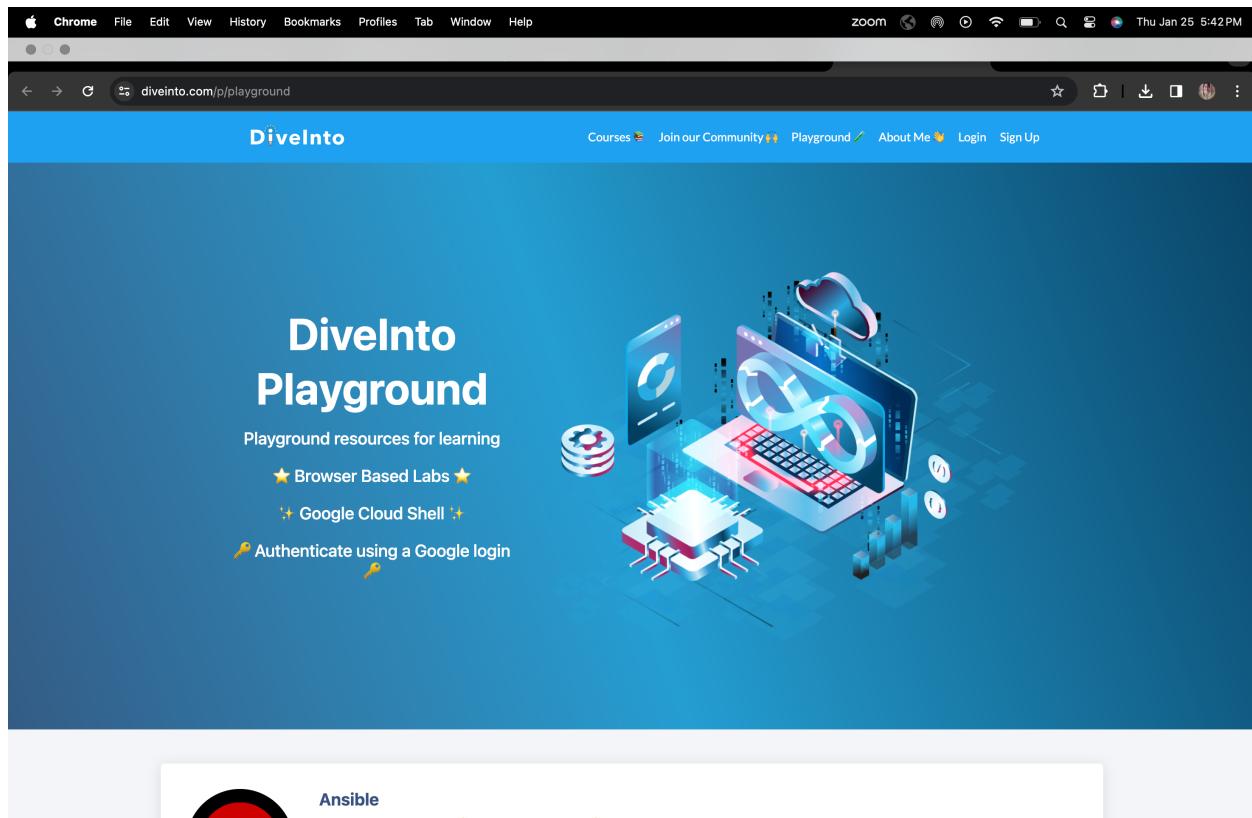


## Cloud Computing

### In class lab assignment- 1

Bindu Parvati, Jonnala Gadda  
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A screenshot of a Cloud Shell Editor in a web browser. The browser interface includes a top bar with tabs, a search bar, and various icons. The main area shows a terminal session with the following command history:

```
Welcome to Cloud Shell! Type "help" to get started.  
To set your Cloud Platform project in this session use "gcloud config set project [PROJECT_ID]"  
bindhuparvathi123@cloudshell:~$ ls  
cloudshell_open README-cloudshell.txt  
bindhuparvathi123@cloudshell:~$ cd cloudshell open  
bindhuparvathi123@cloudshell:~/cloudshell open$ ls  
cs5525_diveintocode-lab-gcp-cloudshell1  
bindhuparvathi123@cloudshell:~/cloudshell open$ cd cs5525  
bindhuparvathi123@cloudshell:~/cloudshell_open/cs5525$ ls  
cs5525Client cs5525Client.py  
bindhuparvathi123@cloudshell:~/cloudshell_open/cs5525$ cd cs5525Client  
bindhuparvathi123@cloudshell:~/cloudshell_open/cs5525/cs5525Client$ ls  
cs5525cli.py cs5525c.py cs5525ser.py  
bindhuparvathi123@cloudshell:~/cloudshell_open/cs5525/cs5525Client$ python cs5525cli.py  
Traceback (most recent call last):  
  File "/home/bindhuparvathi123/cloudshell_open/cs5525/cs5525Client/cs5525cli.py", line 25, in <module>  
    client_program()  
File "/home/bindhuparvathi123/cloudshell_open/cs5525/cs5525Client/cs5525cli.py", line 9, in client_program  
    client_socket.connect((host, port)) # connect to the server  
ConnectionRefusedError: [Errno 111] Connection refused  
bindhuparvathi123@cloudshell:~/cloudshell_open/cs5525/cs5525Client$ python cs5525cli.py  
> hello class  
Received from server: hello server  
> []
```

A screenshot of a Cloud Shell Editor in a web browser, identical to the one above. The terminal session shows the same command history and output, indicating no changes have occurred between the two screenshots.

```
Welcome to Cloud Shell! Type "help" to get started.  
To set your Cloud Platform project in this session use "gcloud config set project [PROJECT_ID]"  
bindhuparvathi123@cloudshell:~$ ls  
cloudshell_open README-cloudshell.txt  
bindhuparvathi123@cloudshell:~$ cd cloudshell open  
bindhuparvathi123@cloudshell:~/cloudshell open$ ls  
cs5525_diveintocode-lab-gcp-cloudshell1  
bindhuparvathi123@cloudshell:~/cloudshell open$ cd cs5525  
bindhuparvathi123@cloudshell:~/cloudshell_open/cs5525$ ls  
cs5525Client cs5525Client.py cs5525.py  
bindhuparvathi123@cloudshell:~/cloudshell_open/cs5525/cs5525Client$ ls  
cs5525cli.py cs5525c.py cs5525ser.py  
bindhuparvathi123@cloudshell:~/cloudshell_open/cs5525/cs5525Client$ python cs5525ser.py  
Connection from: ('10.88.0.3', 46966)  
from connected user: hello class  
> []
```

Users access a web-based command-line interface from their devices, acting as the client, in a client-server connection made possible by a cloud shell. In place of the server, this interface offers a smooth connection to cloud resources housed in data centers run by service providers such as Microsoft Azure or Google Cloud Platform. Cloud provider credentials are used for authentication, guaranteeing secure communication. Through the cloud shell, the client sends commands to the cloud server, which subsequently processes them and returns results and feedback. By streamlining the administration of cloud resources, this configuration provides users with an easy way to communicate with and manage their infrastructure from any internet-connected device.

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## In-class Assignment-2, Cloud Computing

COMP\_SCI-5525-0005-15953-2024SP-Cloud Computing > Assignments

CC - In Class Lab Assignment 2

Due: Thu Feb 1, 2024 7:30pm

10 Points Possible

Attempt 1 In Progress NEXT UP: Submit Assignment

Unlimited Attempts Allowed

Details

In this assignment you will create a container in a virtual environment. (2/2/2024)

Go to virtual playground: (screen print the steps for submission)  
<https://diveinto.com/p/playground>

UMKC Connect

use the following command to install docker:  
`curl -fsSL https://get.docker.com -o get-docker.sh`  
`sudo sh get-docker.sh`

(you will see this file in your directory, get-docker.sh)

Step 1. source: [First Alpine Linux Containers \(play-with-docker.com\)](#)

Run the following docker commands and capture the result in screen print showing your login profile.

1. `sudo docker container run hello-world`  
2. `sudo docker image pull alpine`

Submit Assignment

```
Cloning into '/home/bindhuparvathi123/cloudshell_open/divetoansible-lab-gcp-cloudshell-0'...
remote: Enumerating objects: 102, done.
remote: Counting objects: 100% (102/102), done.
remote: Compressing objects: 100% (100/100), done.
remote: Total 102 (delta 54), reused 9 (delta 2), pack-reused 0
Receiving objects: 100% (102/102), 61.97 Kib | 1.88 MiB/s, done.
Resolving deltas: 100% (54/54), done.
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansible-lab-gcp-cloudshell-0$ pwd
/home/bindhuparvathi123/cloudshell_open/divetoansible-lab-gcp-cloudshell-0
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansible-lab-gcp-cloudshell-0$ ls
Dockerfile Ansible README.md tutorial.md
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansible-lab-gcp-cloudshell-0$ mkdir cs5525
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansible-lab-gcp-cloudshell-0$ cd cs5525/
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansible-lab-gcp-cloudshell-0$ cs5525$ which docker
/usr/bin/docker
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansible-lab-gcp-cloudshell-0$ docker --version
Docker version 25.0.0, build v758r5
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansible-lab-gcp-cloudshell-0$ cs5525$ curl -fsSL https://get.docker.comLinks to an external site. -o get-docker.sh
curl: (6) Could not resolve host: get.docker.comLinks
curl: (6) Could not resolve host: to
curl: (6) Could not resolve host: in
curl: (6) Could not resolve host: external
curl: (6) Could not resolve host: site
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansible-lab-gcp-cloudshell-0$ curl -fsSL https://get.docker.comLinks to an external site. -o get-docker.sh
curl: (6) Could not resolve host: get.docker.comLinks
curl: (6) Could not resolve host: to
curl: (6) Could not resolve host: an
curl: (6) Could not resolve host: external
curl: (6) Could not resolve host: site
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansible-lab-gcp-cloudshell-0$ curl -fsLS \ 
https://get.docker.comLinks to an external site. -o get-docker.sh
curl: (22) The requested URL returned error: 403 Forbidden
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansible-lab-gcp-cloudshell-0$ curl -fsLS https://get.docker.com -o get-docker.sh
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansible-lab-gcp-cloudshell-0$ sudo curl -fsLS https://get.docker.com -o get-docker.sh
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansible-lab-gcp-cloudshell-0$ cs5525$ ls
get-docker.sh
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansible-lab-gcp-cloudshell-0$ cs5525$
```

```
GitCommit: d440ad0
=====
To run Docker as a non-privileged user, consider setting up the
Docker daemon in rootless mode for your user:
dockerd-rootless-setuptool.sh install
Visit https://docs.docker.com/go/rootless/ to learn about rootless mode.

To run the Docker daemon as a fully privileged service, but granting non-root
users access, refer to https://docs.docker.com/go/daemon-access/
WARNING: Access to the remote API on a privileged Docker daemon is equivalent
to root access on the host. Refer to the 'Docker daemon attack surface'
documentation for details: https://docs.docker.com/go/attack-surface/
=====

bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansible-lab-gcp-cloudshell-0$ sudo docker container run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
clec3leb5944: Pull complete
Digest: sha256:4bd7811b6914a99dbc560e6a20eb57ff6655aea4a80c50b0c5491968cbc2e6
Status: Downloaded newer image for hello-world:latest

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
1. The Docker client contacted the Docker daemon.
2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
   (amd64)
3. The Docker daemon created a new container from that image which runs the
   executable that produces the output you are currently reading.
4. The Docker daemon streamed that output to the Docker client, which sent it
   to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
https://hub.docker.com/

For more examples and ideas, visit:
https://docs.docker.com/get-started/
```

A screenshot of a Google Cloud Shell terminal window in a Chrome browser. The URL is shell.cloud.google.com/?amp%3Bcloudshell\_tutorial=tutorial.md&%3Bshellonly=true&show=ide%2Cterminal. The terminal window title is "Cloud Shell Editor" and the tab title is "cloudshell". The terminal content shows a Docker session:

```
3. The Docker daemon created a new container from that image which runs the executable that produces the output you are currently reading.  
4. The Docker daemon streamed that output to the Docker client, which sent it to your terminal.  
  
To try something more ambitious, you can run an Ubuntu container with:  
$ docker run -it ubuntu bash  
  
Share images, automate workflows, and more with a free Docker ID:  
https://hub.docker.com/  
  
For more examples and ideas, visit:  
https://docs.docker.com/get-started/  
  
bindhuparvathi123@cloudshell:~/cloudshell_open/diveintoansible-lab-gcp-cloudshell-0/cs5525$ sudo docker image pull alpine  
Using default tag: latest  
latest: Pulling from library/alpine  
4abc2f066143: Pull complete  
Digest: sha256:c5b1261d63e43071626931fc004f7019baeba2c8ec672bd4f27761f8e1ad6b  
Status: Downloaded newer image for alpine:latest  
docker.io/library/alpine:latest  
bindhuparvathi123@cloudshell:~/cloudshell_open/diveintoansible-lab-gcp-cloudshell-0/cs5525$ sudo docker image ls  
REPOSITORY TAG IMAGE ID CREATED SIZE  
library/alpine latest 05455a09981e 6 days ago 7.38MB  
hello-world latest d7c94e258dcb 9 months ago 13.3kB  
bindhuparvathi123@cloudshell:~/cloudshell_open/diveintoansible-lab-gcp-cloudshell-0/cs5525$ sudo docker container run alpine ls -l  
total 56  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 bin  
drwxr-xr-x 5 root root 340 Feb 2 00:18 dev  
drwxr-xr-x 1 root root 4096 Feb 2 00:18 etc  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 home  
drwxr-xr-x 7 root root 4096 Jan 26 17:53 lib  
drwxr-xr-x 5 root root 4096 Jan 26 17:53 media  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 opt  
drwxr-xr-x 196 root root 4096 Jan 26 17:53 proc  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 root  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 run  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 sbin  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 srv  
dr-xr-xr-x 13 root root 0 Feb 2 00:18 sys  
drwxrwxrwt 2 root root 4096 Jan 26 17:53 tmp  
drwxr-xr-x 7 root root 4096 Jan 26 17:53 usr  
drwxr-xr-x 12 root root 4096 Jan 26 17:53 var  
bindhuparvathi123@cloudshell:~/cloudshell_open/diveintoansible-lab-gcp-cloudshell-0/cs5525$ sudo docker container run alpine echo "hello from alpine"  
hello from alpine  
bindhuparvathi123@cloudshell:~/cloudshell_open/diveintoansible-lab-gcp-cloudshell-0/cs5525$ sudo docker container run -it alpine /bin/sh  
/ # ls -l and uname -a
```

A screenshot of a Google Cloud Shell terminal window in a Chrome browser, identical to the one above but with different terminal content. The URL is shell.cloud.google.com/?amp%3Bcloudshell\_tutorial=tutorial.md&%3Bshellonly=true&show=ide%2Cterminal. The terminal window title is "Cloud Shell Editor" and the tab title is "cloudshell". The terminal content shows a Docker session:

```
drwxr-xr-x 1 root root 4096 Feb 2 00:18 etc  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 home  
drwxr-xr-x 7 root root 4096 Jan 26 17:53 lib  
drwxr-xr-x 5 root root 4096 Jan 26 17:53 media  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 mnt  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 opt  
dr-xr-xr-x 196 root root 4096 Jan 26 17:53 proc  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 root  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 run  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 sbin  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 srv  
dr-xr-xr-x 13 root root 0 Feb 2 00:18 sys  
drwxrwxrwt 2 root root 4096 Jan 26 17:53 tmp  
drwxr-xr-x 7 root root 4096 Jan 26 17:53 usr  
drwxr-xr-x 12 root root 4096 Jan 26 17:53 var  
bindhuparvathi123@cloudshell:~/cloudshell_open/diveintoansible-lab-gcp-cloudshell-0/cs5525$ sudo docker container run alpine echo "hello from alpine"  
hello from alpine  
bindhuparvathi123@cloudshell:~/cloudshell_open/diveintoansible-lab-gcp-cloudshell-0/cs5525$ sudo docker container run -it alpine /bin/sh  
/ # ls -l and uname -a  
ls: and: No such file or directory  
ls: uname: No such file or directory  
/ # uname -a  
Linux 94ef622b1814 6.1.58+ #1 SMP PREEMPT_DYNAMIC Sat Jan 20 15:41:17 UTC 2024 x86_64 Linux  
/ # ls -l and uname -a  
ls: and: No such file or directory  
ls: uname: No such file or directory  
/ # ls -l  
total 56  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 bin  
drwxr-xr-x 5 root root 360 Feb 2 00:20 dev  
drwxr-xr-x 1 root root 4096 Feb 2 00:20 etc  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 home  
drwxr-xr-x 7 root root 4096 Jan 26 17:53 lib  
drwxr-xr-x 5 root root 4096 Jan 26 17:53 media  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 mnt  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 opt  
dr-xr-xr-x 197 root root 0 Feb 2 00:20 proc  
drwxr-xr-x 1 root root 4096 Jan 26 17:53 root  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 run  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 sbin  
drwxr-xr-x 2 root root 4096 Jan 26 17:53 srv  
dr-xr-xr-x 13 root root 0 Feb 2 00:20 sys  
drwxrwxrwt 2 root root 4096 Jan 26 17:53 tmp  
drwxr-xr-x 7 root root 4096 Jan 26 17:53 usr  
drwxr-xr-x 12 root root 4096 Jan 26 17:53 var  
/ # uname -a  
Linux 94ef622b1814 6.1.58+ #1 SMP PREEMPT_DYNAMIC Sat Jan 20 15:41:17 UTC 2024 x86_64 Linux  
/ #
```

```
drwx----- 1 root      root      4096 Feb  2 00:21 root
drwxr-xr-x  2 root      root      4096 Jan 26 17:53 run
drwxr-xr-x  2 root      root      4096 Jan 26 17:53 sbin
drwxr-xr-x  2 root      root      4096 Jan 26 17:53 srv
drwxr-xr-x 13 root      root      4096 Feb  2 00:20 sys
drwxrwxrwt  2 root      root      4096 Jan 26 17:53 tmp
drwxr-xr-x  7 root      root      4096 Jan 26 17:53 usr
drwxr-xr-x 12 root      root      4096 Jan 26 17:53 var
/ # uname -a
Linux 94ef622b1814 6.1.58+ #1 SMP PREEMPT_DYNAMIC Sat Jan 20 15:41:17 UTC 2024 x86_64 Linux
/ # exit
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansiible-lab-gcp-cloudshell-0/cs5525$ sudo docker container ls
CONTAINER ID        IMAGE               COMMAND             CREATED            STATUS              PORTS               NAMES
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansiible-lab-gcp-cloudshell-0/cs5525$ sudo docker container ls -a
CONTAINER ID        IMAGE               COMMAND             CREATED            STATUS              PORTS               NAMES
94ef622b1814        alpine              "/bin/sh"          3 minutes ago     Exited (0) 29 seconds ago   hardcore_hoover
9561f80226c7        alpine              "echo 'hello from al..." 3 minutes ago     Exited (0) 3 minutes ago   stoic_raman
c258cf0338f0        alpine              "ls -l"             5 minutes ago     Exited (0) 5 minutes ago   hopeful_beaver
act74d563746        hello-world        "/hello"           8 minutes ago     Exited (0) 8 minutes ago   frosty_boyd
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansiible-lab-gcp-cloudshell-0/cs5525$ sudo docker container run -it alpine /bin/sh
/ # echo "Hello world" > hello.txt
/ # ls
bin          etc          home         media        opt          root         sbin         sys          usr
dev          hello.txt    lib          libm        proc         run         sbin        sys         var
/ # sudo docker container run alpine ls
/bin/sh: sudo: not found
/ # sudo docker container run alpine ls
/bin/sh: sudo: not found
/ # exit
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansiible-lab-gcp-cloudshell-0/cs5525$ sudo docker container run alpine ls
bin
dev
etc
home
lib
media
mnt
opt
proc
root
run
sbin
srv
sys
tmp
usr
var
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansiible-lab-gcp-cloudshell-0/cs5525$
```

