Documentation

The task that was provided was basically an NLP task where we need to classify the input transcription into multiple classes each time for **action**, **object** and **location**. There are 6 labels for **action**, 14 labels for **object** and 4 labels for **location**. Totol around 11,000 Instances were given in the training dataset and 3000 Instances in the validation dataset.

for most of the NLP tasks transformers have become very powerful. Instead of implementing transformers from scratch it is always better to check with the pretrained models and use transfer learning for our particular task. As text is something which belongs to a very giant data space, training on such a large space will be a difficult task. Hugging face transformers provide one of the best ways to train an NLP model.

Step - 1 : Organize the data in required format.

The whole data is in the form of text. We need number representations. So, first the whole text is converted into lowercase inorder to make sure that we need to to assign different tokens to the same words. For each label action, object and location for each unique class is mapped with a number.

Step - 2 : Applying algorithm

A **Bert base-uncased model** was chosen which has 12 layers. As we want to extract three labels from it, after passing it through bert, three dense layers have been used. The total trainable parameters are 109,500,696.

Step - 3 : choosing parameters and hyperparameter tuning.

Adams optimizer was chosen and categorical cross entropy loss function to monitor loss for each label. Tensorboard callback function was chosen to note the log values. Learning rate of 5×10^{-5} was chosen.model ran through 5 epochs.

Step - 4 : prediction and evaluation

After running it through 5 epochs the loss trend was shown below.

	Action Loss	Object Loss	Location Loss	Overall Loss
Epoch - 1	1.0107	1.2495	0.6175	2.8778
Epoch - 2	0.1871	0.3917	0.1543	0.7331
Epoch - 3	0.0894	0.1981	0.0758	0.3633
Epoch - 4	0.0622	0.1220	0.0528	0.2370
Epoch - 5	0.0482	0.0883	0.0409	0.1773
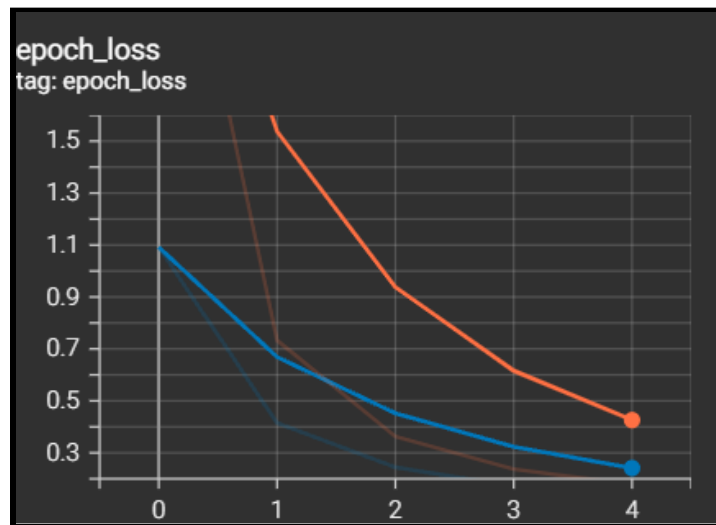
F1 score was also calculated for each label and average was taken for obtaining the final F1 score. Final F1 score obtained was **1.0.** And the accuracy on the validation set was 100 percent.