

# Flask 3 tier project (Docker & k8s)

```
.
├── project-code
│   ├── app.py
│   ├── Dockerfile
│   ├── k8s-flask-deploy.yml
│   ├── k8s-flask-svc.yml
│   ├── k8s-postgres-dep.yml
│   ├── k8s-postgres-pvc.yml
│   ├── k8s-postgres-pvpv.yml
│   ├── k8s-postgres-svc.yml
│   ├── requirements.txt
│   └── templates
│       └── index.html
```

```
<!-- templates/index.html -->
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>User Form</title>
<style>
  body {
    font-family: Arial, sans-serif;
    max-width: 600px;
    margin: 0 auto;
    padding: 20px;
  }
  .form-group {
    margin-bottom: 15px;
  }
  label {
    display: block;
    margin-bottom: 5px;
  }
  input[type="text"],
  input[type="email"],
  textarea {
    width: 100%;
    padding: 8px;
    margin-bottom: 10px;
    border: 1px solid #ddd;
    border-radius: 4px;
  }
```

```

        button {
            background-color: #4CAF50;
            color: white;
            padding: 10px 15px;
            border: none;
            border-radius: 4px;
            cursor: pointer;
        }
        button:hover {
            background-color: #45a049;
        }
    </style>
</head>
<body>
    <h1>User Information Form</h1>
    <form method="POST" action="/">
        <div class="form-group">
            <label for="name">Name:</label>
            <input type="text" id="name" name="name" required>
        </div>

        <div class="form-group">
            <label for="email">Email:</label>
            <input type="email" id="email" name="email" required>
        </div>

        <div class="form-group">
            <label for="message">Message:</label>
            <textarea id="message" name="message" rows="4" required></textarea>
        </div>
    </form>

```

```

        <button type="submit">Submit</button>
    </form>
</body>
</html>

```

```
FROM python:3.9-slim

# Install system dependencies for compiling Python packages
RUN apt-get update && apt-get install -y \
    build-essential \
    libpq-dev \
    && rm -rf /var/lib/apt/lists/*

# Set the working directory in the container
WORKDIR /app

# Copy the application code into the container
COPY ./project-code /app

# Upgrade pip
RUN pip install --upgrade pip

# Install Python dependencies from requirements.txt
# Pin Flask and Werkzeug to compatible versions in requirements.txt
RUN pip install --no-cache-dir -r requirements.txt

# Expose the Flask application port
EXPOSE 5000

# Use gunicorn for running the app in production
CMD ["gunicorn", "-b", "0.0.0.0:5000", "app:app"]
```

```

# app.py
import os
from flask import Flask, render_template, request, redirect, url_for
from flask_sqlalchemy import SQLAlchemy

app = Flask(__name__)

# Get database configuration from environment variables
db_user = os.environ.get('POSTGRES_USER')
db_password = os.environ.get('POSTGRES_PASSWORD')
db_name = os.environ.get('POSTGRES_DB')
db_host = os.environ.get('POSTGRES_HOST')

# Configure PostgreSQL database
app.config['SQLALCHEMY_DATABASE_URI'] = f'postgresql://{db_user}:{db_password}@{db_host}:5432/{db_name}'
app.config['SQLALCHEMY_TRACK_MODIFICATIONS'] = False
db = SQLAlchemy(app)

# Rest of the application code remains the same...

# Define a model for user information
class UserInfo(db.Model):
    id = db.Column(db.Integer, primary_key=True)
    name = db.Column(db.String(100), nullable=False)
    email = db.Column(db.String(100), nullable=False)
    message = db.Column(db.String(500), nullable=False)

# Automatically create tables (if not already created)
with app.app_context():
    db.create_all()

