**Project Pipeline**

* **Data Reading/Data Understanding** → Defining the path for train and test images
* **Dataset Creation**→ Create train & validation dataset from the train directory with a batch size of 32. Also, make sure you resize your images to 180\*180.
* **Dataset visualisation**→ Create a code to visualize one instance of all the nine classes present in the dataset
* **Model Building & training :**
  + Create a CNN model, which can accurately detect 9 classes present in the dataset. While building the model rescale images to normalize pixel values between (0,1).
  + Choose an appropriate optimiser and loss function for model training
  + Train the model for ~20 epochs
  + Write your findings after the model fit, see if there is evidence of model overfit or underfit
* **Choose an appropriate data augmentation strategy to resolve underfitting/overfitting**
* **Model Building & training on the augmented data :**
  + Create a CNN model, which can accurately detect 9 classes present in the dataset. While building the model rescale images to normalize pixel values between (0,1).
  + Choose an appropriate optimiser and loss function for model training
  + Train the model for ~20 epochs
  + Write your findings after the model fit, see if the earlier issue is resolved or not?
* **Class distribution:**Examine the current class distribution in the training dataset
  + - Which class has the least number of samples?
  + - Which classes dominate the data in terms of the proportionate number of samples?
* **Handling class imbalances:** Rectify class imbalances present in the training dataset with [Augmentor](https://augmentor.readthedocs.io/en/master/) library.
* **Model Building & training on the rectified class imbalance data :**
  + Create a CNN model, which can accurately detect 9 classes present in the dataset. While building the model rescale images to normalize pixel values between (0,1).
  + Choose an appropriate optimiser and loss function for model training
  + Train the model for ~30 epochs
  + Write your findings after the model fit, see if the issues are resolved or not?

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| **Stage** | **Weightage** | **Meets Expectations** |
| **Data Reading/Data Understanding** | 5 | Defined the path for both train and test images from dataset. |
| **Dataset creation** | 10 | * Created train & validation dataset from the train directory with a batch size of 32 . * Resized images to 180\*180.(10%) |
| **Dataset visualisation** | 5 | Created a code to visualize one instance of all the nine classes present in the dataset |
| **Model Building & training** | 15 | * Created a CNN model, which can accurately detect 9 classes present in the dataset. * Defined appropriate optimiser and loss function for model training. * Trained the model for ~20 epochs. * Explained the findings after the model fit with evidence if the model overfits or underfits. |
| **Data augmentation** | 10 | Chose an appropriate data augmentation strategy to resolve underfitting/overfitting |
| **Model Building & training** | 15 | * Created a CNN model, which can accurately detect 9 classes present in the dataset. * Defined appropriate optimiser and loss function for model training. * Trained the model for ~20 epochs. * Explained the findings after the model fit with evidence if the earlier issue is resolved or not. |
| **Class distribution** | 15 | Examined the current class distribution in the training dataset & explained the following:   * Which class has the least number of samples? * Which classes dominate the data in terms of the proportionate number of samples? |
| **Handling class imbalances** | 10 | Rectified class imbalances present in the training dataset with Augmentor library |
| **Model Building & training** | 15 | * Created a CNN model, which can accurately detect 9 classes present in the dataset. * Defined appropriate optimiser and loss function for model training. * Trained the model for ~20 epochs. * Explained the findings after the model fit with evidence if the issues are resolved or not. |