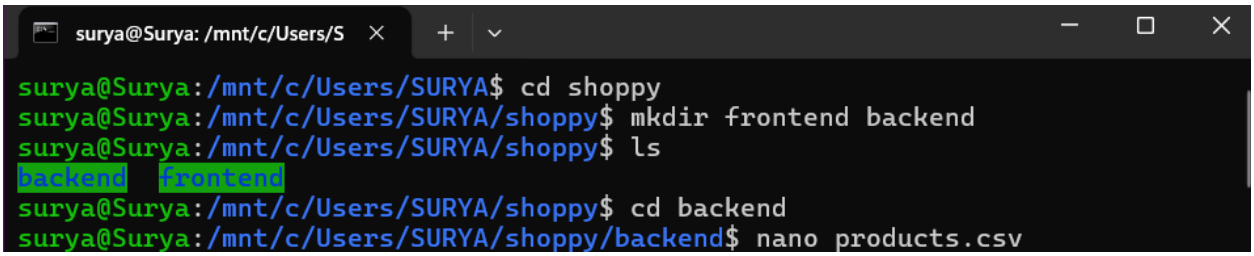
DevOps Task 3 & 4

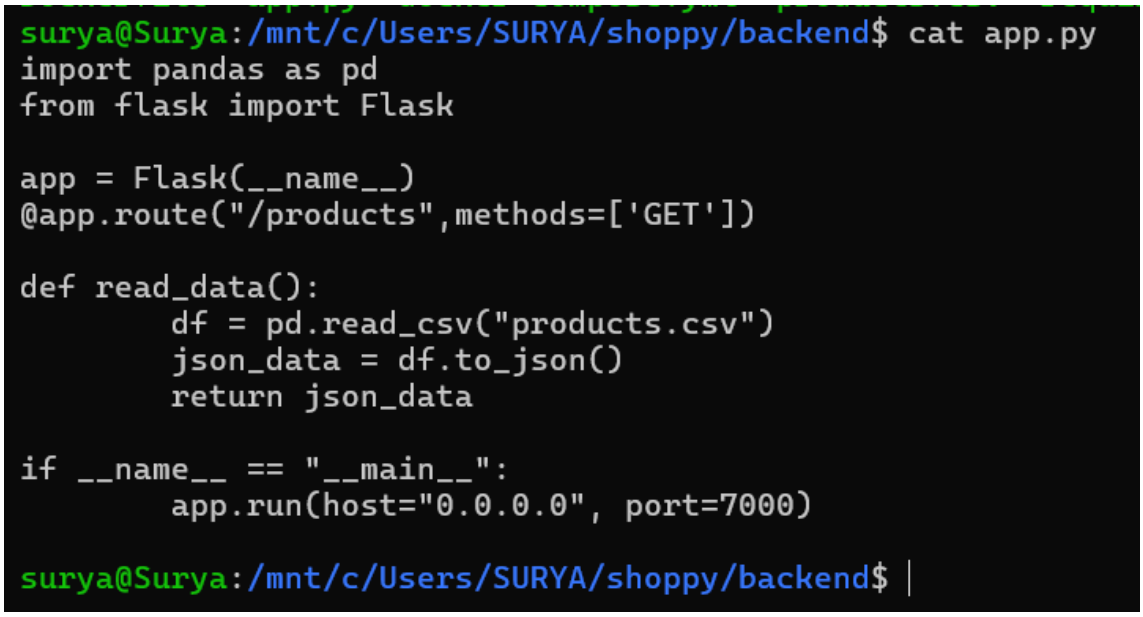
Step 1: create a directory (shoppy) and navigate to shoppy

Step 2: create folder for both frontend and backend

Step 3: Navigate to the backend and create products. csv file and add data (ID, NAME, PRICE,QUANTITY)



Create app.py and write a logic for data handling



Step 4: Install Python. Before that, you want to install pip and pandas for reading the datas from the CSV file

- **sudo apt update**
- **sudo apt install python3-pip**
- **pip3 --version # for verifying**
- **pip3 install pandas**