```

```

@app.route('/', methods=['GET', 'POST'])
def index():
    if request.method == 'POST':
        # Get data from form
        name = request.form['name']
        email = request.form['email']
        message = request.form['message']

        # Create a new user record
        new_user = UserInfo(name=name, email=email, message=message)

        # Add the new user to the database
        try:
            db.session.add(new_user)
            db.session.commit()
            return redirect(url_for('thank_you'))
        except Exception as e:
            db.session.rollback()
            return f"Error occurred while saving data: {str(e)}"

    return render_template('index.html')

# Route to thank the user after form submission
@app.route('/thank-you')
def thank_you():
    return "<h1>Thank you for submitting the form!</h1>"

if __name__ == '__main__':
    app.run(host='0.0.0.0', debug=False)

```

```

flask-sqlalchemy==2.5.1
sqlalchemy==1.4.46
psycpg2-binary==2.9.1
gunicorn==20.1.0
flask==2.3.2
werkzeug==2.3.6

```

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: flask-deploy
  labels:
    flask: deploy
spec:
  replicas: 3
  selector:
    matchLabels:
      flask: deploy
  template:
    metadata:
      name: flask-pod
      labels:
        flask: deploy
    spec:
      containers:
        - name: flask-cont
          image: adhmabdein/myflaskimg2
          ports:
            - containerPort: 5000
          env:
            - name: POSTGRES_USER
              value: "adham"
            - name: POSTGRES_PASSWORD
              value: "1234"
            - name: POSTGRES_DB
              value: "devopsDB"
            - name: POSTGRES_HOST
              value: "postgres-service"

      resources:
        requests:
          memory: "128Mi"
          cpu: "250m"
        limits:
          memory: "256Mi"
          cpu: "500m"
```

```
apiVersion: v1
kind: Service
metadata:
  name: flask-service
spec:
  type: NodePort
  selector:
    flask: deploy
  ports:
    - protocol: TCP
      nodePort: 30009
      port: 80
      targetPort: 5000
```

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: postgres-deploy
  labels:
    postgres: deploy
spec:
  replicas: 3
  selector:
    matchLabels:
      postgres: deploy
  template:
    metadata:
      labels:
        postgres: deploy
    spec:
      containers:
        - name: postgres-pod
          image: postgres:13
          ports:
            - containerPort: 5432
          env:
            - name: POSTGRES_USER
              value: "adham"
            - name: POSTGRES_PASSWORD
              value: "1234"
            - name: POSTGRES_DB
              value: "devopsDB"
          volumeMounts:
            - name: postgres-vol
              mountPath: /data
      volumes:
        - name: postgres-vol
          persistentVolumeClaim:
            claimName: postgres-pvc
```

```
apiVersion: v1
kind: PersistentVolumeClaim
metadata:
  name: postgres-pvc
spec:
  volumeName: postgres-pv
  accessModes:
    - ReadWriteMany
  resources:
    requests:
      storage: 4Gi
```

```
apiVersion: v1
kind: PersistentVolume
metadata:
  name: postgres-pv
spec:
  capacity:
    storage: 5Gi
  accessModes:
    - ReadWriteMany
  hostPath:
    path: "/adhamjenkins"
```

```
apiVersion: v1
kind: Service
metadata:
  name: postgres-service
spec:
  selector:
    postgres: deploy
  ports:
    - port: 5432
      targetPort: 5432
      protocol: TCP
```

```
adham@master:/adhamjenkins/flask-project-adv/project-code$ ls
app.py      k8s-flask-deploy.yml    k8s-postgres-pvc.yml  requirements.txt
config.py   k8s-flask-svc.yml       k8s-postgres-pv.yml   templates
Dockerfile  k8s-postgres-deploy.yml k8s-postgres-svc.yml
```

```
adham@master:/adhamjenkins/flask-project-adv$ sudo git init
Reinitialized existing Git repository in /adhamjenkins/flask-project-adv/.git/
adham@master:/adhamjenkins/flask-project-adv$
adham@master:/adhamjenkins/flask-project-adv$ sudo git add .
```



```
adham@master:/adhamjenkins/flask-project-adv$ sudo git commit -m "initial commit"
[master (root-commit) 42a7df0] initial commit
Committer: root <root@master.localdomain>
Your name and email address were configured automatically based
on your username and hostname. Please check that they are accurate.
You can suppress this message by setting them explicitly. Run the
following command and follow the instructions in your editor to edit
your configuration file:
```

```
git config --global --edit
```

