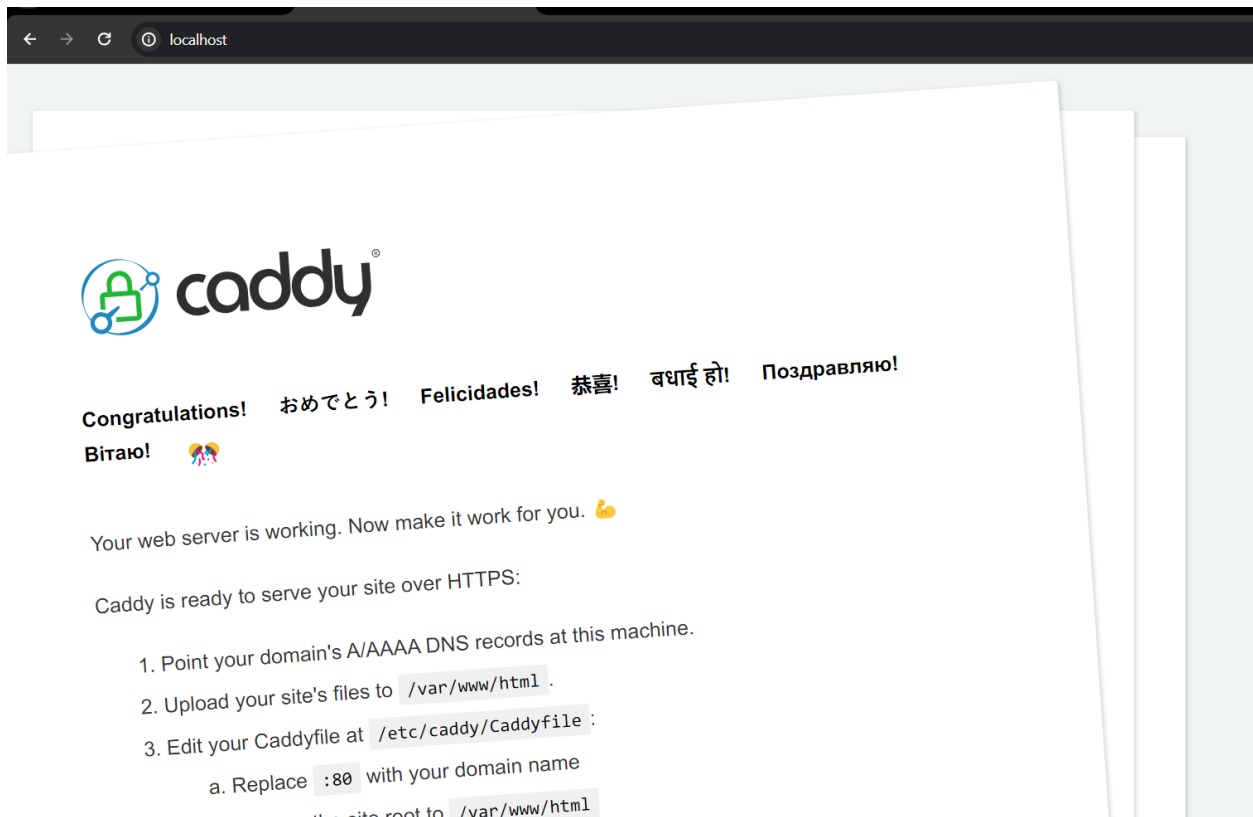Part 1: Blue/Green Deployment

Webpage working before:

Deployment (Blue) and service:

```
~/3495/final on 🐳 acit4640_admin (us-west-2)
❯ kubectl apply -f markus-deploy.yml
deployment.apps/markus-web-deploy created
```

```
~/3495/final on 🐳 acit4640_admin (us-west-2)
❯ kubectl apply -f markus-svc.yml
service/markus-ps-lb created
```

Get all:

```
~/3495/final on ☁  acit4640_admin (us-west-2)
> kubectl get all
NAME                                         READY   STATUS     RESTARTS   AGE
pod/markus-web-deploy-7d6686db54-4fhtd        1/1     Running    0          93s
pod/markus-web-deploy-7d6686db54-jjwxf        1/1     Running    0          92s
pod/markus-web-deploy-7d6686db54-l86zn        1/1     Running    0          96s
pod/markus-web-deploy-7d6686db54-nx5x5        1/1     Running    0          96s
pod/markus-web-deploy-7d6686db54-t8rmg        1/1     Running    0          96s

NAME                     TYPE           CLUSTER-IP       EXTERNAL-IP   PORT(S)         AGE
service/kubernetes       ClusterIP      10.96.0.1        <none>        443/TCP         17m
service/markus-ps-lb     LoadBalancer   10.107.108.149   localhost     80:32425/TCP    33s

NAME                                  READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/markus-web-deploy     5/5     5            5           2m15s

NAME                                            DESIRED   CURRENT   READY   AGE
replicaset.apps/markus-web-deploy-7d6686db54    5         5         5       96s
```

