



Setting up UniTime on Mac

Version: 4.2.185

[1. Install Oracle Java 9](#)

[2. Install MySQL](#)

[2a. Start MySQL Server](#)

[2b. Set the root password](#)

[3. Install Apache Tomcat 8](#)

[3a. Add -Xmx parameter](#)

[3b. Make tomcat/bin/*.sh files executable](#)

[4. Install MySQL JDBC driver](#)

[5. Install UniTime](#)

[5a. Create and populate the timetable database](#)

[5b. Deploy the UniTime application](#)

[5c. Create UniTime custom properties file \(optional step\)](#)

[6. Start Tomcat](#)

[7. Check the logs for any errors \(optional step\)](#)

1. Install Oracle Java 9

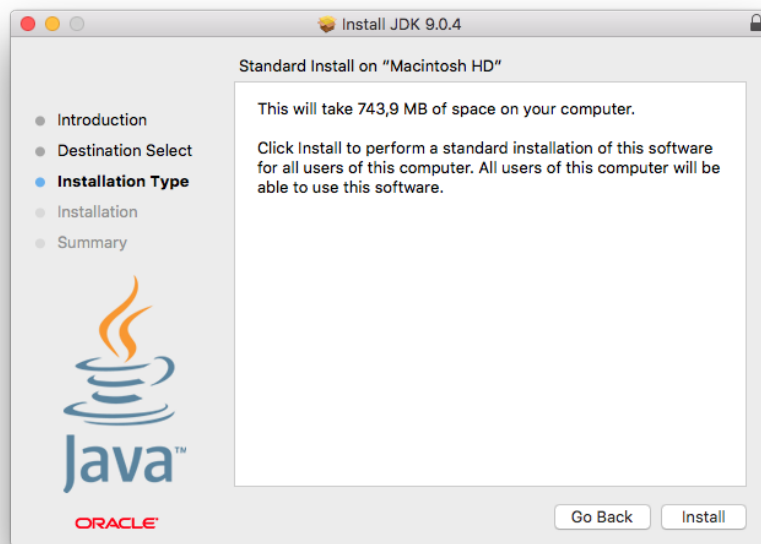
Download Java 9 JDK from <http://www.oracle.com/technetwork/java/javase/downloads> (a file named like jdk-9.0.4_osx-x64_bin.dmg), start it up and follow the installation instructions



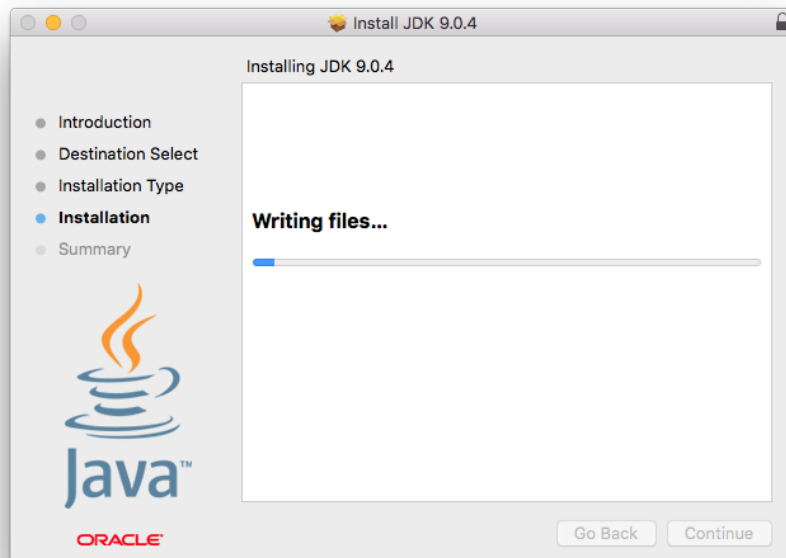
Double click the package icon



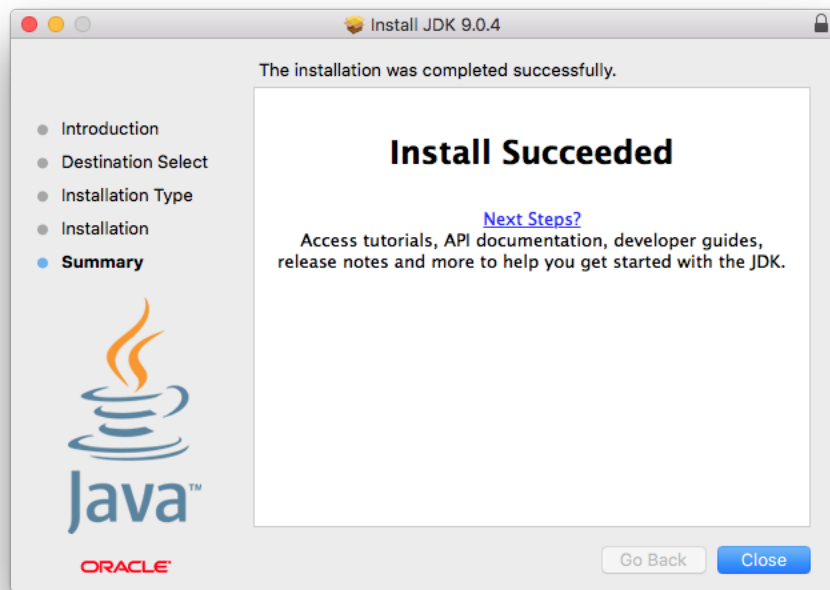
Click Continue



Click Install



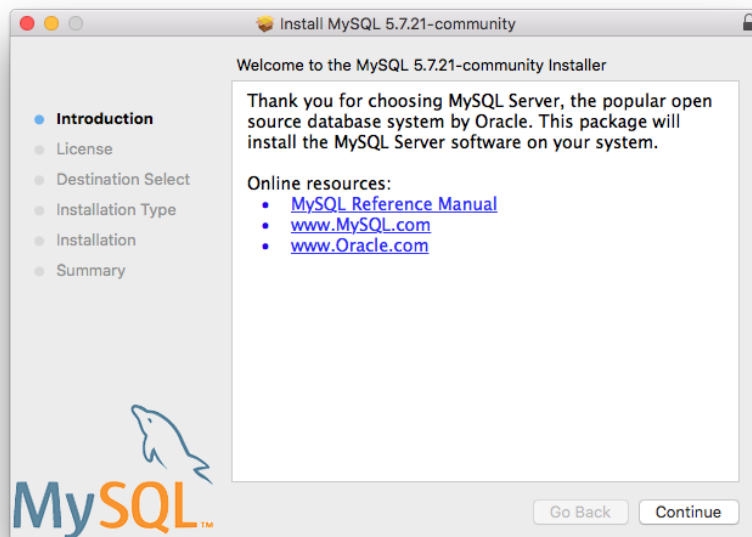
Wait for the installation to finish...