Switch to our new Cloud Shell Editor experience, powered by Code OSS.  
Got it!

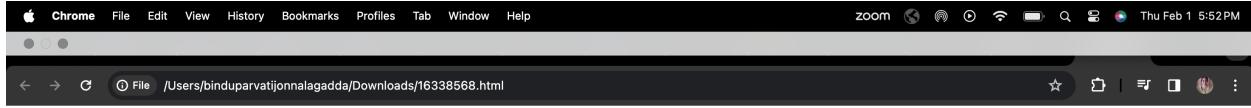
In today's in-class assignment, we delved into the world of virtual environments and containerization using Docker. We initiated our journey by navigating to the virtual playground at <https://diveto.com/p/playground> and followed the provided steps for submission. Employing the command 'curl -fsSL https://get.docker.com -o get-docker.sh' and 'sudo sh get-docker.sh', we successfully installed Docker in our environment. Moving on to the practical aspect, we began with the basic command 'sudo docker container run hello-world', establishing our connection with Docker.

# Cloud Computing- Assignment 1

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16338568

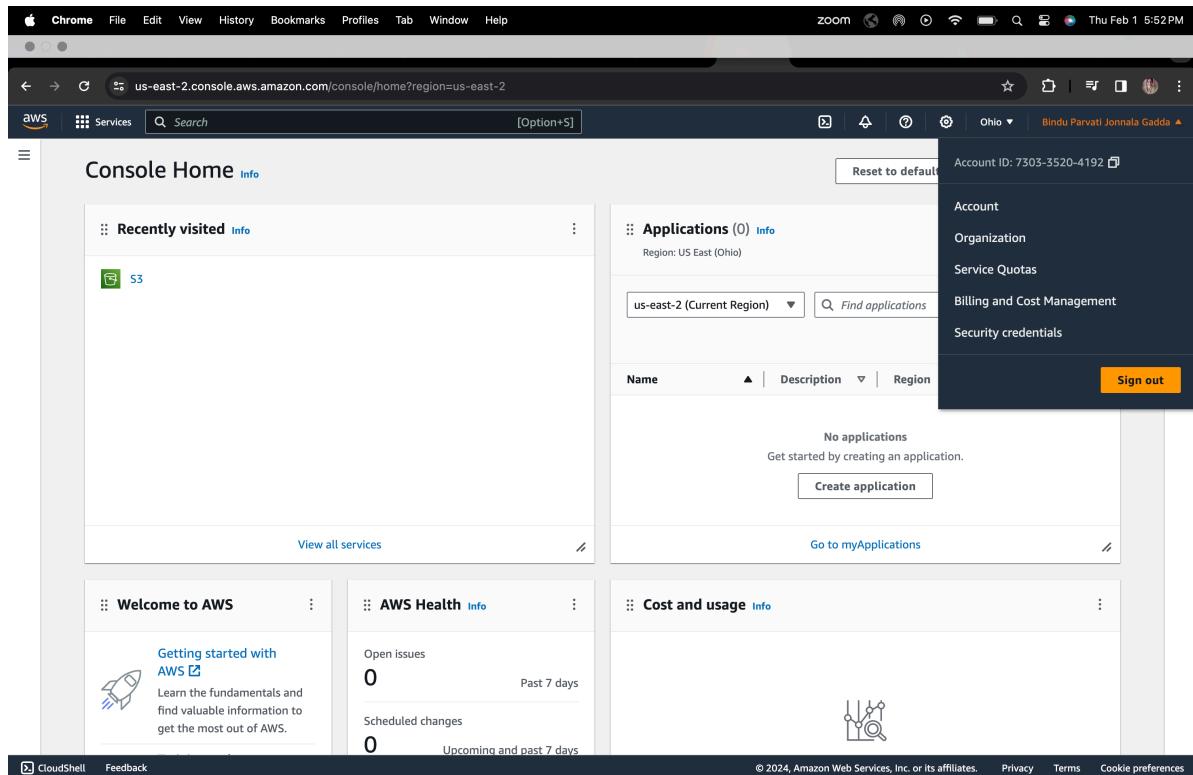
Created a simple HTML file with the below content:

Name, Student ID, Course title and the date along with the semester, Cloud provider name (AWS).



```
Bindu Parvati Jonnala Gadda - Student ID: 16338568
Cloud Computing - Feb 1, 2024 - Spring 2024
Cloud Provider - AWS
Cloud Computing Static Website launch through Amazon AWS cloud platform
Instructor: Dr. Gebre-Amlak Haymanot
```

Access to AWS cloud portal



Created a S3 bucket with appropriate configurations.

The screenshot shows the AWS S3 console interface. At the top, there's a navigation bar with tabs like 'Services', 'Search', and 'Global'. Below it, the main content area has a title 'Amazon S3' and a section titled 'Account snapshot'. Underneath, there are two tabs: 'General purpose buckets' (which is selected) and 'Directory buckets'. A search bar and a 'Create bucket' button are visible. The main table lists one bucket named 'binducc'. The table columns include 'Name', 'AWS Region', 'Access', and 'Creation date'. The bucket details are: Name - binducc, AWS Region - US East (Ohio) us-east-2, Access - Objects can be public, Creation date - February 1, 2024, 11:27:57 (UTC-06:00). At the bottom of the page, there are links for 'CloudShell', 'Feedback', and copyright information.

Access and Transfer the HTML files to the S3 bucket.

This screenshot shows the 'Objects' list for the 'binducc' bucket. The URL in the browser is 's3.console.aws.amazon.com/s3/buckets/binducc?region=us-east-2&bucketType=general&tab=objects'. The interface is similar to the previous screenshot but focuses on the contents of the 'binducc' bucket. It has tabs for 'Objects', 'Properties', 'Permissions', 'Metrics', 'Management', and 'Access Points'. The 'Objects' tab is selected. The table lists one object: '16338568.html'. The table columns are 'Name', 'Type', 'Last modified', 'Size', and 'Storage class'. The object details are: Name - 16338568.html, Type - html, Last modified - February 1, 2024, 17:43:46 (UTC-06:00), Size - 363.0 B, Storage class - Standard. The bottom of the page includes standard AWS footer links.

URL of the static website hosted on AWS environment.

<https://binducc.s3.us-east-2.amazonaws.com/16338568.html>

I was able to obtain practical experience with AWS S3 website deployment through this assignment. I gained knowledge about the complexities of cloud storage and the value of meticulous setup. Despite my initial difficulties with bucket permissions, I enjoyed the process of troubleshooting. Seeing my website come to life and interacting with the AWS console visually was something I really enjoyed. I'm excited to investigate more complex AWS services and learn more about cloud security in upcoming classes. I am appreciative of this hands-on learning opportunity and feel more assured in my capacity to use cloud platforms. The Alpine image was then retrieved, the list of images was examined, and commands were run inside an Alpine container. Among our assignments were to turn on interactive mode, echo messages, and show file listings. As a final task, we created a text document, looked over container listings, and carried out a few file operations inside an Alpine container. This practical experience improved our abilities to manage and communicate with containers by giving us a basic understanding of Docker containerization.

## Ping commands

Ping [www.google.com](http://www.google.com) -c 4

Ping [www.facebook.com](http://www.facebook.com) -c 4

Ping [www.rvrjc.ac.in](http://www.rvrjc.ac.in) -c 4

## Traceroute commands.

traceroute [www.google.com](http://www.google.com)

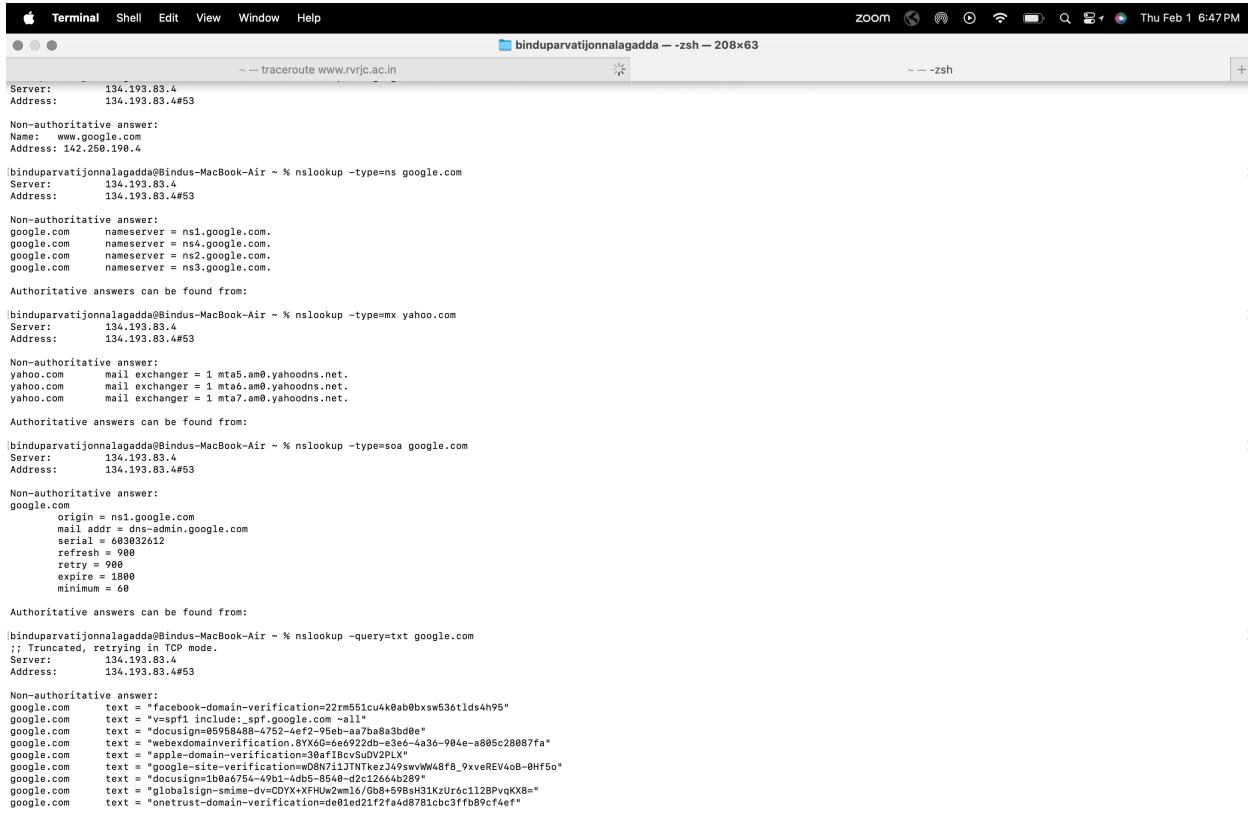
traceroute [www.facebook.com](http://www.facebook.com)

traceroute [www.rvrjc.ac.in](http://www.rvrjc.ac.in)

```
Terminal Shell Edit View Window Help
binduparvatijonnalagadda — traceroute www.rvrjc.ac.in — 208x65
4 packets transmitted, 4 packets received, 0.0% packet loss
round-trip min/avg/max/stddev = 316.188/426.887/587.274/71.944 ms
[binduparvatijonnalagadda@bindus-MacBook-Air ~ % traceroute facebook.com
traceroute to facebook.com (157.240.249.35), 64 hops max, 52 byte packets
 1  10.168.111.254 (10.168.111.254)  3.532 ms  3.328 ms *
 2  10.249.0.2 (10.249.0.2)  3.948 ms
 3  10.249.0.3 (10.249.0.3)  3.510 ms
 4  10.249.0.2 (10.249.0.2)  4.542 ms
 5  10.254.249.1 (10.254.249.1)  3.233 ms  2.631 ms  3.230 ms
 6  pte2-te1-22.umkc.edu (134.193.126.43)  5.615 ms  5.378 ms  4.265 ms
 7  bundle-ether100_1441.core2.kans.net.internet2.edu (198.71.47.161)  7.383 ms  7.707 ms  6.210 ms
 8  fourhundredreduge-0-0-0-0.4079.core1.chic.net.internet2.edu (163.253.2.28)  17.130 ms  20.715 ms  19.838 ms
 9  fourhundredreduge-0-0-0-0.4079.core2.eqch.net.internet2.edu (163.253.1.207)  16.278 ms  15.962 ms  18.190 ms
10  fourhundredreduge-0-0-0-0.4079.core2.eqch.net.internet2.edu (163.253.1.217)  23.897 ms  19.382 ms
fourhundredreduge-0-0-0-0.4079.core2.eqch.net.internet2.edu (163.253.1.215)  19.239 ms
11  aeq1_preqs_ord3_tfwnet.net (157.240.38.170)  19.651 ms
  aeq1_preqs_ord3_tfwnet.net (157.240.38.170)  19.598 ms
  aeq1_preqs_ord3_tfwnet.net (157.240.38.170)  19.535 ms
12  po131.assw04.ord3_tfwnet.net (157.240.33.170)  14.978 ms
  po141.assw04.ord3_tfwnet.net (157.240.33.170)  14.985 ms
  po141.assw03.ord3_tfwnet.net (157.240.33.170)  15.645 ms
13  psw02.ord5_tfwnet.net (129.134.82.166)  14.938 ms
  psw03.ord5_tfwnet.net (129.134.82.165)  15.118 ms
  psw03.ord5_tfwnet.net (129.134.82.165)  15.753 ms
14  157.240.38.187 (157.240.38.187)  93.162 ms
  173.252.67.71 (173.252.67.71)  14.970 ms
  173.252.67.83 (173.252.67.83)  16.944 ms
15  edge-star-mini-shv-01-ord5.facebook.com (157.240.249.35)  15.517 ms  14.668 ms  14.398 ms
[binduparvatijonnalagadda@bindus-MacBook-Air ~ % traceroute google.com
traceroute to google.com (159.199.91.41), 64 hops max, 52 byte packets
 1  10.168.111.254 (10.168.111.254)  6.884 ms  5.782 ms
 2  10.249.0.2 (10.249.0.2)  5.436 ms  92.212 ms  5.599 ms
 3  10.254.249.1 (10.254.249.1)  9.239 ms
 4  10.254.249.9 (10.254.249.9)  4.826 ms  3.596 ms
 5  pte2-te1-22.umkc.edu (134.193.126.43)  102.940 ms  4.727 ms  5.689 ms
 6  k-core-01-he0-1-0-3-431.mo.more.net (159.199.91.41)  5.397 ms  6.811 ms
 7  bundle-ether100_1441.core2.kans.net.internet2.edu (198.71.47.161)  27.431 ms  14.747 ms  16.578 ms
 8  fourhundredreduge-0-0-0-0.4079.core1.eqch.net.internet2.edu (163.253.2.28)  24.722 ms  46.071 ms  25.183 ms
 9  fourhundredreduge-0-0-0-0.4079.core2.eqch.net.internet2.edu (163.253.1.207)  24.838 ms  51.087 ms  23.901 ms
10  fourhundredreduge-0-0-0-0.4079.core2.eqch.net.internet2.edu (163.253.1.219)  174.146 ms  24.443 ms
fourhundredreduge-0-0-0-0.4079.core2.eqch.net.internet2.edu (163.253.1.217)  24.511 ms
11  72.14.216.92 (72.14.216.92)  35.032 ms  24.093 ms  22.751 ms
12  * *
13  142.251.60.212 (142.251.60.212)  67.356 ms
  142.251.60.212 (142.251.60.214)  23.495 ms
  ord373s6-in-f14.1e180.net (142.256.198.142)  32.281 ms
[binduparvatijonnalagadda@bindus-MacBook-Air ~ % traceroute www.rvrjc.ac.in
traceroute to www.rvrjc.ac.in (125.253.1.212), 64 hops max, 4.110 ms
 1  10.168.111.254 (10.168.111.254)  5.825 ms  4.337 ms *
 2  10.249.0.2 (10.249.0.2)  173.280 ms
 3  10.249.0.3 (10.249.0.3)  5.332 ms
 4  10.249.0.2 (10.249.0.2)  4.399 ms
 5  10.254.249.1 (10.254.249.1)  3.181 ms  2.870 ms
 6  10.254.249.9 (10.254.249.9)  5.294 ms
 7  aeq1-22.umkc.edu (134.193.126.43)  5.256 ms  6.123 ms  5.141 ms
 8  igate.umkc.edu (134.193.126.146)  5.527 ms  7.861 ms  5.662 ms
 9  kc-core-01-he0-1-0-3-431.mo.more.net (159.199.91.41)  13.199 ms  13.445 ms  13.675 ms
 7  kc-gw-02-he0-0-0-23.mo.more.net (158.199.7.86)  31.195 ms  13.068 ms  13.198 ms
 8  kanc-b2-link.ip.twelve99.net (62.115.183.252)  12.618 ms  13.738 ms  12.434 ms
9  * |||
```



