WQVN Take Home Test

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# Problem breakdown

* At first glance, there are 2 tasks to the assignment: Create a ML model and build a web application that satisfies given requirements.
* ML task: Not the focus, just need something minimal.
  + Install pip and PyTorch
  + Understand the MNIST challenge.
* I decide to refer to this guide: [Mastering MNIST Classification with PyTorch: A Step-by-Step Tutorial | by Bragadeesh Sundararajan | Dec, 2023 | Medium](https://medium.com/@bragadeeshs/mastering-mnist-classification-with-pytorch-a-step-by-step-tutorial-25151d74fe25)
* Build a UI: The bulk of the work.
  + Define some hyper parameters for users to tune 🡪 I will be using 3 parameters: learning rate, batch size, and epochs.
  + Allow users to run several jobs with different hyper-parameters with a simple click 🡪 I’m unsure how to do this concurrently yet.
  + Display the progress of currently running jobs 🡪 I’m unsure how to display a live progress (%) yet. A static Boolean of running/finished might work.
  + Display the results of all finished jobs 🡪 Save [run time, accuracy, job ID, hyper-parameters selection] in a database in the backend (more on database setup later), write a query and display a table in the front end.
  + Experiments should be sortable 🡪 Sort by accuracy, then run time if possible.
  + Allow resuming of UI
    - Can close and open web browser and still see current state.
    - We have to store the information somehow.
    - Cannot store information with in-memory storage (Python data structures), as data gets wiped across server restarts.
    - We care more about the management system than the data layer.

🡪 For simplicity, let’s use a file-based storage (a .txt file with JSON format)

* + Adding jobs should be available 🡪 I don’t quite understand this task, but I assume we need a functionality for grid search. To check if exactly same job has been run, maintain another file-based storage

# Architecture design

# File Structure

A screen shot of a computer

Description automatically generated