



Exercise 12 (CLI-based chat app)

Include the Couchbase JARs and dependencies

Copy the Couchbase JARs available in the JARs subdirectory to the local directory or include them in the class path as below.

```
javac -cp ../../JARs/couchbase-client-1.1-  
dp.jar:../../JARs/spymemcached-2.8.1.jar Tutorial.java
```

```
java -cp ../../JARs/couchbase-client-1.1-  
dp.jar:../../JARs/spymemcached-2.8.1.jar:../../JARs/jettison-  
1.1.jar:../../JARs/httpcore-4.1.1.jar:../../JARs/commons-codec-  
1.5.jar:../../JARs/httpcore-nio-4.1.1.jar:../../JARs/netty-  
3.3.1.Final.jar Tutorial localhost
```

A sample of the output is included below.

```
May 28, 2012 6:14:12 PM net.spy.memcached.MemcachedConnection  
createConnections
```

```
INFO: Added {QA sa=/127.0.0.1:11210, #Rops=0, #Wops=0, #iq=0,  
topRop=null, topWop=null, toWrite=0, interested=0} to connect  
queue
```

```
May 28, 2012 6:14:12 PM net.spy.memcached.MemcachedConnection  
handleIO
```

```
INFO: Connection state changed for  
sun.nio.ch.SelectionKeyImpl@676bd8ea
```

```
May 28, 2012 6:14:12 PM  
com.couchbase.client.CouchbaseConnection createConnections
```

```
INFO: Added localhost/127.0.0.1:11210 to connect queue
```

```
May 28, 2012 6:14:12 PM com.couchbase.client.CouchbaseClient  
<init>
```

```
INFO: viewmode property isn't defined. Setting viewmode to  
production mode
```

```
May 28, 2012 6:14:12 PM com.couchbase.client.ViewConnection  
createConnections
```

```
INFO: Added localhost/127.0.0.1:8092 to connect queue
```

```
Connection established with localhost/127.0.0.1:11210
```

```
Reconnected count: -1
```

```
May 28, 2012 6:14:12 PM net.spy.memcached.MemcachedConnection  
createConnections
```

```
INFO: Added {QA sa=/127.0.0.1:11210, #Rops=0, #Wops=0, #iq=0,  
topRop=null, topWop=null, toWrite=0, interested=0} to connect  
queue
```



Couchbase Server Developer Training (Java) – Exercise Manual

```
May 28, 2012 6:14:12 PM
com.couchbase.client.CouchbaseConnection createConnections
INFO: Added localhost/127.0.0.1:11210 to connect queue
May 28, 2012 6:14:12 PM net.spy.memcached.MemcachedConnection
handleIO
INFO: Connection state changed for
sun.nio.ch.SelectionKeyImpl@2f242b11
May 28, 2012 6:14:12 PM
com.couchbase.client.CouchbaseConnection createConnections
INFO: Added localhost/127.0.0.1:8092 to connect queue
May 28, 2012 6:14:12 PM
com.couchbase.client.CouchbaseConnection createConnections
INFO: Added localhost/127.0.0.1:8092 to connect queue
UserId -> 4
UserCount -> 0
Messages -> 3
CurrentUsers ->
May 28, 2012 6:14:15 PM
com.couchbase.client.CouchbaseConnection run
INFO: Shut down Couchbase client
You are user 5.
Registration succeeded.
There are currently 1 connected.
Enter text, or /who to see user list, or /quit to exit.
Users: <User-5>
Hello. This is a chat based app.
Hello. This is a chat based app.
<User-5>: Hello. This is a chat based app.
Nothing much happening on a memorial day!
Nothing much happening on a memorial day!
<User-5>: Nothing much happening on a memorial day!
/user
/user
[<User-5>: Hello. This is a chat based app., <User-5>: Nothing
much happening on a memorial day!]
```

Couchbase

```
/users
/users
[<User-5>: Hello. This is a chat based app., <User-5>: Nothing
much happening on a memorial day!]
Users: <User-5><User-6>
/quit
/quit
Unregistered.
Stopped message thread.
May 28, 2012 6:17:03 PM
com.couchbase.client.CouchbaseConnection run
INFO: Shut down Couchbase client
May 28, 2012 6:17:03 PM com.couchbase.client.ViewConnection run
INFO: Shut down Couchbase client
May 28, 2012 6:17:03 PM com.couchbase.client.ViewNode$1 run
INFO: Couchbase I/O reactor terminated
rags@Raghavans-MacBook-Pro ~/HOLs/CouchbaseJava/Exercises/Ex12
```



Couchbase Server Developer Training (Java) – Exercise Manual

Contact

For more information, or to make a booking on either a public or private training session, please contact training@couchbase.com.