Final-Project-Assessment-for-Scalefocus-Academy

Deploy a WordPress on Kubernetes (using Minicube) with Helm and
automation with Jenkins.

Prerequisites:

1. Install the necessary tools: Minicube, Helm and Jenkins.
2. Separate repo in your GitHub Profile named: Final Project Assessment for Scalefocus Academy Requirement for the Project Assessment:
3. Download Helm chart for WordPress. (Bitnami chart: https://github.com/bitnami/charts/tree/main/bitnami/wordpress)
4. In values.yaml, you need to change line 543 from type: LoadBalancer to type: ClusterIP (Hint: there
   will be one more problem when deploying. Resolve it.)
5. Create a Jenkins pipeline that checks if wp namespace exists, if it doesn't then it creates one. Checks if WordPress exists, if it doesn't then it installs the chart.
6. Name the Helm Deployment as: final-project-wp-scalefocus.
7. Deploy the helm chart using the Jenkins pipeline.
8. Load the home page of the WordPress to see the final result.
9. Explain the project directly in a README.md file in your project repo.

For this Assessment we need to install Helm, Minkube and Jenkins.

- **Install Helm** - Official documentation Jenkins

- **Install Minikube** - Official documentation Minikube

- For setting up a ***Jenkins Cluster on Kubernetes***, we will do the following:
  we need to create four files **serviceAccount.yaml**, **volume.yaml**, **deployment.yaml**, **service.yaml'**. and save then in **jeniks** directory and execute them so jenkins can be installed on minikube cluster. Official documentation Jenkins

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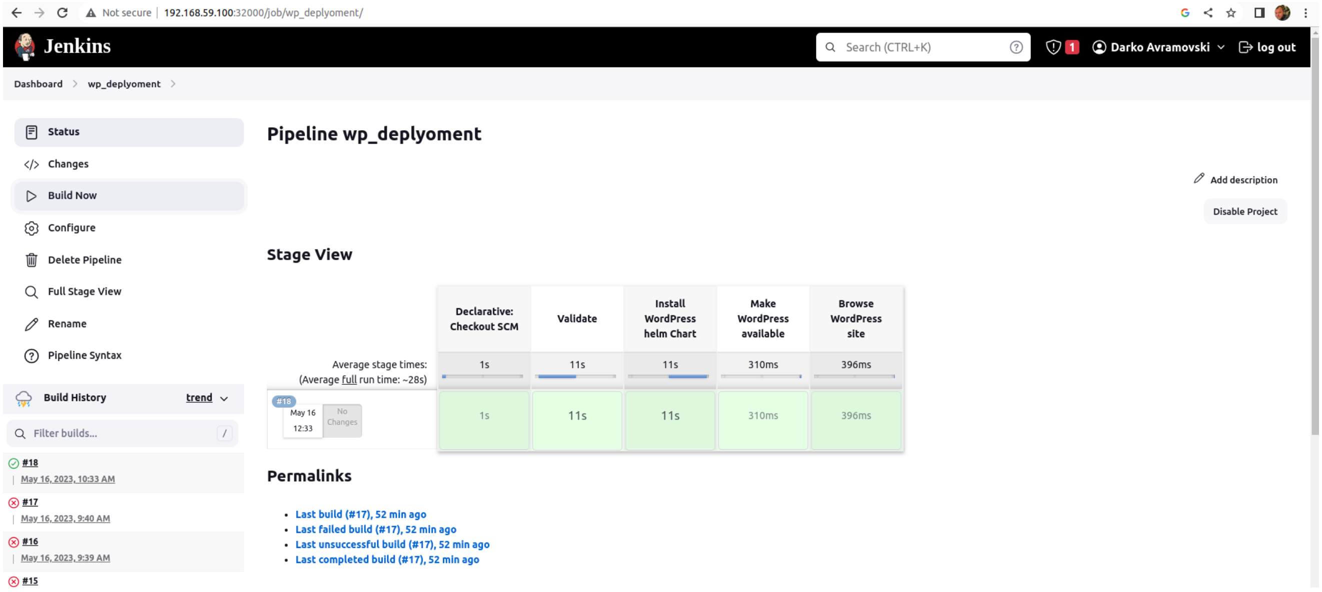
We can pull localy the offical wordpress image from github **bitnami/wordpress/** reposity, and edit ***values.yaml*** on line 534 replace **type: LoadBalancer** to **type: ClusterIP,** after we edit the offical image we can create our repository on GitHub which we are going to use for deployment for the wordpress site, and push to our repository **darevski1/Final-Project-Assessment-for-Scalefocus-Academy**.