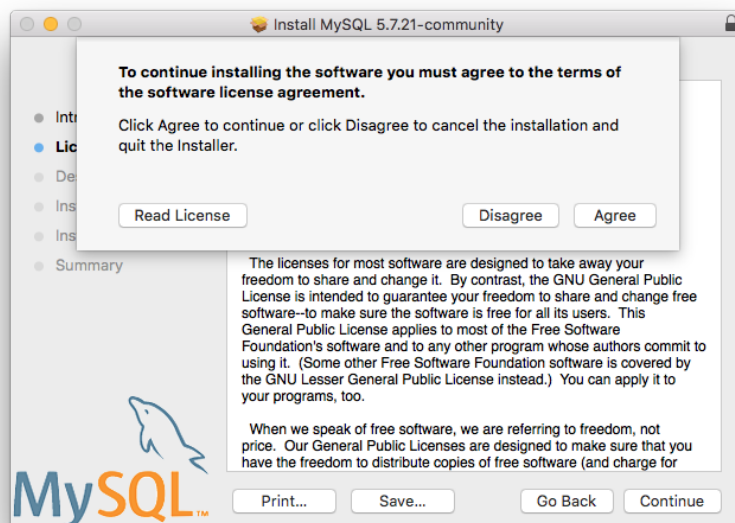
Click Close

2. Install MySQL

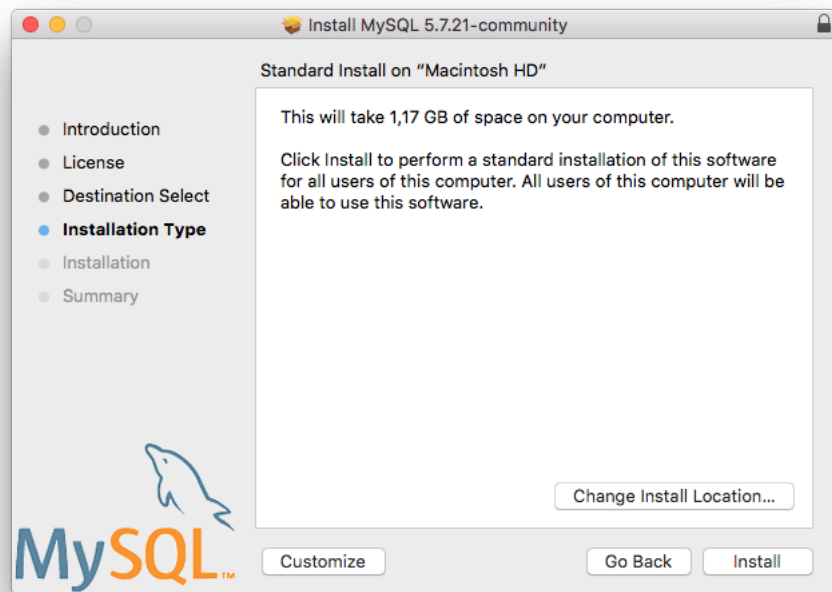
Download MySQL Community Server from <https://dev.mysql.com/downloads/mysql> (a file named like mysql-5.7.21-1-macos10.13-x86_64.dmg), start it up and follow the installation instructions.



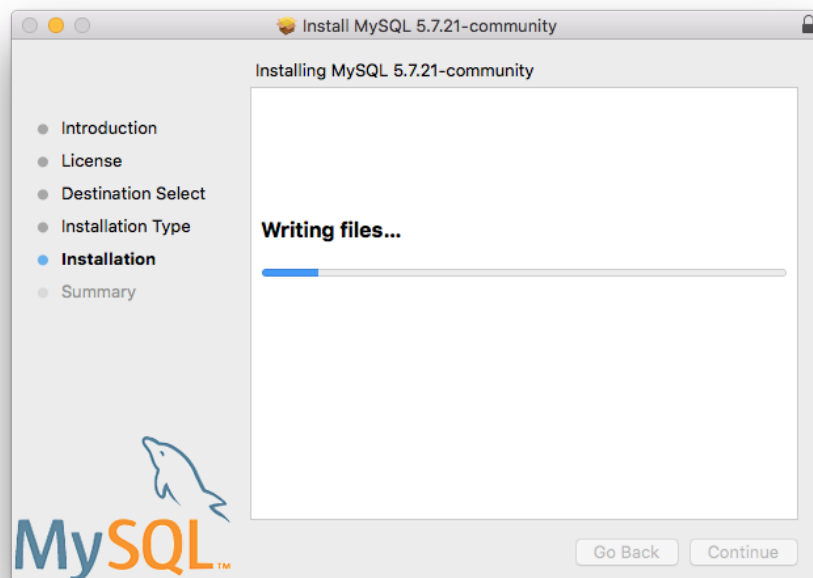
Click Continue



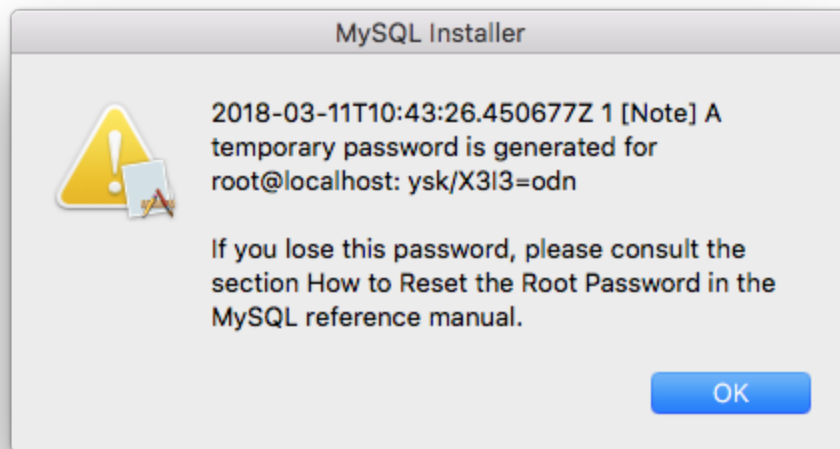
Accept the license by clicking Agree



Click Install



Wait for the installation to finish...



After a successful installation, the installer displays a window with your temporary root password. This cannot be recovered so you must save this password for the initial login to MySQL. Click OK



Click Close

2a. Start MySQL Server

Once installed, you need to start the MySQL Server. Open System Preferences > MySQL



Start the MySQL server by clicking Start MySQL Server and wait for the server to start.



