

## Title: Fusionpact DevOps Gauntlet Challenge

### About Me

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I am **S. Yogesh**, a DevOps enthusiast skilled in Linux, Git, Docker, GitHub Actions, Kubernetes, and Ansible. I enjoy automating deployment processes and building reliable CI/CD pipelines.

### Procedure I follow:

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#### Command 1:

At first, I forked the repository from the given link.

I clone the repo using following command:

```
git clone https://github.com/YogeshS/fusionpact-devops-challenge.git
```

#### Structure:-

```
fusionpact-devops-challenge
├── README.md
├── SOP CREATE HOME WEBPAGE USING NGINX SERVER.pdf
├── backend
│   ├── app
│   │   ├── __init__.py
│   │   ├── data
│   │   │   └── info.txt
│   │   ├── main.py
│   │   ├── schema.py
│   │   └── services.py
│   └── requirements.txt
└── frontend
    └── Devops_Intern.html
```

#### Command 2:

Installed Python virtual environment and project dependencies to check locally.

```
pip install python3-venv
pip install -r backend/requirements.txt
```

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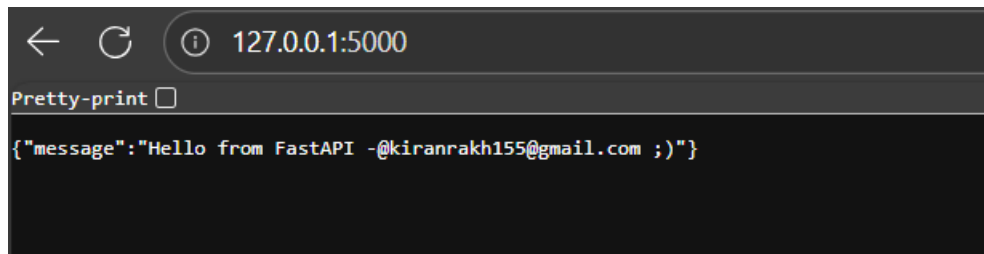
### Command 3:

Check locally before running using the Uvicorn server:

```
uvicorn app.main:app --host 0.0.0.0 --port 5000
```

```
(venv) root@YOGESH:~/fusionpact-devops-challenge/backend/app# cd ..
(venv) root@YOGESH:~/fusionpact-devops-challenge/backend# uvicorn app.main:app --host 0.0.0.0 --port 5000
INFO:      Started server process [2874]
INFO:      Waiting for application startup.
INFO:      Application startup complete.
INFO:      Uvicorn running on http://0.0.0.0:5000 (Press CTRL+C to quit)
INFO:      127.0.0.1:46880 - "GET / HTTP/1.1" 200 OK
^CINFO:      Shutting down
INFO:      Waiting for application shutdown.
INFO:      Application shutdown complete.
INFO:      Finished server process [2874]
(venv) root@YOGESH:~/fusionpact-devops-challenge/backend# |
```

Access link <http://127.0.0.1:5000>



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## Dockerfile Creation and Image Build

### Command 4: Create Dockerfile

```
vi Dockerfile
```

```
FROM python:3.12-slim
WORKDIR /app

# Upgrade pip
RUN pip install --upgrade pip

# Copy requirements and install
COPY requirements.txt .
RUN pip install -r requirements.txt

# Copy backend code
COPY /app ./app

# Expose port
EXPOSE 5000

# Correct module path for Uvicorn
CMD ["uvicorn", "app.main:app", "--host", "0.0.0.0", "--port", "5000"]
```

- Save and exit vi:

Press Esc → type :wq → Enter

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## Command 5: Build Docker Image

```
docker build -t fusionfact .
```

## Verify

```
docker images
```

You should see `fusionfact` listed with the tag `latest`.

