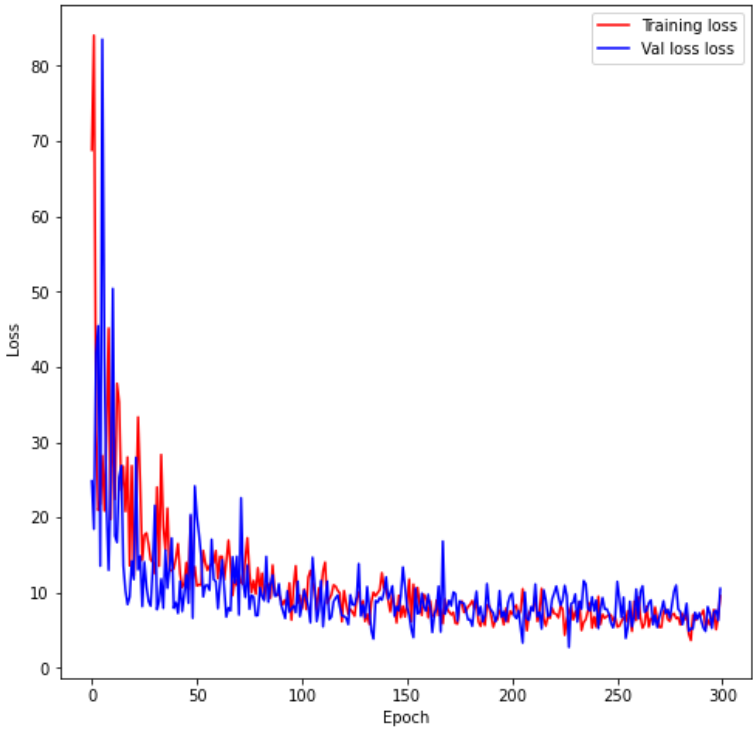
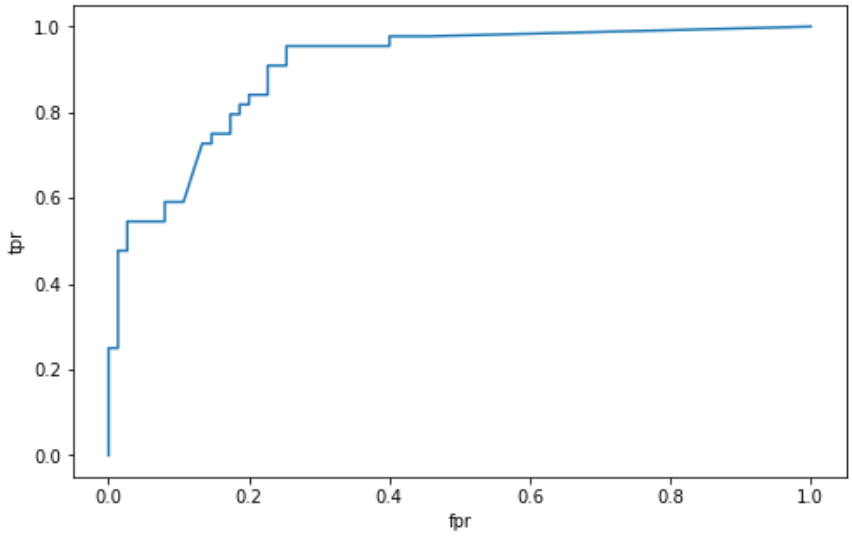
Model performance for patient selection

The training and validation losses of the model look like below:



The ROC for the trained model is as below with an auc value of 0.9



The criteria for selecting the patient is - a stay of 5 -7 days at the hospital.

We have considered a case of minimum 5days, for which roc_auc_score is 0.7969c

For this case, the precision, recall, f1 score is as below:

- Precision - 0.7619
- Recall - 0.7272
- F1 score - 0.744

As can be seen from the numbers above, the model has been trained for a relatively better precision than recall. Precision indicates how many patients of the ones targeted by the algorithm do spend time in hospital for at-least 5 days. A high value for precision is thus very beneficial in this scenario as it would be a unwanted scenario if the new diabetes drug was administered to a patient who didn't need hospitalisation of atleast 5 days.

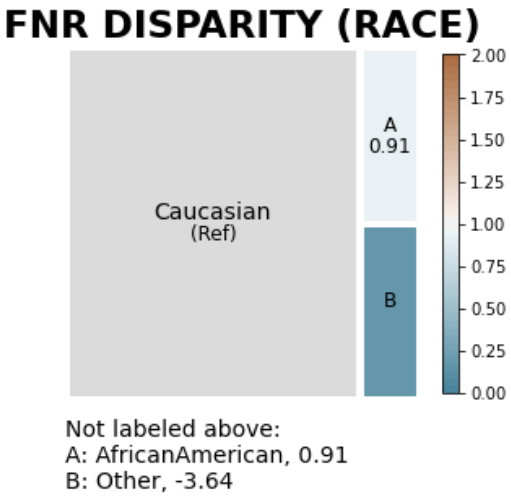
At the same time, we wouldn't want to miss the patents who would satisfy the hospital stay criteria. A high recall rate would help with this.

