Problem 1: Implement a Docker container running a Tomcat server and displaying a single HTML page with your name and the current date. You are welcome to do it in a Docker installation on Ubuntu 14.04.3, Docker installation on Mac OS or Docker installation on Windows. Describe the process of building the container fully. *Please upload your new image into the Docker Hub. Remove your local container and local copy of the image and demonstrate that you could instantiate new container by pulling your image from the hub.*

Total Points: 100

Install Docker

```
Last login: Fri Dec  4 16:17:42 on console
bash --login '/Applications/Docker/Docker Quickstart Terminal.app/Contents/Resources/Scripts/start.sh'
Marnies-MacBook-Air:~ marnie$ bash --login '/Applications/Docker/Docker Quickstart Terminal.app/Contents/Resources/Scripts/start.sh'
Creating Machine default...
Creating CA: /Users/marnie/.docker/machine/certs/ca.pem
Creating client certificate: /Users/marnie/.docker/machine/certs/cert.pem
Running pre-create checks...
Creating machine...
(default) Creating VirtualBox VM...
(default) Creating SSH key...
(default) Starting VM...
Waiting for machine to be running, this may take a few minutes...
Machine is running, waiting for SSH to be available...
Detecting operating system of created instance...
Detecting the provisioner...
Provisioning with boot2docker...
Copying certs to the local machine directory...
Copying certs to the remote machine...
Setting Docker configuration on the remote daemon...
Checking connection to Docker...
Docker is up and running!
To see how to connect Docker to this machine, run: /usr/local/bin/docker-machine env default
Setting environment variables for machine default...


                        ##         .
                  ## ## ##        ==
               ## ## ## ## ##    ===
           /"""""""""""""""""\___/ ===
      ~~~ {~~ ~~~~ ~~~ ~~~~ ~~ ~ /  ===- ~~~
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             \    \         __/
              _____/


docker is configured to use the default machine with IP 192.168.99.100
For help getting started, check out the docs at https://docs.docker.com

Marnies-MacBook-Air:~ marnie$
```

Download Tomcat image within docker.
It should be listed as a docker image.

```
●●●                                1. bash
Marnies-MacBook-Air:~ marnie$ docker images
REPOSITORY          TAG              IMAGE ID         CREATED          VIRTUAL SIZE
tomcat              jre8             77476c3ee3d7     9 days ago       323.5 MB
hello-world         latest           0a6ba66e537a     7 weeks ago      960 B
<none>              <none>           ded5e192a685     6 months ago     247 MB
```

**On local machine create a Tomcat application titled name_date**

Software Foundation
h t t p : / / w w w . a p a c h e . o r g /

Tomcat Web Applicat

Message:	OK

Manager	
List Applications	HTML Manager Help

Applications			
Path	**Version**	**Display Name**	**Runr**
/	None specified	Welcome to Tomcat	tru
/docs	None specified	Tomcat Documentation	tru
/examples	None specified	Servlet and JSP Examples	tru
/host-manager	None specified	Tomcat Host Manager Application	tru
/manager	None specified	Tomcat Manager Application	tru
/name_date	None specified		tru