After we setup jenkins on minikube we can log using following ip ***http://192.168.59.100:32000/*** to login and install required plugin **kuberentes - Kubernetes plugin for Jenkins** the plugin is required
so we can create connection to our minikube local cluster. Next we need to create new pipeline and connect to our **github** respository. Create **Jenkinsfile** we put our script for deplyoment, the deplyoment proces has four stages:

- ***Validate*** - stages check is the namespace **wp** exist, if not exist the namespace will be created
- ***Install*** - wordpress and helm chard, here we install helm binary, and install wordpress helm chart

- ***Make wordpress availble*** - in the stage we are running port forwarding, so the site can be access localy.
- ***Browse WordPress site stage*** - !!! The site can`t be accees from outside because we put ClusterIP in values.yaml, **Cluster ip** default type for service in kubernetes, this type of address can be used only inside the cluster.

We can run the pipeline we created and get following results



Not secure | 192.168.59.100:32000/job/wp_deplyoment/

Jenkins | Search (CTRL+K) | Darko Avramovski | log out

Dashboard > wp_deplyoment >

Status
Changes
Build Now
Configure
Delete Pipeline
Full Stage View
Rename
Pipeline Syntax

Build History trend

Filter builds...

#18 May 16, 2023, 10:33 AM
#17 May 16, 2023, 9:40 AM
#16 May 16, 2023, 9:39 AM
#15