## Run

```
docker run -p 5000:5000 -d fusionfact
```

## Verify

Curl 127.0.0.1:5000

```
root@YOGESH:~/fusionpact-devops-challenge/backend# docker images
REPOSITORY          TAG         IMAGE ID      CREATED       SIZE
fusionfact           latest      ac6d4c4e3b1d  5 seconds ago 164MB
<none>               <none>      8630dab52f84  12 minutes ago 161MB
<none>               <none>      4ef8a5eb8c23  21 minutes ago 129MB
gcr.io/k8s-minikube/kicbase v0.0.48    c6b5532e987b  5 weeks ago   1.31GB
hello-world          latest      1b44b5a3e06a  2 months ago  10.1kB
root@YOGESH:~/fusionpact-devops-challenge/backend# docker run -p 5000:5000 -d fusionfact:latest
54b7dd4d861b226deebb290dc41d0b7c20761949f699832d63294b7ealf30755
root@YOGESH:~/fusionpact-devops-challenge/backend# docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS                               NAMES
54b7dd4d861b   fusionfact:latest "uvicorn app.main:ap..." 4 seconds ago  Up 3 seconds  0.0.0.0:5000->5000/tcp, [::]:5000->5000/tcp  reverent_euler
root@YOGESH:~/fusionpact-devops-challenge/backend# curl 127.0.0.1:5000
{"message":"Hello from FastAPI -@kiranrakh155@gmail.com ;)"}
```

```
root@YOGESH:~/fusionpact-devops-challenge/backend# docker images
REPOSITORY          TAG         IMAGE ID      CREATED       SIZE
fusionfact           latest      ac6d4c4e3b1d  7 minutes ago 164MB
<none>               <none>      8630dab52f84  19 minutes ago 161MB
<none>               <none>      4ef8a5eb8c23  28 minutes ago 129MB
gcr.io/k8s-minikube/kicbase v0.0.48    c6b5532e987b  5 weeks ago   1.31GB
hello-world          latest      1b44b5a3e06a  2 months ago  10.1kB
```

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## Command 6 :


## Push build image to Docker Hub

### Tag the image

```
docker tag fusionfact ghcr.io/SYOGESH26/fusionfact
```

### Push to Docker Hub

```
docker push ghcr.io/SYOGESH26/fusionfact
```



**S YOGESH**  
SYOGESH26 · he/him

Type: All Search packages... Visibility: All Sort by: Most downloads

2 packages

- nextjs-devops-app** (Private)  
Published last week by S YOGESH 0
- fusionfact** (Private)  
Published 49 minutes ago by S YOGESH 0

## Command 7:

### Configure Manifest Files

#### 1. Edit Deployment Manifest

```
vi Deployment.yml
```

#### 2. Edit Service Manifest

```
vi Service.yml
```

#### 3. Apply Manifests

```
kubectl apply -f Deployment.yml
kubectl apply -f Service.yml
```

#### 4. Verify Deployment

```
kubectl get pods
```

```
yogesh26@YOGESH:~$ kubectl get pods
NAME                                READY   STATUS              RESTARTS   AGE
fusionpact-fastapi-7b7dcfbc7-h9hmc  0/1     ImagePullBackOff    0           8m10s
fusionpact-fastapi-84b8cdb69d-kq844  0/1     ContainerCreating   0           14s
fusionpact-fastapi-b48f9bb44-xpdxr   0/1     Terminating       0           10m
nextjs-deployment-94d6db67f-bp6kh    0/1     ImagePullBackOff    0           7d8h
nextjs-deployment-94d6db67f-cgn2l    0/1     ImagePullBackOff    0           7d8h
```

## Command 8: Monitoring setup

### Run cAdvisor

#### Command executed:

```
docker run \
  --name=cadvisor \
  --volume=/:/rootfs:ro \
  --volume=/var/run:/var/run:ro \
  --volume=/sys:/sys:ro \
  --volume=/var/lib/docker/:/var/lib/docker:ro \
  --publish=8080:8080 \
  --detach=true \
  --restart=always \
  gcr.io/cadvisor/cadvisor:latest
```

#### Verification:

- Open browser: <http://localhost:8080/> → cAdvisor UI should appear
- Terminal check:

### Configure Prometheus

#### Create `prometheus.yml` file:

```
global:
  scrape_interval: 15s

scrape_configs:
  - job_name: 'cadvisor'
    static_configs:
      - targets: ['localhost:8080']
```

### PromQL Query Example

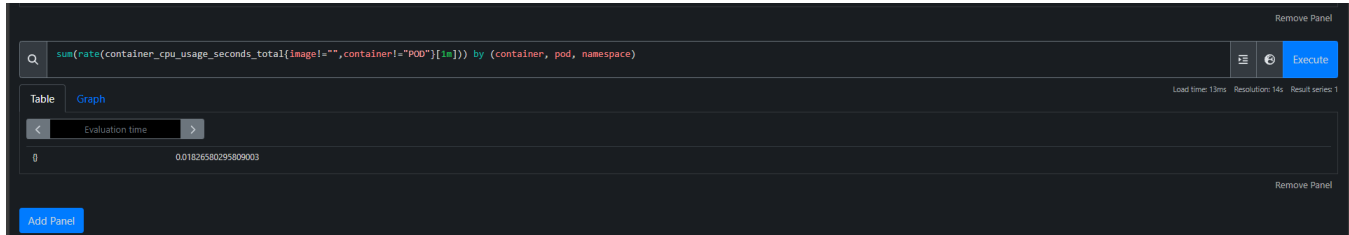
#### Query: Memory usage % of container limit

```
(container_memory_usage_bytes{container!="POD"} /
container_spec_memory_limit_bytes{container!="POD"}) * 100
```