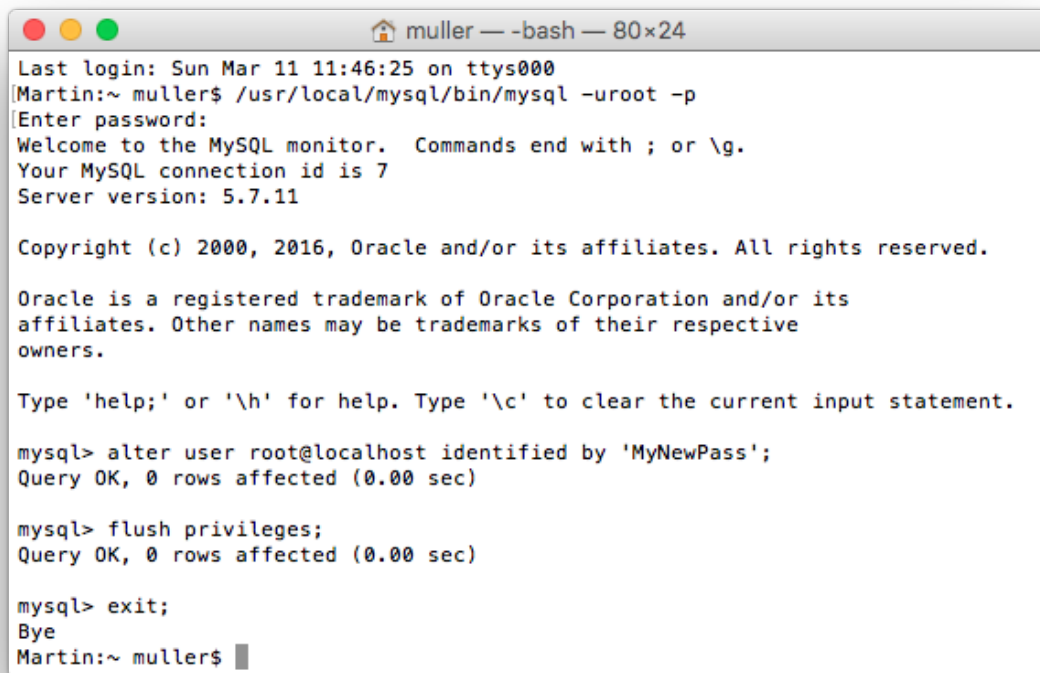
2b. Set the root password

Start the Terminal (Launchpad > Other > Terminal), execute:

```
/usr/local/mysql/bin/mysql -uroot -p
```

Type in the temporary root password you got during the installation or just hit Enter when no password was provided (MySQL 5.6). When the mysql> command prompt appears, put in the following commands:

```
alter user root@localhost identified by 'MyNewPass';
flush privileges;
exit;
```

A screenshot of a macOS Terminal window titled "muller — -bash — 80x24". The window shows the execution of the MySQL command-line client. The user enters the command `/usr/local/mysql/bin/mysql -uroot -p`. The prompt `[Enter password:]` is shown, followed by the MySQL welcome message: "Welcome to the MySQL monitor. Commands end with ; or \g. Your MySQL connection id is 7. Server version: 5.7.11". The user then enters the command `alter user root@localhost identified by 'MyNewPass';`, which returns "Query OK, 0 rows affected (0.00 sec)". Next, the user enters `flush privileges;`, which also returns "Query OK, 0 rows affected (0.00 sec)". Finally, the user enters `exit;`, and the terminal displays "Bye" and returns to the shell prompt `Martin:~ muller$`.

```
muller — -bash — 80x24
Last login: Sun Mar 11 11:46:25 on ttys000
Martin:~ muller$ /usr/local/mysql/bin/mysql -uroot -p
[Enter password:]
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 7
Server version: 5.7.11

Copyright (c) 2000, 2016, Oracle and/or its affiliates. All rights reserved.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

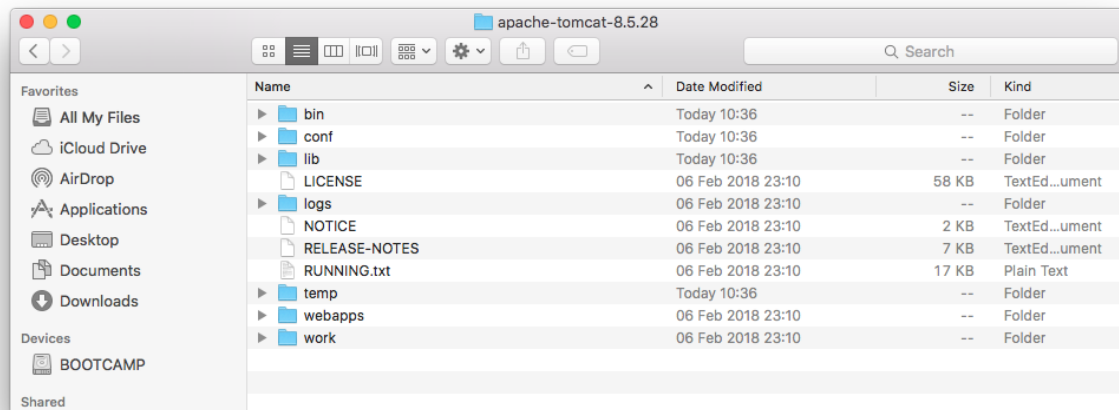
mysql> alter user root@localhost identified by 'MyNewPass';
Query OK, 0 rows affected (0.00 sec)

mysql> flush privileges;
Query OK, 0 rows affected (0.00 sec)

mysql> exit;
Bye
Martin:~ muller$
```

3. Install Apache Tomcat 8

Download Apache Tomcat 8 from <https://tomcat.apache.org/download-80.cgi> (choose zip option, a file named like apache-tomcat-8.5.28.zip), unzip the archive by double clicking on its name.



The Apache Tomcat does not have any Mac installation. It could be just started up using the startup.sh in the bin folder, but do not do that just yet.

Note: The unzipped apache-tomcat-8.5.28 is left in the Downloads folder, but it can be moved some place else if needed. This could be done at any time or after the installation is done.

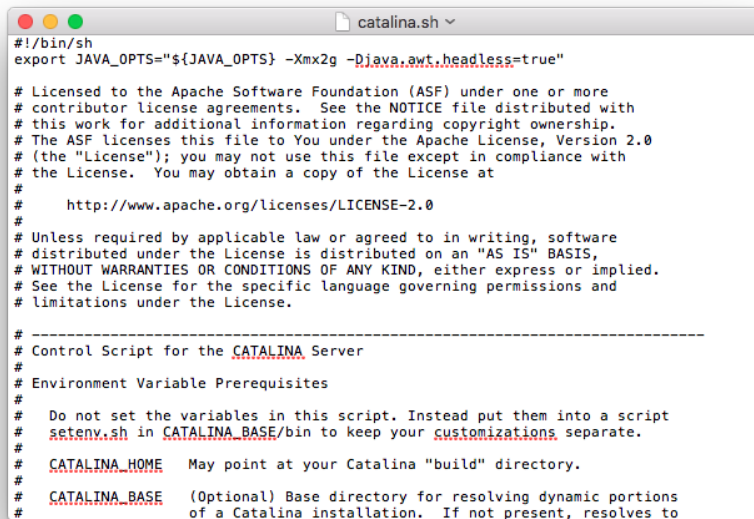
3a. Add -Xmx parameter

To ensure that the Tomcat will be able to allocate enough memory, we need to set the -Xm parameter. In this manual it is set to 2 GB, but some other number can be used.