Pipeline wp_deplyoment

Add description

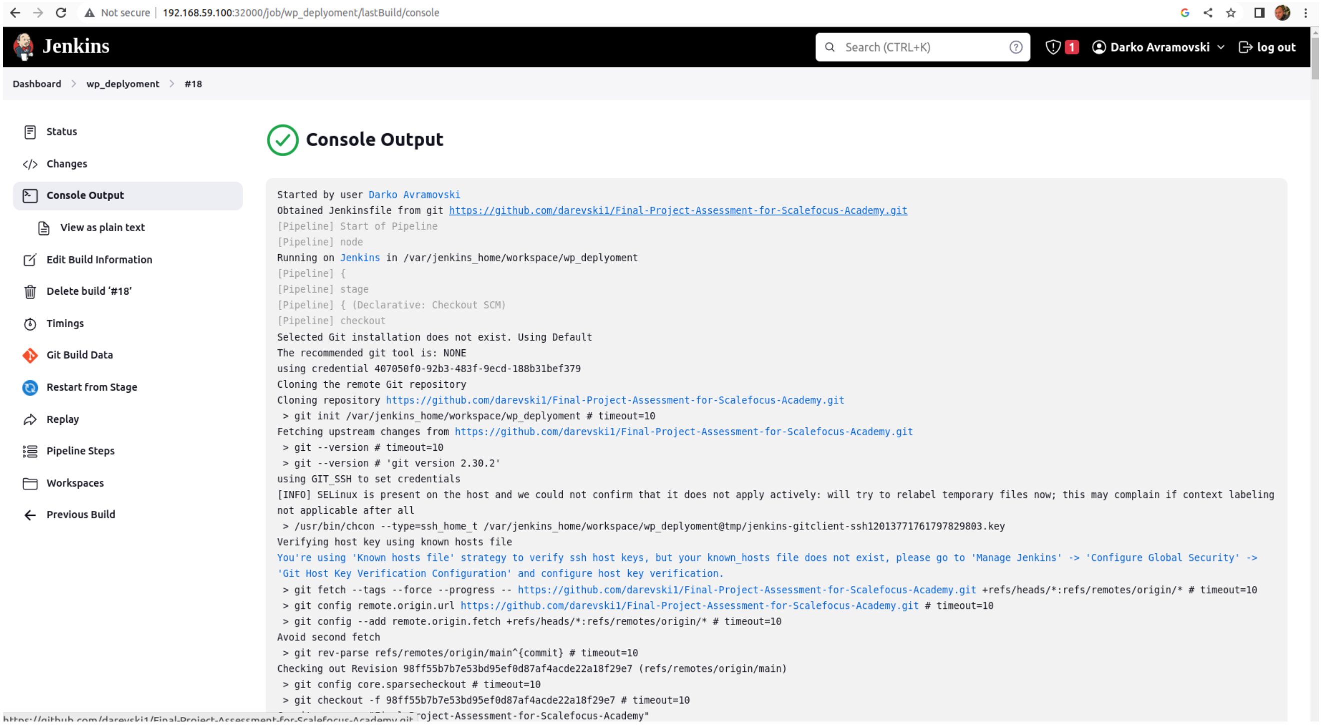
Disable Project

Stage View

	Declarative: Checkout SCM	Validate	Install WordPress helm Chart	Make WordPress available	Browse WordPress site
Average stage times: (Average full run time: ~28s)	1s	11s	11s	310ms	396ms
#18 May 16 12:33 No Changes	1s	11s	11s	310ms	396ms

Permalinks

- Last build (#17), 52 min ago
- Last failed build (#17), 52 min ago
- Last unsuccessful build (#17), 52 min ago
- Last completed build (#17), 52 min ago



Not secure | 192.168.59.100:32000/job/wp_deplyoment/lastBuild/console

Jenkins | Search (CTRL+K) | Darko Avramovski | log out

Dashboard > wp_deplyoment > #18

Status
Changes
Console Output
View as plain text
Edit Build Information
Delete build '#18'
Timings
Git Build Data
Restart from Stage
Replay
Pipeline Steps
Workspaces
Previous Build

Console Output

```
Started by user Darko Avramovski
Obtained Jenkinsfile from git https://github.com/darevski1/Final-Project-Assessment-for-Scalefocus-Academy.git
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in /var/jenkins_home/workspace/wp_deplyoment
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Declarative: Checkout SCM)
[Pipeline] checkout
Selected Git installation does not exist. Using Default
The recommended git tool is: NONE
using credential 407050f0-92b3-483f-9ecd-188b31bef379
Cloning the remote Git repository
Cloning repository https://github.com/darevski1/Final-Project-Assessment-for-Scalefocus-Academy.git
 > git init /var/jenkins_home/workspace/wp_deplyoment # timeout=10
Fetching upstream changes from https://github.com/darevski1/Final-Project-Assessment-for-Scalefocus-Academy.git
 > git --version # timeout=10
 > git --version # 'git version 2.30.2'
using GIT_SSH to set credentials
[INFO] SELinux is present on the host and we could not confirm that it does not apply actively: will try to relabel temporary files now; this may complain if context labeling
not applicable after all
 > /usr/bin/chcon --type=ssh_home_t /var/jenkins_home/workspace/wp_deplyoment@tmp/jenkins-gitclient-ssh12013771761797829803.key
Verifying host key using known hosts file
You're using 'Known hosts file' strategy to verify ssh host keys, but your known_hosts file does not exist, please go to 'Manage Jenkins' -> 'Configure Global Security' ->
'Git Host Key Verification Configuration' and configure host key verification.
 > git fetch --tags --force --progress -- https://github.com/darevski1/Final-Project-Assessment-for-Scalefocus-Academy.git +refs/heads/*:refs/remotes/origin/* # timeout=10
 > git config remote.origin.url https://github.com/darevski1/Final-Project-Assessment-for-Scalefocus-Academy.git # timeout=10
 > git config --add remote.origin.fetch +refs/heads/*:refs/remotes/origin/* # timeout=10
Avoid second fetch
 > git rev-parse refs/remotes/origin/main^{commit} # timeout=10
Checking out Revision 98ff55b7b7e53bd95ef0d87af4acde22a18f29e7 (refs/remotes/origin/main)
 > git config core.sparsecheckout # timeout=10
 > git checkout -f 98ff55b7b7e53bd95ef0d87af4acde22a18f29e7 # timeout=10
https://github.com/darevski1/Final-Project-Assessment-for-Scalefocus-Academy.git roject-Assessment-for-Scalefocus-Academy"
```