Have the index.html page display your name and today's date
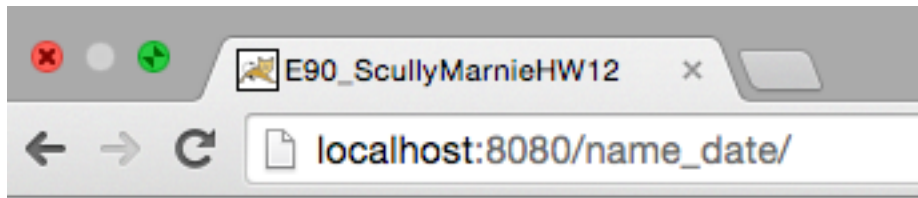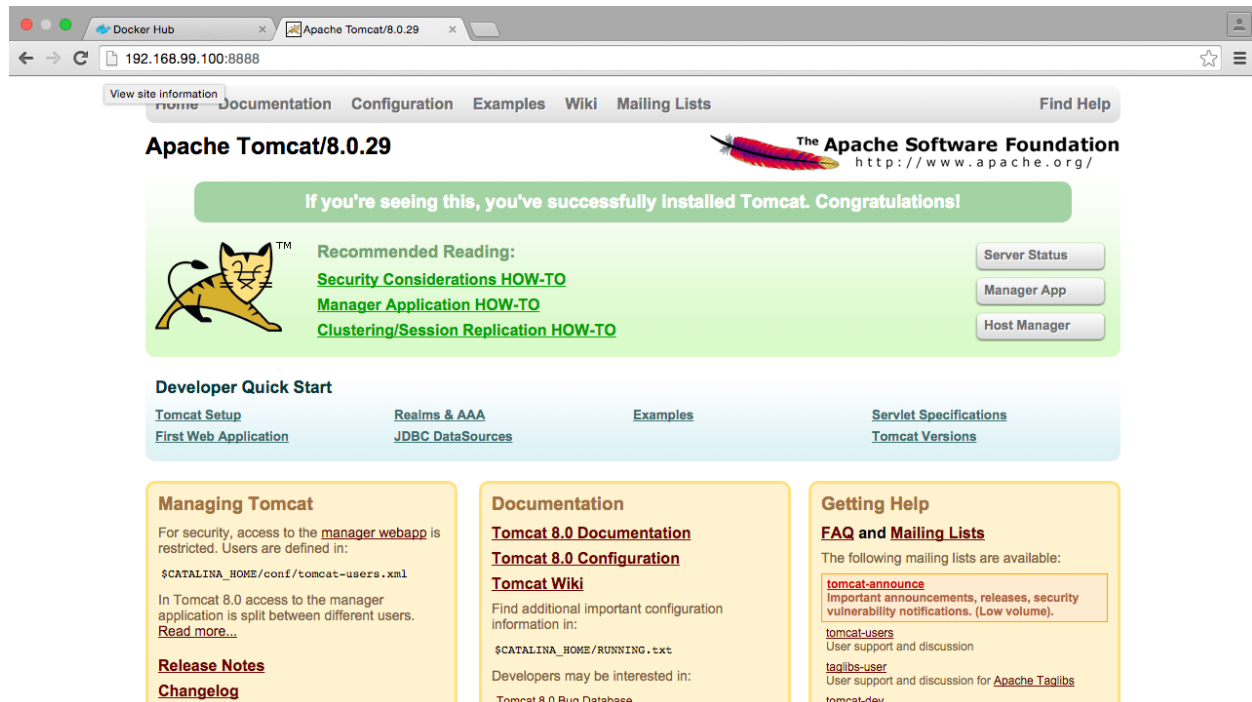

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Run the tomcat container within docker and map its 8080 port to the 8888 of your computer