Open apache-tomcat-8.5.28/bin/catalina.sh file in a text editor (e.g., right click on the file > Open with ... > Other > select TextEdit). Add the following line at the top of the file (as the second line):

```
export JAVA_OPTS="${JAVA_OPTS} -Xmx2g -Djava.awt.headless=true"
```

Save the file. It should look like this (note the second line):



```
#!/bin/sh
export JAVA_OPTS="${JAVA_OPTS} -Xmx2g -Djava.awt.headless=true"

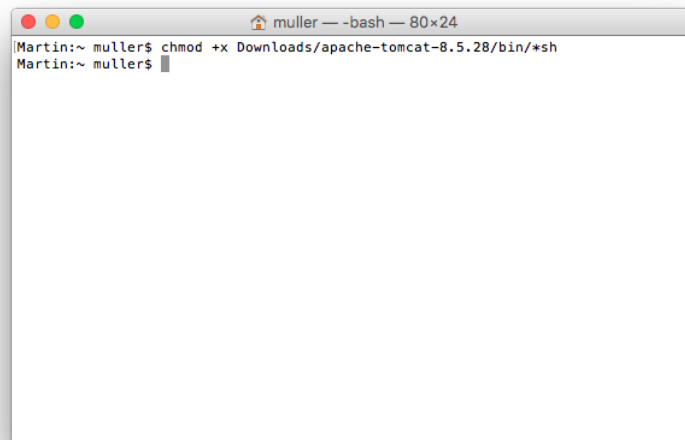
# Licensed to the Apache Software Foundation (ASF) under one or more
# contributor license agreements. See the NOTICE file distributed with
# this work for additional information regarding copyright ownership.
# The ASF licenses this file to You under the Apache License, Version 2.0
# (the "License"); you may not use this file except in compliance with
# the License. You may obtain a copy of the License at
#
#     http://www.apache.org/licenses/LICENSE-2.0
#
# Unless required by applicable law or agreed to in writing, software
# distributed under the License is distributed on an "AS IS" BASIS,
# WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
# See the License for the specific language governing permissions and
# limitations under the License.

# -----
# Control Script for the CATALINA Server
# Environment Variable Prerequisites
#
# Do not set the variables in this script. Instead put them into a script
# setenv.sh in CATALINA_BASE/bin to keep your customizations separate.
#
# CATALINA_HOME May point at your Catalina "build" directory.
#
# CATALINA_BASE (Optional) Base directory for resolving dynamic portions
# of a Catalina installation. If not present, resolves to
```

3b. Make tomcat scripts executable

In the terminal (open Launchpad > Other > Terminal), execute the following command

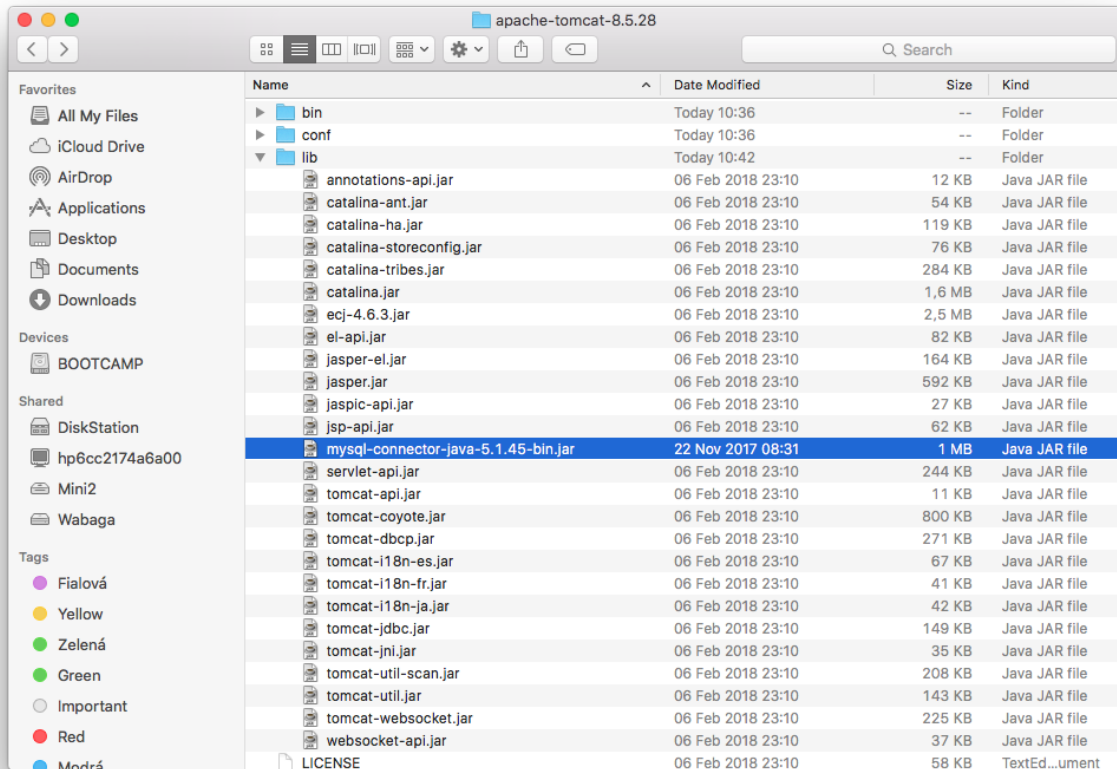
```
chmod +x ~/Downloads/apache-tomcat-8.5.28/bin/*sh
```



```
muller ~ -bash — 80x24
Martin:~ muller$ chmod +x Downloads/apache-tomcat-8.5.28/bin/*sh
Martin:~ muller$
```

4. Install MySQL JDBC driver

Download MySQL Connector/J driver from <https://dev.mysql.com/downloads/connector/j/> (choose Platform Independent ZIP Archive, a file named like mysql-connector-java-5.1.45.zip). Unzip the downloaded file (double click the downloaded file). In mysql-connector-java-5.1.45, copy the extracted mysql-connector-java-5.1.45-bin.jar into apache-tomcat-8.5.28/lib.