PROF

```
    Started by user Darko Avramovski
    Obtained Jenkinsfile from git https://github.com/darevski1/Final-
Project-Assessment-for-Scalefocus-Academy.git
    [Pipeline] Start of Pipeline
    [Pipeline] node
    Running on Jenkins in /var/jenkins_home/workspace/wp_deplyoment
    [Pipeline] {
    [Pipeline] stage
    [Pipeline] { (Declarative: Checkout SCM)
    [Pipeline] checkout
    Selected Git installation does not exist. Using Default
    The recommended git tool is: NONE
    using credential 407050f0-92b3-483f-9ecd-188b31bef379
    > git rev-parse --resolve-git-dir
/var/jenkins_home/workspace/wp_deplyoment/.git # timeout=10
    Fetching changes from the remote Git repository
    > git config remote.origin.url https://github.com/darevski1/Final-
Project-Assessment-for-Scalefocus-Academy.git # timeout=10
    Fetching upstream changes from https://github.com/darevski1/Final-
Project-Assessment-for-Scalefocus-Academy.git
    > git --version # timeout=10
    > git --version # 'git version 2.30.2'
    using GIT_SSH to set credentials
    [INFO] SELinux is present on the host and we could not confirm that
it does not apply actively: will try to relabel temporary files now;
this may complain if context labeling not applicable after all
    > /usr/bin/chcon --type=ssh_home_t
/var/jenkins_home/workspace/wp_deplyoment@tmp/jenkins-gitclient-
ssh10553168664119525960.key
    Verifying host key using known hosts file
    You're using 'Known hosts file' strategy to verify ssh host keys,
but your known_hosts file does not exist, please go to 'Manage Jenkins'
-> 'Configure Global Security' -> 'Git Host Key Verification
Configuration' and configure host key verification.
    > git fetch --tags --force --progress --
https://github.com/darevski1/Final-Project-Assessment-for-Scalefocus-
Academy.git +refs/heads/*:refs/remotes/origin/* # timeout=10
    > git rev-parse refs/remotes/origin/main^{commit} # timeout=10
    Checking out Revision 63537e1b18e43701363da80a5a1f02a7f929794d
(refs/remotes/origin/main)
    > git config core.sparsecheckout # timeout=10
    > git checkout -f 63537e1b18e43701363da80a5a1f02a7f929794d #
timeout=10
    Commit message: "Final-Project-Assessment-for-Scalefocus-Academy"
    > git rev-list --no-walk 6759a289e693ab6dd7848391e6a0582a2515f7fb #
timeout=10
    [Pipeline] }
    [Pipeline] // stage
    [Pipeline] withEnv
    [Pipeline] {
    [Pipeline] stage
    [Pipeline] { (Validate)
    [Pipeline] sh
    + echo Download required binaries
    Download required binaries
    + curl -L -s https://dl.k8s.io/release/stable.txt
    + curl -LOs
https://dl.k8s.io/release/v1.27.1/bin/linux/amd64/kubectl
    + chmod +x kubectl
```