#### Usage:

1. Open **Prometheus UI** → **Graph tab**
2. Enter the above query

3. Click **Execute** → see memory usage as percentage



## Command 9 : Visual Dashboard

### 1. Access Grafana Dashboard

`http://127.0.0.1:3000`

### 2. Add Prometheus Data Source

- In Grafana → **Settings** → **Data Sources** → **Add data source** → **Prometheus**
- Enter Prometheus server URL:

`http://172.28.164.58:9090`

- Click **Save & Test** to verify connection.
- 

### 3. Import cAdvisor Dashboard

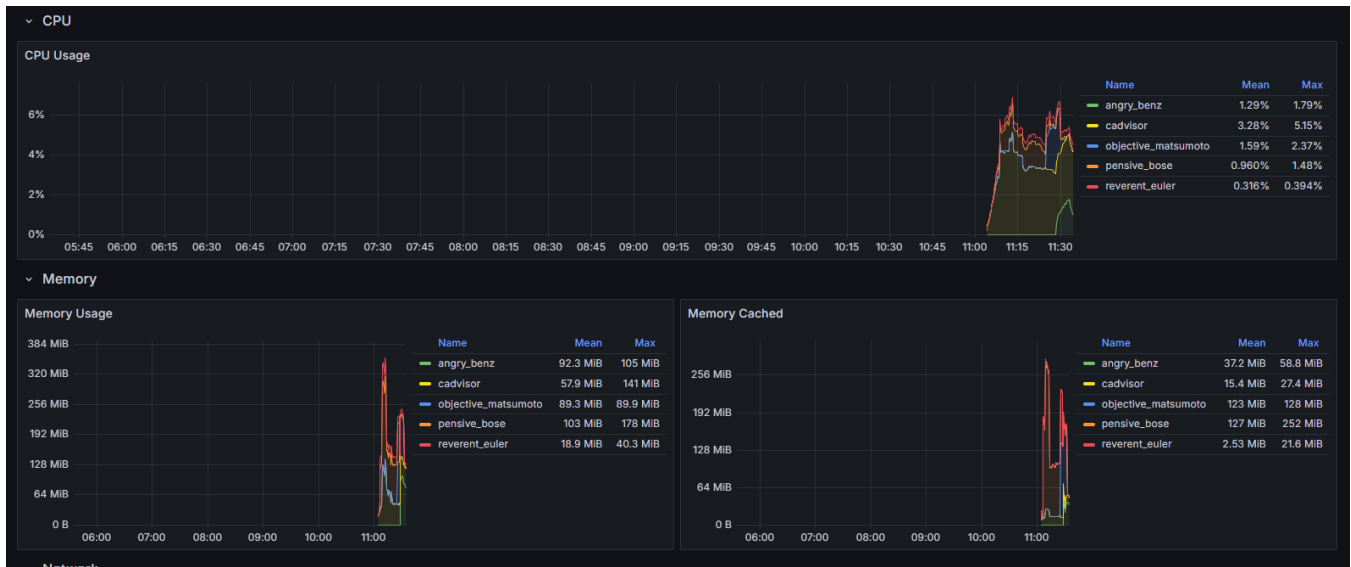
Enter **Dashboard ID:** 14282

Select the Prometheus data source.

Click **Import**.

### 4. Monitor Metrics

- View container CPU, memory, network, and I/O metrics.
- Real-time monitoring of all Docker containers via cAdvisor metrics.



## Command 9: Final structure

tree fusionpact-devops-challenge

```

├── README.md
├── backend
│   ├── Dockerfile
│   └── app
│       ├── __init__.py
│       ├── __pycache__
│       │   ├── __init__.cpython-311.pyc
│       │   ├── main.cpython-311.pyc
│       │   ├── schema.cpython-311.pyc
│       │   └── services.cpython-311.pyc
│       ├── data
│       │   └── info.txt
│       ├── main.py
│       ├── schema.py
│       └── services.py
│   └── requirements.txt
├── frontend
│   └── Devops_Intern.html
├── kubernetes
│   ├── deployment.yml
│   └── service.yml
└── prometheus.yml
  
```

--- END OF SOP ---