5. Install UniTime

Download UniTime from <https://github.com/UniTime/unitime/releases/latest> (a file named like unitime-4.2_bld185.zip) and unzip it (double click the downloaded file).

5a. Create and populate the timetable database

Start the Terminal (Launchpad > Other > Terminal), execute:

```
/usr/local/mysql/bin/mysql -u root -p -f \  
<~/Downloads/unitime-4.2_bld185/doc/mysql/schema.sql  
  
/usr/local/mysql/bin/mysql -utimetable -punitime \  
<~/Downloads/unitime-4.2_bld185/doc/mysql/woebegon-data.sql
```

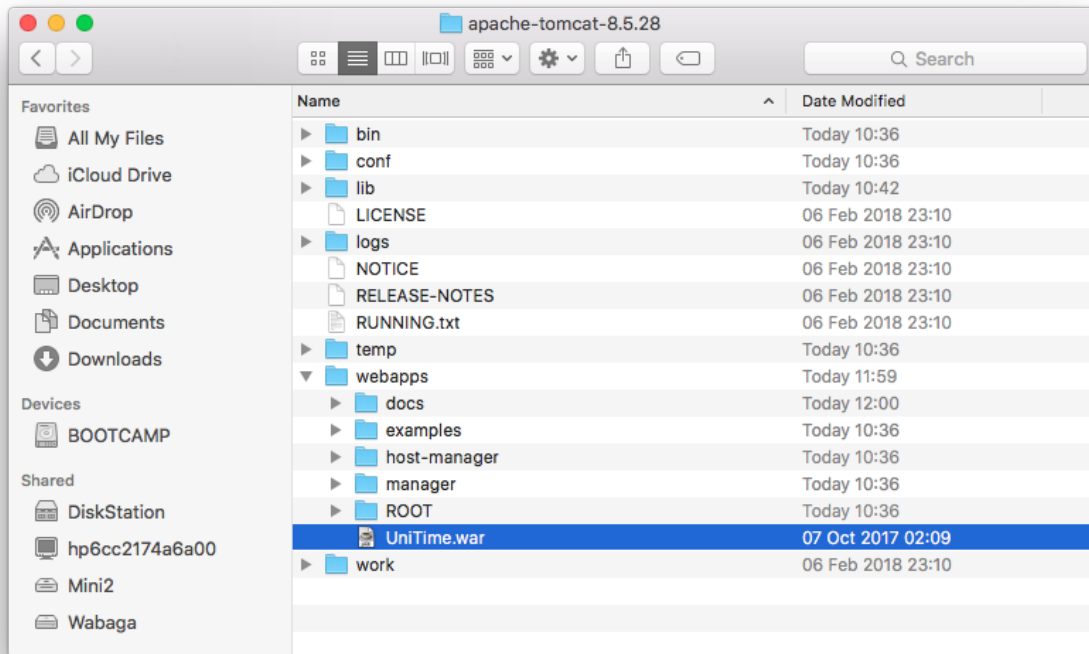
When prompted, use the MySQL root user password as provided in step 2b. You can safely ignore the DROP USER failed error (the script tries to drop the timetable user first).



```
Martin:~ muller$ /usr/local/mysql/bin/mysql -u root -p -f \  
> <~/Downloads/unitime-4.2_bld185/doc/mysql/schema.sql  
[Enter password:  
ERROR 1396 (HY000) at line 23: Operation DROP USER failed for 'timetable'@'local  
host'  
Martin:~ muller$ /usr/local/mysql/bin/mysql -utimetable -punitime \  
> <~/Downloads/unitime-4.2_bld185/doc/mysql/woebegon-data.sql  
mysql: [Warning] Using a password on the command line interface can be insecure.  
Martin:~ muller$
```

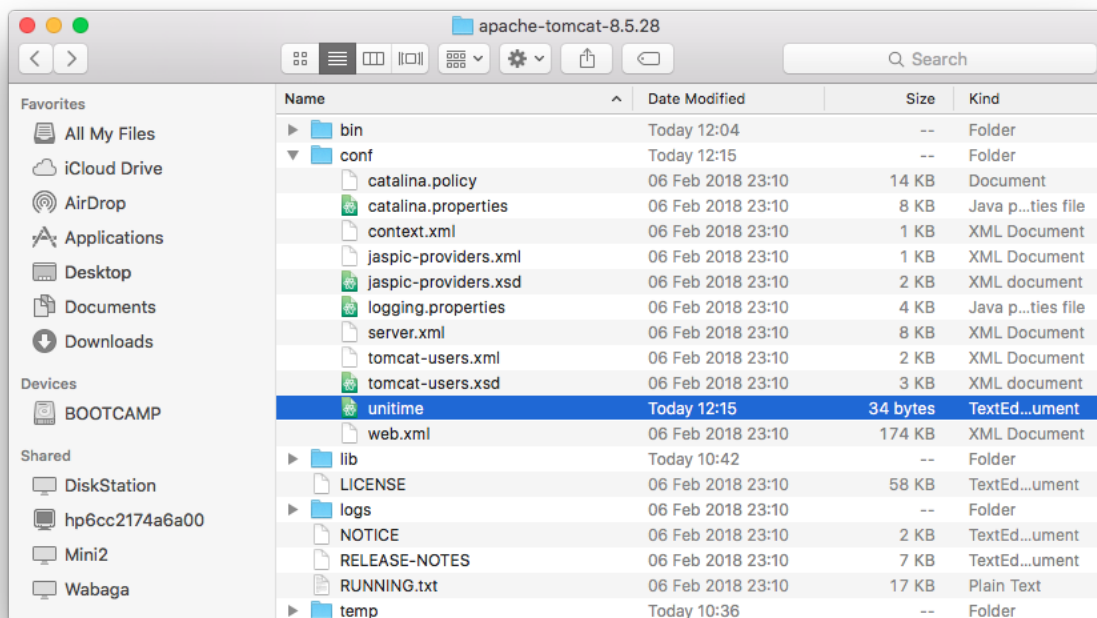
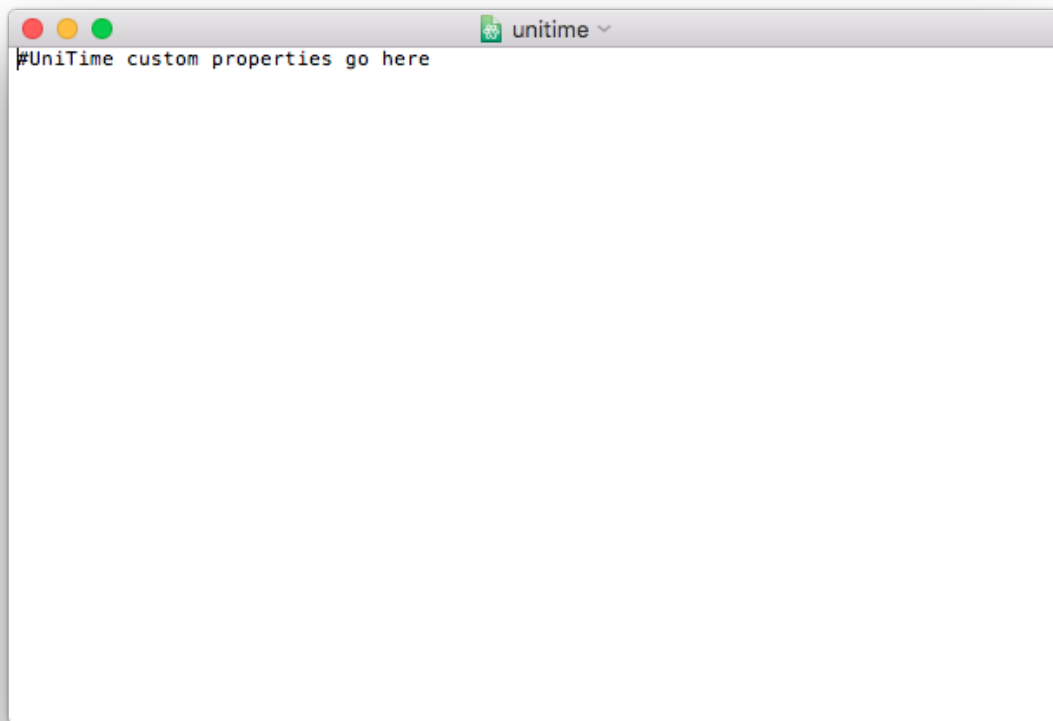
5b. Deploy the UniTime application