After completing the installation, run it by python3 app.py

```
surya@Surya:/mnt/c/Users/SURYA/shoppy/backend$ python3 app.py
    ID        Name  Price  Quantity
0  101  Smartphone  29999        50
1  102      Laptop  74999        30
2  103      Tablet  19999        45
3  104  Smartwatch   9999        70
4  105  Headphones   2999       100
{"ID":{"0":101,"1":102,"2":103,"3":104,"4":105,"5":106,"6":107,"7":1
08,"8":109,"9":110,"10":111,"11":112,"12":113,"13":114,"14":115},"Na
me":{"0":"Smartphone","1":"Laptop","2":"Tablet","3":"Smartwatch","4"
:"Headphones","5":"Keyboard","6":"Mouse","7":"Monitor","8":"Printer"
,"9":"Router","10":"External Hard Drive","11":"USB Flash Drive","12"
:"Power Bank","13":"Wireless Earbuds","14":"Gaming Console"},"Price"
:{"0":29999,"1":74999,"2":19999,"3":9999,"4":2999,"5":1499,"6":799,"
7":14999,"8":8999,"9":2499,"10":5999,"11":499,"12":1999,"13":3499,"1
4":49999},"Quantity":{"0":50,"1":30,"2":45,"3":70,"4":100,"5":120,"6
":150,"7":40,"8":25,"9":60,"10":35,"11":200,"12":90,"13":110,"14":20
}}
surya@Surya:/mnt/c/Users/SURYA/shoppy/backend$
```

Create docker-compose.yml file and add the code

nano docker-compose.yml

Take the build using

sudo docker build -t backend:latest .

```
 ---> df51c4eaa489
Step 5/7 : COPY . .
 ---> 298833c496aa
Step 6/7 : EXPOSE 7000
 ---> Running in a256fe5e2982
 ---> Removed intermediate container a256fe5e2982
 ---> 15ddbbff5759
Step 7/7 : CMD ["python", "app.py"]
 ---> Running in 75f04bda8d16
 ---> Removed intermediate container 75f04bda8d16
 ---> 3bb49d9a4ff5
Successfully built 3bb49d9a4ff5
Successfully tagged backend:latest
```

Run the docker using the command: docker run -p 7000:7000 backend

```
surya@Surya:/mnt/c/Users/SURYA/shoppy/backend$ docker run -p 7000:7000 backend
 * Serving Flask app 'app'
 * Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a production
WSGI server instead.
 * Running on all addresses (0.0.0.0)
 * Running on http://127.0.0.1:7000
 * Running on http://172.17.0.2:7000
Press CTRL+C to quit
172.17.0.1 - - [20/Mar/2025 06:18:26] "GET /products HTTP/1.1" 200 -
```

OuutPut:

```
surya@Surya:/mnt/c/Users/SURYA$ curl http://localhost:7000/products
{"ID":{"0":101,"1":102,"2":103,"3":104,"4":105,"5":106,"6":107,"7":108,"8":109,"9":110},"Name":{"0
":"Smartphone","1":"Laptop","2":"Tablet","3":"Smartwatch","4":"Headphones","5":"Keyboard","6":"Mou
se","7":"Monitor","8":"Printer","9":"Router"},"Price":{"0":29999,"1":74999,"2":19999,"3":9999,"4":
2999,"5":1499,"6":799,"7":14999,"8":8999,"9":2499},"Quantity":{"0":50,"1":30,"2":45,"3":70,"4":100
,"5":120,"6":150,"7":40,"8":25,"9":60}}surya@Surya:/mnt/c/Users/SURYA$
surya@Surya:/mnt/c/Users/SURYA$
```

Create index.html file and Dockerfile in the frontend directory and add the code for the each files

```
surya@Surya:/mnt/c/Users/SURYA/shoppy/frontend$ cat Dockerfile
FROM nginx:alpine
COPY index.html /usr/share/nginx/html/index.html
surya@Surya:/mnt/c/Users/SURYA/shoppy/frontend$ cat index.html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>E-Commerce Store</title>
    <script>
        async function fetchProducts() {
            const response = await fetch("http://localhost:7000/products");
            const products = await response.json();
            let output = `<h2 style="color: #4CAF50; text-align: center;">Product List</h2>`;
            output += `<ul style="list-style: none; padding: 0;">`;

            products.forEach(product => {
                output += `
                    <li style="background: #f1f1f1;
                               margin: 15px 0;
                               padding: 15px 20px;
```

