Project Planning Worksheet

To pass this course, you'll need to create a project that matches this criteria:

> *"Based on your understanding of the material, you're required to build and submit an open-source project that uses NVIDIA Jetson and incorporates elements of AI (machine learning or deep learning) with GPU acceleration, along with a video demonstrating the project in action. For example, you could collect your own dataset and train a new DNN model for a specific application, add a new autonomous mode to JetBot, or create a smart home / IoT device using AI - these need not be limited only to topics covered in the course. For inspiration, see the Jetson Community Projects page - the possibilities are endless!"*

To pass the certification, your project will be reviewed based on the following criteria:

- **AI** - The project uses deep learning, machine learning, and/or computer vision in a meaningful way and demonstrates a fundamental understanding of creating applications with AI. Factors include the effectiveness, technical complexity, and performance of your AI solution on Jetson.
- **Impact / Originality** - The concept of your project is novel and applies AI to solve or address challenges or issues faced by yourself or society. Also, our ideas and work are either original or derivative in a significant way.
- **Reproducibility**- Any plans, code, and resources needed for someone else to build and use the project are included in the repository and are easy to follow.
- **Presentation and Documentation** - The video effectively demonstrates and explains various aspects of the project, and there exists a clear, complete README in the repository that documents any steps needed to build/run the project, along with diagrams and images.

Follow these steps to plan out your project

Part One: Brainstorming

Write down 3-5 ideas for problems that you see in the world around you that you could create an AI to help solve. You can use student example projects or community example projects for inspiration or look back on past lessons that you enjoyed.

1. Medical Symptom Checker
2. Dietary Recommendations
3. Mental Health Monitoring
4. Fitness Advisory
5. Healthiness of a vegetable leaf

Part Two: Details

Write down the answers to these questions for your **two favorite** ideas:

AI: How would the AI work? Technically speaking what kind of network is it and how does this network work?

Idea 1: Medical Symptom Checker
RNN. A neural network that remembers previous information, making it useful for tasks like understanding sequences of words in a sentence or predicting what comes next in a series. The AI would compare a person's healthy facial appearance with newly taken photos.

Idea 2: Diseased Leaves and Healthy Leaves
CNN. A neural network that is especially good at recognizing patterns in images, like identifying objects or features in photos. The AI would detect how diseased a vegetable leaf is, or essentially how 'not normal' it looks.

Impact: What impact would this project have? Who does it impact and in what ways?

Idea 1: It impacts everyone with access to the AI as it is a very general check on the person's health. For instance, some illnesses cause subtle changes in facial color or complexion.

Idea 2: It impacts farmers and also people who check the health of their vegetables. I have had personal experience where I would be washing my vegetables and some leaves would leave me questioning whether they are safe to eat.

Part Three: Resources

Now that you have thought out the impact and technical aspects of how the AI will work, it is time to map out what resources are going to be needed to complete your project.

Docs from jetson-inference: Add your documentation or tutorial link below
https://github.com/dusty-nv/jetson-inference/blob/master/docs/imagenet-console-2.md

Example code: Add your example code below
https://github.com/dusty-nv/jetson-inference/tree/master/examples/my-recognition

Datasets: If applicable, add the dataset that you will be using below
https://www.kaggle.com/datasets/kaustubhb999/tomatoleaf
https://www.kaggle.com/datasets/rizwan123456789/potato-disease-leaf-datasetpld

Miscellaneous: Add any other resources you might need for your project below.

Part Four: Documentation

Video: Write down any key points that you want to add into your video below

- Explain what the AI is, what it does and helps, and show how it works
- Show dataset and layout of the VS Code setup
- Show commands, and the components of them
- Show result

Documentation: Write down any key points that you want to make sure are in your readme doc.

- It is a pretrained resnet18.onnx
- Can detect how diseased a leaf is
- Include code commands
- Include video

Reproducibility: How could your project be reproduced or run on another machine. Make sure to remember all steps that make your project work.

1. Download labels.txt and resnet18.onnx. Use the dataset given as reference. Replace the images in the dataset with your own images.
2. Be in the classification directory, set net and data variables.
3. Type image processing command.
4. Lastly, check if it is blight or healthy.