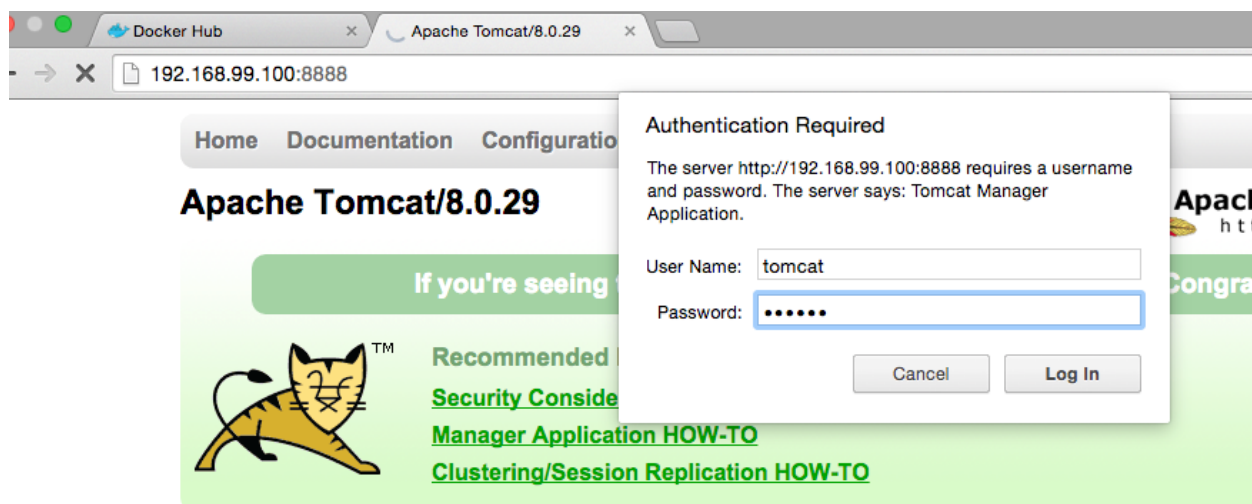**docker run -it   - -rm -p 8888:8080 tomcat:jre8**
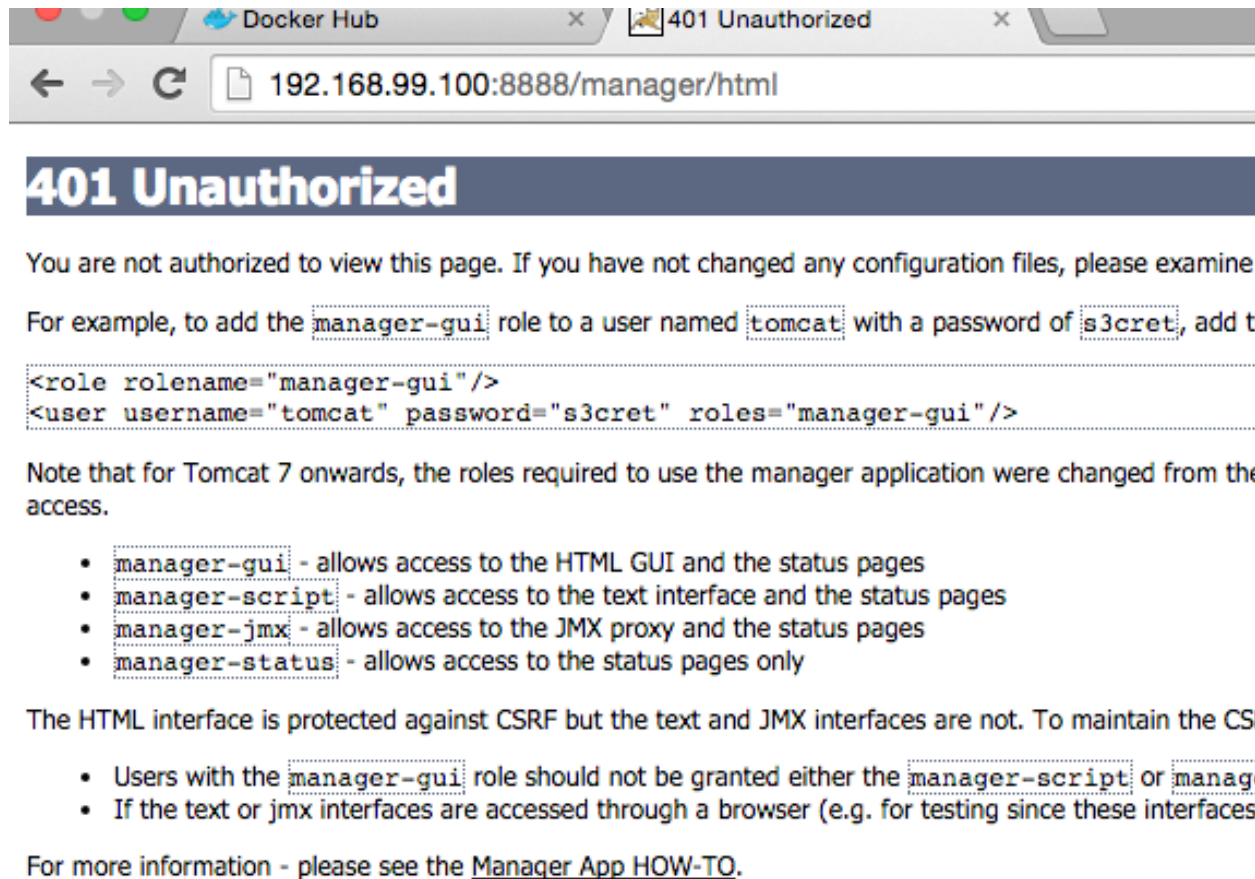