## Nslookup Commands:



The screenshot shows a macOS Terminal window with the title bar "binduparvatijonnalagadda -- zsh -- 208x63". The window contains the output of several nslookup commands. The output includes:

- Traceroute to www.rvjc.ac.in: Server 134.193.83.4, Address 134.193.83.4#53.
- Non-authoritative answer for www.google.com: Server 134.193.83.4, Address 142.250.190.4.
- Non-authoritative answer for google.com: Nameservers ns1.google.com, ns4.google.com, ns2.google.com, ns3.google.com.
- Authoritative answers for yahoo.com: Mail exchangers mta5.am0.yahoodns.net, mta6.am0.yahoodns.net, mta7.am0.yahoodns.net.
- Authoritative answers for google.com: SOA parameters: origin ns1.google.com, mailaddr dns-admin.google.com, serial 201308302612, refresh 900, retry 900, expire 1800, minimum 60.
- Authoritative answers for google.com: TXT records: v=spf1 include:spt.google.com -all, docsign=g9595848b-4752-4ef2-95eb-aa7ba8a3b0e0, webhexdomainverification.8YX60e6e6922db-e3ee-4a36-904e-a805c28087fa, apple-domain-verification=30af1BcVsUdW2PLX, googlegmail-com-v=spf1a.fqdn=1137k1kewww48fb\_9xveREV4oB-8Hf5o, domainkey-signature=75c-49a1-4db5-8541-d2464b289, globalsign-smime-dw=CDXxXFHUw2am16/GB8+598sH31KzUr6c112BPvkX8=, onettust-domain-verification=d01ed212fa4d8781cbc3fb89cf4ef.

```

  Terminal  Shell  Edit  View  Window  Help
  binduparvatijonnalagadda -- zsh -- 208x63
  ~ — traceroute www.rvjc.ac.in
  binduparvatijonnalagadda@bindus-MacBook-Air ~ % nslookup -type=ns google.com
  Server:      134.193.83.4
  Address:    134.193.83.4#53

  Non-authoritative answer:
  google.com      nameserver = ns1.google.com.
  google.com      nameserver = ns4.google.com.
  google.com      nameserver = ns2.google.com.
  google.com      nameserver = ns3.google.com.

  Authoritative answers can be found from:
  binduparvatijonnalagadda@bindus-MacBook-Air ~ % nslookup -type=mx yahoo.com
  Server:      134.193.83.4
  Address:    134.193.83.4#53

  Non-authoritative answer:
  yahoo.com      mail exchanger = 1 mta5.am0.yahoodns.net.
  yahoo.com      mail exchanger = 1 mta6.am0.yahoodns.net.
  yahoo.com      mail exchanger = 1 mta7.am0.yahoodns.net.

  Authoritative answers can be found from:
  binduparvatijonnalagadda@bindus-MacBook-Air ~ % nslookup -type=soa google.com
  Server:      134.193.83.4
  Address:    134.193.83.4#53

  Non-authoritative answer:
  google.com      origin = ns1.google.com
  google.com      mail addr = dns-admin.google.com
  google.com      serial = 60303262
  google.com      refresh = 900
  google.com      retry = 900
  google.com      expire = 1800
  google.com      minimum = 60

  Authoritative answers can be found from:
  binduparvatijonnalagadda@bindus-MacBook-Air ~ % nslookup -query=txt google.com
  ; Truncated, trying in TCP mode.
  Server:      134.193.83.4
  Address:    134.193.83.4#53

  Non-authoritative answer:
  google.com      text = "facebook-domain-verification=22rm551cu4k0ab0bxsw536t1ds4h95"
  google.com      text = "vmspf1 include:_spf.google.com -all"
  google.com      text = "docsignin=0595848d-4752-4ef2-95eb-a37ba8a3ud0e"
  google.com      text = "apple-domain-verification=8VnF8o-3DwP2LX"
  google.com      text = "apple-domain-verification=39nfB8o-3DwP2LX"
  google.com      text = "google-site-verification=w08N7113TNTkez3k9awWW48f8_9xveREV4oB-0Hf5o"
  google.com      text = "docsignin=1b8a6754-49b1-4db5-854d-d2c12664289"
  google.com      text = "globalsign-smime-dv=DXVxFHMu2wm16/Gb8+598sH31KzUr6c112BPvqX8="
  google.com      text = "onetrust-domain-verification=de01ed21f2fa4d8781cbc3fb89cf4ef"
  google.com      text = "MS-EA6889AB2B9678BCCE18412F6291616ACB820BB"
  google.com      text = "google-site-verification=T9v-DBe4R8BXavbM4U_bd_J9cp0JM0niKft0jAgjmsQ"
  google.com      text = "atlassian-domain-verification=8YjTmwmjI92ewqkX2oXmBa0d60Td92Wn9zeekvHX6877zzkFQt08PQ9QsKnbf4I"

  Authoritative answers can be found from:
  binduparvatijonnalagadda@bindus-MacBook-Air ~ %

```

## CC-In Class Assignment 3

Bindu Parvati, Jonnala Gadda  
16338568

Chrome File Edit View History Bookmarks Profiles Tab Window Help

Thu Feb 8 5:41PM

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CC - In Class Lab Assignment 3 Due: Thu Feb 8, 2024 7:30pm

10 Points Possible

Attempt 1 In Progress NEXT UP: Submit Assignment Add Comment

Unlimited Attempts Allowed

Details

In this assignment you will create a docker container in a virtual environment. (2/8/2024)  
(We installed docker in the last assignment - we will use the existing docker in this assignment)  
Go to virtual playground: (screen print the steps for submission)  
<https://diveinto.com/p/playground>

< Previous Submit Assignment Next >



```
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansiable-lab-gcp-cloudshell-1$ mkdir cs5525
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansiable-lab-gcp-cloudshell-1$ cd cs5525
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansiable-lab-gcp-cloudshell-1$ cd cs5525$ sudo apt-get update
*****
You are running apt-get inside of Cloud Shell. Note that your Cloud Shell
machine is ephemeral and no system-wide change will persist beyond session end.

To suppress this warning, create an empty ~/.cloudshell/no-apt-get-warning file.
The command will automatically proceed in 5 seconds or on any key.

Visit https://cloud.google.com/shell/help for more information.
*****
Hit:1 http://packages.sury.org/bullseye InRelease
Hit:2 http://deb.debian.org/debian bullseye InRelease
Hit:3 https://download.docker.com/linux/debian bullseye InRelease
Hit:4 https://packages.cloud.google.com/apt/gcsfuse-bullseye InRelease
Hit:5 https://packages.cloud.google.com/apt/cloud-sdk-bullseye InRelease
Hit:6 https://apt.releases.hashicorp.com bullseye InRelease
Hit:7 http://deb.debian.org/debian-security bullseye-security InRelease
Hit:8 https://cli.github.com/packages bullseye InRelease
Hit:9 https://repo.mysql.org/debian bullseye InRelease
Hit:10 http://deb.debian.org/debian-bullseye-updates InRelease
Hit:11 https://packages.microsoft.com/debian/11/prod bullseye InRelease
Hit:12 http://deb.debian.org/debian-bullseye-12 InRelease
Hit:13 https://apt.postgresql.org/pub/repos/apt bullseye-pgdg InRelease
Reading package lists... Done
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansiable-lab-gcp-cloudshell-1$ sudo apt-get install -y figlet
*****
You are running apt-get inside of Cloud Shell. Note that your Cloud Shell
machine is ephemeral and no system-wide change will persist beyond session end.
FROM golang:1.14

To suppress this warning, create an empty ~/.cloudshell/no-apt-get-warning file.
The command will automatically proceed in 5 seconds or on any key.

Visit https://cloud.google.com/shell/help for more information.
*****
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
figlet is already the newest version (2.2.5-3+b1).
The following package was automatically installed and is no longer required:
libpcre2-posix2
Use 'sudo apt autoremove' to remove it.
0 upgraded, 0 newly installed, 0 to remove and 47 not upgraded.
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansiable-lab-gcp-cloudshell-1$ sudo figlet "hello docker"
[REDACTED]
```

```
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansiable-lab-gcp-cloudshell-1$ sudo docker container ls -a
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS               NAMES
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansiable-lab-gcp-cloudshell-1$ sudo docker image ls
Usage: docker image COMMAND

Manage images

Commands:
  build      Build an image from a Dockerfile
  history   Show the history of an image
  import    Import the contents from a tarball to create a filesystem image
  inspect   Display detailed information on one or more images
  load      Load an image from a tar archive or STDIN
  ls       List images
  prune    Remove unused images
  pull     Download an image from a registry
  push     Upload an image to a registry
  rm       Remove one or more images
  save     Save one or more images to a tar archive (streamed to STDOUT by default)
  tag      Create a tag TARGET_IMAGE that refers to SOURCE_IMAGE

Run 'docker image COMMAND --help' for more information on a command.
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansiable-lab-gcp-cloudshell-1$ sudo docker image ls
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansiable-lab-gcp-cloudshell-1$ sudo vi Dockerfile
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansiable-lab-gcp-cloudshell-1$ ls
Dockerfile
bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansiable-lab-gcp-cloudshell-1$ more Dockerfile
FROM golang:1.14
WORKDIR /do/src/app
COPY * .
RUN go get -d -v ./...
RUN go install -v ./...

bindhuparvathi123@cloudshell:~/cloudshell_open/divetoansiable-lab-gcp-cloudshell-1$ sudo docker image build -t hello:v0.1 .
[+] Building 26.1s (10/10) FINISHED
-> [internal] load build definition from Dockerfile
-> transferring Dockerfile: 132B
-> [internal] load metadata for docker.io/library/golang:1.14
-> [internal] load .dockerignore
-> [internal] transfer context: 2B
[REDACTED]
```

The screenshot shows a Cloud Shell Editor interface within a browser window. The title bar includes the Apple logo, the word 'Chrome', and standard menu options like File, Edit, View, History, Bookmarks, Profiles, Tab, Window, Help. On the right side of the browser window, there are various system icons for zoom, battery, signal, and network. The URL bar shows 'shell.cloud.google.com?amp%3BcloudshellTutorial=tutorial.md&amp%3Bshellonly=true&show=ide%2Cterminal'. The main content area is titled 'Cloud Shell Editor' and contains a terminal session. The terminal output shows commands being run to pull the alpine image and inspect it. Below the terminal, a detailed JSON object represents the Docker container configuration, including fields like 'Id', 'RepoTags', 'RepoDigests', 'Parent', 'Comment', 'Created', 'ContainerID', 'ContainerConfig', and 'Cmd'. The configuration specifies a command of '/bin/sh' and an image ID of 'sha256:9a5ce069f40fce0f2270eafbf0a0f2fa08f1add73571af9f78209e96bb8a5e9'.

```
=> => naming to docker.io/library/hello:v0.2
bindhuparvathi123@cloudshell:~/cloudshell/_open/divedintoansible-lab-gcp-cloudshell-1/cs5525$ docker image ls
REPOSITORY        TAG      IMAGE ID      CREATED          SIZE
hello             v0.2     0e6eb47d622b   9 seconds ago   811MB
hello             v0.1     07639ade65f1   10 minutes ago  811MB
bindhuparvathi123@cloudshell:~/cloudshell/_open/divedintoansible-lab-gcp-cloudshell-1/cs5525$ sudo docker image pull alpine
Using default tag: latest
latest: Pulling from library/alpine
5a5c0056143...: Pull complete
Digest: sha256:c5b1261d6d3e43071626931fc004f70149baeba2c8ec672bd4f27761f8e1ad6b
Status: Downloaded newer image for alpine:latest
docker.io/library/alpine:latest
bindhuparvathi123@cloudshell:~/cloudshell/_open/divedintoansible-lab-gcp-cloudshell-1/cs5525$ sudo docker image inspect alpine
[
  {
    "Id": "sha256:05455a08881ea9cf0e752bc48e61bbd71a34c029bb13df01e40e3e70e0d007bd",
    "RepoTags": [
      "alpine:latest"
    ],
    "RepoDigests": [
      "alpine@sha256:c5b1261d6d3e43071626931fc004f70149baeba2c8ec672bd4f27761f8e1ad6b"
    ],
    "Parent": "",
    "Comment": "",
    "Created": "2024-01-27T00:30:48.743965523Z",
    "ContainerID": "4189cbc53495765760c227f328eclcd52e8550681c2bf9f8f990b27b644f9c",
    "ContainerConfig": {
      "Hostname": "4189cbc53495",
      "Domainname": "",
      "User": "root",
      "AttachStdin": false,
      "AttachStdout": false,
      "AttachStderr": false,
      "Tty": false,
      "OpenStdin": false,
      "StdinOnce": false,
      "Env": [
        "PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin"
      ],
      "Cmd": [
        "/bin/sh",
        "-c",
        "#(nop)",
        "#(nop) \"\\"/>
      ],
      "Image": "sha256:9a5ce069f40fce0f2270eafbf0a0f2fa08f1add73571af9f78209e96bb8a5e9",
      "Volumes": null,
      "WorkingDir": ""
    }
  }
]
```

```
Cloud Shell Editor
cloudshell X + *
Try the new Editor | [Edit] [New tab] [New window] [Help] [Logout]
***
```

```
"Cmd": [
    "/bin/sh"
],
"Image": "sha256:9a5ce069f40cfef02270eafbffa0f2fa08fladd73571af9f78209e96bb8a5e9",
"Volumes": null,
"WorkingDir": "",
"Entrypoint": null,
"OnBuild": null,
"Labels": null
},
"Architecture": "amd64",
"Os": "linux",
"Size": 7377074,
"GraphDriver": {
    "Data": {
        "MergedDir": "/var/lib/docker/overlay2/ebed17de9192e22657a9dc00ebae854b6c5e236d76ec8c88c9dc17f6972263a3/merged",
        "UpperDir": "/var/lib/docker/overlay2/ebed17de9192e22657a9dc00ebae854b6c5e236d76ec8c88c9dc17f6972263a3/diff",
        "WorkDir": "/var/lib/docker/overlay2/ebed17de9192e22657a9dc00ebae854b6c5e236d76ec8c88c9dc17f6972263a3/work"
    },
    "Name": "overlay2"
},
"RootFS": {
    "Type": "layers",
    "Layers": [
        "sha256:d4fc045c9e3a848011de66f34b81f052d4f2c15a17bb196d637e526349601820"
    ]
},
"Metadata": {
    "LastTagTime": "2000-01-01T00:00:00Z"
}
}
bindhuparvathil23@cloudshell:~/cloudshell_open/divineintoansible-lab-gcp-cloudshell-1/cs5525$ sudo docker image inspect --format "{{ json .RootFS.Layers }}" alpine
["sha256:d4fc045c9e3a848011de66f34b81f052d4f2c15a17bb196d637e526349601820"]
bindhuparvathil23@cloudshell:~/cloudshell_open/divineintoansible-lab-gcp-cloudshell-1/cs5525$ sudo docker image inspect --format "{{ json .GraphDriver.Layers }}" alpine

template parsing error: template: :1:20: executing "" at <.GraphDriver.Layers>: map has no entry for key "Layers"
bindhuparvathil23@cloudshell:~/cloudshell_open/divineintoansible-lab-gcp-cloudshell-1/cs5525$ sudo docker image inspect --format "{{ json .GraphDriver.Data }}" alpine
{"MergedDir": "/var/lib/docker/overlay2/ebed17de9192e22657a9dc00ebae854b6c5e236d76ec8c88c9dc17f6972263a3/merged", "UpperDir": "/var/lib/docker/overlay2/ebed17de9192e22657a9dc00ebae854b6c5e236d76ec8c88c9dc17f6972263a3/diff", "WorkDir": "/var/lib/docker/overlay2/ebed17de9192e22657a9dc00ebae854b6c5e236d76ec8c88c9dc17f6972263a3/work"}
bindhuparvathil23@cloudshell:~/cloudshell_open/divineintoansible-lab-gcp-cloudshell-1/cs5525$ ps -ef | grep containerd
root      238     19  0 Feb08 ?          0:00:00 containedr --config /var/run/docker/containerd/containerd.toml
bindhup+  5570     419  0  pts/2    0:00:00 grep --color=auto containedr
bindhuparvathil23@cloudshell:~/cloudshell_open/divineintoansible-lab-gcp-cloudshell-1/cs5525$ ps -ef | grep docker
root      238     19  0 Feb08 ?          0:00:00 /usr/bin/docker-pid --pidfile=/run/docker.pid --mtu=1460 --registry-mirror=https://us-mirror.gcr.io
bindhup+  5588     419  0  pts/2    0:00:00 grep --color=auto docker
bindhuparvathil23@cloudshell:~/cloudshell_open/divineintoansible-lab-gcp-cloudshell-1/cs5525$
```

During this assignment, I executed a sequence of Docker commands to establish a Docker source and construct Docker images. The process commenced with the update and installation of packages within a Docker container, followed by utilizing Figlet to showcase the phrase "hello docker" in the terminal. Subsequent steps involved crafting a Dockerfile for a Go application, generating Docker images for different versions (v0.1 and v0.2), and initiating containers based on these images. Additionally, I delved into Docker image management tasks, such as fetching an Alpine image, examining its particulars, and comprehending its layer structure. This assignment delivered hands-on practice in Docker commands, image creation, and container execution, reinforcing practical insights into containerization and Docker workflows.

