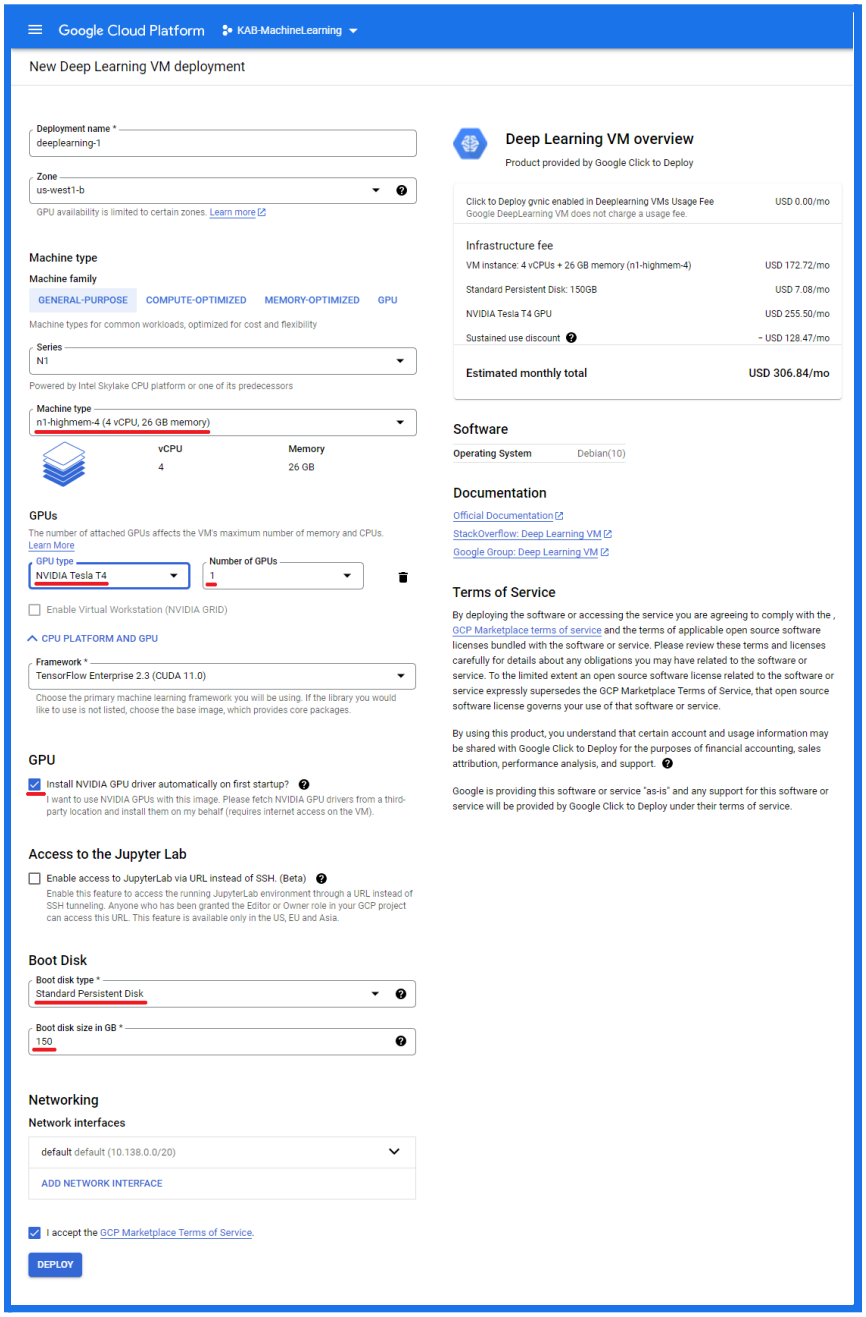
Google Cloud Platform Quick Start Guide

1. Create VM

Open the Deep Learning VM Deployment Page in the GCP Marketplace. We selected the n1-highmem-4 which utilized 4 vCPUs and includes 26 GB memory. Add a GPU, the NVIDIA Tesla T4 is the least expensive option and will work for our needs. A more expensive option will speed up training and detection times. Verify "Install NVIDIA GPU driver automatically on first startup?" is selected. A minimum 150 GB persistent boot disk size should be selected, however more would be better depending on the dataset being used and how much information you plan on working on at once.



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2. Setup VM

In your instance clone our copy of the YOLOv5 repo which includes our TCP Detection code. Install requirements.txt in a Python ≥ 3.7.0 environment (3.9.0 if performing hyperparameter evolution training) and PyTorch ≥ 1.7.

```
git clone https://github.com/SushiTeam2022/KAAB-ML/tree/main/YOLOv5  # clone
cd yolov5
pip install -r requirements.txt  #install
```

3. Train

These commands are examples on how to train data using the YOLOv5 machine learning model. These are the settings we used which we found worked best on small litter objects. The data.yaml file will come from your dataset. Setting the batch size to -1 uses YOLOv5's auto-batching feature to maximize the capability of your GPU.

```
python train.py --data data.yaml --cfg yolov5l.yaml –weights '' --batch-size -1 --name "training run name"
```

4. Optional Setup

a. Weights and Biases

Weights and Biases (WANDB) is a website that allows an easy to use interface to track and compare training runs. This is an optional component, but very useful to quickly review data from many different training runs and their parameters. You can either first make an account on https://wandb.ai or when first running you will be prompted to create an account. Use your API key, (from https://wandb.ai/authorize if you are already a user) to login.

```
pip install wandb
wandb login
```

b. Anaconda Environment

Anaconda allows you to create different environments to develop in so that you can run a program with separate settings than what you may want to run your system on. If the sole purpose of this machine is to run this program Anaconda may not be necessary. For verifying different system configurations prior to actual deployment, Anaconda is recommended. To create an environment with a specific Python version the command is as follows, and remember all "pip install" commands ran in one environment will not transfer to another so the requirements will need to be installed in each environment..

```
conda create --name nameOfYourEnvironment python=3.9
```

The environment must be activated, and deactivated before returning to the normal system state. You will know you are in the environment when the name appears on the left side of your screen.

```
USERNAME:~$ conda activate nameOfYourEnvironment
(nameOfYourEnvironment) USERNAME:~$
(nameOfYourEnvironment) USERNAME:~ conda deactivate
```