

# Assignment 2 Tasks & Guidelines - Beginners

## Assignment 2 - Tasks:

### The Road Ahead

We have broken the notebook into separate tasks. Feel free to use the links below to navigate through the notebook.

Task 1: Loading Data

Task 2: Pre-processing

Task 3: Building a Multi-Layer Perceptron

Task 4: Loss Function and Optimizer

Task 5: Training the model

Task 6: Tensorboard

Task 7: Optimization Techniques (Optional but do carry bonus marks)

Task 8: Prediction

### Help Documentation:

- As promised in the Slack discussion forums, we have put up a help notebook and a walkthrough video on how to fetch, load, and pre-process image datasets for Deep Learning. Many thanks to coach Raviraj for doing this.
- **Notebook for helping you get started:**  
[https://github.com/dphi-official/Deep\\_Learning\\_Bootcamp/blob/master/Assignment\\_2/Reading\\_Zip\\_Data\\_From\\_GitHub\\_Beginners.ipynb](https://github.com/dphi-official/Deep_Learning_Bootcamp/blob/master/Assignment_2/Reading_Zip_Data_From_GitHub_Beginners.ipynb)
- **A quick glance at [open CV notebook](#) will be helpful**
- **Optional:** Help notebook link can be found [here](#) and video tutorial can be found [here](#). Ignore the fetching dataset part in the video and notebook as the required code is given under getting started in this document.

### Elaborate Task Explanations:

#### TASK 1: Loading Data

Load the data using OpenCV's imread function . The basic code has been added to the [Getting Started Notebook](#).

Display any random image using OpenCV's imshow function along with its corresponding label.

#### TASK 2: Pre-processing

Apply the required pre-processing steps on the image data. These may include scaling, converting to grayscale, data augmentation, or anything else. Justify your decision about performing those particular pre-processing steps.

### **TASK 3: Building a Multi-Layer Perceptron**

Create a multi-layer perceptron, deciding on the number of layers, neurons and activation functions that should be provided. Print a summary and architecture of the model. Explain the architecture.

### **TASK 4: Optimizer**

Decide the Learning Rate, Optimizer, Loss Function and Metrics to be used and justify why they were chosen.

### **TASK 5: Training the model**

Fit the model to the data by dividing the train data into train and validation set in a ratio of 80:20. Decide the number of epochs and ensure underfitting/overfitting doesn't occur.

### **TASK 6: Tensorboard**

Use Tensorboard to display the accuracy and loss graphs of the training.

### **TASK 7: Optimization Techniques (Optional but do carry bonus marks)**

Apply a minimum of two optimization techniques on the data and list down any performance improvements.

### **TASK 8: Predict**

Use the model that is performing better (in case you have applied one or more optimization techniques) to predict over new\_test\_data. Please pay attention to the class labels, since your predictions will be evaluated against the same labels.

**Link to the problem page:** <https://dphi.tech/practice/challenge/34>

## Getting Started & Help Documentation

- We have provided 2 Zip files and 2 CSV files here:  
[https://github.com/dphi-official/Datasets/tree/master/animal\\_data](https://github.com/dphi-official/Datasets/tree/master/animal_data)
- The information about the contents of these files is provided here:  
<https://dphi.tech/practice/challenge/33#data>
- You can either download the whole Datasets repository or access the files using the links below.

- For the **CSV data**, you can either access it through the downloaded files or use the following links directly:
  - **training set:**  
[https://raw.githubusercontent.com/dphi-official/Datasets/master/animal\\_data/Training\\_set\\_animals.csv](https://raw.githubusercontent.com/dphi-official/Datasets/master/animal_data/Training_set_animals.csv)
  - **testing set:**  
[https://raw.githubusercontent.com/dphi-official/Datasets/master/animal\\_data/Testing\\_set\\_animals.csv](https://raw.githubusercontent.com/dphi-official/Datasets/master/animal_data/Testing_set_animals.csv)
- **Zip Files**
  - Zip files links:
    - **train image data:**  
[https://github.com/dphi-official/Datasets/blob/master/animal\\_data/train\\_image.zip?raw=true](https://github.com/dphi-official/Datasets/blob/master/animal_data/train_image.zip?raw=true)
    - **test image data:**  
[https://github.com/dphi-official/Datasets/blob/master/animal\\_data/test\\_image.zip?raw=true](https://github.com/dphi-official/Datasets/blob/master/animal_data/test_image.zip?raw=true)
  - **Google Colab user**
    - This starting code will help you with accessing the zip files and unzipping them:  
[https://github.com/dphi-official/Deep\\_Learning\\_Bootcamp/blob/master/Assignment\\_2/Reading\\_Zip\\_Data\\_From\\_GitHub\\_Beginners.ipynb](https://github.com/dphi-official/Deep_Learning_Bootcamp/blob/master/Assignment_2/Reading_Zip_Data_From_GitHub_Beginners.ipynb)
  - **Jupyter Notebook user**
    - You can download and extract the files in the zip folder using any unzip tool present on your device and use them directly. The provided CSV file indicates the label for each file so make sure you combine them accordingly.

## Assignment 2 - Guidelines:

What is the Start Date of the assignment?

2nd September 2020

What is the deadline to submit the assignment?

13th September 2020

How to access the assignment?

The assignment is available under Deep Learning Bootcamp - **Assignment 2** section

What topics do I need to know before attempting the assignment?

The assignment is based on everything you've learned during the Bootcamp. Feel free to apply any skills or techniques learnt from somewhere else.

What is the assignment structure like?

The assignment is broken down into multiple tasks. Each task carries different weightage. Some tasks require you to add an explanation of your thought process behind the code you wrote.

## What all needs to be submitted?

1. Predictions generated on new\_test\_data.
2. Well documented notebook of your solution.

## How to submit?

### Predictions

- The steps to submit predictions are listed in this post on Discuss: <https://discuss.dphi.tech/t/how-to-submit-predictions/548>
- Links to make submissions:
  - Beginners: <https://dphi.tech/practice/challenge/34#submission>
  - Intermediates: <https://dphi.tech/practice/challenge/33#submission>

### Notebook

- The well-documented notebook for your solution can be submitted on the platform which is put under Assignment 2 section

## How many submissions can I make?

There is no limit to the number of submissions you can make before the deadline.

## How will the assignment be graded?

The total score of the assignment will be based both on the score you achieve on the test\_new\_data as well as the completion of tasks in the notebook.

- The score on test\_new\_data as well as your rank based on the score will be immediately visible to you on the leaderboard on making a submission.
- The notebook will be graded based on a peer-review process or by the coaches - we will inform you about this once the deadline has passed.