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 (5 points)** - 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 (5 points)** - 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 (5 points)** - 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 (5 points)** - 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. Noticing backyard intruders through a video feed
2. Identifying different household spiders
3. Color Recognizer
4. Cup filler
5.

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: Spiders
Uses Ai (imageNet) to classify different breeds of spiders, especially those that can be found in a house. After classifying which spider it is, it also provides information if it is venomous or not.

Idea 2: Intruder Detector
It would use object detection on a live video feed to detect specifically people or objects out of the ordinary.

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

Idea 1: Knowing whether it's venomous or not determines how to deal with the spider.

Idea 2: Can be especially useful when on vacation to make sure your home is secure.

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
Image Classification Inference

Example code: Add your example code below

```
#!/usr/bin/python3

import jetson.inference
import jetson.utils

import argparse

# parse the command line
parser = argparse.ArgumentParser()
parser.add_argument("filename", type=str, help="filename of the image to process")
parser.add_argument("--network", type=str, default="googlenet", help="model to use, can be:  googlenet, resnet-18, ect.")
args = parser.parse_args()

# load an image (into shared CPU/GPU memory)
img = jetson.utils.loadImage(args.filename)

# load the recognition network
net = jetson.inference.imageNet(args.network)

# classify the image
class_idx, confidence = net.Classify(img)

# find the object description
class_desc = net.GetClassDesc(class_idx)

# print out the result
print("image is recognized as '{:s}' (class #{:d}) with {:f}% confidence".format(class_desc, class_idx, confidence * 100))
```

Datasets: If applicable, add the dataset that you will be using below
https://www.kaggle.com/datasets/gpiosenka/yikes-spiders-15-species

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

- Show the code used to run Imagenet
- Show the commands to get the program to run
- Provide an accurate response from the AI

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

- How the program is useful
- Why I made it
- How to use it

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 the same dataset
2.
3.
4.