After doing this, you may fix the identity used for this commit with:

```
git commit --amend --reset-author
```

```
12 files changed, 195 insertions(+)
create mode 100644 project-code/.k8s-postgres-deploy.yml.swp
create mode 100644 project-code/Dockerfile
create mode 100644 project-code/app.py
create mode 100644 project-code/config.py
create mode 100644 project-code/k8s-flask-deploy.yml
create mode 100644 project-code/k8s-flask-svc.yml
create mode 100644 project-code/k8s-postgres-deploy.yml
create mode 100644 project-code/k8s-postgres-pv.yml
create mode 100644 project-code/k8s-postgres-pvc.yml
create mode 100644 project-code/k8s-postgres-svc.yml
create mode 100644 project-code/requirements.txt
create mode 100644 project-code/templates/form.html
```

# Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? [Import a repository.](#)

Required fields are marked with an asterisk (\*).

Owner \*



AdhmAbdein



Repository name \*

flask-project-adv

✔ flask-project-adv is available.

Great repository names are short and memorable. Need inspiration? How about **cuddly-parakeet** ?

Description (optional)



Public

Anyone on the internet can see this repository. You choose who can commit.



Private

You choose who can see and commit to this repository.

Initialize this repository with:



Add a README file

This is where you can write a long description for your project. [Learn more about READMEs.](#)

Add .gitignore

.gitignore template: None

```
adham@master:/adhamjenkins/flask-project-adv$
adham@master:/adhamjenkins/flask-project-adv$ sudo git remote add origin https://github.com/AdhmAbdein/flask
-project-adv.git
adham@master:/adhamjenkins/flask-project-adv$ sudo git push -u origin master
Username for 'https://github.com': AdhmAbdein
Password for 'https://AdhmAbdein@github.com':
Enumerating objects: 16, done.
Counting objects: 100% (16/16), done.
Delta compression using up to 2 threads
Compressing objects: 100% (13/13), done.
Writing objects: 100% (16/16), 3.48 KiB | 395.00 KiB/s, done.
Total 16 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/AdhmAbdein/flask-project-adv.git
 * [new branch]      master -> master
branch 'master' set up to track 'origin/master'.
```

Activate Windows



flask-project-adv

Public



Pin



Unwatch

1



master



1 Branch



0 Tags



Go to file



Add file



&lt;&gt; Code



root initial commit

42a7df0 · 8 minutes ago



1 Commit



project-code

initial commit

8 minutes ago



README

```
pipeline{
  agent {label 'node1'}

  environment {
    docker_img_name = 'adhmabdein/myflaskimg2'
  }

  stages{
    stage('pull code from github'){
      steps{
        script{
          git "https://github.com/AdhmAbdein/flask-project-adv.git"
        }
      }
    }
    stage('log in to docker hub'){
      steps{
        script{
          withCredentials ([usernamePassword(credentialsId:'docker_hub', usernameVariable:'d_hub_usr', passwordVariable:'d_hub_pass')]){
            sh 'docker login -u ${d_hub_usr} -p ${d_hub_pass}'
          }
        }
      }
    }
    stage('CI - Build docker image'){
      steps{
        script{
          sh 'docker build -t ${docker_img_name} -f project-code/Dockerfile .'
        }
      }
    }
    stage('push image to docker hub'){
      steps{
        script{
          sh 'docker push ${docker_img_name}'
        }
      }
    }
    stage('CD - Deploy in k8s'){
      steps{
        script{
          dir('project-code'){
            sh 'kubectl apply -f k8s-postgres-pvpv.yml'
            sh 'kubectl apply -f k8s-postgres-pvc.yml'
            sh 'kubectl apply -f k8s-postgres-dep.yml'
            sh 'kubectl apply -f k8s-postgres-svc.yml'

            sh 'kubectl apply -f k8s-flask-deploy.yml'
            sh 'kubectl apply -f k8s-flask-svc.yml'
          }
        }
      }
    }
  }
}
```