**Assignment-2**  
**Cloud Computing**

Bindu Parvati, Jonnala Gadda  
16338568  
CS-5525

Using the algorithms listed below calculate the seek time of all requests (request queue (0-199))

**1. First Come-First Serve (FCFS)**

Given Request sequence: {176, 79, 34, 60, 92, 10, 41, 114}

Given Initial head position: 50.

$$\begin{aligned}\text{Seek Time} &= (50 - 176) + (176 - 79) + (79 - 34) + (34 - 60) + (60 - 92) + (92 - 10) + (10 - 41) \\ &\quad + (41 - 114) \\ &= 126 + 97 + 45 + 26 + 32 + 82 + 31 + 73 \\ &= 512.\end{aligned}$$

**2. Shortest Seek Time First (SSTF).**

For the given sequence, the SSTF order is: 176, 79, 34, 60, 92, 10, 41, 114.

Seek Time = 9 + 7 + 24 + 50 + 19 + 13 + 22 + 62 = 206.

3. Elevator (SCAN) Seek Sequence: 41, 34, 11, 0, 60, 79, 92, 114, 176 = 226.

**4. Circular SCAN (C-SCAN)**

C-SCAN also moves from the initial head position of 50 towards the higher track.

$$\text{Seek Time} = (60-50) + (79-60) + (92-79) + (114-92) + (176-114) + (199-176) + (199-0) + (11-0) + (34-11) + (41-34) = 389$$

**5. LOOK**

Move the head to the closest request in the direction it was already traveling.

Seek Sequence is 60, 79, 92, 114, 176, 41, 34, 10 = 292.

**6. C-LOOK**

Move the head to the closest request in the direction it was already traveling, but only go as far as the last request in that direction.

Seek Sequence is 60, 79, 92, 114, 176, 10, 34, 41 = 323.

https://portal.azure.com/#home

Microsoft Azure Search resources, services, and docs (G+/-)

Thu Feb 15 5:53 PM

bj35v@umsystem.edu UNIVERSITY OF MISSOURI

### Azure services

- Create a resource
- Storage accounts
- Cost Management ...
- Azure Databricks
- Power BI Embedded
- SQL databases
- All resources
- Quickstart Center
- Virtual machines
- More services

### Resources

Recent Favorite

Name	Type	Last Viewed
cs5525	Storage account	a few seconds ago
Bindu	Resource group	a minute ago

See all

### Navigate

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- Microsoft Defender for Cloud
- Cost Management

https://portal.azure.com/#create/hub

Microsoft Azure Search resources, services, and docs (G+/-)

Thu Feb 15 5:51PM

bj35v@umsystem.edu UNIVERSITY OF MISSOURI

Home > Storage accounts > cs5525 > Bindu >

Storage account

static

Upload Open in Explorer Delete Move Refresh Open in mobile CLI / PS Feedback

JSON View

Essentials

Resource group (move) : Bindu	Performance : Standard
Location : centralus	Replication : Locally-redundant storage (LRS)
Subscription (move) : Subscription 1	Account kind : StorageV2 (general purpose v2)
Subscription ID : 5325d4dc-973a-4dd9-bc1c-396f86493c8c	Provisioning state : Succeeded
Disk state : Available	Created : 2/15/2020, 4:55:09 PM

Tags (edit) : Add tags

Properties Monitoring Capabilities (7) Recommendations (0) Tutorials Tools + SDKs

Blob service

Hierarchical namespace	Disabled	Require secure transfer for REST API operations	Enabled
Default access tier	Hot	Storage account key access	Enabled
Blob anonymous access	Enabled	Minimum TLS version	Version 1.2
Blob soft delete	Enabled (7 days)	Infrastructure encryption	Disabled
Container soft delete	Enabled (7 days)		
Versioning	Disabled		
Change feed	Disabled		
NFS v3	Disabled		
Allow cross-tenant replication	Disabled		

Security

Allow access from	All networks
Number of private endpoint connections	0
Network routing	Microsoft network routing
Access for trusted Microsoft services	Yes
Endpoint type	Standard

Networking

Allow access from	All networks
Number of private endpoint connections	0
Network routing	Microsoft network routing
Access for trusted Microsoft services	Yes
Endpoint type	Standard

File service

Large file share	Disabled
------------------	----------

Chrome File Edit View History Bookmarks Profiles Tab Window Help

Thu Feb 15 5:52 PM

portal.azure.com/#@mail.missouri.edu/resource/subscriptions/5325d4dc-973a-4dd9-bc1c-396f86493c8c/resourceGroups/Bindu/providers/Microsoft...

Microsoft Azure Search resources, services, and docs (G+)

bj35v@umsystem.edu UNIVERSITY OF MISSOURI

Home > Storage accounts > cs5525 > Bindu > cs5525

cs5525 | Static website

Storage account

static Save Discard Give feedback

Data management

Static website

Disabled Enabled

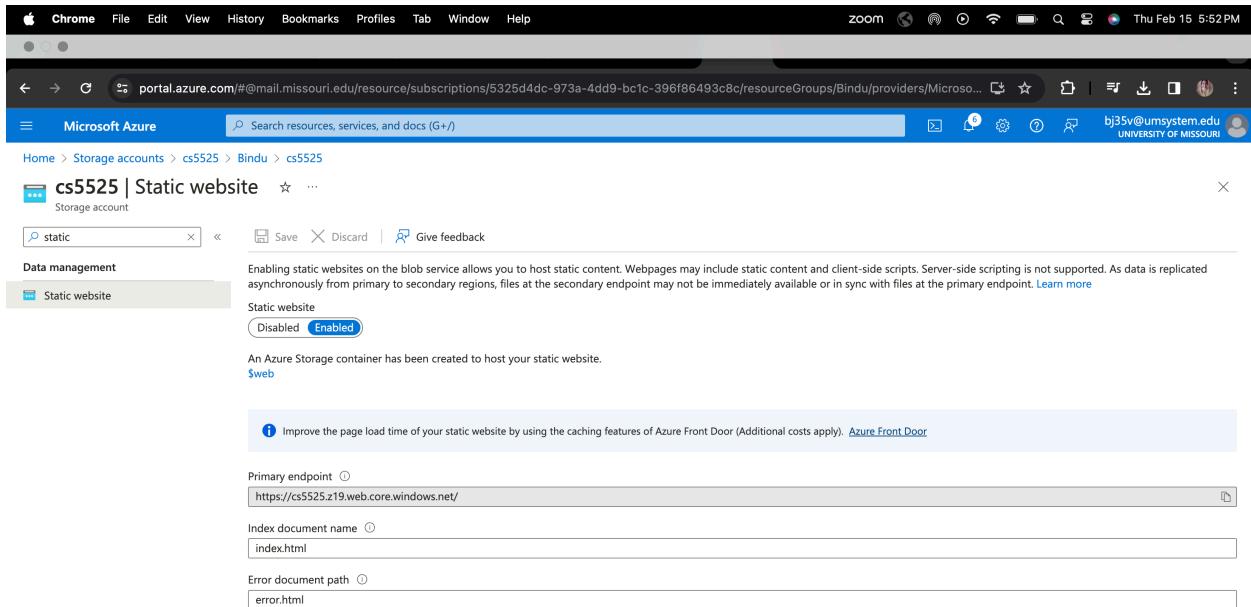
An Azure Storage container has been created to host your static website.  
\$web

Improve the page load time of your static website by using the caching features of Azure Front Door (Additional costs apply). [Azure Front Door](#)

Primary endpoint https://cs5525.z19.web.core.windows.net/

Index document name index.html

Error document path error.html



Chrome File Edit View History Bookmarks Profiles Tab Window Help

Thu Feb 15 5:50 PM

portal.azure.com/#view/Microsoft\_Azure\_Storage/ContainerMenuBlade/-/overview/storageAccountName%2Fsubscriptions%2F5325d4dc-973a-4dd9-bc1c-396f86493c8c/resourceGroups/Bindu/providers/Microsoft...

Microsoft Azure Search resources, services, and docs (G+)

bj35v@umsystem.edu UNIVERSITY OF MISSOURI

Home > Storage accounts > cs5525 > Bindu > cs5525 > Bindu > cs5525 | Static website > \$web

\$web Container

Search Upload Change access level Refresh Delete Change tier Acquire lease Break lease View snapshots Create snapshot Give feedback

Authentication method: Access key ([Switch to Microsoft Entra user account](#))

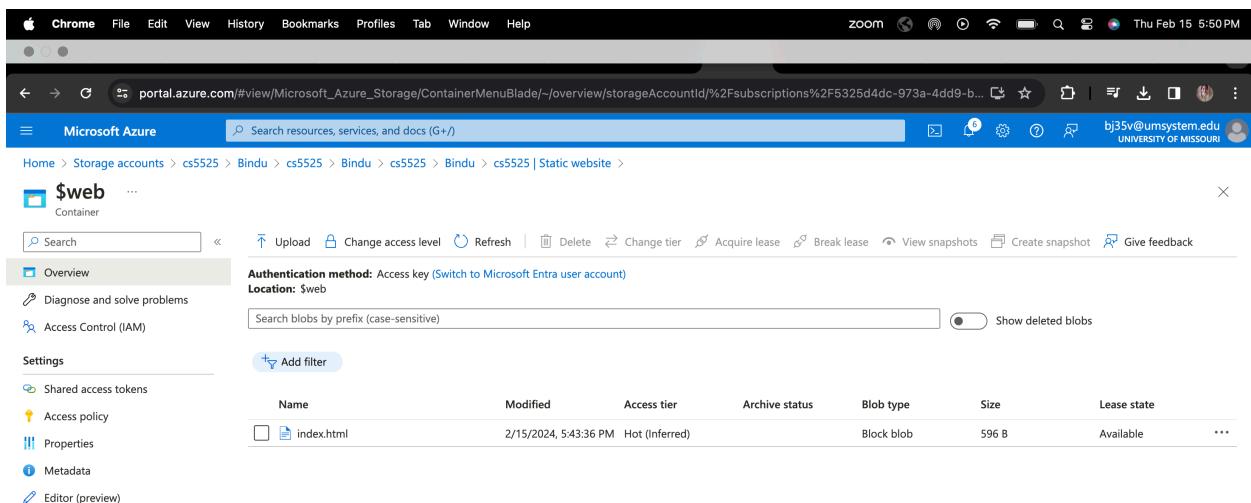
Location: \$web

Search blobs by prefix (case-sensitive) Show deleted blobs

Add filter

Name	Modified	Access tier	Archive status	Blob type	Size	Lease state
index.html	2/15/2024, 5:43:36 PM	Hot (Inferred)		Block blob	596 B	Available

Shared access tokens  
Access policy  
Properties  
Metadata  
Editor (preview)





## Assignment2\_16338568

- Name: Bindu Parvati Jonnala Gadda
- Student ID: 16338568
- Course Title: Cloud Computing-cs5525
- Date: 2/13/2024
- Semester: Spring 2024
- Cloud Provider: Microsoft-Azure
- Instructor Name: Helen Gebre-Amlak

### Website Link

[https://cs5525.blob.core.windows.net/\\$web/index.html](https://cs5525.blob.core.windows.net/$web/index.html)

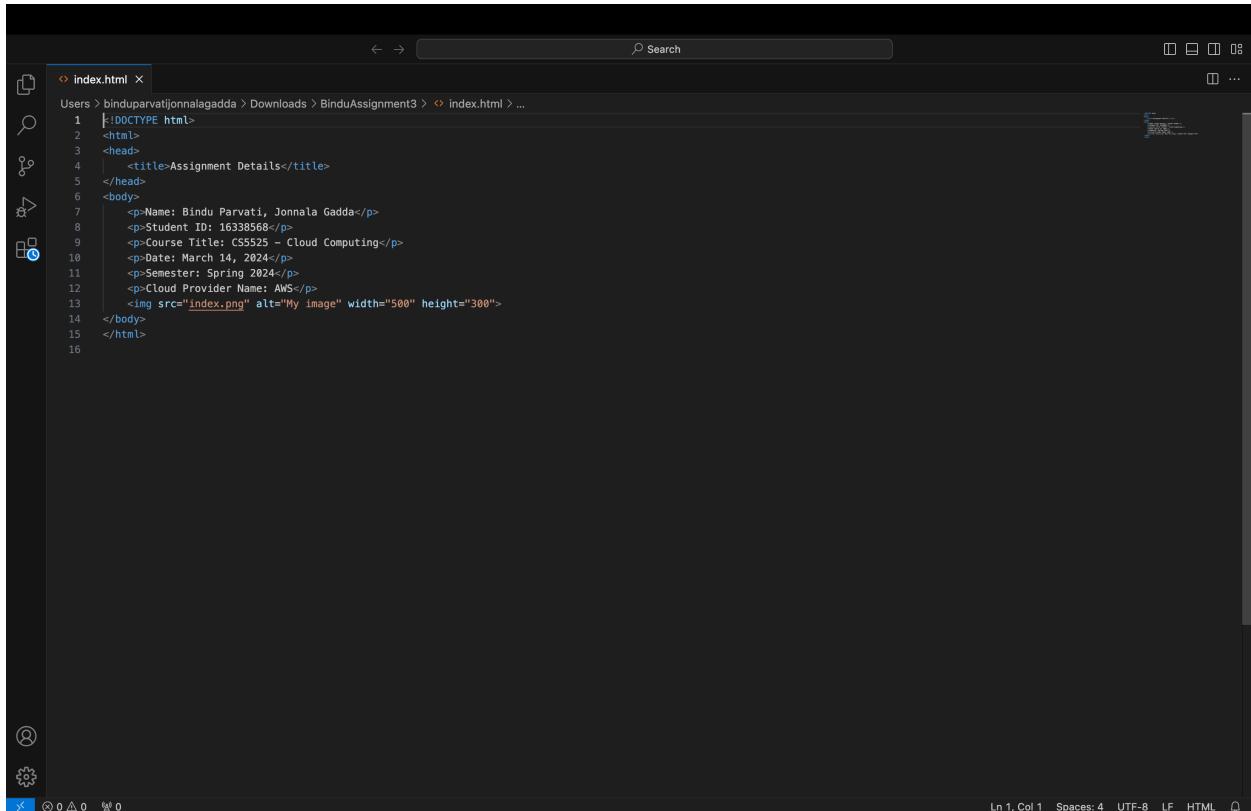
Note: I have used all my 200\$ azure credit for a project in my previous semester. I cannot leave my resources running as I am using pay as you go subscription. Please consider!!!

After completing the assigned tasks of creating and configuring a storage account bucket in Microsoft Azure, I gained valuable hands-on experience in working with cloud platforms. The process of accessing and transferring HTML files to the storage account enhanced my understanding of cloud storage and deployment. While some parts were challenging, such as configuring the storage account, the overall experience was insightful and rewarding. I look forward to applying these skills in future projects and am eager to explore more advanced features of cloud computing in future classes.

# Cloud Computing

## Assignment-3

Bindu Parvati, Jonnala Gadda  
16338568



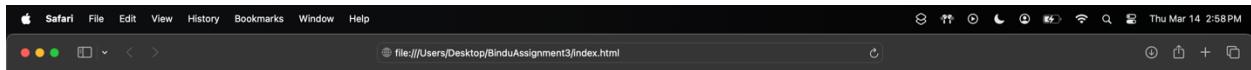
```
index.html ×
Users > binduparvatijonnala > Downloads > BinduAssignment3 > index.html > ...
1 <!DOCTYPE html>
2 <html>
3 <head>
4 |   <title>Assignment Details</title>
5 </head>
6 <body>
7 |   <p>Name: Bindu Parvati, Jonnala Gadda</p>
8 |   <p>Student ID: 16338568</p>
9 |   <p>Course Title: CSS525 - Cloud Computing</p>
10 |  <p>Date: March 14, 2024</p>
11 |  <p>Semester: Spring 2024</p>
12 |  <p>Cloud Provider Name: AWS</p>
13 |  
14 </body>
15 </html>
16
```

The screenshot shows a code editor window with a dark theme. The left sidebar has icons for file operations like copy, paste, and search. The main area displays an HTML file named 'index.html'. The code content is as follows:

```
<!DOCTYPE html>
<html>
<head>
<title>Assignment Details</title>
</head>
<body>
<p>Name: Bindu Parvati, Jonnala Gadda</p>
<p>Student ID: 16338568</p>
<p>Course Title: CSS525 - Cloud Computing</p>
<p>Date: March 14, 2024</p>
<p>Semester: Spring 2024</p>
<p>Cloud Provider Name: AWS</p>

</body>
</html>
```

At the bottom of the editor, there are status indicators: Line 1, Column 1, Spaces: 4, UTF-8, LF, HTML, and a refresh icon.