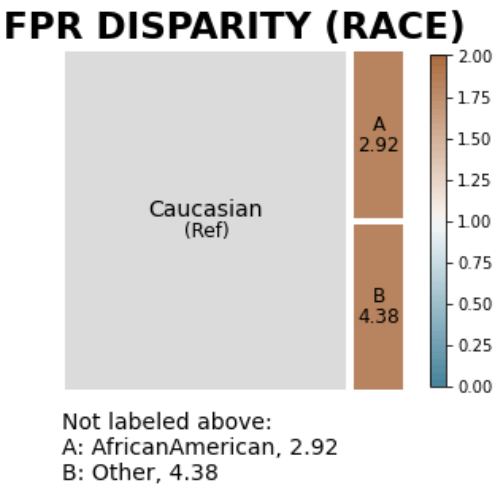
Areas of improvement –

1. Increase precision further (through more exhaustive training) while at the same time having a good recall
2. Further analysis of data, for a better performing model.

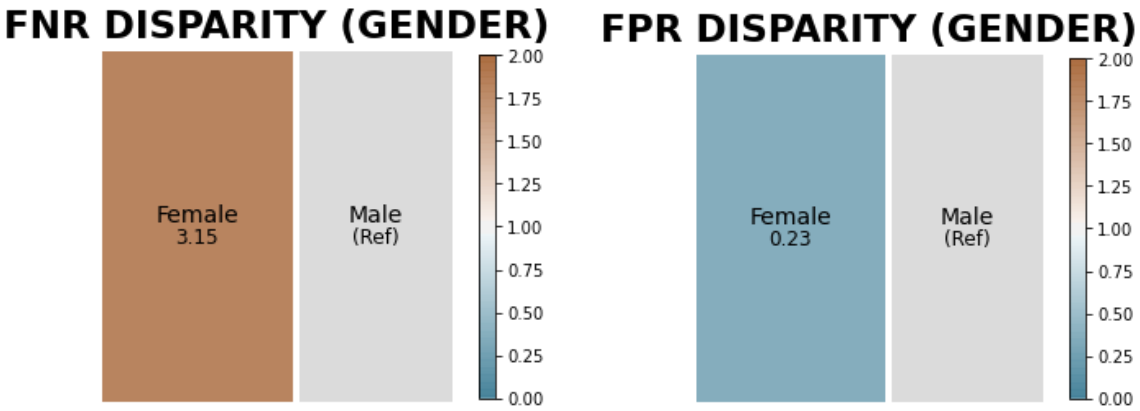
The Bias in the model:

For Race: The plots below show that there is bias towards the AfricanAmerican and other races for FPR – i.e. incorrectly being selected for the trials

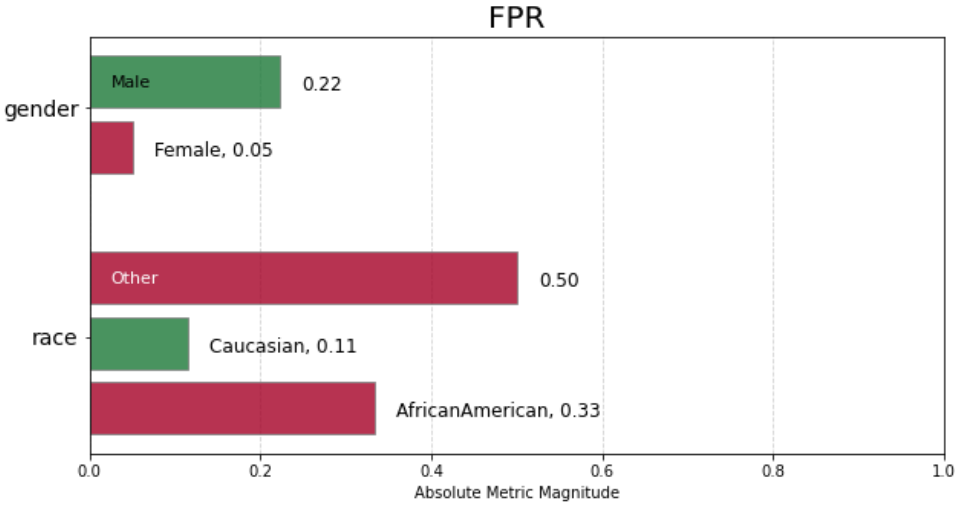


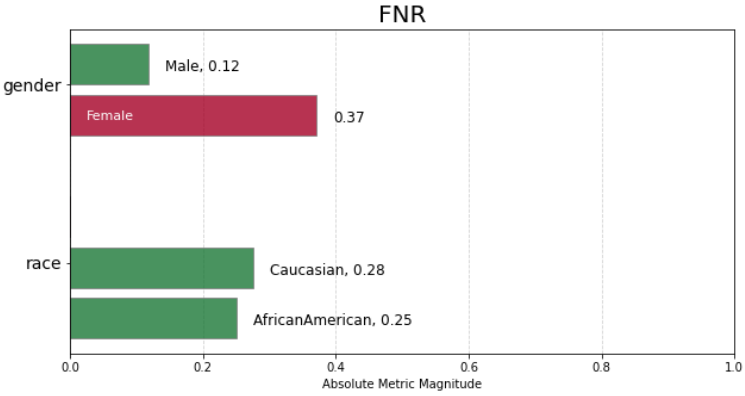


For Gender: The model is biased towards females. Females are more likely to be missed in the selection for the trial as compared to males. Similarly they are also more likely to be incorrectly selected for the trials.



The fairness plot reveals the same – the red bars show the model being unfair.





Other, -1.00