Taking Build for the Frontend

```
surya@Surya:/mnt/c/Users/SURYA/shoppy/frontend$ sudo docker build -t frontend:latest .
[sudo] password for surya:
DEPRECATED: The legacy builder is deprecated and will be removed in a future release.
            Install the buildx component to build images with BuildKit:
            https://docs.docker.com/go/buildx/

Sending build context to Docker daemon   5.12kB
Step 1/2 : FROM nginx:alpine
alpine: Pulling from library/nginx
f18232174bc9: Pull complete
ccc35e35d420: Pull complete
43f2ec460bdf: Pull complete
984583bcf083: Pull complete
8d27c072a58f: Pull complete
ab3286a73463: Pull complete
6d79cc6084d4: Pull complete
0c7e4c092ab7: Pull complete
Digest: sha256:4ff102c5d78d254a6f0da062b3cf39eaf07f01eec0927fd21e219d0af8bc0591
Status: Downloaded newer image for nginx:alpine
 ---> 1ff4bb4faebc
Step 2/2 : COPY index.html /usr/share/nginx/html/index.html
 ---> dda577add387
Successfully built dda577add387
Successfully tagged frontend:latest
surya@Surya:/mnt/c/Users/SURYA/shoppy/frontend$
```

Then create frontend-deployment.yml file and also add the code into the file, also change the port number to 3000

To combine both services (frontend and backend) create service.yml and replace with frontend and backend port number of yours

Create configmap.yml and add the configuration code

```
surya@Surya:/mnt/c/Users/SURYA/shoppy/k8s$ nano frontend-deployment.yaml
surya@Surya:/mnt/c/Users/SURYA/shoppy/k8s$ nano service.yml
surya@Surya:/mnt/c/Users/SURYA/shoppy/k8s$ nano congigmap.yml
surya@Surya:/mnt/c/Users/SURYA/shoppy/k8s$
```

Update the packages and installl

```
surya@Surya:/mnt/c/Users/SURYA/shoppy$ sudo apt update
[sudo] password for surya:
Ign:1 https://pkg.jenkins.io/debian-stable binary/ InRelease
Hit:2 https://pkg.jenkins.io/debian-stable binary/ Release
Get:4 http://security.ubuntu.com/ubuntu jammy-security InRelease [129 kB]
Hit:5 http://archive.ubuntu.com/ubuntu jammy InRelease
Get:6 http://archive.ubuntu.com/ubuntu jammy-updates InRelease [128 kB]
Get:7 http://archive.ubuntu.com/ubuntu jammy-backports InRelease [127 kB]
Fetched 384 kB in 3s (113 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
15 packages can be upgraded. Run 'apt list --upgradable' to see them.
surya@Surya:/mnt/c/Users/SURYA/shoppy$ sudo apt install docker.io -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
docker.io is already the newest version (26.1.3-0ubuntu1~22.04.1).
0 upgraded, 0 newly installed, 0 to remove and 15 not upgraded.
surya@Surya:/mnt/c/Users/SURYA/shoppy$ docker --version
Docker version 26.1.3, build 26.1.3-0ubuntu1~22.04.1
surya@Surya:/mnt/c/Users/SURYA/shoppy$ curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube-linux-amd64
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100  119M  100  119M    0     0  3332k      0  0:00:36  0:00:36 --:--:-- 3420k
surya@Surya:/mnt/c/Users/SURYA/shoppy$
surya@Surya:/mnt/c/Users/SURYA/shoppy$ sudo install minikube-linux-amd64 /usr/local/bin/minikube
```

```
surya@Surya:/mnt/c/Users/SURYA/shoppy$ minikube version
minikube version: v1.35.0
commit: dd5d320e41b5451cdf3c01891bc4e13d189586ed-dirty
surya@Surya:/mnt/c/Users/SURYA/shoppy$ curl -LO "https://dl.k8s.io/release/$(curl -L -s https://dl.k8s.io/release/stable.txt)/
l"
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   138  100   138    0     0    123      0  0:00:01  0:00:01 --:--:--   123
100 54.6M  100 54.6M    0     0   468k      0  0:01:59  0:01:59 --:--:--  271k
surya@Surya:/mnt/c/Users/SURYA/shoppy$ chmode +x kubectl
Command 'chmode' not found, did you mean:
  command 'chmod' from deb coreutils (8.32-4.1ubuntu1.2)
Try: sudo apt install <deb name>
surya@Surya:/mnt/c/Users/SURYA/shoppy$ chmod +x kubectl
surya@Surya:/mnt/c/Users/SURYA/shoppy$
```