Assignment - 3    Console Home | Console Home

us-east-2.console.aws.amazon.com/console/home?nc2=h\_ct&region=us-east-2&src=header-signin#

AWS Services Search [Option+S]

Reset to default layout + Add widgets

Console Home Info

Recently visited Info

S3

View all services

Applications (0) Info

Create application

Region: US East (Ohio)

us-east-2 (Current Region) Find applications

Name Description Region Originating account

No applications

Get started by creating an application to view your application cost, security findings, and metrics all in one place.

Create application Go to myApplications

Welcome to AWS

Getting started with AWS

Learn the fundamentals and find valuable information to get the most out of AWS.

AWS Health Info

Open issues 0 Past 7 days

Scheduled changes 0 Upcoming and past 7 days

Cost and usage Info

CloudShell Feedback

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The screenshot shows the AWS S3 buckets dashboard. At the top, there are three tabs: 'Assignment - 3', 'AWS CloudFront CDN for S3', and 'S3 buckets | S3 | Global'. The 'S3 buckets' tab is active. The URL in the address bar is [s3.console.aws.amazon.com/s3/buckets?region=us-east-2&bucketType=general&region=us-east-2](https://s3.console.aws.amazon.com/s3/buckets?region=us-east-2&bucketType=general&region=us-east-2). The navigation bar includes 'aws', 'Services', 'Search [Option+S]', and 'Global ▾ Bindu Parvati Jonnala Gadda ▾'. Below the navigation is a breadcrumb trail: 'Amazon S3 > Buckets'. A 'Account snapshot' section displays storage usage and activity trends with a 'View Storage Lens dashboard' button. The main content area shows two tabs: 'General purpose buckets' (selected) and 'Directory buckets'. Under 'General purpose buckets', there is a table with one row:

Name	AWS Region	Access	Creation date
binducc	US East (Ohio) us-east-2	Objects can be public	February 1, 2024, 11:27:57 (UTC-06:00)

Actions for this bucket include 'Copy ARN', 'Empty', 'Delete', and 'Create bucket'. A search bar at the top of the table says 'Find buckets by name'. The bottom of the page includes links for 'CloudShell', 'Feedback', and copyright information: '© 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences'.

The screenshot shows the AWS S3 upload interface for the 'binducc' bucket. The top navigation bar and tabs are identical to the previous screenshot. The URL is [s3.console.aws.amazon.com/s3/upload/binducc?region=us-east-2&bucketType=general](https://s3.console.aws.amazon.com/s3/upload/binducc?region=us-east-2&bucketType=general). The breadcrumb trail is 'Amazon S3 > Buckets > binducc > Upload'. The main title is 'Upload' with an 'Info' link. A note says: 'Add the files and folders you want to upload to S3. To upload a file larger than 160GB, use the AWS CLI, AWS SDK or Amazon S3 REST API. [Learn more](#)'.

The upload interface includes a large dashed box for dragging and dropping files, with the placeholder text 'Drag and drop files and folders you want to upload here, or choose Add files or Add folder.' Below this is a table showing the selected files and folders:

Files and folders (2 Total, 17.0 KB)		
All files and folders in this table will be uploaded.		
Name	Folder	Type
index.html	-	text/html
index.png	-	image/png

Below the table is a 'Destination' section with an 'Info' link. It shows the destination as 's3://binducc' and includes a 'Destination details' link. At the bottom, there are 'Permissions' and 'CloudShell' links.

Assignment - 3 | AWS CloudFront CDN for S3 | CloudFront | Global

us-east-1.console.aws.amazon.com/cloudfront/v4/home?region=us-east-2#/distributions/create

AWS Services Search [Option+S]

CloudFront > Distributions > Create

## Create distribution

**Origin**

**Origin domain**  
Choose an AWS origin, or enter your origin's domain name.

**Warning:** This S3 bucket has static web hosting enabled. If you plan to use this distribution as a website, we recommend using the S3 website endpoint rather than the bucket endpoint.  
[Use website endpoint](#)

**Origin path - optional**  
Enter a URL path to append to the origin domain name for origin requests.

**Name**  
Enter a name for this origin.

**Origin access** [Info](#)

- Public**  
Bucket must allow public access.
- Origin access control settings (recommended)**  
Bucket can restrict access to only CloudFront.

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Assignment - 3 | Cloud Computing AWS - Chat | CloudFront | Global | binducc - S3 bucket | S3 | Global | Assignment Details

us-east-1.console.aws.amazon.com/cloudfront/v4/home?region=us-east-2#/distributions

AWS Services Search [Option+S]

CloudFront > Distributions

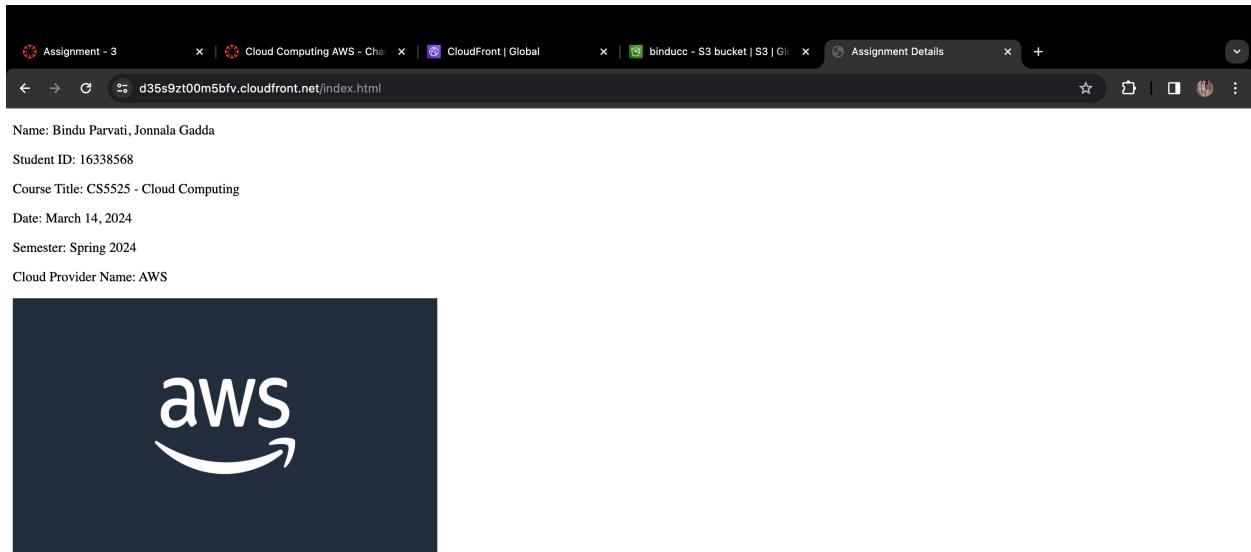
Distributions (3) <a href="#">Info</a>						
<a href="#">Create distribution</a> <span style="float: right;">Last modified</span>						
	ID	Description	Type	Domain name	Origins	Status
<input type="checkbox"/>	E144BG8FZ4JD84	AWS CloudFront	Production	d35s9zt00m5bfv.cloudfront.net	- binducc.s3.us-east-2.amazonaws.com	<span>Enabled</span> March 14, 2024
<input type="checkbox"/>	EX0XJVH0L3AOI	CloudFront	Production	d3ut3b64l46z2d.cloudfront.net	- binducc.s3-web-eu-west-1.amazonaws.com	<span>Enabled</span> March 14, 2024
<input type="checkbox"/>	E3B7D5U425KWUP	-	Production	d1u6mgq1niegc6.cloudfront.net	- binducc.s3.us-east-2.amazonaws.com	<span>Enabled</span> March 14, 2024

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The screenshot shows the AWS CloudFront distribution configuration page for distribution ID E144BG8FZ4JD84. The top navigation bar includes tabs for Assignment - 3, Cloud Computing AWS - Chat, CloudFront | Global, binducc - S3 bucket | S3 | Global, Assignment Details, and a search bar. The main content area has tabs for General, Security, Origins, Behaviors, Error pages, Invalidations, and Tags, with General selected. The General tab displays the distribution domain name (d35s9zt00m5bfv.cloudfront.net), ARN (arn:aws:cloudfront::730335204192:distribution/E144BG8FZ4JD84), and last modified date (March 14, 2024 at 8:21:25 PM UTC). The Settings tab shows description (AWS Cloudfront), alternate domain names (-), standard logging (Off), cookie logging (Off), and default root object (index.html). The Continuous deployment tab contains a 'Create staging distribution' button.

The screenshot shows the AWS S3 bucket policy editor for the 'binducc' bucket. The top navigation bar includes tabs for Assignment - 3, Cloud Computing AWS - Chat, CloudFront | Global, binducc - S3 bucket | S3 | Global, Assignment Details, and a search bar. The main content area shows a success message: 'Successfully edited bucket policy.' Below it is a 'Bucket policy' section with an 'Edit' and 'Delete' button. A large JSON code block displays the policy document:

```
{
  "Version": "2008-10-17",
  "Id": "PolicyForCloudFrontPrivateContent",
  "Statement": [
    {
      "Sid": "AllowCloudFrontServicePrincipal",
      "Effect": "Allow",
      "Principal": {
        "Service": "cloudfront.amazonaws.com"
      },
      "Action": "s3:GetObject",
      "Resource": "arn:aws:s3:::binducc/*",
      "Condition": {
        "StringEquals": {
          "AWS:SourceArn": "arn:aws:cloudfront::730335204192:distribution/E144BG8FZ4JD84"
        }
      }
    }
  ]
}
```



CloudfrontDistributionLink : <https://d35s9zt00m5bfv.cloudfront.net/index.html>

#### Epilog:

During the completion of each step in this AWS cloud deployment exercise, several valuable lessons were learned. Firstly, accessing the AWS Management Console reinforced the significance of having secure login credentials and understanding the navigation of cloud portals. Creating the S3 bucket with appropriate configurations underscored the importance of selecting the correct region, setting up versioning for data protection, and implementing proper access controls such as bucket policies and access control lists (ACLs).

Transferring the HTML files to the S3 bucket highlighted the ease and efficiency of utilizing AWS tools like the AWS Management Console or AWS Command Line Interface (CLI) for file management tasks. Creating the CloudFront distribution provided insights into content delivery networks (CDNs) and the benefits they offer in terms of improved latency and distribution of content globally.

Limiting access to the S3 buckets only through CloudFront emphasized the necessity of implementing security best practices, such as using Origin Access Identity (OAI) to restrict direct access to S3 and leveraging signed URLs or cookies for enhanced access control.

Finally, obtaining the URLs for the Origin HTML and CloudFront distribution served as a culmination of the deployment process, showcasing the successful integration of various AWS services to deliver content securely and efficiently over the web. Overall, this exercise reinforced the importance of meticulous planning, proper configuration, and adherence to security principles when deploying applications in cloud environments.

# In Class Lab Assignment 4

Bindu Parvati, Jonnala Gadda  
16338568

COMP SCI-5525-0005-15953-2024SP-Cloud Computing > Assignments

In Class Lab Assignment 4  
Due: Thu Feb 15, 2024 7:30pm

10 Points Possible

Attempt 1 In Progress  
NEXT UP: Submit Assignment

Add Comment

This lab assignment will focus on Kubernetes:  
Go to virtual playground: (screen print the steps for submission)  
<https://diveinto.com/p/playground>

If you don't have Kubernetes installed follow the steps to install:  
`curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube-darwin-amd64  
sudo install minikube-darwin-amd64 /usr/local/bin/minikube`

Create a minikube cluster [🔗](#)

minikube start

Open the Dashboard

Open a new terminal, and run:

Submit Assignment Next >

< Previous

Cloud Shell Editor

```
binduparvathi123@cloudshell:~/cloudshell_open/divedintoansible-lab-gcp-cloudshell-2$ which minikube
/usr/bin/minikube
binduparvathi123@cloudshell:~/cloudshell_open/divedintoansible-lab-gcp-cloudshell-2$ minikube start
* minikube v1.32.0 on Debian 11.8 (amd64)
  - MINIKUBE_FORCE_SYSTEMD=true
  - MINIKUBE_HOME=/google/minikube
  - MINIKUBE_WANTUPDATENOTIFICATION=false
* Automatically selected the docker driver. Other choices: none, ssh
* Using Docker driver with root privileges
* Starting control plane node minikube in cluster minikube
* Pulling base image ...
* Downloading Kubernetes v1.28.3 preload ...
  Preparing default-k8s-1.28.3-v1 ...
  403.35 MiB / 403.35 MiB 100.00% 159.50
  > http://k8s-minikube.xlibbase...: 453.90 MiB / 453.90 MiB 100.00% 75.26 M
* Creating docker container (CPU=2, Memory=2200MB) ...
X Docker is nearly out of disk space, which may cause deployments to fail! (94% of capacity). You can pass '--force' to skip this check.
* Suggestion:

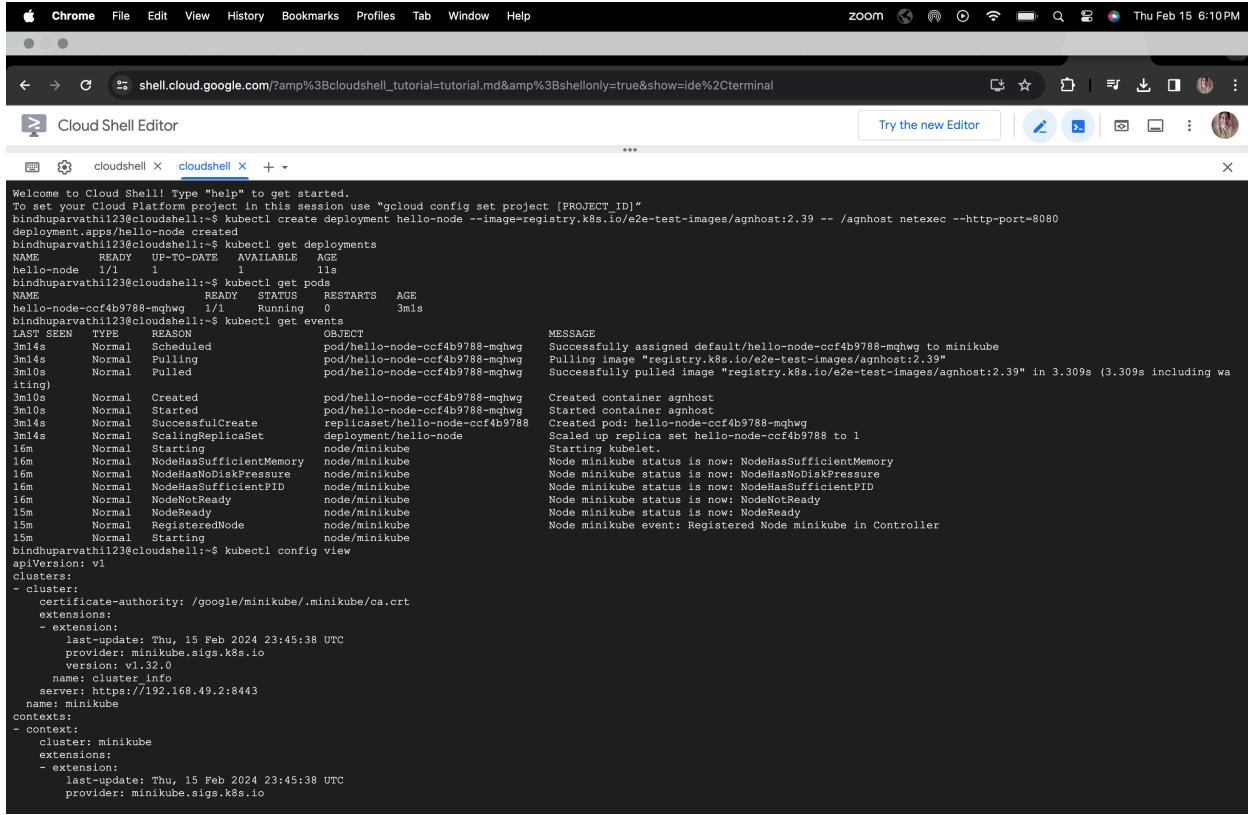
  Try one or more of the following to free up space on the device:
  1. Run "docker system prune" to remove unused Docker data (optionally with "-a")
  2. Increase the storage allocated to Docker for Desktop by clicking on:
    Docker icon > Preferences > Disk Image Size
  3. Run "minikube ssh" > docker system prune" if using the Docker container runtime
* Related issue: https://github.com/kubernetes/minikube/issues/9024

* Preparing Kubernetes v1.28.3 on Docker 24.0.7 ...
  - kubelet.cgroups-per-qos=false
  - kubelet.enforce-node-allocatable=""
  - Generating certificates and keys ...
  - Booting up control plane ...
  - Configuring RBAC roles ...
  - Configuring CNI (Container Networking Interface) ...
    Using image docker.io/k8s-minikube/storage-provisioner:v5
* Verifying Kubernetes components...
* Enabled addons: storage-provisioner, default-storageclass
* Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
binduparvathi123@cloudshell:~/cloudshell_open/divedintoansible-lab-gcp-cloudshell-2$ minikube dashboard
* Enabling dashboard ...
  - Using image docker.io/kubernetesui/dashboard:v2.7.0
  - Using image docker.io/kubernetesui/metrics-scraper:v1.0.8
* Some dashboard features require the metrics-server addon. To enable all features please run:

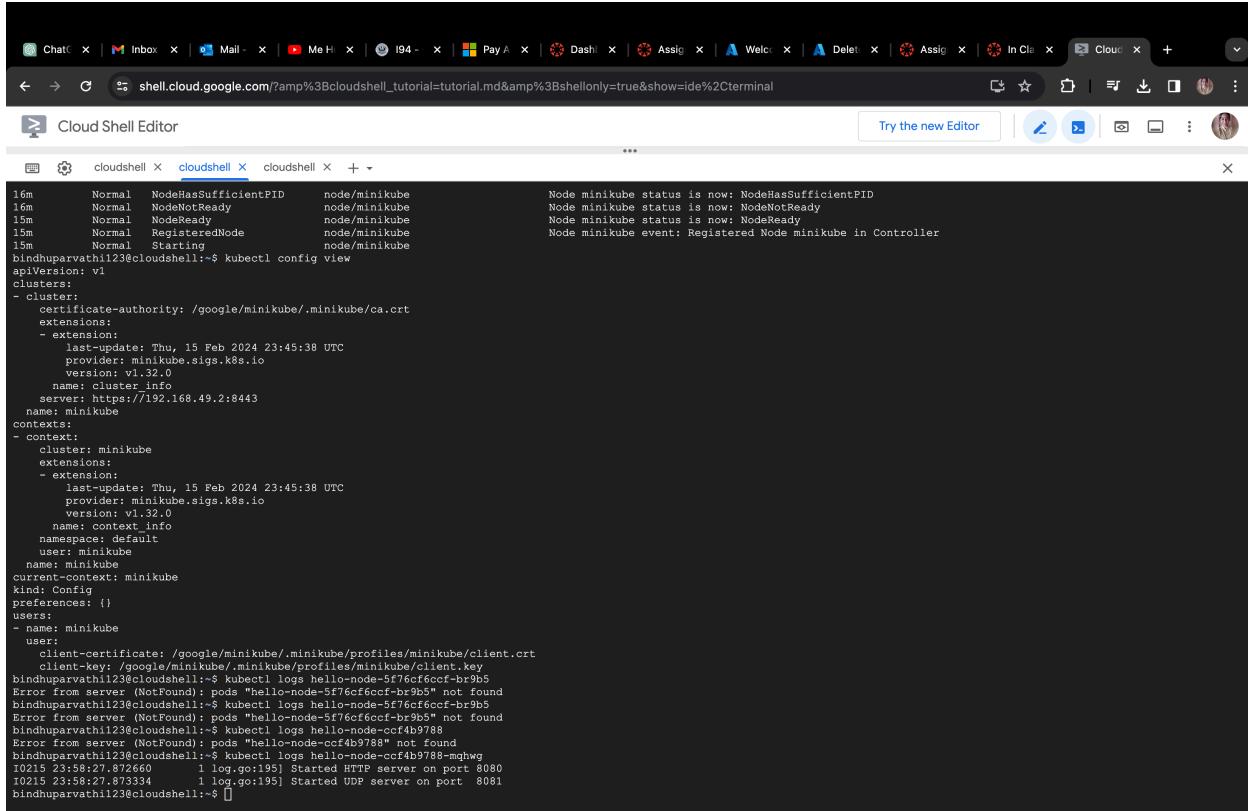
  minikube addons enable metrics-server

* Verifying dashboard health ...
```

```
{
  "paths": [
    "/.well-known/openid-configuration",
    "/api",
    "/api/v1",
    "/apis",
    "/apis/*",
    "/apis/admissionregistration.k8s.io",
    "/apis/admissionregistration.k8s.io/v1",
    "/apis/apiextensions.k8s.io",
    "/apis/apiextensions.k8s.io/v1",
    "/apis/apiregistration.k8s.io",
    "/apis/apiregistration.k8s.io/v1",
    "/apis/apps",
    "/apis/apps/v1",
    "/apis/authentication.k8s.io",
    "/apis/authentication.k8s.io/v1",
    "/apis/authorization.k8s.io",
    "/apis/authorization.k8s.io/v1",
    "/apis/autoscaling",
    "/apis/autoscaling/v1",
    "/apis/autoscaling/v2",
    "/apis/batch",
    "/apis/batch/v1",
    "/apis/certificates.k8s.io",
    "/apis/certificates.k8s.io/v1",
    "/apis/configration.k8s.io",
    "/apis/configration.k8s.io/v1",
    "/apis/discovery.k8s.io",
    "/apis/discovery.k8s.io/v1",
    "/apis/events.k8s.io",
    "/apis/events.k8s.io/v1",
    "/apis/flowcontrol.apiserver.k8s.io",
    "/apis/flowcontrol.apiserver.k8s.io/vbeta2",
    "/apis/flowcontrol.apiserver.k8s.io/vbeta3",
    "/apis/networking.k8s.io",
    "/apis/networking.k8s.io/v1",
    "/apis/node.k8s.io",
    "/apis/node.k8s.io/v1",
    "/apis/policy",
    "/apis/policy/v1",
    "/apis/rbac.authorization.k8s.io",
    "/apis/rbac.authorization.k8s.io/v1",
    "/apis/scheduling.k8s.io",
    "/apis/scheduling.k8s.io/v1",
    "/apis/storage.k8s.io",
    "/apis/storage.k8s.io/v1",
    "/healthz",
    "/apis/autoregister-completion",
    "/healthz/etcd",
    "/healthz/lon",
    "/healthz/ping",
    "/healthz/poststarthook/aggregator-reload-proxy-client-cert",
    "/healthz/poststarthook/apiservice-discovery-controller",
    "/healthz/nontstarthook/apiservice-nonnanicontroller"
  ]
}
```



Welcome to Cloud Shell! Type "help" to get started.  
To set your Cloud Platform project in this session use "gcloud config set project [PROJECT\_ID]"  
bindhuparvathi123@cloudshell:~\$ kubectl create deployment hello-node --image=registry.k8s.io/e2e-test-images/agnhost:2.39 -- /agnhost netexec --http-port=8080  
deployment.apps/hello-node created  
bindhuparvathi123@cloudshell:~\$ kubectl get deployments  
NAME READY UP-TO-DATE AVAILABLE AGE  
hello-node 1/1 1 1 11s  
bindhuparvathi123@cloudshell:~\$ kubectl get pods  
NAME READY STATUS RESTARTS AGE  
hello-node-ccf4b9788-mqhwg 1/1 Running 0 3m1s  
bindhuparvathi123@cloudshell:~\$ kubectl get events  
LAST SEEN TYPE Reason MESSAGE  
3m10s Normal Scheduled pod/hello-node-ccf4b9788-mqhwg Successfully assigned default/hello-node-ccf4b9788-mqhwg to minikube  
3m14s Normal Pulling pod/hello-node-ccf4b9788-mqhwg Pulling image "registry.k8s.io/e2e-test-images/agnhost:2.39"  
3m10s Normal Pulled pod/hello-node-ccf4b9788-mqhwg Successfully pulled image "registry.k8s.io/e2e-test-images/agnhost:2.39" in 3.309s (3.309s including waiting)  
3m10s Normal Created pod/hello-node-ccf4b9788-mqhwg Created container agnhost  
3m10s Normal Started pod/hello-node-ccf4b9788-mqhwg Started container agnhost  
3m44s Normal SuccessfulCreate replicaset/hello-node-ccf4b9788 Created pod: hello-node-ccf4b9788-mqhwg  
3m44s Normal ScalingReplicaSet deployment/hello-node Scaled up replica set hello-node-ccf4b9788 to 1  
16m Normal Starting node/minikube Starting kubelet.  
16m Normal NodeHasSufficientMemory node/minikube Node minikube status is now: NodeHasSufficientMemory  
16m Normal NodeHasNoDiskPressure node/minikube Node minikube status is now: NodeHasNoDiskPressure  
16m Normal NodeHasSufficientPID node/minikube Node minikube status is now: NodeHasSufficientPID  
16m Normal NodeNotReady node/minikube Node minikube status is now: NodeNotReady  
15m Normal NodeReady node/minikube Node minikube status is now: NodeReady  
15m Normal RegisteredNode node/minikube Node minikube event: Registered Node minikube in Controller  
15m Normal Starting node/minikube Node minikube event: Registered Node minikube in Controller  
bindhuparvathi123@cloudshell:~\$ kubectl config view  
apiVersion: v1  
clusters:  
- cluster:  
 certificate-authority: /google/minikube/.minikube/ca.crt  
 extensions:  
 - extension:  
 last-update: Thu, 15 Feb 2024 23:45:38 UTC  
 provider: minikube.sigs.k8s.io  
 version: v1.32.0  
 name: cluster info  
 server: https://192.168.49.2:8443  
name: minikube  
contexts:  
- context:  
 cluster: minikube  
 extensions:  
 - extension:  
 last-update: Thu, 15 Feb 2024 23:45:38 UTC  
 provider: minikube.sigs.k8s.io



16m Normal NodeHasSufficientPID node/minikube Node minikube status is now: NodeHasSufficientPID  
16m Normal NodeNotReady node/minikube Node minikube status is now: NodeNotReady  
15m Normal NodeReady node/minikube Node minikube status is now: NodeReady  
15m Normal RegisteredNode node/minikube Node minikube event: Registered Node minikube in Controller  
bindhuparvathi123@cloudshell:~\$ kubectl config view  
apiVersion: v1  
clusters:  
- cluster:  
 certificate-authority: /google/minikube/.minikube/ca.crt  
 extensions:  
 - extension:  
 last-update: Thu, 15 Feb 2024 23:45:38 UTC  
 provider: minikube.sigs.k8s.io  
 version: v1.32.0  
 name: cluster info  
 server: https://192.168.49.2:8443  
name: minikube  
contexts:  
- context:  
 cluster: minikube  
 extensions:  
 - extension:  
 last-update: Thu, 15 Feb 2024 23:45:38 UTC  
 provider: minikube.sigs.k8s.io  
 version: v1.32.0  
 name: context\_info  
 namespace: default  
 user: minikube  
 user: minikube  
 user: minikube  
current-context: minikube  
kind: Config  
preferences: {}  
users:  
- name: minikube  
 user:  
 client-certificate: /google/minikube/.minikube/profiles/minikube/client.crt  
 client-key: /google/minikube/.minikube/profiles/minikube/client.key  
bindhuparvathi123@cloudshell:~\$ kubectl logs hello-node-5f76cf6ccf-br9b5  
Error from server (NotFound): pods "hello-node-5f76cf6ccf-br9b5" not found  
bindhuparvathi123@cloudshell:~\$ kubectl logs hello-node-5f76cf6ccf-br9b5  
Error from server (NotFound): pods "hello-node-5f76cf6ccf-br9b5" not found  
bindhuparvathi123@cloudshell:~\$ kubectl logs hello-node-ccf4b9788  
Error from server (NotFound): pods "hello-node-ccf4b9788" not found  
bindhuparvathi123@cloudshell:~\$ kubectl logs hello-node-ccf4b9788-mqhwg  
I0215 23:58:27.872660 1 log.go:195] Started HTTP server on port 8080  
I0215 23:58:27.873334 1 log.go:195] Started UDP server on port 8081  
bindhuparvathi123@cloudshell:~\$ [

Cloud Shell Editor

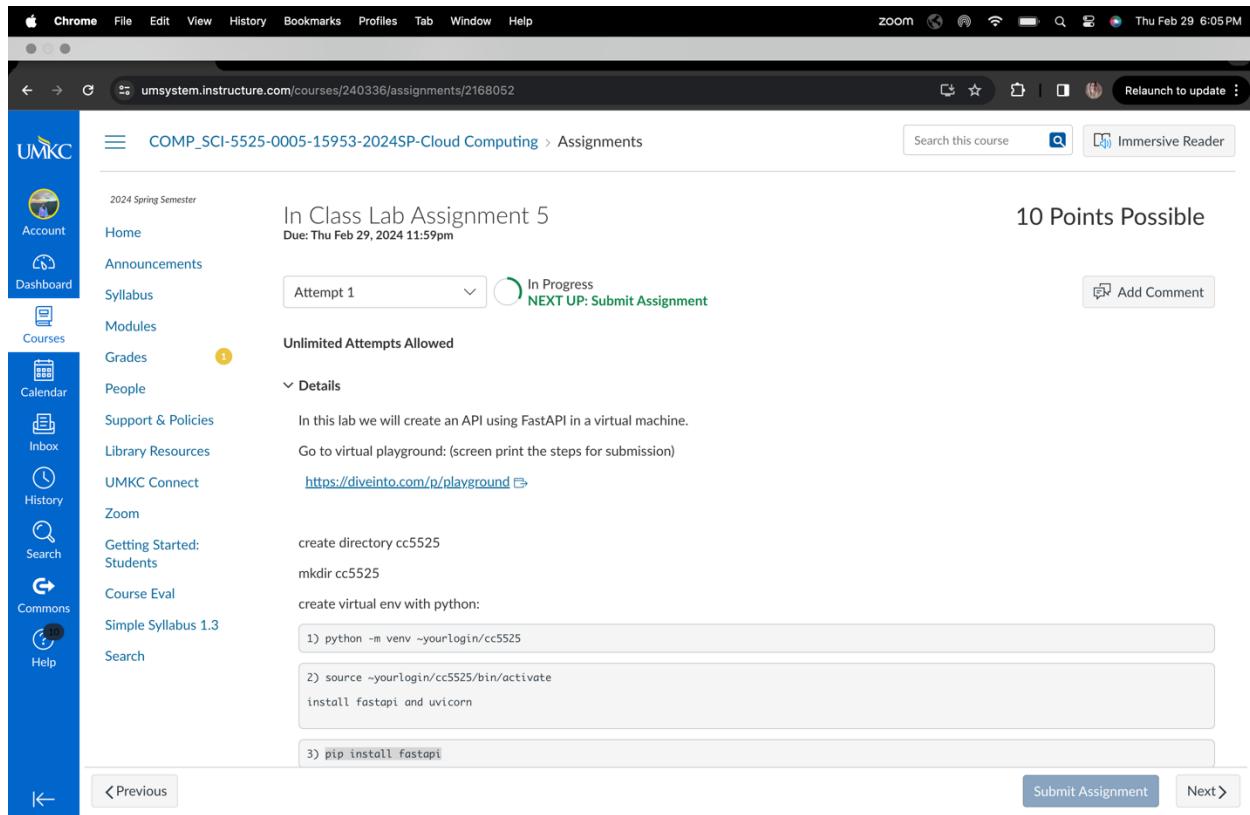
```
* Opening service default/hello-node in default browser...
http://192.168.49.2:31747
binduparvathi123@cloudshell:~$ minikube addons list
----|----|----|----|----|
| ADDON NAME | PROFILE | STATUS | MAINTAINER |
----|----|----|----|----|
| ambassador | minikube | disabled | 3rd party (Ambassador) |
| auto-pause | minikube | disabled | minikube |
| cloud-spanner | minikube | disabled | Google |
| csi-hostpath-driver | minikube | disabled | Kubernetes |
| dashboard | minikube | enabled | [minikube] |
| default-storageclass | minikube | enabled | Kubernetes |
| efk | minikube | disabled | 3rd party (Elastic) |
| freshpod | minikube | disabled | Google |
| gcp-auth | minikube | disabled | Google |
| gvisor | minikube | disabled | minikube |
| headlamp | minikube | disabled | 3rd party (kinvolk.io) |
| helm-tiller | minikube | disabled | 3rd party (Helm) |
| inacel | minikube | disabled | 3rd party (InAccel) |
| ingress | minikube | disabled | Kubernetes |
| ingress-dns | minikube | disabled | minikube |
| inspektor-gadget | minikube | disabled | 3rd party ([inspektor-gadget.io]) |
| istio | minikube | disabled | 3rd party (Istio) |
| istio-provisioner | minikube | disabled | 3rd party (Istio) |
| kong | minikube | disabled | 3rd party (Kong HQ) |
| kubeflow | minikube | disabled | 3rd party |
| kubevirt | minikube | disabled | 3rd party (KubeVirt) |
| logviewer | minikube | disabled | 3rd party (unknown) |
| metallb | minikube | disabled | 3rd party (MetalLB) |
| metrics-server | minikube | disabled | Kubernetes |
| nvidia-device-plugin | minikube | disabled | 3rd party (NVIDIA) |
| nvidia-driver-installer | minikube | disabled | 3rd party (Nvidia) |
| nvidia-gpu-device-plugin | minikube | disabled | 3rd party (Nvidia) |
| olm | minikube | disabled | 3rd party (Operator Framework) |
| pod-security-policy | minikube | disabled | 3rd party (unknown) |
| portainer | minikube | disabled | 3rd party (Portainer.io) |
| registry | minikube | disabled | minikube |
| registry-aliases | minikube | disabled | 3rd party (unknown) |
| registry-creds | minikube | disabled | 3rd party (UPMC Enterprises) |
| storage-provisioner | minikube | enabled | [minikube] |
| storage-provisioner-gluster | minikube | disabled | 3rd party (Gluster) |
| storage-provisioner-rancher | minikube | disabled | 3rd party (Rancher) |
| volumesnapshots | minikube | disabled | Kubernetes |
----|----|----|----|----|
binduparvathi123@cloudshell:~$ minikube addons enable metrics-server
```

