EE-105
NN eval on MNIST

3/26/2025

Objective

- Objectives:
  - Cloud based training
  - GPU acceleration
  - Data augmentation
  - Real time hand written digit classification

Files

- NN training:
  - Colab notebook: https://colab.research.google.com/drive/1rN-xKptCIfcoZG2GLx4XZI0PTeYfAdEx?usp=sharing
- NN Eval:
  - Arduino (Camera stream): tinyML_camera.ino
  - Notebook (Image classification): tinyML_camera_capture.ipynb

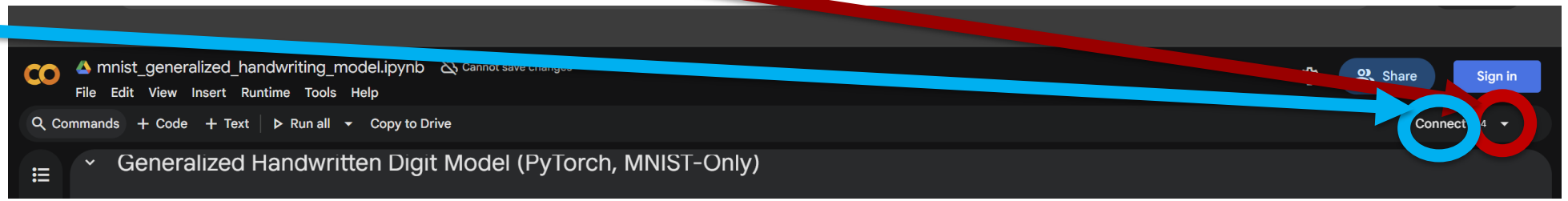
Checkpoint 1 – Cloud GPU training

- Open Colab notebook
- If prompted to create profile/account/sign in/etc, do it

Checkpoint 1 – Cloud GPU training

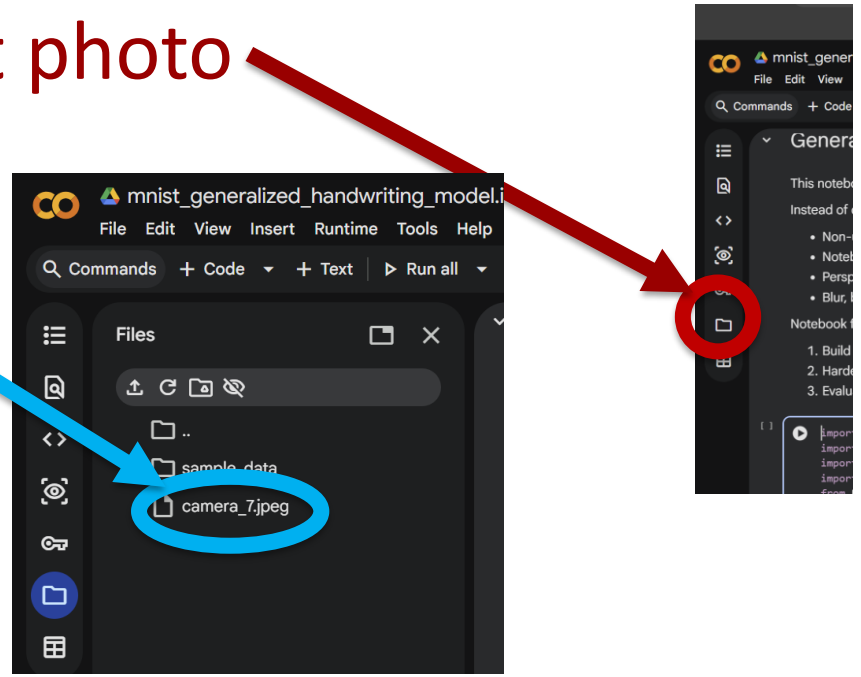
Selecting GPU instance:

- Click on the drop down
- Select “T4 GPU”
- Click save
- Click connect



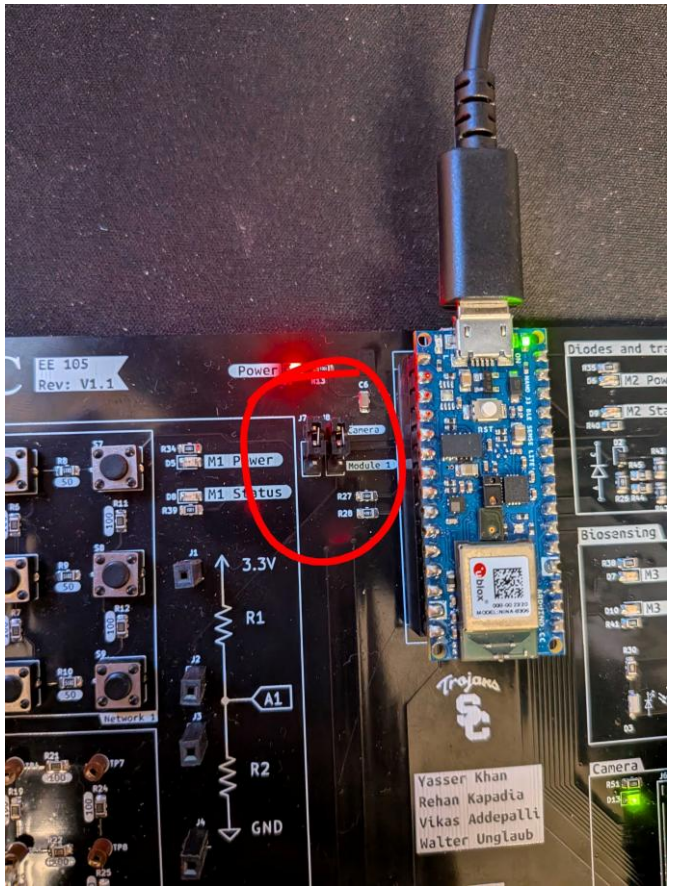
Checkpoint 1 – Cloud GPU training

- Upload a custom handwritten digit photo
- Drag and drop jpeg here
  - NOT INSDE “SAMPLE DATA”
- Change the file name in:
  - “Add File name here”
- Run all!
- Once done: download “mnist_generalized_model.pth”



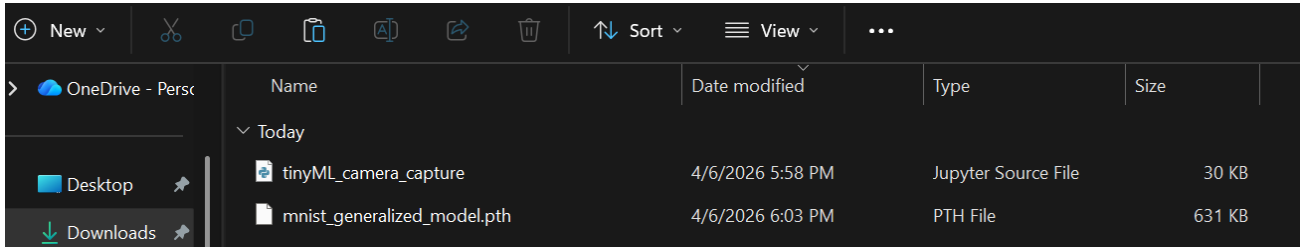
Checkpoint 2 – Arduino code

- Change the jumper connection on the board
- Connect the board, change the selector to the camera module
- Open tinyML_camera.ino
  - Arduino/tinyML_camera
- Locate and add "Arduino_OV767X.zip“
  - Arduino
- Upload the sketch



Checkpoint 3 – NN Eval

- Open tinyML_camera_capture.ipynb
  - Inside “Python”



- Move the downloaded checkpoint next to the notebook
- Select kernel same as last lab’s
- Run all!
- Select the correct Port
- Capture