

Helm/Kubernetes Code Challenge

Challenge:

Implement a Helm chart for a basic web application that consists of a frontend and a backend service. The frontend service serves static HTML pages, and the backend service returns JSON responses.

Requirements:

1. The chart should contain following components
 - Deployment for the frontend service.
 - Service for the frontend service.
 - Ingress for the frontend service.
 - Deployment for the backend service.
 - Service for the backend service.
 - Ingress for the backend service.
2. The frontend service should:
 - Use a Docker image named "frontend:latest".
 - Expose port 80.
 - Mount a ConfigMap named "frontend-config" containing a configuration file at "/etc/config/frontend-config.yaml" inside the container.
3. The backend service should:
 - Use a Docker image named "backend:latest".
 - Expose port 8080.
 - Ensure that the backend service's deployment has an environment variable named "DB_URL" set to "mysql://mysql:3306/database".
4. Provide values for configurable parameters such as image names, container ports, and environment variables, etc.

Deliverables:

- Helm chart directory structure
- Values YAML file with default and configurable values
- Template files for deployments, services and ingresses
- ConfigMap YAML file

Directory Structure:

```
1 web-app-chart/
2 |─ templates/
3 |   |─ frontend-config.yaml
4 |   |─ frontend-deployment.yaml
5 |   |─ frontend-service.yaml
6 |   |─ frontend-ingress.yaml
7 |   |─ backend-deployment.yaml
8 |   |─ backend-service.yaml
9 |   |─ backend-ingress.yaml
10 |─ values.yaml
```

Snippet:

values.yaml

```
1 frontend:
2   image: <write value here>
3   port: <write value here>
4
5 backend:
6   image: <write value here>
7   port: <write value here>
8   env:
9     db_url: <write value here>
```

frontend-config.yaml

```
1 apiVersion: <write api version here>
2 kind: <write kind here>
3 metadata:
4   name: <write name here>
5 data:
6   frontend-config.yaml: |
7     <write dummy configurations here>
```

frontend-deployment.yaml

```
1 apiVersion: <write api version here>
2 kind: <write kind here>
3 metadata:
4   name: <write name here>
5 spec:
6   replicas: <write replica count here>
7   selector:
8     matchLabels:
9       <write labels here>
10  template:
11    metadata:
12      labels:
13        <write labels here>
14    spec:
15      containers:
16        - name: <write name here>
17          image: {{ <write image here> }}
18          ports:
19            - containerPort: {{ <write port here> }}
20          volumeMounts:
21            - name: <write name here>
22              mountPath: <write mount path here>
23          volumes:
24            - name: <write name here>
25              configMap:
26                name: <write name here>
```

frontend-service.yaml

```
1 apiVersion: <write api version here>
2 kind: <write kind here>
3 metadata:
4   name: <write name here>
5 spec:
6   selector:
7     <write selectors here>
8   ports:
9     - protocol: <write protocol here>
10      port: <write port here>
11      targetPort: {{ <write target port here> }}
12
```

frontend-ingress.yaml

```
1 apiVersion: <write api version here>
2 kind: <write kind here>
3 metadata:
4   name: <write name here>
5 spec:
6   rules:
7     - host: <write host here>
8       http:
9         paths:
10          - path: <write path here>
11            pathType: <write path type here>
12            backend:
13              service:
14                name: <write name here>
15                port:
16                  number: <write port here>
```

backend-deployment.yaml

```
1 apiVersion: <write api version here>
2 kind: <write kind here>
3 metadata:
4   name: <write name here>
5 spec:
6   replicas: <write replica count here>
7   selector:
8     matchLabels:
9       <write labels here>
10  template:
11    metadata:
12      labels:
13        <write labels here>
14    spec:
15      containers:
16        - name: <write name here>
17          image: {{ <write image here> }}
18          ports:
```

```
19     - containerPort: {{ <write port here> }}
20   env:
21     - name: DB_URL
22       value: {{ <write value here> }}
```

backend-service.yaml

```
1  apiVersion: <write api version here>
2  kind: <write kind here>
3  metadata:
4    name: <write name here>
5  spec:
6    selector:
7      <write selectors here>
8    ports:
9      - protocol: <write protocol here>
10        port: <write port here>
11        targetPort: {{ <write target port here> }}
```

backend-ingress.yaml

```
1  apiVersion: <write api version here>
2  kind: <write kind here>
3  metadata:
4    name: <write name here>
5  spec:
6    rules:
7      - host: <write host here>
8        http:
9          paths:
10            - path: <write path here>
11              pathType: <write path type here>
12              backend:
13                service:
14                  name: <write name here>
15                  port:
16                    number: <write port here>
17
```