localhost:8888 does not work
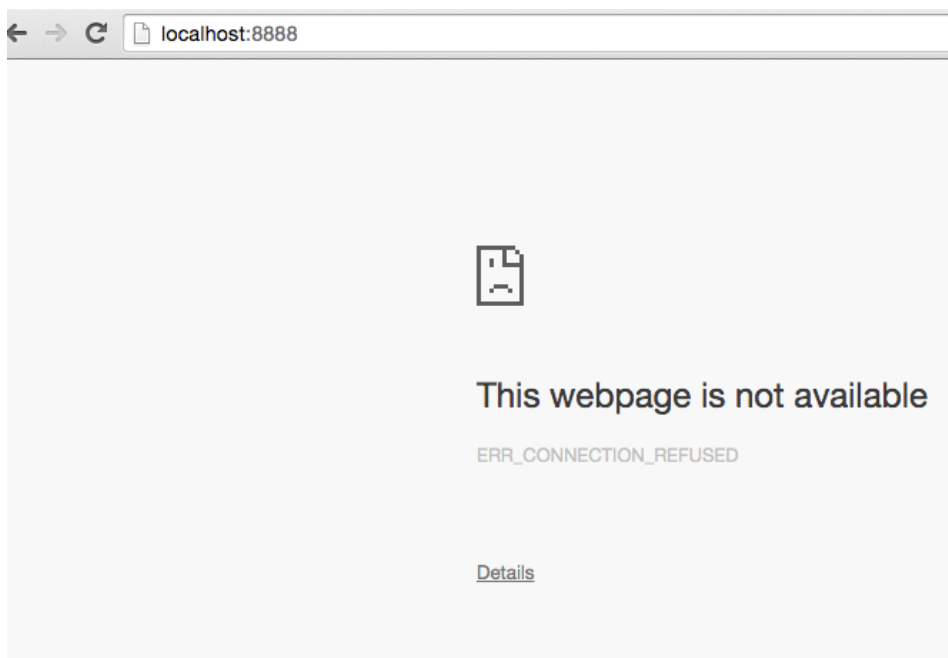
Must use IP address of Docker default machine