Copy `unitime-4.2_bld185/web/UniTime.war` (from the unzipper UniTime archive) to `apache-tomcat-8.5.28/webapps`



5c. Create UniTime custom properties file (*optional step*)

Create `apache-tomcat-8.5.28/conf/unitime.properties` file (e.g., by using the TextEdit application). Please note that if you are using TextEdit, you need to select `Format > Make Plain Text` in order to make the file plain text.

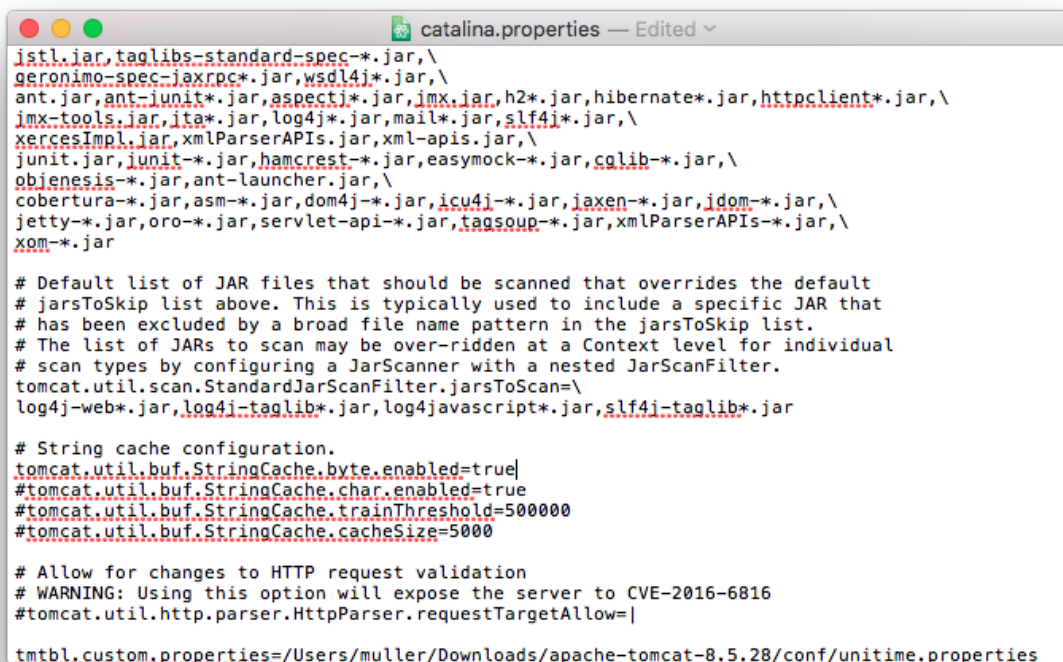


Open apache-tomcat-8.5.28/conf/unitime.properties file in a text editor (e.g., right click on the file > Open with ... > Other > select TextEdit). Add the following line at the bottom of the file:

```
tmtbl.custom.properties=/Users/<user>/Downloads/apache-tomcat-8
.5.28/conf/unitime.properties
```

The tmtbl.custom.properties property needs to contain the full path leading to the newly created unitime.properties file.

