

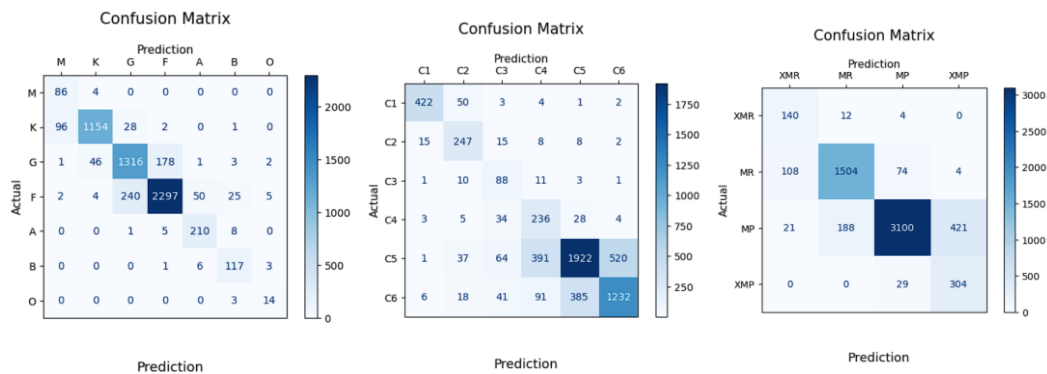
Weekly Research Project Status Report

Project Title : Stellar spectral classification using Active learning approach

Report Date : 22nd March, 2025

Summary of Progress

1. Initially we used proportionate stratified sampling. Now we tried to implement K_fold stratify sampling method. Both the methods are showing approx. same accuracy.
2. After implementing KNN with weights and did classification in terms of T_{eff} , $\log(g)$ and $[\text{Fe}/\text{H}]$ ($k = 230$, training size = 53176, test size = 5909), we found the accuracy for f1-score as 0.82, 0.67, and 0.67, respectively.
3. We tried to implement SMOTE (Synthetic Monitoring Oversampling technique) on the training data and then perform K-NN for three parameters. We found the increase in overall accuracy (T_{eff} : 0.88, $\log(g)$: 0.70, and $[\text{Fe}/\text{H}]$: 0.85)



Planned Activities for Next Week

- Try decision-tree based algorithm (random forest).
- Try to implement the ensemble learning.