Attempting to sign in to manager application will not work because manager-gui role is not configured by default.

Our new image will have the tomcat-users.xml file and our name_date application copied over to it. Then the docker image will function like our local tomcat.

Within Docker, create a folder, dock_tomcat, to place our image and the files that will be

```
Marnies-MacBook-Air:dock_tomcat marnie$ cp /usr/local/tomcat/webapps/name_date/index.html .
Marnies-MacBook-Air:dock_tomcat marnie$ cp /usr/local/tomcat/conf/tomcat-users.xml .
Marnies-MacBook-Air:dock_tomcat marnie$ ls
index.html              tomcat-users.xml
```

added. Copy the index.html page (into a new directory name_date) and the server configuration page tomcat-users.xml to the directory just created.

Create a Dockerfile that will contain instructions for docker to create a new Docker image based on Tomcat configured with the additional files that we just added.

(Contents of Dockerfile)

FROM tomcat:jre8

MAINTAINER "Marnie Scully<marniescully@g.harvard.edu>"

ADD tomcat-users.xml /usr/local/tomcat/conf/
ADD name_date /usr/local/tomcat/webapps/name_date

Within the Docker terminal, cd to the dock_tomcat folder and run this command to create an image called newtomcat :

docker build -t new tomcat .

```
Marnies-MacBook-Air:dock_tomcat marnie$ docker build -t newtomcat .
Sending build context to Docker daemon 6.144 kB
Step 1 : FROM tomcat:jre8
 ---> 77476c3ee3d7
Step 2 : MAINTAINER "Marnie Scully<marniescully@g.harvard.edu>"
 ---> Running in 6e829ede3c3b
 ---> e47826bc5200
Removing intermediate container 6e829ede3c3b
Step 3 : ADD tomcat-users.xml /usr/local/tomcat/conf/
 ---> 5a9a8728e12a
Removing intermediate container ae4b0e3c76b4
Step 4 : ADD name_date /usr/local/tomcat/webapps/name_date
 ---> 43b0e07fade6
Removing intermediate container dda7c5833ca5
Successfully built 43b0e07fade6
Marnies-MacBook-Air:dock_tomcat marnie$ 
```

Now it is in list of Docker Images

```
Marnies-MacBook-Air:~ marnie$ docker images
REPOSITORY          TAG             IMAGE ID          CREATED
VIRTUAL SIZE
newtomcat           latest          43b0e07fade6      4 minutes ago
323.5 MB
tomcat              jre8            77476c3ee3d7      10 days ago
323.5 MB
```

Now run the new image at port 8081. Docker starts that Tomcat

```
Marnies-MacBook-Air:~ marnie$ docker run -it --rm -p 8081:8080 newtomcat
Using CATALINA_BASE:   /usr/local/tomcat
Using CATALINA_HOME:   /usr/local/tomcat
Using CATALINA_TMPDIR: /usr/local/tomcat/temp
Using JRE_HOME:        /usr
Using CLASSPATH:       /usr/local/tomcat/bin/bootstrap.jar:/usr/local/tomcat/b
/tomcat-juli.jar
05-Dec-2015 03:42:41.288 INFO [main] org.apache.catalina.startup.VersionLogger
stener.log Server version:        Apache Tomcat/8.0.29
05-Dec-2015 03:42:41.293 INFO [main] org.apache.catalina.startup.VersionLogger
stener.log Server built:          Nov 20 2015 09:18:00 UTC
05-Dec-2015 03:42:41.294 INFO [main] org.apache.catalina.startup.VersionLogger
stener.log Server number:         8.0.29.0
05-Dec-2015 03:42:41.295 INFO [main] org.apache.catalina.startup.VersionLogger
stener.log OS Name:               Linux
05-Dec-2015 03:42:41.296 INFO [main] org.apache.catalina.startup.VersionLogger
stener.log OS Version:            4.1.13-boot2docker
```

**Test if manager app is accessible and name_date page is viewable in newtomcat.**

← → C   🗋 192.168.99.100:8081/manager/html

Manager

List Applications

Applications		
Path	**Version**	
/	None specified	Welcome to Tor
/docs	None specified	Tomcat Docume
/examples	None specified	Servlet and JSP
/host-manager	None specified	Tomcat Host Ma
/manager	None specified	Tomcat Manage
/name_date	None specified	

Deploy

← → C ◻ 192.168.99.100:8081/name_date/
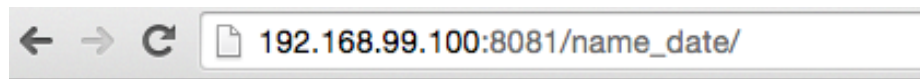
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Now that we have the image configured, we can push it to our DockerHub repository. Create a new repository named newtomcat and set its visibility to public.