Save the file. It should look like this (note the last line).



```
istl.jar,taglibs-standard-spec-*.jar,\
geronimo-spec-jaxrpc*.jar,wsdl4j*.jar,\
ant.jar,ant-junit*.jar,aspectj*.jar,imx.jar,h2*.jar,hibernate*.jar,httpclient*.jar,\
imx-tools.jar,ita*.jar,log4j*.jar,mail*.jar,slf4j*.jar,\
xercesImpl.jar,xmlParserAPIs.jar,xml-apis.jar,\
junit.jar,junit-*.jar,hamcrest-*.jar,easymock-*.jar,cglib-*.jar,\
objenesis-*.jar,ant-launcher.jar,\
cobertura-*.jar,asm-*.jar,dom4j-*.jar,icu4j-*.jar,jaxen-*.jar,ido-*.jar,\
jetty-*.jar,oro-*.jar,servlet-api-*.jar,taglibs*.jar,xmlParserAPIs-*.jar,\
xom-*.jar

# Default list of JAR files that should be scanned that overrides the default
# jarsToSkip list above. This is typically used to include a specific JAR that
# has been excluded by a broad file name pattern in the jarsToSkip list.
# The list of JARs to scan may be over-ridden at a Context level for individual
# scan types by configuring a JarScanner with a nested JarScanFilter.
tomcat.util.scan.StandardJarScanFilter.jarsToScan=\
log4j-web*.jar,log4j-taglib*.jar,log4javascript*.jar,slf4j-taglib*.jar

# String cache configuration.
tomcat.util.buf.StringCache.byte.enabled=true
#tomcat.util.buf.StringCache.char.enabled=true
#tomcat.util.buf.StringCache.trainThreshold=500000
#tomcat.util.buf.StringCache.cacheSize=5000

# Allow for changes to HTTP request validation
# WARNING: Using this option will expose the server to CVE-2016-6816
#tomcat.util.http.parser.HttpParser.requestTargetAllow=|

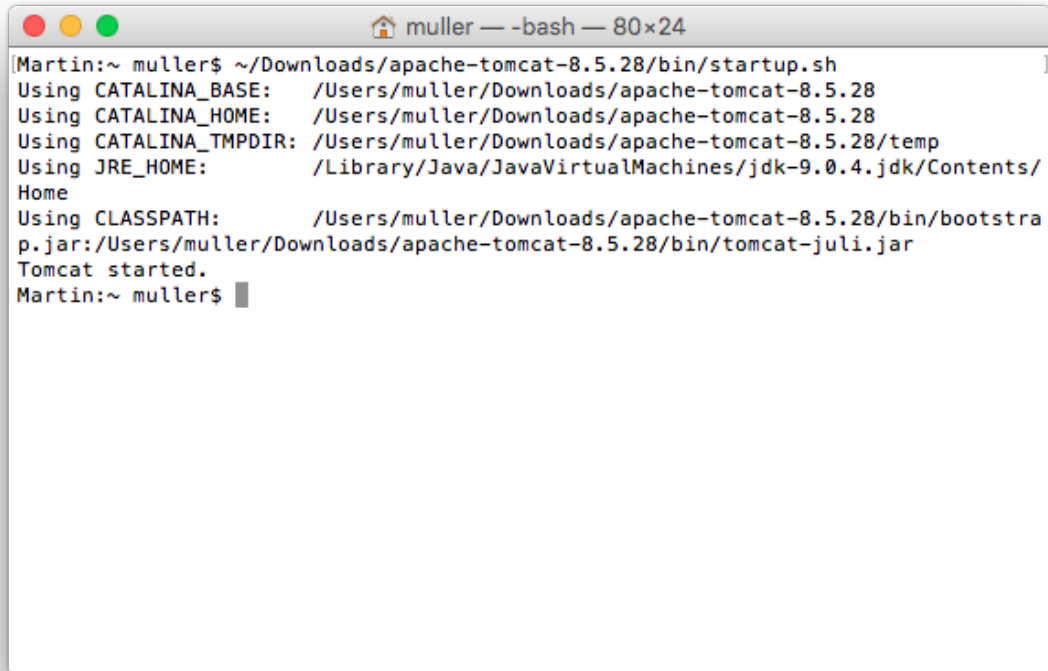
tmtbl.custom.properties=/Users/muller/Downloads/apache-tomcat-8.5.28/conf/unitime.properties
```

See http://help.unitime.org/Timetabling_Installation#TOC-Customization for more details.

6. Start Tomcat

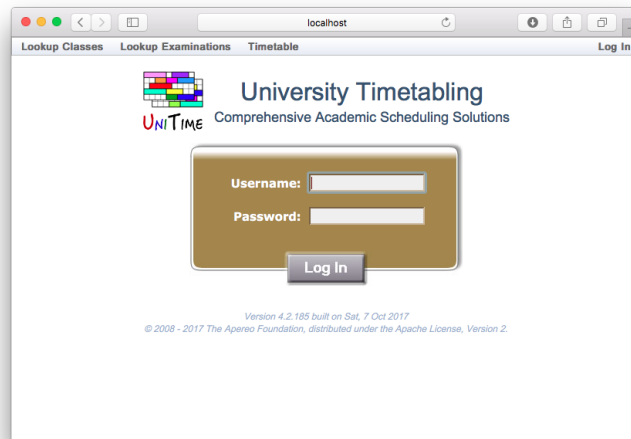
Start the Terminal (Launchpad > Other > Terminal), execute:

```
~/Downloads/apache-tomcat-8.5.28/bin/startup.sh
```

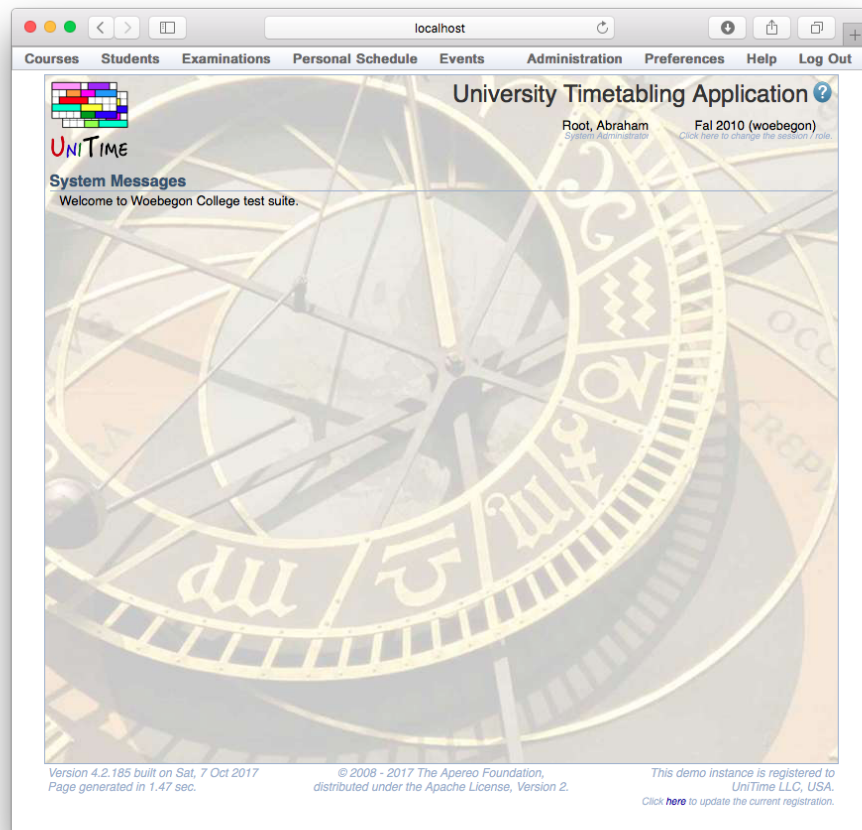
A screenshot of a macOS Terminal window. The title bar shows a home icon, the name 'muller', and the command prompt '-bash' followed by the window size '80x24'. The terminal content shows the user 'Martin' at the prompt '~ muller\$' running the command '~/Downloads/apache-tomcat-8.5.28/bin/startup.sh'. The script outputs several environment variables: CATALINA_BASE, CATALINA_HOME, CATALINA_TMPDIR, JRE_HOME, and CLASSPATH. It then reports 'Tomcat started.' and returns the prompt to '~ muller\$'.

```
[Martin:~ muller$ ~/Downloads/apache-tomcat-8.5.28/bin/startup.sh  
Using CATALINA_BASE:   /Users/muller/Downloads/apache-tomcat-8.5.28  
Using CATALINA_HOME:   /Users/muller/Downloads/apache-tomcat-8.5.28  
Using CATALINA_TMPDIR: /Users/muller/Downloads/apache-tomcat-8.5.28/temp  
Using JRE_HOME:        /Library/Java/JavaVirtualMachines/jdk-9.0.4.jdk/Contents/  
Home  
Using CLASSPATH:       /Users/muller/Downloads/apache-tomcat-8.5.28/bin/bootstra  
p.jar:/Users/muller/Downloads/apache-tomcat-8.5.28/bin/tomcat-juli.jar  
Tomcat started.  
Martin:~ muller$ ]
```