PROF

```
    + curl -Os https://github.com/stedolan/jq/releases/download/jq-
1.6/jq-linux64
    + mv jq-linux64 jq
    + chmod +x jq
    [Pipeline] script
    [Pipeline] {
    [Pipeline] sh
    + ./kubectl get ns wp -o jsonpath={.status.phase}
    [Pipeline] echo
    Active
    [Pipeline] echo
    wp namespace already created
    [Pipeline] }
    [Pipeline] // script
    [Pipeline] }
    [Pipeline] // stage
    [Pipeline] stage
    [Pipeline] { (Install WordPress helm Chart)
    [Pipeline] sh
    + curl -Os https://get.helm.sh/helm-v3.12.0-linux-amd64.tar.gz
    + tar zxvf helm-v3.12.0-linux-amd64.tar.gz
    linux-amd64/
    linux-amd64/helm
    linux-amd64/README.md
    linux-amd64/LICENSE
    [Pipeline] sh
    + ./linux-amd64/helm dependency build ./helm/wordpress/
    Saving 3 charts
    Downloading memcached from repo oci://registry-
1.docker.io/bitnamicharts
    Pulled: registry-1.docker.io/bitnamicharts/memcached:6.4.2
    Digest:
sha256:ac800af4f9b6be921043eb5cd2ba07828ad6fc404b5762f2630657d9fdf5a6fe
    Downloading mariadb from repo oci://registry-
1.docker.io/bitnamicharts
    Pulled: registry-1.docker.io/bitnamicharts/mariadb:12.2.2
    Digest:
sha256:f18fd0e930041ef6a1dff0789eb801f2c4c52f1e8e0ff7c610b109ae8304d74c
    Downloading common from repo oci://registry-
1.docker.io/bitnamicharts
    Pulled: registry-1.docker.io/bitnamicharts/common:2.2.5
    Digest:
sha256:a088a039a53958fdd4ddff5a9799c0dba38d1c480bc768a9141cb87e7fcf7036
    Deleting outdated charts
    + ./linux-amd64/helm upgrade -i -f ./helm/wordpress/values.yaml
final-project-wp-scalefocus ./helm/wordpress -n wp
    Release "final-project-wp-scalefocus" has been upgraded. Happy
Helming!
    NAME: final-project-wp-scalefocus
    LAST DEPLOYED: Tue May 16 13:24:09 2023
    NAMESPACE: wp
    STATUS: deployed
    REVISION: 14
```

PROF

```
    TEST SUITE: None
    NOTES:
    CHART NAME: wordpress
    CHART VERSION: 16.1.2
    APP VERSION: 6.2.0

    ** Please be patient while the chart is being deployed **

    Your WordPress site can be accessed through the following DNS name
from within your cluster:

    final-project-wp-scalefocus-wordpress.wp.svc.cluster.local (port 80)

    To access your WordPress site from outside the cluster follow the
steps below:

    1. Get the WordPress URL by running these commands:

    kubectl port-forward --namespace wp svc/final-project-wp-scalefocus-
wordpress 80:80 &
    echo "WordPress URL: http://127.0.0.1//"
    echo "WordPress Admin URL: http://127.0.0.1//admin"

    2. Open a browser and access WordPress using the obtained URL.

    3. Login with the following credentials below to see your blog:

    echo Username: user
    echo Password: $(kubectl get secret --namespace wp final-project-wp-
scalefocus-wordpress -o jsonpath="{.data.wordpress-password}" | base64 -
d)
    [Pipeline] }
    [Pipeline] // stage
    [Pipeline] stage
    [Pipeline] { (Make WordPress available)
    [Pipeline] sh
    + echo WordPress URL: http://127.0.0.1//
    WordPress URL: http://127.0.0.1//
    + echo WordPress Admin URL: http://127.0.0.1//admin
    WordPress Admin URL: http://127.0.0.1//admin
    + ./kubectl port-forward --namespace wp svc/final-project-wp-
scalefocus-wordpress 8000:80
    Forwarding from 127.0.0.1:8000 -> 8080
    [Pipeline] }
    [Pipeline] // stage
    [Pipeline] stage
    [Pipeline] { (Browse WordPress site)
    [Pipeline] sh
    + curl -I http://final-project-wp-scalefocus-
wordpress.wp.svc.cluster.local
    % Total    % Received % Xferd  Average Speed   Time    Time     Time
Current
                                    Dload  Upload   Total   Spent
```