Cloud Shell Editor

```
* The 'metrics-server' addon is enabled
binduparvathi123@cloudshell:~$ minikube addons list
----|----|----|----|----|
| ADDON NAME | PROFILE | STATUS | MAINTAINER |
----|----|----|----|----|
| ambassador | minikube | disabled | 3rd party (Ambassador) |
| auto-pause | minikube | disabled | minikube |
| cloud-spanner | minikube | disabled | Google |
| csi-hostpath-driver | minikube | disabled | Kubernetes |
| dashboard | minikube | enabled | [minikube] |
| default-storageclass | minikube | enabled | Kubernetes |
| efk | minikube | disabled | 3rd party (Elastic) |
| freshpod | minikube | disabled | Google |
| gcp-auth | minikube | disabled | Google |
| gvisor | minikube | disabled | minikube |
| headlamp | minikube | disabled | 3rd party (kinvolk.io) |
| helm-tiller | minikube | disabled | 3rd party (Helm) |
| inacel | minikube | disabled | [info@inacel.com] |
| ingress | minikube | disabled | Kubernetes |
| ingress-dns | minikube | disabled | minikube |
| inspektor-gadget | minikube | disabled | 3rd party ([inspektor-gadget.io]) |
| istio | minikube | disabled | 3rd party (Istio) |
| istio-provisioner | minikube | disabled | 3rd party (Istio) |
| kong | minikube | disabled | 3rd party (Kong HQ) |
| kubeflow | minikube | disabled | 3rd party |
| kubevirt | minikube | disabled | 3rd party (KubeVirt) |
| logviewer | minikube | disabled | 3rd party (unknown) |
| metallb | minikube | disabled | 3rd party (MetalLB) |
| metrics-server | minikube | enabled | Kubernetes |
| nvidia-device-plugin | minikube | disabled | 3rd party (NVIDIA) |
| nvidia-driver-installer | minikube | disabled | 3rd party (Nvidia) |
| nvidia-gpu-device-plugin | minikube | disabled | 3rd party (Nvidia) |
| olm | minikube | disabled | 3rd party (Operator Framework) |
| pod-security-policy | minikube | disabled | 3rd party (unknown) |
| portainer | minikube | disabled | 3rd party (Portainer.io) |
| registry | minikube | disabled | minikube |
| registry-aliases | minikube | disabled | 3rd party (unknown) |
| registry-creds | minikube | disabled | 3rd party (UPMC Enterprises) |
| storage-provisioner | minikube | enabled | [minikube] |
| storage-provisioner-gluster | minikube | disabled | 3rd party (Gluster) |
| storage-provisioner-rancher | minikube | disabled | 3rd party (Rancher) |
| volumesnapshots | minikube | disabled | Kubernetes |
----|----|----|----|----|
binduparvathi123@cloudshell:~$
```

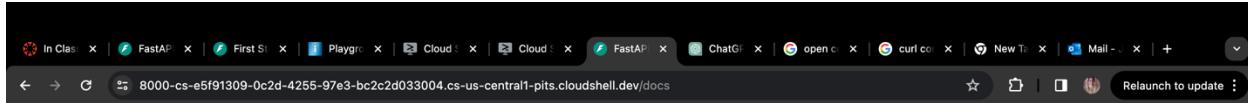
The Minikube cluster creation and Kubernetes exploration involved initiating the cluster with 'minikube start', accessing the Kubernetes Dashboard through 'minikube dashboard', and deploying a web server using 'kubectl create deployment'. The service exposing the application to the public internet was established with 'kubectl expose deployment'. Additionally, the tutorial showcased the enabling and disabling of Minikube addons, specifically the metrics-server. The cleanup process involved deleting the Deployment and Service with 'kubectl delete' commands, stopping the Minikube cluster using 'minikube stop', and optionally deleting the Minikube VM. This practical experience provided fundamental insights into Kubernetes basics and efficient cluster management.

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**16338568**  
**Cloud Computing – CS5525**



The screenshot shows a web browser window for the course COMP\_SCI-5525-0005-15953-2024SP-Cloud Computing. The assignment page displays the following details:

- Title:** In Class Lab Assignment 5
- Due Date:** Thu Feb 29, 2024 11:59pm
- Status:** In Progress
- Points Possible:** 10 Points Possible
- Description:** In this lab we will create an API using FastAPI in a virtual machine.
- Links:** Go to virtual playground: ([screen print the steps for submission](https://diveinto.com/p/playground))
- Code Snippets:**
  - 1) python -m venv ~yourlogin/cc5525
  - 2) source ~yourlogin/cc5525/bin/activate  
install fastapi and uvicorn
  - 3) pip install fastapi
- Buttons:** Previous, Submit Assignment, Next



## FastAPI 0.1.0 OAS 3.1

/openapi.json

### default

GET / Root

POST / Root

GET /items/{item\_id} Read Item

POST /item/{item\_id} Create Item

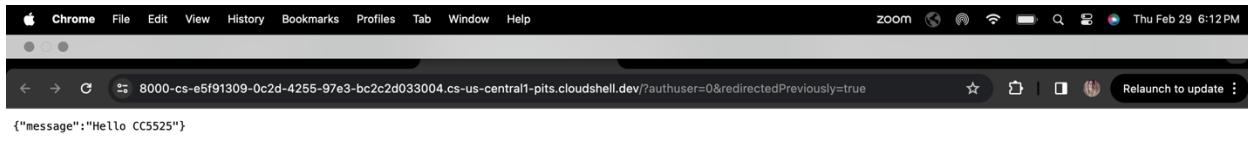
### Schemas

HTTPValidationError > Expand all object

ValidationError > Expand all object

```
Cloud Shell Editor
Welcome x Start Walkthroughs
cloudshell x cloudshell x + x

Using cached exceptiongroup-1.2.0-py3-none-any.whl (16 kB)
Collecting idna>=2.0
  Using cached idna-3.6-py3-none-any.whl (61 kB)
Installing collected packages: typing-extensions, sniffio, idna, exceptiongroup, pydantic-core, aiohttp, annotated-types, starlette, pydantic, fastapi
Successfully installed annotated-types-0.6.0 aiohttp-4.3.0 exceptiongroup-1.2.0 fastapi-0.11.0 idna-3.6 pydantic-2.6.3 pydantic-core-2.16.3 sniffio-1.3.1 starlette-0.36.3 typing-extensi
ons-4.10.0
(cc5525) bindhuparvathil23@cloudshell:~/cs5525$ pip install uvicorn
Collecting uvicorn
  Downloading uvicorn-0.27.1-py3-none-any.whl (60 kB)
|██████████| 60 kB 1.2 MB/s
Collecting click>=7.0
  Downloading click-8.1.7-py3-none-any.whl (97 kB)
|██████████| 97 kB 1.4 MB/s
Requirement already satisfied: typing-extensions>=4.1.0 in ./bj35v/cc5525/lib/python3.9/site-packages (from uvicorn) (4.10.0)
Collecting h11<=0.8
  Downloading h11-0.14.0-py3-none-any.whl (58 kB)
|██████████| 58 kB 3.8 MB/s
Installing collected packages: h11, click, uvicorn
Successfully installed click-8.1.7 h11-0.14.0 uvicorn-0.27
(cc5525) bindhuparvathil23@cloudshell:~/cs5525$ vi main.py
(cc5525) bindhuparvathil23@cloudshell:~/cs5525$ uvicorn main:app --reload
INFO: Will watch for changes in these directories: ['/home/bindhuparvathil23/cs5525']
INFO: Uvicorn running on http://127.0.0.1:8000 (Press CTRL+C to quit)
INFO: Started reloader process [1694] using StatReload
INFO: Started server process [1694]
INFO: Waiting for application startup.
INFO: Application startup complete.
INFO: Shutting down
INFO: Waiting for application shutdown.
INFO: Application shutdown complete.
INFO: Finished server process [1694]
INFO: Stopping reloader process [1694]
(cc5525) bindhuparvathil23@cloudshell:~/cs5525$ uvicorn main:app --reload
INFO: Will watch for changes in these directories: ['/home/bindhuparvathil23/cs5525']
INFO: Uvicorn running on http://127.0.0.1:8000 (Press CTRL+C to quit)
INFO: Started reloader process [1709] using StatReload
INFO: Started server process [1711]
INFO: Waiting for application startup.
INFO: Application startup complete.
INFO: 127.0.0.1:49862 - "GET /?authuser=0&redirectedPreviously=true HTTP/1.1" 200 OK
INFO: 127.0.0.1:49862 - "GET /favicon.ico HTTP/1.1" 404 Not Found
```

A screenshot of a Cloud Shell Editor window titled 'Cloud Shell Editor'. The main area shows a terminal session with the following content:

```
self.run()
File "/usr/lib/python3.9/multiprocessing/process.py", line 108, in run
    self._target(*self._args, **self._kwargs)
File "/home/bindhuparvathi123/cs5525-/bj35v/cc5525/lib/python3.9/site-packages/uvicorn/_subprocess.py", line 78, in subprocess_started
    target(sockets=sockets)
File "/home/bindhuparvathi123/cs5525-/bj35v/cc5525/lib/python3.9/site-packages/uvicorn/server.py", line 62, in run
    return asyncio.run(self._serve(sockets=sockets))
File "/usr/lib/python3.9/asyncio/runners.py", line 44, in run
    return loop.run_until_complete(main)
File "/usr/lib/python3.9/asyncio/base_events.py", line 642, in run_until_complete
    return future.result()
File "/home/bindhuparvathi123/cs5525-/bj35v/cc5525/lib/python3.9/site-packages/uvicorn/server.py", line 69, in serve
    config.loaded()
File "/home/bindhuparvathi123/cs5525-/bj35v/cc5525/lib/python3.9/site-packages/uvicorn/config.py", line 458, in load
    self._loaded_app = import_from_string(self.app)
File "/home/bindhuparvathi123/cs5525-/bj35v/cc5525/lib/python3.9/site-packages/uvicorn/importer.py", line 21, in import_from_string
    module = importlib.import_module(module_str)
File "/usr/lib/python3.9/importlib/_bootstrap__.py", line 127, in import_module
    return _bootstrap._gcd_import(name[level:], package, level)
File "<frozen importlib._bootstrap>", line 1030, in _gcd_import
    file, _level0, in _find_and_load
File "<frozen importlib._bootstrap>", line 986, in _find_and_load_unlocked
File "<frozen importlib._bootstrap>", line 980, in _find_and_load
File "<frozen importlib._bootstrap_external>", line 785, in exec_module
File "<frozen importlib._bootstrap_external>", line 923, in get_code
File "<frozen importlib._bootstrap_external>", line 853, in source_to_code
File "<frozen importlib._bootstrap>", line 228, in _call_with_frames_removed
File "/home/bindhuparvathi123/cs5525/main.py", line 13
    @app.get("/{item_id}")
    ^
IndentationError: unindent does not match any outer indentation level
^C[INFO:  Stopping reloader process [1708]
(cc5525) bindhuparvathi123@cloudshell:~/cs5525$ vi main.py
(cc5525) bindhuparvathi123@cloudshell:~/cs5525$ uvicorn main:app --reload
INFO:  Will watch for changes in these directories: ['/home/bindhuparvathi123/cs5525']
INFO:  Unicorn running on http://127.0.0.1:8000 (Press CTRL+C to quit)
INFO:  Started reloader process [2537] using StatReload
INFO:  Started server process [2539]
INFO:  Waiting for application startup.
INFO:  Application startup complete.
INFO:  127.0.0.1:60852 - "GET /?authuser=0 HTTP/1.1" 200 OK
```

The terminal shows a user interacting with the Cloud Shell, running a Python script, and starting a Uvicorn server. The logs at the bottom show the server is running on port 8000 and handling a GET request for the root path.

The screenshot shows a Cloud Shell Editor interface within a web browser. The title bar includes tabs for 'In Class' (active), 'First Steps', 'Cloud Shell' (selected), and several other '8000' and '8000-CS' tabs. The main area displays a Python script named 'main.py' with the following content:

```
from fastapi import FastAPI
from typing import Optional

app = FastAPI()

@app.get("/")
async def root():
    return {"message": "Hello World"}

@app.post("/")
async def root():
    return {"message": "This is Bindu"}


@app.get("/items/{item_id}")
async def read_item(item_id: int, query: Optional[str]=None):
    return {"item_id": item_id, "query": query}

@app.post("/items/{item_id}")
async def create_item(item_id: int, query: Optional[str]=None):
    return {"item_id": item_id, "query": query}

~
```

The status bar at the bottom indicates the file has 23L and 504B. The browser toolbar at the very bottom shows 'Chrome' and various system icons.

The screenshot shows a browser window with multiple tabs open. The active tab is for the FastAPI documentation at [https://8000-cs-e5f91309-0c2d-4255-97e3-bc2c2d033004.cs-us-central1-pits.cloudshell.dev/docs#](https://8000-cs-e5f91309-0c2d-4255-97e3-bc2c2d033004.cs-us-central1-pits.cloudshell.dev/docs#/). The page displays the 'default' API endpoint. It includes a 'GET / Root' section with parameters, responses (including a curl command and request URL), and a detailed server response with code 200, showing a JSON body with "message": "Hello World".

## default

GET / Root

Parameters

No parameters

Responses

Curl

```
curl -X 'GET' \
  'https://8000-cs-e5f91309-0c2d-4255-97e3-bc2c2d033004.cs-us-central1-pits.cloudshell.dev/' \
  -H 'accept: application/json'
```

Request URL

```
https://8000-cs-e5f91309-0c2d-4255-97e3-bc2c2d033004.cs-us-central1-pits.cloudshell.dev/
```

Server response

Code	Details
200	<p>Response body</p> <pre>{ "message": "Hello World" }</pre> <p>Download</p> <p>Response headers</p> <pre>content-length: 25 content-type: application/json date: Fri, 01 Mar 2024 00:59:02 GMT server: uvicorn</pre>

The screenshot shows a browser window with multiple tabs open. The active tab is for the FastAPI documentation at [https://8000-cs-e5f91309-0c2d-4255-97e3-bc2c2d033004.cs-us-central1-pits.cloudshell.dev/docs#/default/read\\_item\\_items\\_item\\_id\\_get](https://8000-cs-e5f91309-0c2d-4255-97e3-bc2c2d033004.cs-us-central1-pits.cloudshell.dev/docs#/default/read_item_items_item_id_get). The page displays the 'read\_item\_items\_item\_id\_get' API endpoint. It includes a form for inputting parameters: 'item\_id' (required, integer, path) set to 123, and 'query' (query) set to Hello Class. Below the form are sections for 'Responses', 'Curl' (showing a curl command with the query parameter), 'Request URL' (showing the full URL with the query parameter), and a detailed 'Server response' section with code 200, showing a JSON body with 'item\_id': 123 and 'query': "Hello Class".