Commands to stop the process

```
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ minikube stop
🤷  Profile "minikube" not found. Run "minikube profile list" to view all profiles.
👉  To start a cluster, run: "minikube start"
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ minikube delete --all --purge
🔥  Successfully deleted all profiles
💀  Successfully purged minikube directory located at - [/home/surya/.minikube]
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ docker kill $(docker ps -q)
048acd5a7d26
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ docker rm -f $(docker ps -aq)
2017205b0046
4993aaec6f2d
1be812b13e3d
c8ec8c2f6dd5
5d0ae705ac75
bd8c7e1b30d3
98f2a49566b0
97c34422c389
ba88ed22fa91
048acd5a7d26
bc8d8af3d1d4
```

```
surya@Surya:/mnt/c/Users/SURYA$ minikube delete --all --purge
🔥  Successfully deleted all profiles
💀  Successfully purged minikube directory located at - [/home/surya/.minikube]
surya@Surya:/mnt/c/Users/SURYA$ minikube stop
🤷  Profile "minikube" not found. Run "minikube profile list" to view all profiles.
👉  To start a cluster, run: "minikube start"
surya@Surya:/mnt/c/Users/SURYA$ systemctl stop docker
Failed to stop docker.service: Interactive authentication required.
See system logs and 'systemctl status docker.service' for details.
surya@Surya:/mnt/c/Users/SURYA$ sudo systemctl stop docker
Warning: Stopping docker.service, but it can still be activated by:
  docker.socket
```

```
surya@Surya:/mnt/c/Users/SURYA$ sudo pkill -f docker
surya@Surya:/mnt/c/Users/SURYA$ sudo pkill -f minikube
surya@Surya:/mnt/c/Users/SURYA$ sudo pkill -f kubectl
surya@Surya:/mnt/c/Users/SURYA$ sudo pkill -f containerd
surya@Surya:/mnt/c/Users/SURYA$ sudo docker system prune -a --volumes -f
Deleted Networks:
docker-python-app_default

Deleted Images:
untagged: backend:latest
deleted: sha256:7e84a8bec29020caee7fe15bf36d7b96a09da441a45ca4bd4201e815df96255a
deleted: sha256:b2533d739f7addaed1cc3c0677a4dae2a5cbe33a2abb5e26e8d38a6ea7c43c9c
deleted: sha256:50d9e8520a1bc36161d6337960fccfb473cdafe017d902de86a4ff98f0ec98f6
deleted: sha256:09a3ddcd3962e50746d0ae0dda337c29f526a6b27e05c90d626783390c5c56b9
untagged: surya2k4/docker-app:latest
untagged: surya2k4/docker-app@sha256:fa14f4f12e6c1eba951583cc687e440b03ac34504c1bea3a334cb6a45c
431dd7
deleted: sha256:3ca54f9ef55926a53323a36830b249876f70d11f177a19444713eb69b373b84c
deleted: sha256:ff91502d2f533393de62776a4f54a5e2871d74960f1e2b3e85bfabed4a5d8cd1
deleted: sha256:55363999bc6408b17a39c63fe78bbda3171b13e4cfbb1d80d2b9d0d867315c1f
deleted: sha256:3cb95d0e9951116cd284dc990dc744e0c6204c840e2c4403fd354a3132c001a8
deleted: sha256:3bb49d9a4ff534a3c941daf1492fa8091b96a9e418ab1ce054fcd050f62c48b6
deleted: sha256:15ddbbff57597a7cbc56fcba6733410fc1f66084d7c4bbb1ba50fbbe557899ca
deleted: sha256:298833c496aa92a2bcbe70f19d8406ad47a8b967b46bc1c314c5b9883be88863
deleted: sha256:93eb79be3047182bdbd94e79276e306a5311f8adb0ca16b78d4c22d124f39c83
untagged: nginx:alpine
untagged: nginx@sha256:4ff102c5d78d254a6f0da062b3cf39eaf07f01eec0927fd21e219d0af8bc0591
untagged: python:3.11
```

