**Hello My name is Mayank Rastogi**

**HackerEarth Deep Learning Challenge: 'Tis STILL the season to be jolly** as in this challenge I have using Transfer learning technique called**(Vgg-16)** to classify the images belongs to certain no of classes that is given us to i.e **6 classes** .

Soo My approach is simple that first. I have importing necessary libraries including pandas ,scikit learn , open cv module cv2 , PIL this pil and open cv is basically for image reading functioning(imread,imshow,image\_read,etc) and other related operations like converting the dimensions and RGB format and other operations you can see on My Notebook and other Keras related libraries and Resnet application architecture library, etc.

Next step, is to read The file using pandas method called read\_csv and others operations.

Next step, is to set the path of train and test folder to use in further use.

Next step, is creating the train\_img list and appending on the list of images from train folder on the train\_img list scaling it using 255 scale and initialize all this in y\_train variable and creating the class into list onto numeric and initialize into the x-train

Now building our Model using **Vgg-16** and weights we have taken is **imagenet**  and setting the layer i.e; Input layer and last layer to our layer which is passed by including the 6 classes.

Now by creating the sequential layer and flatten layer we add our layer using dense layer i.e; our last layer here we use **softmax** activation function and optimizer **SGD** using **lr=1e-4** ie; learning rate and momentum

Initialize the batch size and no of epochs (basically indicates no of iterations)

Now, Performing **Data Augmentation** on train data and git o our model and iterate by fitting the model and here using **Vgg-16** I have obtained **95.36 accuracy** i.e is pretty good

Now Our Second last step after, fitting the model or say training the model now we test the image using same as we can do with train folders images by appending the images into test\_img list by passing it to test images path and image and then after this we have to scale the image and initialize it to x\_test by

Now , predict the test images by passing the x\_test to it and then convert it to array and the get from it argmax for max value of the array and on that predicts the classes by iterating all images and classes my matching their numeric value of the classes by using for loop by forming dictionary and initialize to **pred\_labels** i.e **predicted labels or classes** or that particular image which our model predicts that this image belongs to that particular class

Last Part is to create the data frame for submission (**submission\_vgg16.csv** i,e; our predicted results) in the form of image and their Predicted classes or labels.

**Tool I have used is only Google Collab(GPU version)**