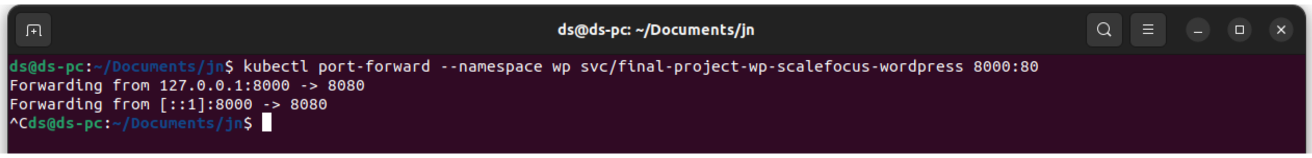
```
Left  Speed

    0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:-
-:--     0
    0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:-
-:--     0
    HTTP/1.1 200 OK
    Date: Tue, 16 May 2023 13:24:12 GMT
    Server: Apache
    Link: <http://final-project-wp-scalefocus-
wordpress.wp.svc.cluster.local/wp-json/>; rel="https://api.w.org/"
    Content-Type: text/html; charset=UTF-8

    [Pipeline] }
    [Pipeline] // stage
    [Pipeline] }
    [Pipeline] // withEnv
    [Pipeline] }
    [Pipeline] // node
    [Pipeline] End of Pipeline
    Finished: SUCCESS
```

To create port forwarding use the following command

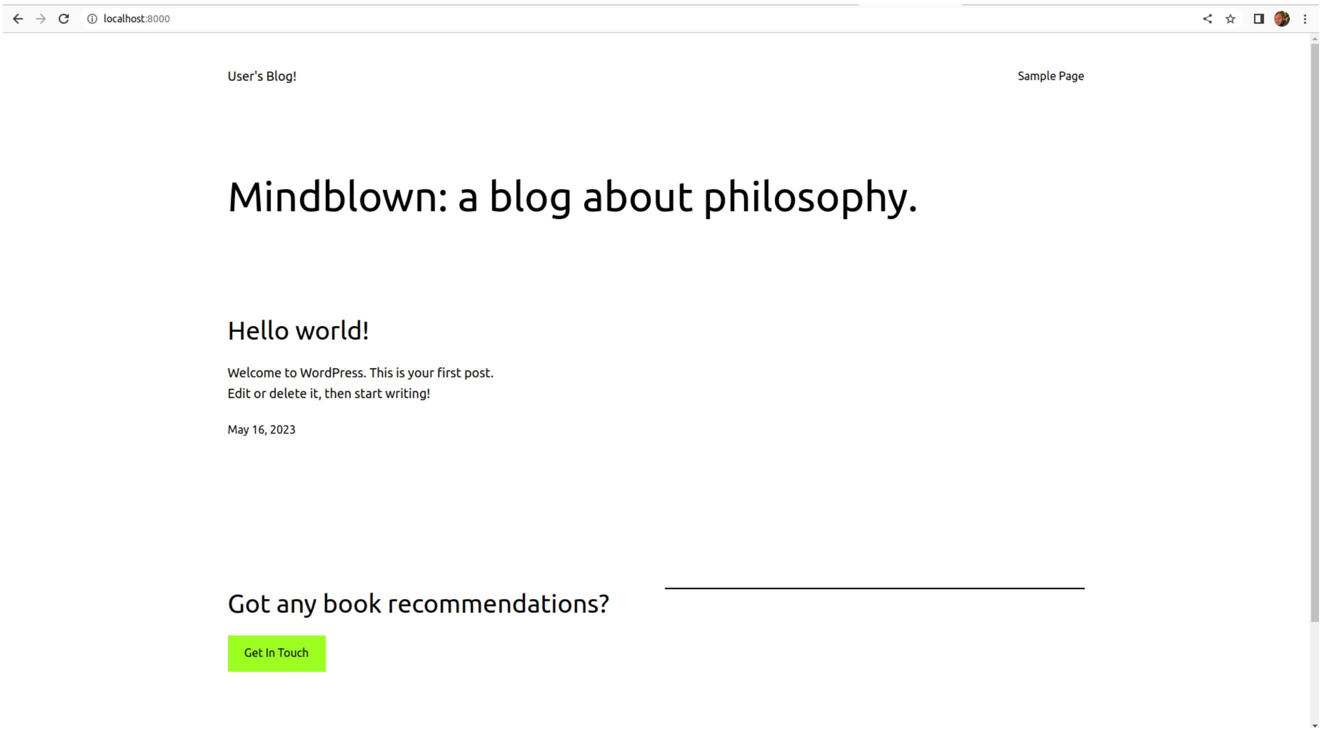
```
    kubectl port-forward --namespace wp svc/final-project-wp-scalefocus-
wordpress 8000:80
```



```
ds@ds-pc:~/Documents/jn$ kubectl port-forward --namespace wp svc/final-project-wp-scalefocus-wordpress 8000:80
Forwarding from 127.0.0.1:8000 -> 8080
Forwarding from [::1]:8000 -> 8080
^Cds@ds-pc:~/Documents/jn$
```

PROF

We can view the wp site from our browser



localhost:8000

User's Blog!

