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| **Team ID :** LTVIP2025TMID32402 |
| Project Name : Enchanted Wings: Marvels of Butterfly Species |

# Prior Knowledge

You must have prior knowledge of the following topics to complete this project.

## DL Concepts

* **Neural Networks:** https://www.analyticsvidhya.com/blog/2020/02/cnn-vs-rnn-vs-mlp-analyzing-3-types-of-neural-networks-in-deep-learning/
* **Deep Learning Frameworks:** https://www.knowledgehut.com/blog/data-science/pytorch-vs-tensorflow
* **Transfer Learning:** https://towardsdatascience.com/a-demonstration-of-transfer-learning-of-vgg-convolutional-neural-network-pre-trained-model-with-c9f5b8b1ab0a
* **VGG16:** https://www.geeksforgeeks.org/vgg-16-cnn-model/
* **Convolutional Neural Networks (CNNs):** https://www.analyticsvidhya.com/blog/2021/05/convolutional-neural-networks-cnn/
* **Overfitting and Regularization:** https://www.analyticsvidhya.com/blog/2021/07/prevent-overfitting-using-regularization-techniques/
* **Optimizers:** https://www.analyticsvidhya.com/blog/2021/10/a-comprehensive-guide-on-deep-learning-optimizers/
* **Flask Basics:** <https://www.youtube.com/watch?v=lj4I_CvBnt0>

**Project Objectives**

* By the end of this project, you will:
* Know fundamental concepts and techniques used for Deep Learning.
* Gain a broad understanding of data.
* Have knowledge of pre-processing the data/transformation techniques on outliers and some visualization concepts.

**Project Flow**

* The user interacts with the UI (User Interface) to choose the image.
* The chosen image is analyzed by the model which is integrated with the Flask application.
* Once the model analyses the input, the prediction is showcased on the UI.
* To accomplish this, we have to complete all the activities listed below:
* **Data Collection:** Collect or download the dataset that you want to train.
* **Data Pre-processing**
* **Data Augmentation**
* **Splitting data into train and test**
* **Model Building**
* **Import the model-building libraries**
* **Initializing the model**
* **Training and testing the model**
* **Evaluating the performance of the model**
* **Save the model**
* **Application Building**
* **Create an HTML file**
* **Build Python code**