Installing pre-requisites-command

```
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ docker --version
Docker version 26.1.3, build 26.1.3-0ubuntu1~22.04.1
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ curl -LO https://storage.googleap
is.com/minikube/releases/latest/minikube-linux-amd64
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Curr
ent
                                 Dload  Upload   Total   Spent    Left  Spee
d
  0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--
  0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--
  0     0    0     0    0     0      0      0 --:--:--  0:00:01 --:--:--
  0  119M    0  158k    0     0  66431      0  0:31:25  0:00:02  0:31:23 664
  1  119M    1 2224k    0     0   645k      0  0:03:09  0:00:03  0:03:06  64
  6  119M    6 8013k    0     0  1775k      0  0:01:08  0:00:04  0:01:04 177
 11  119M   11 13.6M    0     0  2561k      0  0:00:47  0:00:05  0:00:42 278
 15  119M   15 18.1M    0     0  2880k      0  0:00:42  0:00:06  0:00:36 373
 20  119M   20 24.5M    0     0  3293k      0  0:00:37  0:00:07  0:00:30 481
 24  119M   24 29.7M    0     0  3603k      0  0:00:33  0:00:08  0:00:25 563
 31  119M   31 38.0M    0     0  4129k      0  0:00:29  0:00:09  0:00:20 628
 37  119M   37 44.8M    0     0  4397k      0  0:00:27  0:00:10  0:00:17 639
 43  119M   43 51.8M    0     0  4618k      0  0:00:26  0:00:11  0:00:15 683
 50  119M   50 60.3M    0     0  4963k      0  0:00:24  0:00:12  0:00:12 760
 55  119M   55 65.9M    0     0  5019k      0  0:00:24  0:00:13  0:00:11 741
 60  119M   60 72.5M    0     0  5124k      0  0:00:23  0:00:14  0:00:09 697
 66  119M   66 79.7M    0     0  5287k      0  0:00:23  0:00:15  0:00:08 714
 72  119M   72 86.4M    0     0  5384k      0  0:00:22  0:00:16  0:00:06 716
 77  119M   77 93.1M    0     0  5461k      0  0:00:22  0:00:17  0:00:05 669
 83  119M   83 99.2M    0     0  5480k      0  0:00:22  0:00:18  0:00:04 669
 87  119M   87  104M    0     0  5479k      0  0:00:22  0:00:19  0:00:03 649
 91  119M   91  109M    0     0  5493k      0  0:00:22  0:00:20  0:00:02 612
 98  119M   98  117M    0     0  5587k      0  0:00:21  0:00:21 --:--:-- 623
100  119M  100  119M    0     0  5612k      0  0:00:21  0:00:21 --:--:-- 622
2k
```