Sample Page

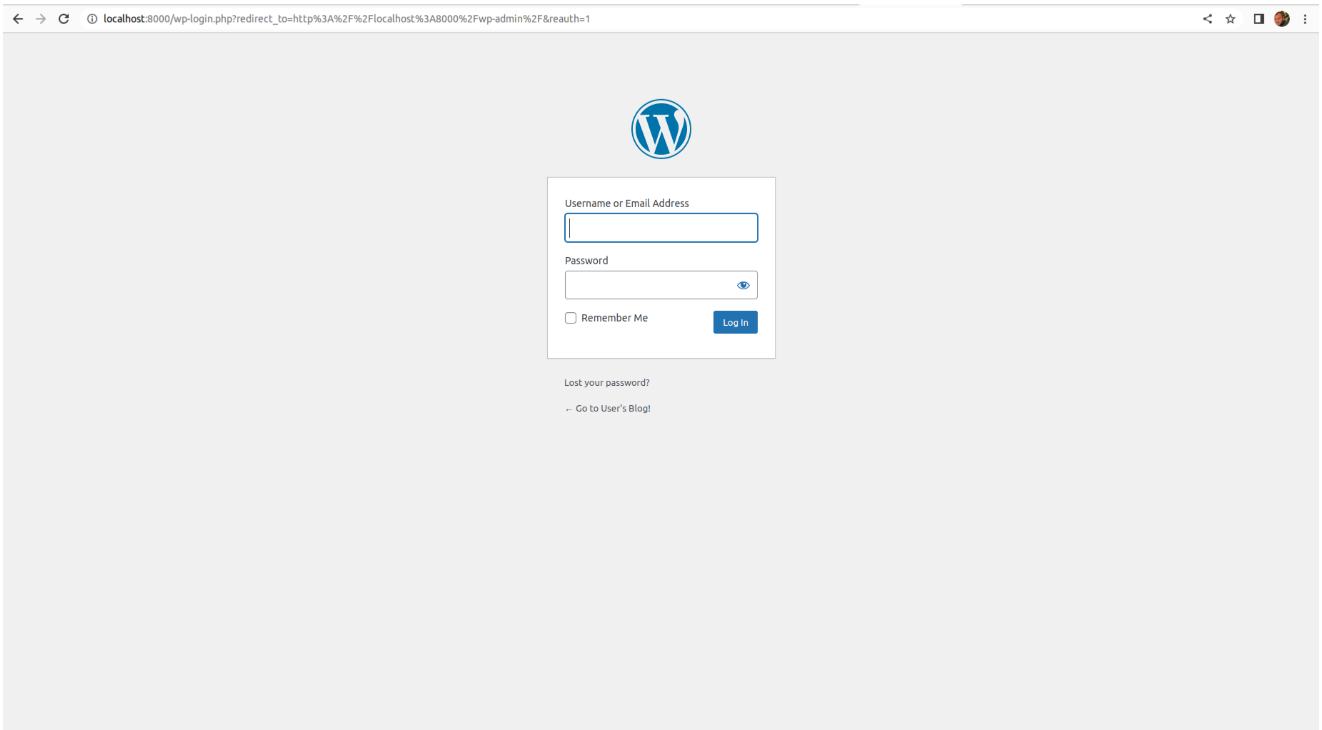
Mindblown: a blog about philosophy.

Hello world!

Welcome to WordPress. This is your first post.
Edit or delete it, then start writing!

May 16, 2023

Got any book recommendations?



localhost:8000/wp-login.php?redirect_to=http%3A%2F%2Flocalhost%3A8000%2Fwp-admin%2F&reauth=1

Username or Email Address

Password

☐ Remember Me

Lost your password?

← Go to User's Blog!

PROF