Now, you should be able to open UniTime at <http://localhost:8080/UniTime>



And log in using the admin user (both username and password is admin)

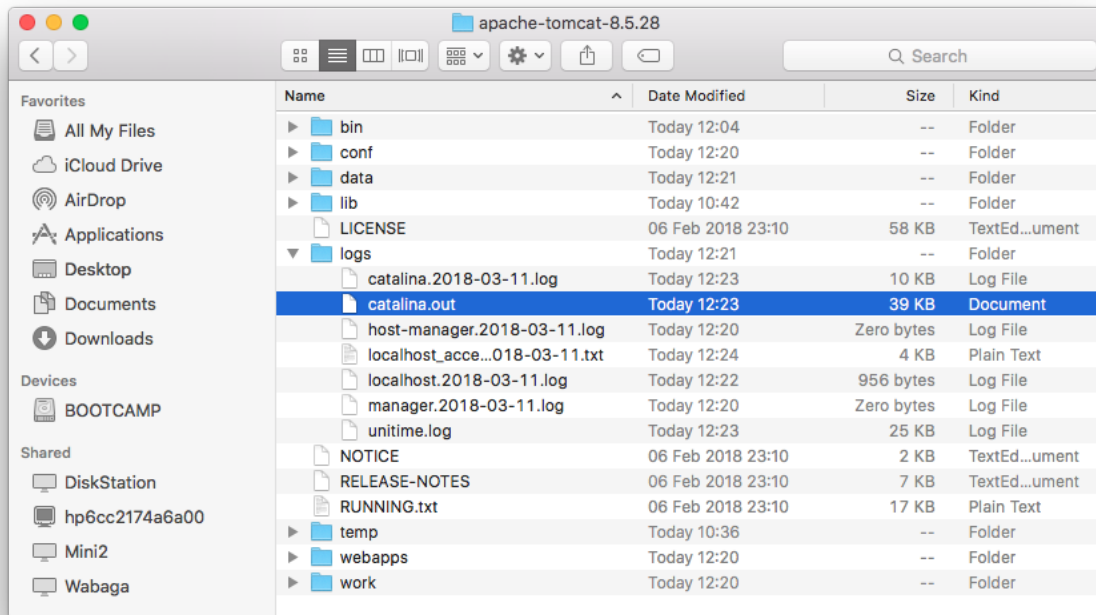


Tomcat can be stopped the same way, but using the stop.sh script instead.

~/Downloads/apache-tomcat-8.5.28/bin/stop.sh

7. Check the logs for any errors (*optional step*)

The logs are located in apache-tomcat-8.5.28/logs folder.



You can use the Utilities > Console app to view the log files.

All the UniTime related messages should be placed in the `unitime.log`, but other files (especially the `catalina.out` and `catalina.<DATE>.log`) may contain useful information. If everything started as it should, there should be the following messages in the `unitime.log` file (abbreviated):

```
[03/11/18 12:21:14] INFO    afterPropertiesSet -> - Initializing Hibernate ...
[03/11/18 12:21:14] INFO    Version -> HCANN000001: Hibernate Commons Annotations
{4.0.5.Final}
[03/11/18 12:21:14] INFO    Version -> HHH000412: Hibernate Core {4.3.11.Final}
[03/11/18 12:21:17] INFO    ConnectionProviderInitiator -> HHH000130: Instantiating explicit
connection provider: org.unitime.commons.hibernate.connection.LoggingDBCPCConnectionProvider
[03/11/18 12:21:18] INFO    LoggingDBCPCConnectionProvider -> Database connection pool logging
is enabled.
[03/11/18 12:21:18] INFO    Dialect -> HHH000400: Using dialect:
org.hibernate.dialect.MySQLInnoDBDialect
[03/11/18 12:21:27] INFO    SessionFactoryRegistry -> HHH000094: Bound factory to JNDI name:
unitime:hibernate/SessionFactory
[03/11/18 12:21:27] INFO    TransactionFactoryInitiator -> HHH000399: Using default
transaction strategy (direct JDBC transactions)
[03/11/18 12:21:28] INFO    <init> -> Reading
file:/Users/muller/Downloads/apache-tomcat-8.5.28/webapps/UniTime/WEB-INF/lib/timetable.jar!
/dbupdate.xml ...
[03/11/18 12:21:28] INFO    DatabaseUpdate -> Current UniTime database version: 123
[03/11/18 12:21:28] INFO    DatabaseUpdate -> Performing UniTime update to version 124
```

```
(Instructor Note)
[03/11/18 12:21:29] INFO DatabaseUpdate -> UniTime Database version increased to: 124
[03/11/18 12:21:29] INFO DatabaseUpdate -> Performing UniTime update to version 125
(Solution Export XML)
[03/11/18 12:21:29] INFO DatabaseUpdate -> UniTime Database version increased to: 125
...
[03/11/18 12:22:13] INFO DatabaseUpdate -> Performing UniTime update to version 188
(Event Service Provider)
[03/11/18 12:22:15] INFO DatabaseUpdate -> UniTime Database version increased to: 188
[03/11/18 12:22:15] INFO DatabaseUpdate -> Performing UniTime update to version 189
(Larger Event Note)
[03/11/18 12:22:15] INFO DatabaseUpdate -> UniTime Database version increased to: 189
[03/11/18 12:22:15] INFO DatabaseUpdate -> New UniTime database version: 189
[03/11/18 12:22:15] INFO afterPropertiesSet -> - Creating Message Log Appender ...
[03/11/18 12:22:15] INFO afterPropertiesSet -> - Initializing Room Availability Service
...
[03/11/18 12:22:15] INFO afterPropertiesSet -> - Cleaning Logs ...
[03/11/18 12:22:15] INFO LogCleaner -> All records older than 14 days deleted from the
student sectioning queue (9 records).
[03/11/18 12:22:15] INFO afterPropertiesSet -> - Starting Event Expiration Service ...
[03/11/18 12:22:15] INFO EventExpirationService -> Event expiration service started.
[03/11/18 12:22:15] INFO afterPropertiesSet -> ***** UniTime 4.2.185 build on Sat, 7 Oct
2017 initialized successfully *****
```