New deployment (green) and service:

```
~/3495/final on ☁  acit4640_admin (us-west-2)
> kubectl apply -f markus-deploy2.yml
deployment.apps/markus-web-deploy configured
```

```
~/3495/final on ☁  acit4640_admin (us-west-2)
> kubectl apply -f markus-svc2.yml
service/markus-ps-lbv2 created
```

Changes made:

```yaml
markus-deploy2.yml > {} metadata > {} labels
1  apiVersion: apps/v1
2  kind: Deployment
3  metadata:
4    name: markus-web-deployv2
5    labels:
6      app: webv2
7  spec:
8    replicas: 5
9    selector:
10     matchLabels:
11        app: web
12   template:
13     metadata:
14       labels:
15         app: web
16     spec:
17       terminationGracePeriodSeconds: 60
18       containers:
19       - name: markus-hello-pod
20         image: aldiab/webapp:v2 # changed version to 2
21         imagePullPolicy: Always
22         ports:
23         - containerPort: 8080
24
```

```yaml
markus-svc2.yml > {} spec > {} selector
1  # LoadBalancer Service. Will only work on supported cloud platforms (AKS, EKS, GKE, DOK, IBM, LKE etc ...)
2  # Listens externally on 80 and forwards to Pod/container on 8080
3  apiVersion: v1
4  kind: Service
5  metadata:
6    name: markus-ps-lbv2 # difference name
7  spec:
8    type: LoadBalancer
9    ports:
10   - port: 80
11     targetPort: 8080
12   selector:
13     app: webv2
14
```

Get all after adding the Green deployment. We now have the new deployment (green) in place of the old (blue), with the new service pointing at the new deployment:

```
~/3495/final on ☁  acit4640_admin (us-west-2)
> kubectl get all
NAME                                          READY   STATUS     RESTARTS   AGE
pod/markus-web-deploy-844bb9f56f-6v29g        1/1     Running    0          66s
pod/markus-web-deploy-844bb9f56f-766rz        1/1     Running    0          66s
pod/markus-web-deploy-844bb9f56f-7jf8h        1/1     Running    0          66s
pod/markus-web-deploy-844bb9f56f-7srxx        1/1     Running    0          66s
pod/markus-web-deploy-844bb9f56f-ng7t2        1/1     Running    0          66s
pod/markus-web-deployv2-7d6686db54-4xwg7      1/1     Running    0          8s
pod/markus-web-deployv2-7d6686db54-97jj4      1/1     Running    0          8s
pod/markus-web-deployv2-7d6686db54-gsn2v      1/1     Running    0          8s
pod/markus-web-deployv2-7d6686db54-tb6fj      1/1     Running    0          8s
pod/markus-web-deployv2-7d6686db54-wrqt6      1/1     Running    0          8s

NAME                     TYPE           CLUSTER-IP      EXTERNAL-IP   PORT(S)          AGE
service/kubernetes       ClusterIP      10.96.0.1       <none>        443/TCP          35m
service/markus-ps-lb     LoadBalancer   10.100.93.77    localhost     80:32089/TCP     10m
service/markus-ps-lbv2   LoadBalancer   10.109.213.11   <pending>     80:31741/TCP     2s

NAME                                   READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/markus-web-deploy      5/5     5            5           66s
deployment.apps/markus-web-deployv2    5/5     5            5           8s

NAME                                              DESIRED   CURRENT   READY   AGE
replicaset.apps/markus-web-deploy-844bb9f56f      5         5         5       66s
replicaset.apps/markus-web-deployv2-7d6686db54    5         5         5       8s
```