Installing Minikube and checking the version

```
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ sudo install minikube-linux-amd64
 /usr/local/bin/minikube
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ minikube version
minikube version: v1.35.0
commit: dd5d320e41b5451cdf3c01891bc4e13d189586ed-dirty
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ curl -LO "https://dl.k8s.io/relea
se/$(curl -L -s https://dl.k8s.io/release/stable.txt)/bin/linux/amd64/kubect
l"
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Curr
ent
                                 Dload  Upload   Total   Spent    Left  Spee
d
  0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--
100   138  100   138    0     0    297      0 --:--:-- --:--:-- --:--:--   2
98
  0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--
```

```
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ chmod +x kubectl
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ sudo mv kubectl /usr/local/bin/
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ kubectl version --client
Client Version: v1.32.3
Kustomize Version: v5.5.0
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ minikube start
😄  minikube v1.35.0 on Ubuntu 22.04 (amd64)
✨  Automatically selected the docker driver. Other choices: none, ssh
📌  Using Docker driver with root privileges
👍  Starting "minikube" primary control-plane node in "minikube" cluster
🚜  Pulling base image v0.0.46 ...
💾  Downloading Kubernetes v1.32.0 preload ...
    > preloaded-images-k8s-v18-v1...:  30.78 KiB / 333.57 MiB [>] 0.01% ? p/
    > preloaded-images-k8s-v18-v1...:  46.78 KiB / 333.57 MiB [>] 0.01% ? p/
    > preloaded-images-k8s-v18-v1...:  78.76 KiB / 333.57 MiB [>] 0.02% ? p/
    > preloaded-images-k8s-v18-v1...:  158.76 KiB / 333.57 MiB  0.05% 213.42
    > gcr.io/k8s-minikube/kicbase...:  0 B [                      ] 2% ? p/
```

```
 Mi
🔥  Creating docker container (CPUs=2, Memory=2200MB) ...
🐳  Preparing Kubernetes v1.32.0 on Docker 27.4.1 ...
    ▪ Generating certificates and keys ...
    ▪ Booting up control plane ...
    ▪ Configuring RBAC rules ...
🔗  Configuring bridge CNI (Container Networking Interface) ...
🔎  Verifying Kubernetes components...
    ▪ Using image gcr.io/k8s-minikube/storage-provisioner:v5
🌟  Enabled addons: storage-provisioner, default-storageclass
🏄  Done! kubectl is now configured to use "minikube" cluster and "default"
namespace by default
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ kubectl get nodes
NAME       STATUS   ROLES           AGE   VERSION
minikube   Ready    control-plane   25s   v1.32.0
surya@Surya:/mnt/c/Users/SURYA/kubernetes$
```

Taking build of backend

```
surya@Surya:/mnt/c/Users/SURYA/kubernetes/backend$ docker build -t backend:latest .
DEPRECATED: The legacy builder is deprecated and will be removed in a future release.
            Install the buildx component to build images with BuildKit:
            https://docs.docker.com/go/buildx/

Sending build context to Docker daemon   5.12kB
Step 1/6 : FROM python:3.9
3.9: Pulling from library/python
7cd785773db4: Pull complete
091eb8249475: Pull complete
255774e0027b: Pull complete
353e14e5cc47: Pull complete
f6d72b00ae7c: Pull complete
6e02a90e58ae: Pull complete
f299e0671245: Pull complete
Digest: sha256:bc2e05bca883473050fc3b7c134c28ab822be73126ba1ce29517d9e8b7f3703b
Status: Downloaded newer image for python:3.9
 ---> 859d4a0f1fd8
Step 2/6 : WORKDIR /app
 ---> Running in d6ca122cf0fd
 ---> Removed intermediate container d6ca122cf0fd
 ---> dfee6a046e98
Step 3/6 : COPY requirements.txt .
 ---> cec55fc4f0bb
Step 4/6 : RUN pip install -r requirements.txt
 ---> Running in 209f7383351d
Collecting flask
  Downloading flask-3.1.0-py3-none-any.whl (102 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 103.0/103.0 kB 428.1 kB/s eta 0:00:00
```

```
 ---> Removed intermediate container 209f7383351d
 ---> be77465437de
Step 5/6 : COPY . .
 ---> 69aeef829fe1
Step 6/6 : CMD ["python", "app.py"]
 ---> Running in 6bb0a732b706
 ---> Removed intermediate container 6bb0a732b706
 ---> 21fabc2db118
Successfully built 21fabc2db118
Successfully tagged backend:latest
```

