Assignment 4: Extending

1. (*20% grade*) Provide the YAML that allows you to manage a custom resource of type "Fruit" with Kubernetes. An example instance is the following:

```
apiVersion: hy548.csd.uoc.gr/v1
kind: Fruit
metadata:
  name: apple
spec:
  origin: Krousonas
  count: 3
  grams: 980
```

Also, provide the kubectl commands needed to:
   a. Install the custom resource.
   b. Create the above instance.
   c. Return the new instance in YAML format.
   d. Return a list of all available instances.

2. (*40% grade*) The example code for CRDs is available on GitHub (https://github.com/chazapis/hy548). Extend the example so that:
   a. The executable `controller.py` runs inside a container. Provide the `Dockerfile`. Build and upload the new container to Docker Hub.
   b. Provide `greeting-controller.yaml`, which will create a Deployment with the container you made. Make sure the necessary permissions are set so the controller can read the "Greeting" CRDs and create the corresponding Deployments with the `hello-kubernetes` container in all namespaces.
   Provide the commands you used to verify that the deployment works correctly.

3. (*40% grade*) The example code for the webhooks is available on GitHub (https://github.com/chazapis/hy548). Extend the example so that:
   a. The executable `controller.py` runs inside a container. Provide the `Dockerfile`. Build and upload the new container to Docker Hub.
   b. The `webhook.yaml` should use the new container instead of the proxy with Nginx. Provide the new `webhook.yaml`.
   Provide the commands you used to verify the webhook works correctly.

Notes:
   ● The assignment is personal.

- All exercises contribute equally to the overall grade (unless individual percentages are defined).
- A day/time will be set for answering questions and giving clarifications.
- Write down your answers in a Markdown-formatted text file in either Greek or English and commit it (along with any other files) in a private GitHub repository before the exercise's deadline. Share the repository with the instructor (username "chazapis").