After deleting the old service, the new service is now using localhost, and we have now replaced it with the new deployment:
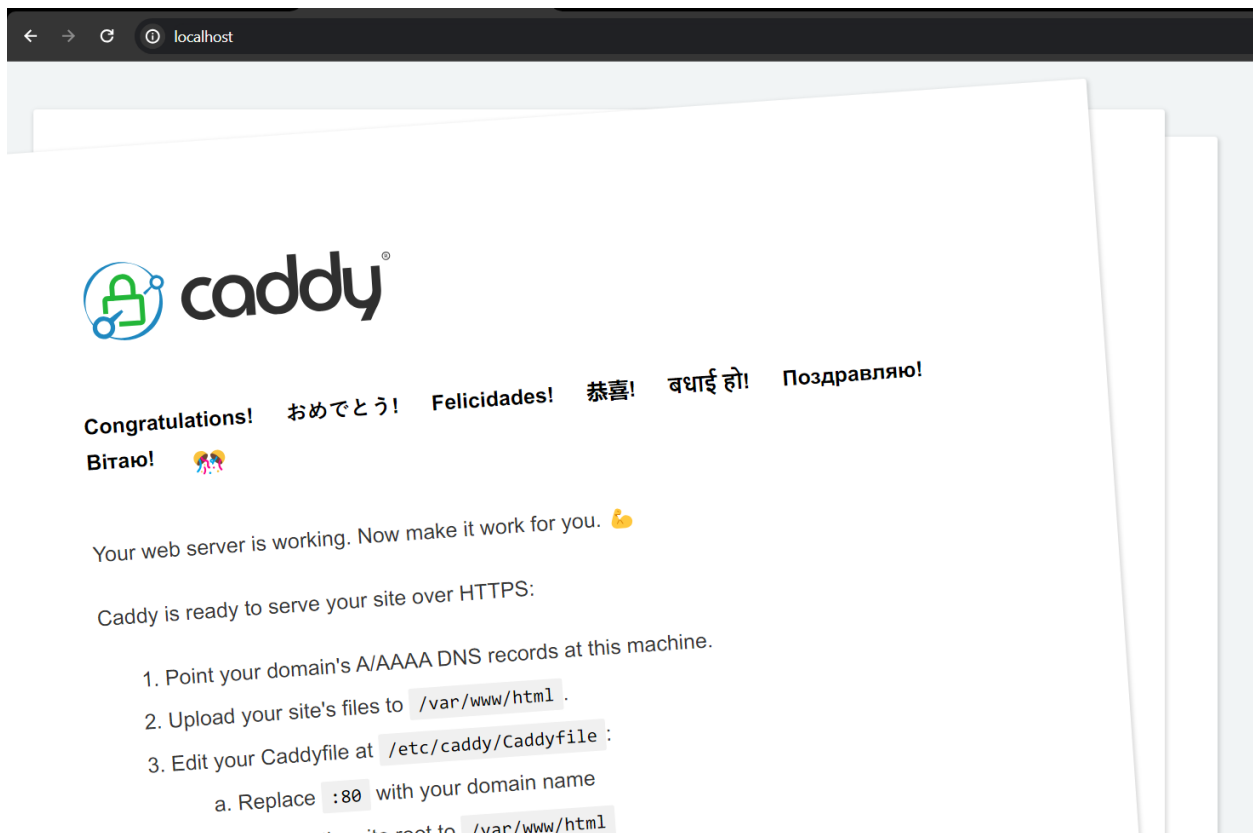
```
~/3495/final on ☁  acit4640_admin (us-west-2)
> kubectl get all
NAME                                          READY   STATUS        RESTARTS   AGE
pod/markus-web-deploy-844bb9f56f-6v29g        1/1     Terminating   0          2m21s
pod/markus-web-deploy-844bb9f56f-766rz        1/1     Terminating   0          2m21s
pod/markus-web-deploy-844bb9f56f-7jf8h        1/1     Terminating   0          2m21s
pod/markus-web-deploy-844bb9f56f-7srxx        1/1     Terminating   0          2m21s
pod/markus-web-deploy-844bb9f56f-ng7t2        1/1     Terminating   0          2m21s
pod/markus-web-deployv2-7d6686db54-4xwg7      1/1     Running       0          83s
pod/markus-web-deployv2-7d6686db54-97jj4      1/1     Running       0          83s
pod/markus-web-deployv2-7d6686db54-gsn2v      1/1     Running       0          83s
pod/markus-web-deployv2-7d6686db54-tb6fj      1/1     Running       0          83s
pod/markus-web-deployv2-7d6686db54-wrqt6      1/1     Running       0          83s

NAME                     TYPE           CLUSTER-IP      EXTERNAL-IP   PORT(S)          AGE
service/kubernetes       ClusterIP      10.96.0.1       <none>        443/TCP          37m
service/markus-ps-lbv2   LoadBalancer   10.109.213.11   localhost     80:31741/TCP     77s

NAME                                   READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/markus-web-deployv2    5/5     5            5           83s

NAME                                              DESIRED   CURRENT   READY   AGE
replicaset.apps/markus-web-deployv2-7d6686db54    5         5         5       83s
```
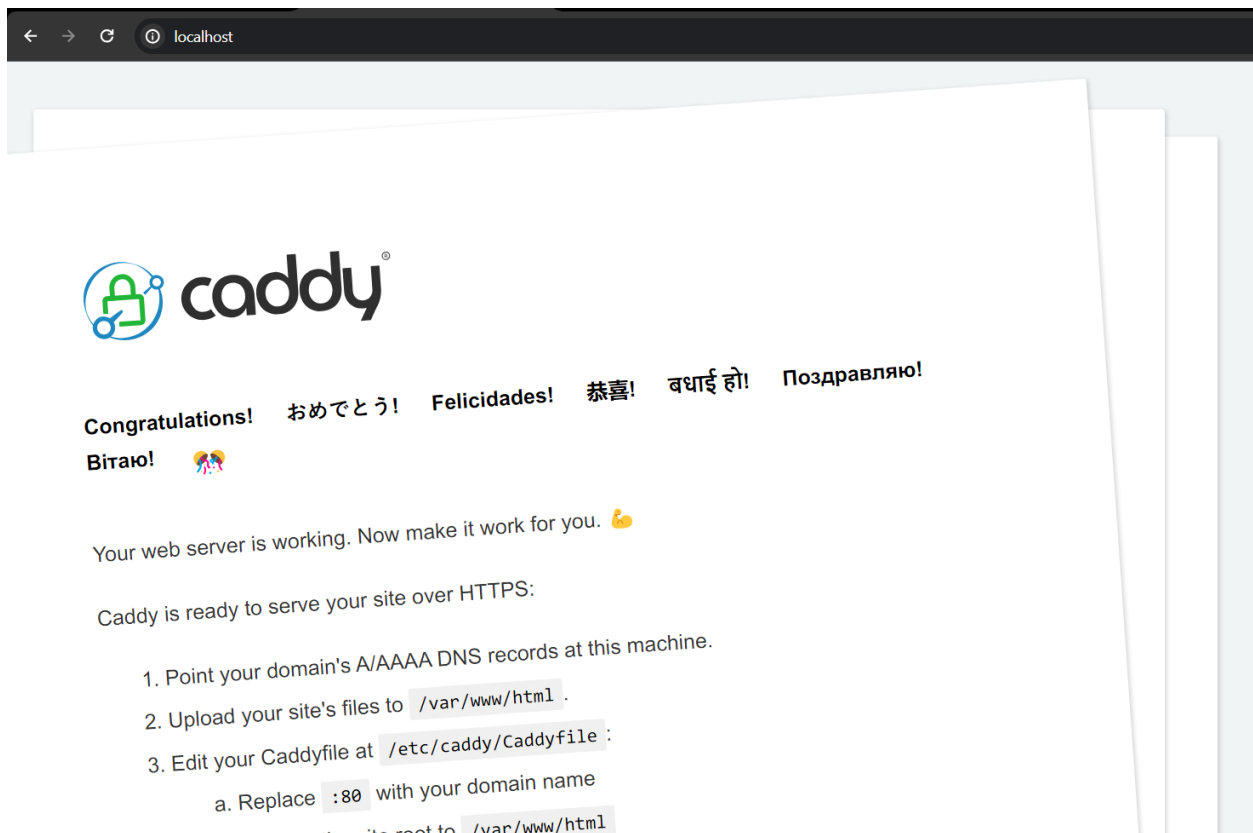
Part 2: Canary Deployment