The above attached image shows the successful docker build for backend

Load the images to the Minikube

```
surya@Surya:/mnt/c/Users/SURYA/kubernetes/backend$ minikube image load backend:latest
surya@Surya:/mnt/c/Users/SURYA/kubernetes/backend$    surya@Surya:/mnt/c/Users/SURYA/kubernetes/backend$
ya@Surya:/mnt/c/Users/SURYA/kubernetes/backend$                                          $
surya@Surya:/mnt/c/Users/SURYA/kubernetes/backend$ cd ..
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ cd frontend
surya@Surya:/mnt/c/Users/SURYA/kubernetes/frontend$ docker build -t frontend:latest .
DEPRECATED: The legacy builder is deprecated and will be removed in a future release.
            Install the buildx component to build images with BuildKit:
            https://docs.docker.com/go/buildx/

Sending build context to Docker daemon  3.584kB
Step 1/2 : FROM nginx:alpine
alpine: Pulling from library/nginx
f18232174bc9: Pull complete
ccc35e35d420: Pull complete
43f2ec460bdf: Pull complete
984583bcf083: Pull complete
8d27c072a58f: Pull complete
ab3286a73463: Pull complete
6d79cc6084d4: Pull complete
0c7e4c092ab7: Pull complete
Digest: sha256:4ff102c5d78d254a6f0da062b3cf39eaf07f01eec0927fd21e219d0af8bc0591
Status: Downloaded newer image for nginx:alpine
 ---> 1ff4bb4faebc
Step 2/2 : COPY index.html /usr/share/nginx/html/index.html
 ---> dce13c08c8cd
Successfully built dce13c08c8cd
Successfully tagged frontend:latest
surya@Surya:/mnt/c/Users/SURYA/kubernetes/frontend$ minikube image load frontend:latest
surya@Surya:/mnt/c/Users/SURYA/kubernetes/frontend$
```

Configuring the kubectyl and run the frontend service—url

```
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ kubectl apply -f k8s/backend-deployment.yaml
deployment.apps/backend created
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ kubectl apply -f k8s/frontend-deployment.yaml
deployment.apps/frontend created
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ kubectl apply -f k8s/service.yaml
service/backend-service created
service/frontend-service created
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ kubectl apply -f k8s/configmap.yaml
configmap/backend-config created
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ kubectl get pods
NAME                       READY   STATUS    RESTARTS   AGE
backend-dfd8d5579-4ctl2    1/1     Running   0          30s
frontend-6cfd7c46-8p8cm    1/1     Running   0          24s
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ kubectl get svc
NAME               TYPE        CLUSTER-IP      EXTERNAL-IP   PORT(S)          AGE
backend-service    ClusterIP   10.98.212.194   <none>        5000/TCP         23s
frontend-service   NodePort    10.104.72.147   <none>        3000:32749/TCP   23s
kubernetes         ClusterIP   10.96.0.1       <none>        443/TCP          4h44m
surya@Surya:/mnt/c/Users/SURYA/kubernetes$ minikube service frontend-service --url
http://127.0.0.1:43269
❗  Because you are using a Docker driver on linux, the terminal needs to be open to run it.
```

Run the test pod , and give the url link prefix with curl

`kubectl run test-pod --image=alpine --restart=Never -it -- sh`

`curl http://backend-service:5000/products`

```
surya@Surya:/mnt/c/Users/SURYA/kubernetes/backend$ kubectl run test-pod --image=alpine --restart=
Never -it -- sh
If you don't see a command prompt, try pressing enter.
/ # apk add curl
fetch https://dl-cdn.alpinelinux.org/alpine/v3.21/main/x86_64/APKINDEX.tar.gz
fetch https://dl-cdn.alpinelinux.org/alpine/v3.21/community/x86_64/APKINDEX.tar.gz
(1/9) Installing brotli-libs (1.1.0-r2)
(2/9) Installing c-ares (1.34.3-r0)
(3/9) Installing libunistring (1.2-r0)
(4/9) Installing libidn2 (2.3.7-r0)
(5/9) Installing nghttp2-libs (1.64.0-r0)
(6/9) Installing libpsl (0.21.5-r3)
(7/9) Installing zstd-libs (1.5.6-r2)
(8/9) Installing libcurl (8.12.1-r1)
(9/9) Installing curl (8.12.1-r1)
Executing busybox-1.37.0-r12.trigger
OK: 12 MiB in 24 packages
/ # curl http://backend-service:5000/products
[{"id":1,"name":"Smartphone","price":299.99},{"id":2,"name":"Laptop","price":799.99},{"id":3,"nam
e":"Headphones","price":49.99},{"id":4,"name":"Tablet","price":199.99}]
/ #
```

You can see the output from the above-attached image; it displays the products details in the terminal and frontend output in the below image.