In Class | FastAPI - | First Step | Playgroup | Cloud Sh | Cloud Sh | ChatGPT | open com | curl com | New Tab | Mail - Jc | + | Relaunch to update :

8000-CS-e5f91309-0c2d-4255-97e3-bc2c2d033004.cs-us-central1-pits.cloudshell.dev/docs#/default/read\_item\_items\_\_item\_id\_\_get

content-type: application/json  
date: Fri, 01 Mar 2024 01:03:03 GMT  
server: uvicorn

Responses

Code	Description	Links
200	Successful Response	No links
422	Validation Error	No links

Code: application/json

Example Value | Schema

```
"string"
```

Code: application/json

Example Value | Schema

```
{
  "detail": [
    {
      "loc": [
        "string",
        0,
        "msg",
        "type"
      ],
      "msg": "string",
      "type": "string"
    }
  ]
}
```

POST /item/{item\_id} Create Item

Parameters

Cancel

In Class | FastAPI - | First Step | Playgroup | Cloud Sh | Cloud Sh | ChatGPT | open com | curl com | New Tab | Mail - Jc | + | Relaunch to update :

Request URL  
<https://8000-CS-e5f91309-0c2d-4255-97e3-bc2c2d033004.cs-us-central1-pits.cloudshell.dev/item/987?query=hello%20class>

Server response

Code	Details
200	Response body <pre>{"item_id": 987, "query": "hello class"}</pre> Download

Response headers

```
access-control-allow-credentials: true  
access-control-allow-methods: GET,POST,OPTIONS,PATCH,DELETE  
access-control-allow-origin: https://8000-CS-e5f91309-0c2d-4255-97e3-bc2c2d033004.cs-us-central1-pits.cloudshell.dev  
content-length: 37  
content-type: application/json  
date: Fri, 01 Mar 2024 01:03:04 GMT  
server: uvicorn
```

Responses

Code	Description	Links
200	Successful Response	No links
422	Validation Error	No links

Code: application/json

Example Value | Schema

```
"string"
```

Code: application/json

Example Value | Schema

```
{}
```

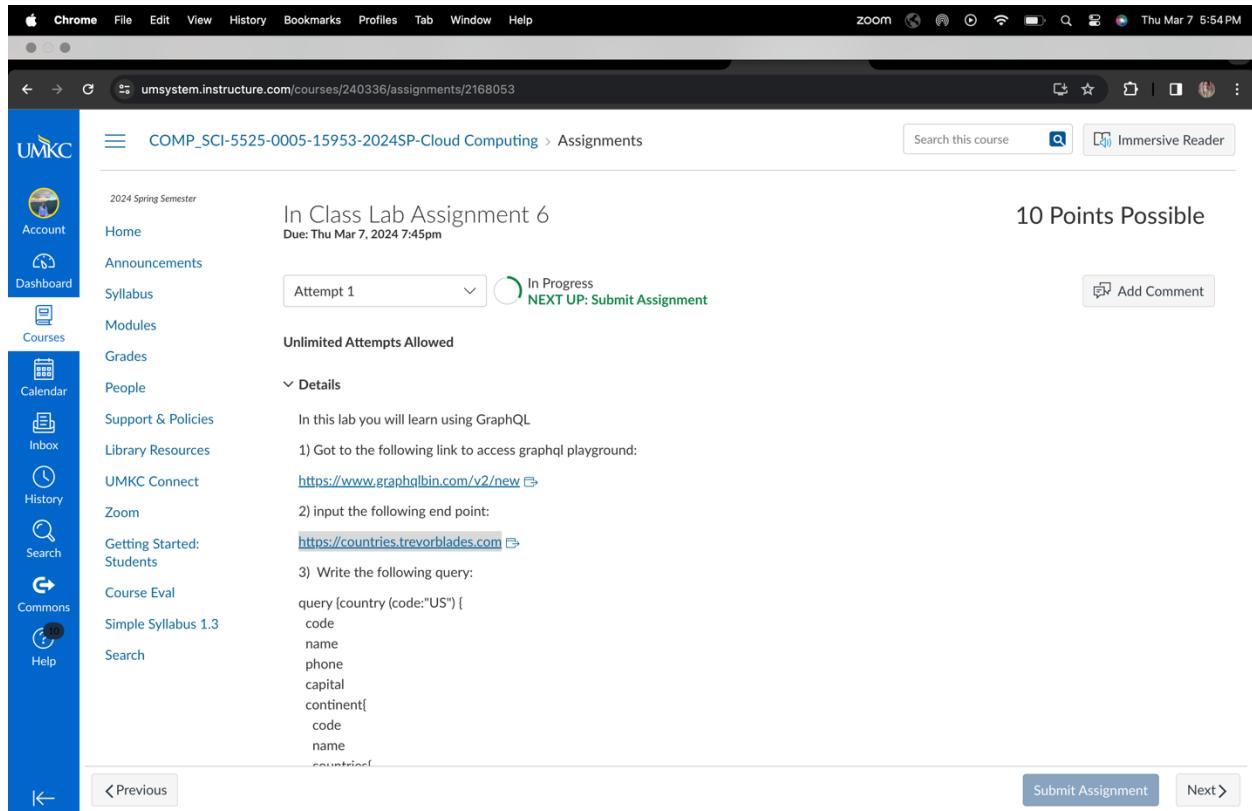
In this class lab, we learned how to set up a FastAPI project from scratch using a virtual environment. The step-by-step process involved creating a directory, setting up a virtual environment, installing FastAPI and Uvicorn, and creating a simple FastAPI application with GET and POST endpoints.

The tutorial guided us through the basics of creating routes, handling path parameters, and working with optional query parameters. We also saw how to start the development server using Uvicorn and how to make changes to the application code, with automatic reloading enabled.

Through this hands-on experience, we gained practical insights into building APIs with FastAPI, understanding the structure of a FastAPI project, and creating endpoints that respond to different HTTP methods. The ability to define route parameters, handle optional query parameters, and implement a POST endpoint added to our understanding of building more complex API functionalities.

Overall, this lab provided a solid foundation for working with FastAPI, enabling us to create and run a simple API, and it serves as a valuable introduction to building APIs with FastAPI in a Python environment.

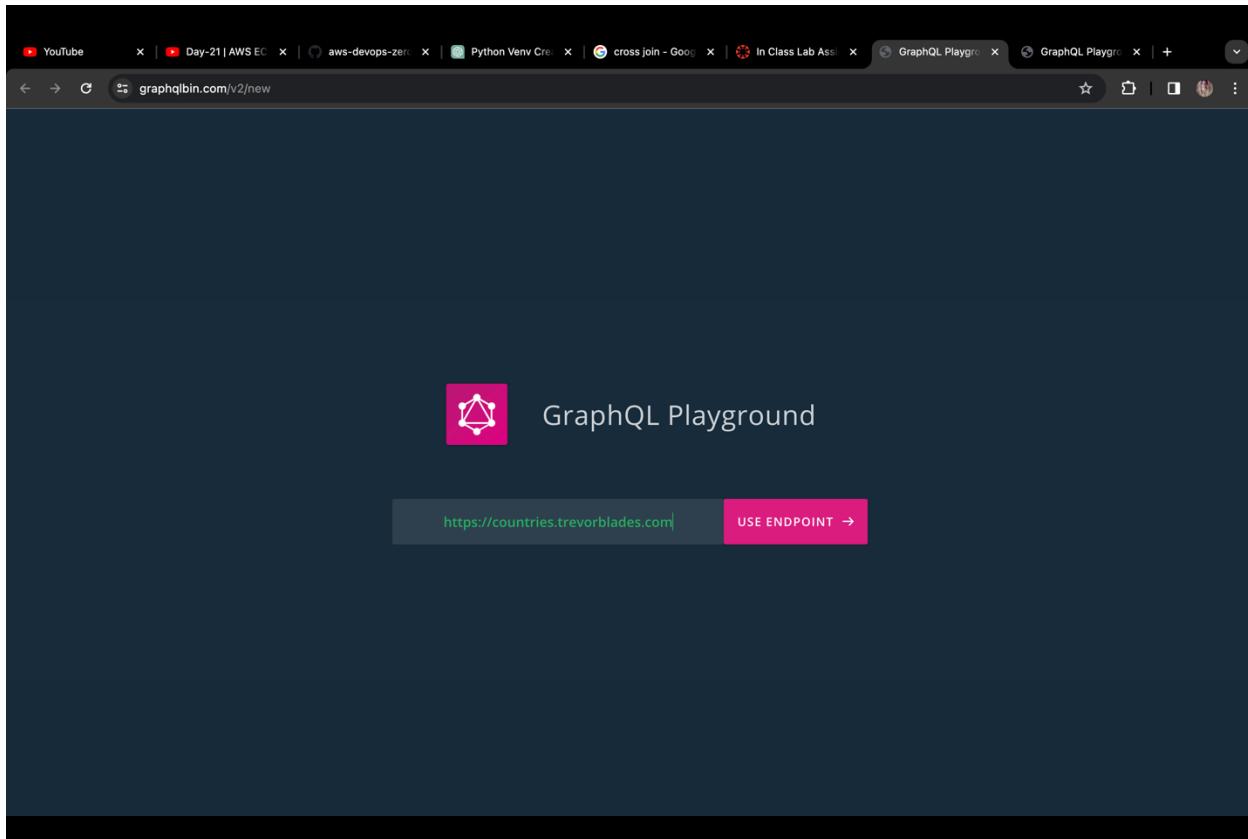
**Bindu Parvati, Jonnala Gadda  
16338568**  
**Cloud Computing- In class lab assignment-6**



The screenshot shows a web browser window for Chrome, displaying a course assignment page from umsystem.instructure.com. The URL in the address bar is <https://umsystem.instructure.com/courses/240336/assignments/2168053>. The page title is "COMP\_SCI-5525-0005-15953-2024SP-Cloud Computing > Assignments". On the left, there is a sidebar with various UMKC links: Account, Dashboard, Courses, Calendar, Inbox, History, Search, Commons, and Help. The main content area shows an assignment titled "In Class Lab Assignment 6" due on "Thu Mar 7, 2024 7:45pm". It has a status of "In Progress" and "NEXT UP: Submit Assignment". A dropdown menu shows "Attempt 1". The assignment details include "Unlimited Attempts Allowed" and a "Details" section describing the task: "In this lab you will learn using GraphQL". It lists three steps: 1) Go to the following link to access graphql playground: <https://www.graphqlbin.com/v2/new>; 2) input the following end point: <https://countries.trevorblades.com>; 3) Write the following query: 

```
query {country (code:"US") {code name phone capital continent{code name}}}
```

. At the bottom, there are "Previous" and "Next" buttons, and "Submit Assignment" and "Add Comment" buttons.

This screenshot shows the GraphQL Playground interface with a dark theme, displaying a complex query and its results. The query is as follows:

```
1 v query {country (code:"US") {  
2   code  
3   name  
4   phone  
5   capital  
6   continent{  
7     code  
8     name  
9     countries{  
10       name  
11       code  
12     }  
13   }  
14 }  
15 }  
16 # Write your query or mutation here  
17
```

The results pane on the right shows the JSON response for the "US" country, including its details and a list of its dependencies. The results are displayed in a hierarchical tree structure with expandable nodes. A play button icon is positioned above the results tree.

A screenshot of the GraphQL playground interface on [graphqlbin.com/v2/new](https://graphqlbin.com/v2/new). The query is:

```
1 query {country (code:"US") {  
2   code  
3   name  
4   phone  
5   capital  
6   continent{  
7     code  
8     name  
9     countries{  
10       name  
11       code  
12     }  
13   }  
14   languages{name}  
15 }  
16 }  
17 # Write your query or mutation here  
18 }
```

The response shows the data for the United States, including its continent (North America) and its languages (Antigua and Barbuda, Anguilla, Aruba, Barbados, Saint Barthélemy).

A screenshot of the GraphQL playground interface on [graphqlbin.com/v2/new](https://graphqlbin.com/v2/new). The query is:

```
1 # Write your query or mutation here  
2 query {country (code:"IN") {  
3   code  
4   name  
5   phone  
6   capital  
7   continent{  
8     code  
9     name  
10    countries{  
11      name  
12      code  
13    }  
14  }  
15  languages{  
16    name,  
17    native}  
18 }  
19 }  
20 # Write your query or mutation here  
21  
22 }
```

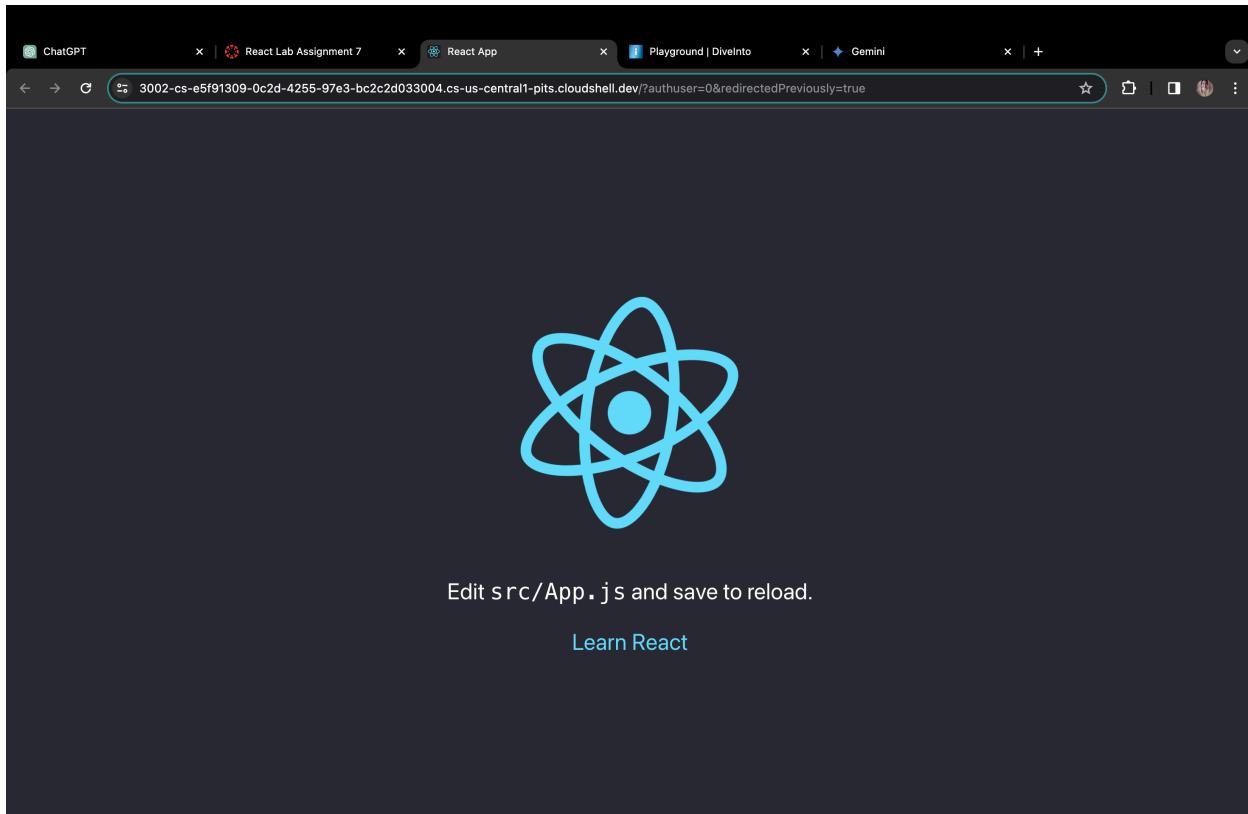
The response shows the data for India, including its continent (Asia) and its languages (United Arab Emirates, Afghanistan, Armenia, Azerbaijan, Bangladesh).

## In class Assignment 7- cloud computing

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The screenshot shows a browser window with three tabs: "React Lab Assignment 7", "Cloud Shell", and "React App". The "Cloud Shell" tab is active, displaying a terminal session on shell.cloud.google.com. The terminal output shows the process of creating a new React app named "hello-world". The command `npx create-react-app hello-world` was run, followed by the installation of dependencies and the creation of the app structure. A warning about vulnerabilities is shown, with 8 moderate and 6 high severity issues found. The final code snippet in the terminal is a simple React component definition:

```
Welcome to Cloud Shell! Type "help" to get started.  
To set your Cloud Platform project in this session use "gcloud config set project [PROJECT_ID]"  
bindhuparvathi123@cloudshell:~$ which npx  
/usr/local/nvm/versions/node/v20.11.1/bin/npx  
bindhuparvathi123@cloudshell:~$ npx create-react-app hello-world  
Creating a new React app in /home/bindhuparvathi123/hello-world.  
Installing packages. This might take a couple of minutes.  
Installing react, react-dom, and react-scripts with cra-template...  
added 1492 packages in 2m  
255 packages are looking for funding  
  run 'npm fund' for details  
Initialized a git repository.  
Installing template dependencies using npm...  
added 69 packages, and changed 1 package in 14s  
259 packages are looking for funding  
  run 'npm fund' for details  
Removing template package using npm...  
removed 1 package, and audited 1561 packages in 4s  
259 packages are looking for funding  
  run 'npm fund' for details  
  8 vulnerabilities (2 moderate, 6 high)  
To address all issues (including breaking changes), run:  
  npm audit fix --force  
Run 'npm audit' for details.  
GNU nano 5.4  
import logo from './logo.svg';  
import './App.css';  
  
function App() {  
  return (  
    <div className="App">
```

A screenshot of a Cloud Shell terminal session. The URL in the address bar is "shell.cloud.google.com/?amp%3Bcloudshell\_tutorial=tutorial.md&%3Bshellonly=true&show=ide%2Cterminal". The terminal window shows a "Cloud Shell Editor" interface with tabs for "Welcome", "cloudshell", and "cloudshell". The terminal itself displays a series of command-line logs. The logs start with "Welcome to Cloud Shell! Type 'help' to get started." followed by "To set your Cloud Platform project in this session use 'gcloud config set project [PROJECT\_ID]'". Subsequent lines show directory navigation and file listing within a "hello-world" directory, including files like package.json, package-lock.json, README.md, src, index.css, index.js, logo.svg, reportWebVitals.js, setupTests.js, App.css, App.js, App.test.js, component, and App.test.js.

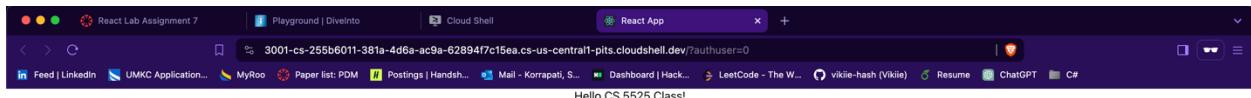
A screenshot of a Cloud Shell Editor window. The title bar says "Cloud Shell Editor". The main area contains the following React component code:

```
import logo from './logo.svg';
import './App.css';
import Hello from './component/Hello';

function App() {
  return (
    <div className="App">
      <Hello> </Hello>
    </div>
  );
}

export default App;
```

The code is mostly commented out with numerous single quotes ('). The status bar at the bottom right shows "1,1 All".



In this scenario, we first checked for the existence of **npx** in the virtual playground by using the **which npx** command. Once confirmed, we proceeded to create a new React application named **hello-world** using **npx create-react-app hello-world**. After navigating into the newly created **hello-world** directory, we started the React framework with **npm start**, launching the frontend on port 3000. Subsequently, we edited the **App.js** file in the **src** directory to update the default message to "Hello CC 5525 Class!". Following this, we worked with functional components by removing the content between the outer **div** tags in **App.js** and creating a new folder named **component** within the **src** directory. Inside this **component** folder, we created a **Hello.js** file containing a functional component named **Hello**, which renders the message "Hello CS 5525 Class!". Finally, we imported and used this **Hello** component in the **App.js** file, replacing the removed content. Upon saving the changes, the page refreshed automatically, reflecting the updated message. This sequence of steps demonstrates the process of creating and integrating functional components within a React application, enhancing its functionality and user experience.