Create Repository

1. Choose a namespace *(Required)*
2. Add a repository name *(Required)*
3. Add a short description
4. Add markdown to the full description field
5. Set it to be a private or public repository

marniescully   ▾   newtomcat

Short Description (100 Characters)

Full Description

Visibility

public

Create

From the docker terminal push the image to the repository.

First tag and name it

docker tag 43b0e07fade6 marniescully/newtomcat:latest

Log into dockerhub.com

docker login - -username=marniescully - -email=marniescully@g.harvard.edu

Then push it to docker hub

docker push marniescully/newtomcat

```
Marnies-MacBook-Air:~ marnie$ docker login --username=marniescully --email=marniescully@g.harvard.edu
WARNING: login credentials saved in /Users/marnie/.docker/config.json
Login Succeeded
Marnies-MacBook-Air:~ marnie$ docker push marniescully/newtomcat
The push refers to a repository [docker.io/marniescully/newtomcat] (len: 1)
43b0e07fade6: Pushed
5a9a8728e12a: Pushed
e47826bc5200: Pushed
351dffc0b94d: Pushed
ec494e093674: Pushed
b0eeef845ad7: Pushed
20e756f23350: Pushed
709515e3008f: Pushed
d989f1023f13: Pushing 51.52 MB/140 MB
```

Remove the containers and all local images of newtomcat to test pulling from dockerhub.com

Stop and remove containers
docker stop $(docker ps -a -q)
docker rm $(docker ps -a -q)

Remove all local images
docker rmi $(docker images -q)

List Local Images and then Pull from public repo

```
Marnies-MacBook-Air:~ marnie$ docker images
REPOSITORY            TAG              IMAGE ID           CREATED            VIRTUAL SIZE
Marnies-MacBook-Air:~ marnie$ docker pull marniescully/newtomcat
Using default tag: latest
latest: Pulling from marniescully/newtomcat

1565e86129b8: Pulling fs layer
a604b236bcde: Pulling fs layer
1565e86129b8: Downloading 12.58 MB/51.35 MB
00ef84872481: Download complete
3fda001c4a9d: Download complete
52fa1b91a9e0: Download complete
d79ac6c813b8: Download complete
33d424d40a66: Download complete
6687f498122c: Download complete
d989f1023f13: Downloading 14.59 MB/53.33 MB
```

Map the pulled tomcat to a new port to verify (creates container with run command)
docker run -it - -rm -p 8889:8080 marniescully/newtomcat

```
Marnies-MacBook-Air:~ marnie$ docker run -it --rm -p 8889:8080 marniescully/newtomcat
Using CATALINA_BASE:   /usr/local/tomcat
Using CATALINA_HOME:   /usr/local/tomcat
Using CATALINA_TMPDIR: /usr/local/tomcat/temp
Using JRE_HOME:        /usr
Using CLASSPATH:       /usr/local/tomcat/bin/bootstrap.jar:/usr/local/tomcat/bin/tomcat-juli.jar
05-Dec-2015 04:39:53.367 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Server version
    Apache Tomcat/8.0.29
05-Dec-2015 04:39:53.383 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Server built:
    Nov 20 2015 09:18:00 UTC
05-Dec-2015 04:39:53.384 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Server number:
    8.0.29.0
05-Dec-2015 04:39:53.385 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log OS Name:
    Linux
05-Dec-2015 04:39:53.386 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log OS Version:
    4.1.13-boot2docker
```

View web page within Docker Container created with pulled image

E90_ScullyMarnieHW12   ×

192.168.99.100:8889/name_date/

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Dashboard Explore Organizations   Q Search

marniescully   ▼   Repositories   ★ Stars   Contributed   Private

Repositories

Type to filter repositories by name

| marniescully/newtomcat public | 0 STARS | 3 PULLS | > DETAILS |