Adham Abdein



Community User



Joined December 25, 2024

Repositories

Starred



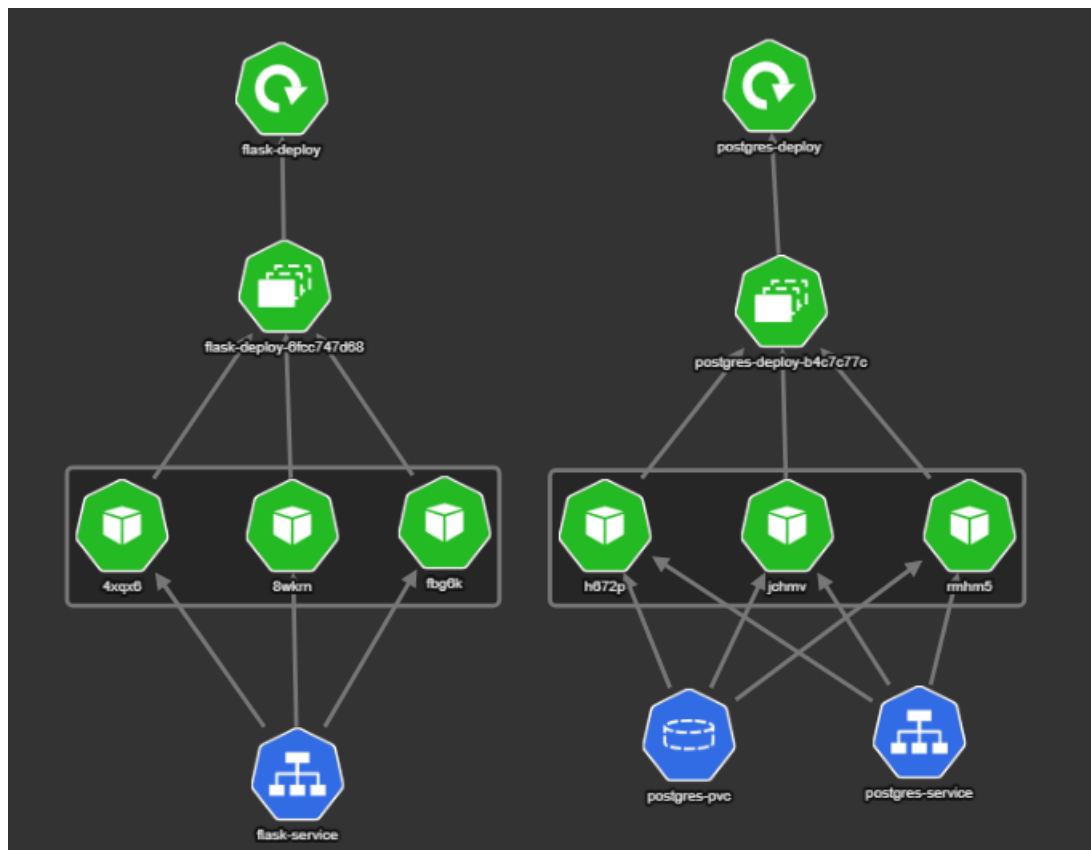
Search by repository nam

Displaying 1 to 4 of 4 repositories



adhmadbein/myflaskimg2

By [adhmabdein](#) · Updated 10 minutes ago



```

flask-deploy-6fcc747d68-4xqx6    1/1    Running    0    98s
flask-deploy-6fcc747d68-8wkrn    1/1    Running    0    98s
flask-deploy-6fcc747d68-fbg6k    1/1    Running    0    98s
kubeview-78dd597bd8-gswkz        1/1    Running    10 (5h40m ago)    7d5h
podaff                            1/1    Running    10 (5h40m ago)    7d4h
podafffff                        1/1    Running    0    5h18m
podselector                      1/1    Running    8 (5h40m ago)    6d3h
postgres-deploy-b4c7c77c5-h672p  1/1    Running    0    101s
postgres-deploy-b4c7c77c5-jchmv  1/1    Running    0    101s
postgres-deploy-b4c7c77c5-rmhm5  1/1    Running    0    101s

