Nautilus - Task 3

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Exploring Nautilus Jypternotebook

- Started by exploring the Jypter notebook environment on Nautilus - jupyterhub-west.nrp-nautilus.io
- Ran the cifar10 tutorial python file by going through each cell step and running the cell.
- Obtained the final output with following accuracy for each class.

```
Accuracy for class: plane is 55.2 %
Accuracy for class: car   is 74.5 %
Accuracy for class: bird  is 63.2 %
Accuracy for class: cat   is 37.9 %
Accuracy for class: deer  is 25.9 %
Accuracy for class: dog   is 60.2 %
Accuracy for class: frog  is 47.0 %
Accuracy for class: horse is 55.6 %
Accuracy for class: ship  is 65.3 %
Accuracy for class: truck is 40.0 %
```

Nautilus Setup

- Explored nautilus platform after requesting access to the platform.
- Installed docker desktop and enabled kubernetes engine for easier kubernetes access
- Downloaded the kubeconfig from nautilus dashboard and replaced the local config
- Installed Docker and Kubernetes extensions on VS code to easily view and manage workloads
- Got familiar with running kubernetes commands by watching some tutorials, exploited the nautilus github with sample deployment configuration.

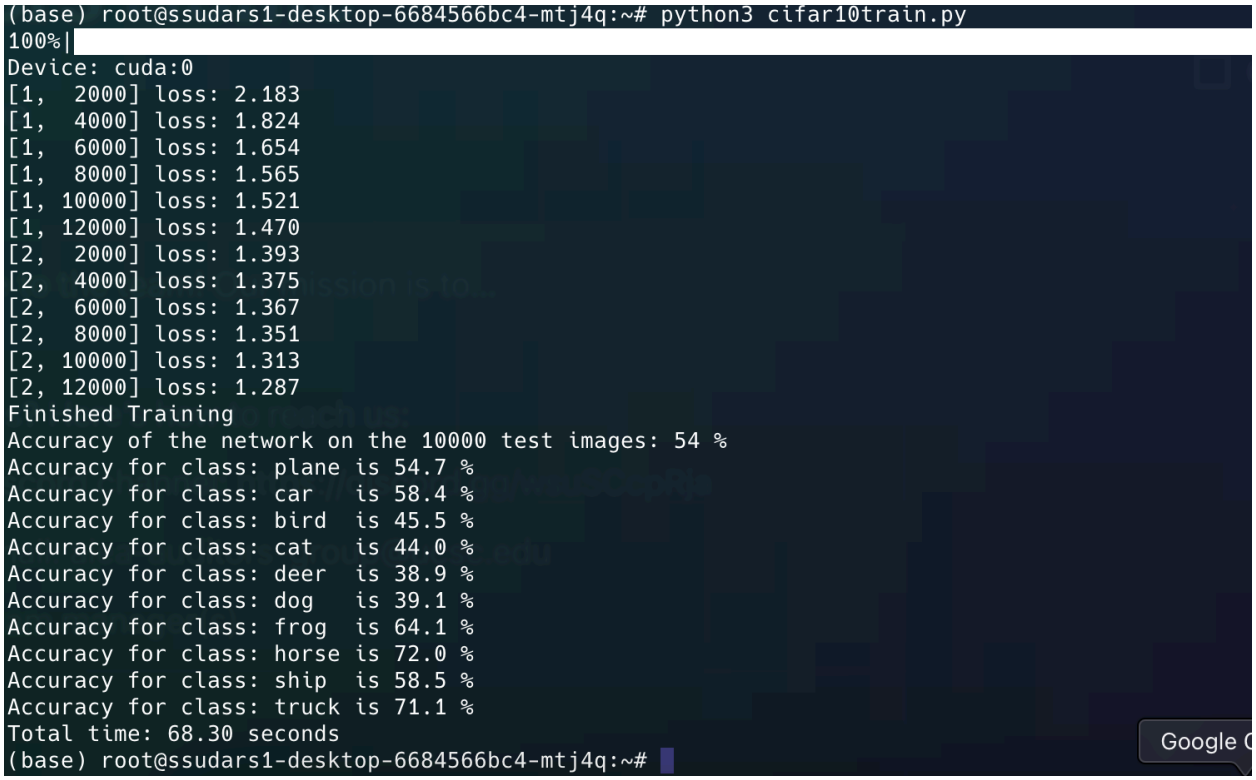
Cifar Training using a Deployment

- Created a deployment yaml to run with Nvidia cuda image

```Shell
nvidia/cuda:11.3.1-devel-ubuntu20.04
```

- Created a Persistent volume with 5Gib resource and volume claim name as cruzid.
- Copied the cifar10train.py and setup.sh files using the vscode dev container remote environment.
- Successfully ran the training deployment by running Kubectl interactive exec inside the pod.

Output:



Cifar Training using a Job

- Created a job configuration with the same nvidia base image.
- Utilised the same pvc volume since the files were already copied to persistent storage.
- However, while running the job, there were hurdles in the command line environment. The command sh ***setup.sh*** ***&& python3*** ***cifartraining.py*** was losing context of the environment and hence the command failed with “python3 not found”
- Eventually, by tweaking the script to include additional commands, the final job completed successfully.

```shell
pip install torch torchvision matplotlib numpy
```

```
python3 cifar10train.py
```

Output :

```
mended to use a virtual environment instead: https://pip.pypa
100.0%
Device: cuda:0
[1,  2000] loss: 2.172
[1,  4000] loss: 1.813
[1,  6000] loss: 1.650
[1,  8000] loss: 1.554
[1, 10000] loss: 1.512
[1, 12000] loss: 1.434
[2,  2000] loss: 1.386
[2,  4000] loss: 1.357
[2,  6000] loss: 1.322
[2,  8000] loss: 1.312
[2, 10000] loss: 1.290
[2, 12000] loss: 1.276
Finished Training
Accuracy of the network on the 10000 test images: 55 %
Accuracy for class: plane is 66.3 %
Accuracy for class: car   is 76.8 %
Accuracy for class: bird  is 31.2 %
Accuracy for class: cat   is 6.3 %
Accuracy for class: deer  is 43.9 %
Accuracy for class: dog   is 61.3 %
Accuracy for class: frog  is 73.8 %
Accuracy for class: horse is 61.5 %
Accuracy for class: ship  is 63.6 %
Accuracy for class: truck is 69.5 %
Total time: 71.72 seconds
```

```
aiea ~/code/aiea-auditor/llm_logic/task_3 git:(main)±1 ⎈ nautilus (1.383s)
kubectl get jobs
NAME             STATUS     COMPLETIONS   DURATION   AGE
ssudars1-task3   Complete   1/1           6m22s      96m
```