Create deployment, service and working webpage:

```
~/3495/final on ☁  acit4640_admin (us-west-2)
❯ kubectl apply -f markus-deploy.yml
deployment.apps/markus-web-deploy created
```

```
~/3495/final on ☁  acit4640_admin (us-west-2)
❯ kubectl apply -f markus-svc.yml
service/markus-ps-lb created
```

Get all:

```
~/3495/final on ☁  acit4640_admin (us-west-2)
> kubectl get all
NAME                                         READY    STATUS     RESTARTS    AGE
pod/markus-web-deploy-844bb9f56f-7fz64       1/1      Running    0           11s
pod/markus-web-deploy-844bb9f56f-7vlw8       1/1      Running    0           11s
pod/markus-web-deploy-844bb9f56f-pjnb6       1/1      Running    0           11s
pod/markus-web-deploy-844bb9f56f-qdldv       1/1      Running    0           11s
pod/markus-web-deploy-844bb9f56f-qvv6w       1/1      Running    0           11s

NAME                    TYPE           CLUSTER-IP      EXTERNAL-IP    PORT(S)          AGE
service/kubernetes      ClusterIP      10.96.0.1       <none>         443/TCP          25m
service/markus-ps-lb    LoadBalancer   10.100.93.77    localhost      80:32089/TCP     3s

NAME                                   READY    UP-TO-DATE    AVAILABLE    AGE
deployment.apps/markus-web-deploy      5/5      5             5            11s

NAME                                             DESIRED    CURRENT    READY    AGE
replicaset.apps/markus-web-deploy-844bb9f56f     5          5          5        11s
```