```

```

adham@node1:~$ kubectl get svc
NAME                TYPE          CLUSTER-IP    EXTERNAL-IP    PORT(S)          AGE
flask-service       NodePort      10.102.1.1     <none>         80:30009/TCP     6h25m
kubernetes           ClusterIP     10.96.1.1     <none>         443/TCP          13d
kubeview            LoadBalancer 10.96.1.1     <pending>      80:31262/TCP     12d
node-svc            LoadBalancer 10.100.1.1     <pending>      3000:30007/TCP   2d3h
postgres-service    ClusterIP     None          <none>         5432/TCP         3h46m
service-ing         NodePort      10.99.1.1     <none>         8889:31000/TCP   7d6h
service2            NodePort      10.107.1.1     <none>         8088:30001/TCP   11d
svc                 NodePort      10.98.1.1     <none>         6666:30003/TCP   6d4h
svc-calc            LoadBalancer 10.109.1.1     <pending>      8000:30008/TCP   26h
web-service         NodePort      10.108.1.1     <none>         4444:30000/TCP   12d

adham@node1:~$ kubectl get pv
NAME                CAPACITY    ACCESS MODES    RECLAIM POLICY    STATUS    CLAIM                STORAGECLASS    VOLUMEATTRIBUTESCLASS    AGE
node-pv             1G          RWX             Retain            Bound     default/node-pvc     <unset>         <unset>                  2d3h
postgres-pv         5Gi        RWX             Retain            Bound     default/postgres-pvc <unset>         <unset>                  74m
pv                  1G          RWO             Retain            Bound     default/pvc          <unset>         <unset>                  8d
pv-calc             1Gi        RWX             Retain            Bound     default/pvc-calc     <unset>         <unset>                  26h

adham@node1:~$ kubectl get pvc
NAME                STATUS    VOLUME          CAPACITY    ACCESS MODES    STORAGECLASS    VOLUMEATTRIBUTESCLASS    AGE
node-pvc           Bound     node-pv         1G          RWX             <unset>         <unset>                  2d3h
postgres-pvc       Bound     postgres-pv     5Gi        RWX             <unset>         <unset>                  74m
pvc                Bound     pv              1G          RWO             <unset>         <unset>                  8d
pvc-calc           Bound     pv-calc         1Gi        RWX             <unset>         <unset>                  26h

```

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## User Information Form

Name:

Email:

Message:

# Thank you for submitting the form!

```
root@postgres-deploy-b4c7c77c5-h672p:/# psql -U adham -d devopsDB
psql (13.18 (Debian 13.18-1.pgdg120+1))
Type "help" for help.
```

```
root@postgres-deploy-b4c7c77c5-h672p:/# psql -U adham -d devopsDB
psql (13.18 (Debian 13.18-1.pgdg120+1))
Type "help" for help.
```

```
devopsDB=# \l
```

```

              List of databases
  Name      | Owner  | Encoding | Collate  | Ctype    | Access privileges
-----+-----+-----+-----+-----+-----
 devopsDB   | adham  | UTF8     | en_US.utf8 | en_US.utf8 |
 postgres  | adham  | UTF8     | en_US.utf8 | en_US.utf8 |
 template0  | adham  | UTF8     | en_US.utf8 | en_US.utf8 | =c/adham      +
            |        |          |            |            | adham=CTc/adham
 template1  | adham  | UTF8     | en_US.utf8 | en_US.utf8 | =c/adham      +
            |        |          |            |            | adham=CTc/adham
(4 rows)
```

```
devopsDB=# SELECT * FROM user_info;
```

id	name	email	message
1	adhm	adhm@outlook.com	hello i am try to become devops & cloud eng
2	adhm	adhm@outlook.com	hello i am try to become devops & cloud eng
3	adhm5y5	adhm55@outlook.com	hello i am55 try to become devops & cloud eng

(3 rows)

```
devopsDB=#
```