New deployment only has 1 replica with a new a new version:

```yaml
markus-deploy-canary.yml > {} spec
1  apiVersion: apps/v1
2  kind: Deployment
3  metadata:
4    name: markus-web-deploy
5    labels:
6      app: web
7  spec:
8    replicas: 1 # only 1 replica
9    selector:
10     matchLabels:
11       app: web
12   template:
13     metadata:
14       labels:
15         app: web
16     spec:
17       terminationGracePeriodSeconds: 60
18       containers:
19       - name: markus-hello-pod
20         image: aldiab/webapp:v2 # changed to use version 2
21         imagePullPolicy: Always
22         ports:
23         - containerPort: 8080
24
```

Deploying new replica:

```
~/3495/final on ☁  acit4640_admin (us-west-2)
> kubectl apply -f markus-deploy-canary.yml
deployment.apps/markus-web-deploy configured
```

Get all:

```
~/3495/final on ☁  acit4640_admin (us-west-2)
> kubectl get all
NAME                                        READY   STATUS        RESTARTS   AGE
pod/markus-web-deploy-7d6686db54-ncczp      1/1     Running       0          19s
pod/markus-web-deploy-844bb9f56f-bf6x6      1/1     Terminating   0          94s
pod/markus-web-deploy-844bb9f56f-d7bvc      1/1     Terminating   0          89s
pod/markus-web-deploy-844bb9f56f-h8qw4      1/1     Terminating   0          90s
pod/markus-web-deploy-844bb9f56f-p25ff      1/1     Terminating   0          94s
pod/markus-web-deploy-844bb9f56f-wxrcn      1/1     Terminating   0          94s

NAME                    TYPE           CLUSTER-IP      EXTERNAL-IP   PORT(S)         AGE
service/kubernetes      ClusterIP      10.96.0.1       <none>        443/TCP         30m
service/markus-ps-lb    LoadBalancer   10.100.93.77    localhost     80:32089/TCP    5m17s

NAME                                    READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/markus-web-deploy       1/1     1            1           5m25s

NAME                                               DESIRED   CURRENT   READY   AGE
replicaset.apps/markus-web-deploy-7d6686db54       1         1         1       4m11s
replicaset.apps/markus-web-deploy-844bb9f56f       0         0         0       5m25s
```

Increasing the replicas to 5

```
~/3495/final on ☁   acit4640_admin (us-west-2)
> kubectl scale deployment markus-web-deploy --replicas=2
deployment.apps/markus-web-deploy scaled

~/3495/final on ☁   acit4640_admin (us-west-2)
> kubectl scale deployment markus-web-deploy --replicas=3
deployment.apps/markus-web-deploy scaled

~/3495/final on ☁   acit4640_admin (us-west-2)
> kubectl scale deployment markus-web-deploy --replicas=4
deployment.apps/markus-web-deploy scaled

~/3495/final on ☁   acit4640_admin (us-west-2)
> kubectl scale deployment markus-web-deploy --replicas=5
deployment.apps/markus-web-deploy scaled
```

Get all we can see all 5 pods with the new version:

```
~/3495/final on ☁  acit4640_admin (us-west-2)
> kubectl get all
NAME                                         READY   STATUS    RESTARTS   AGE
pod/markus-web-deploy-7d6686db54-842qd       1/1     Running   0          19s
pod/markus-web-deploy-7d6686db54-8kl8g       1/1     Running   0          33s
pod/markus-web-deploy-7d6686db54-cmg2p       1/1     Running   0          16s
pod/markus-web-deploy-7d6686db54-ncczp       1/1     Running   0          2m10s
pod/markus-web-deploy-7d6686db54-phm64       1/1     Running   0          18s

NAME                     TYPE           CLUSTER-IP      EXTERNAL-IP   PORT(S)        AGE
service/kubernetes       ClusterIP      10.96.0.1       <none>        443/TCP        32m
service/markus-ps-lb     LoadBalancer   10.100.93.77    localhost     80:32089/TCP   7m8s

NAME                                   READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/markus-web-deploy      5/5     5            5           7m16s

NAME                                             DESIRED   CURRENT   READY   AGE
replicaset.apps/markus-web-deploy-7d6686db54     5         5         5       6m2s
replicaset.apps/markus-web-deploy-844bb9f56f     0         0         0       7m16s
```