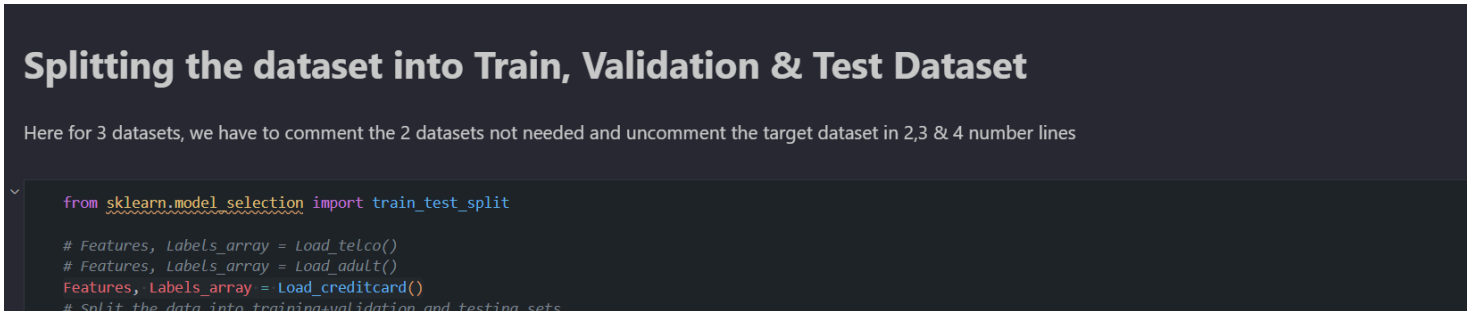
CSE472 (Machine Learning Sessional)

Assignment# 2: Logistic Regression with Bagging and Stacking

First, we look at what changes we need to make to run the code on 3 different datasets.



Here, we have three lines. We need to uncomment the line with the desired dataset.

1. For the first telco-customer-churn dataset

```
Features, Labels_array = Load_telco()
# Features, Labels_array = Load_adult()
# Features, Labels_array = Load_creditcard()
```

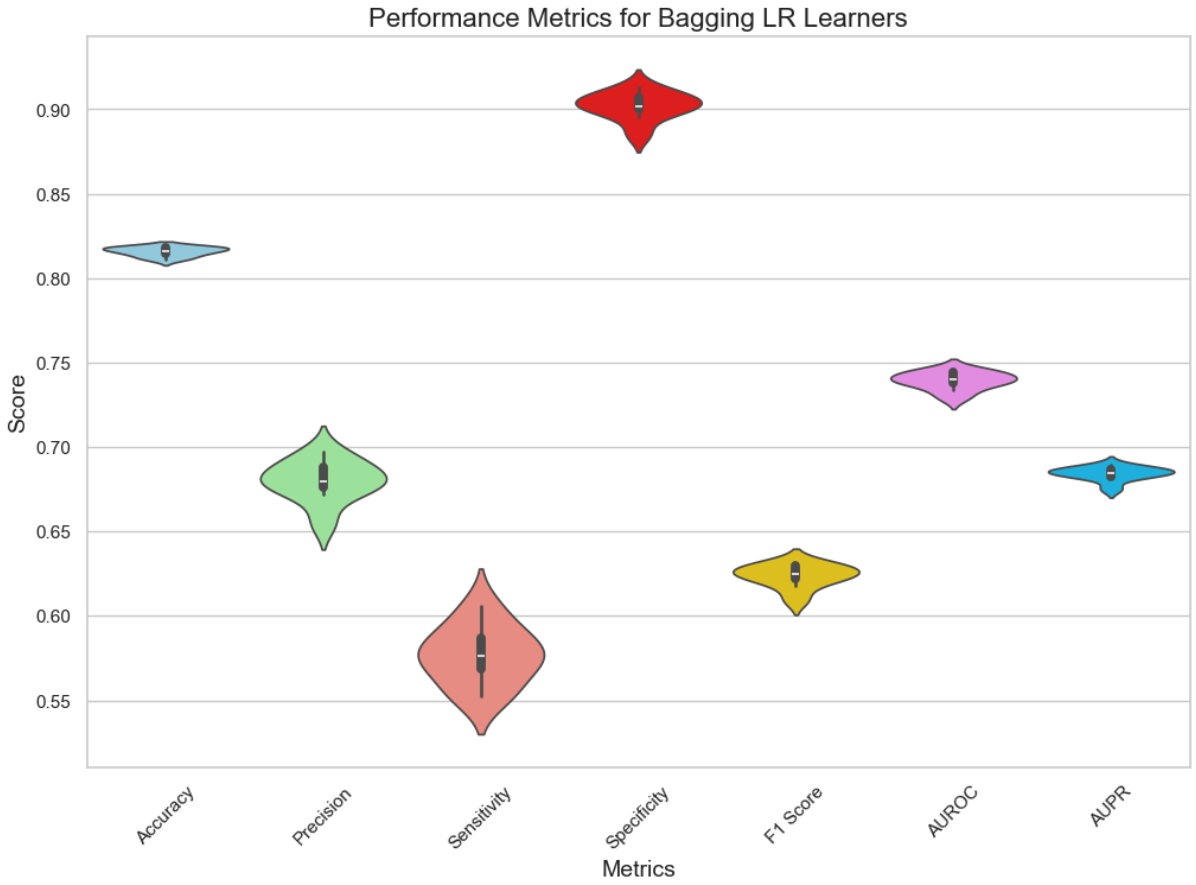
2. For the second adult dataset

```
# Features, Labels_array = Load_telco()
Features, Labels_array = Load_adult()
# Features, Labels_array = Load_creditcard()
```

3. For the third CreditCard dataset

```
# Features, Labels_array = Load_telco()
# Features, Labels_array = Load_adult()
Features, Labels_array = Load_creditcard()
```

Telco-Customer-Churn Dataset:

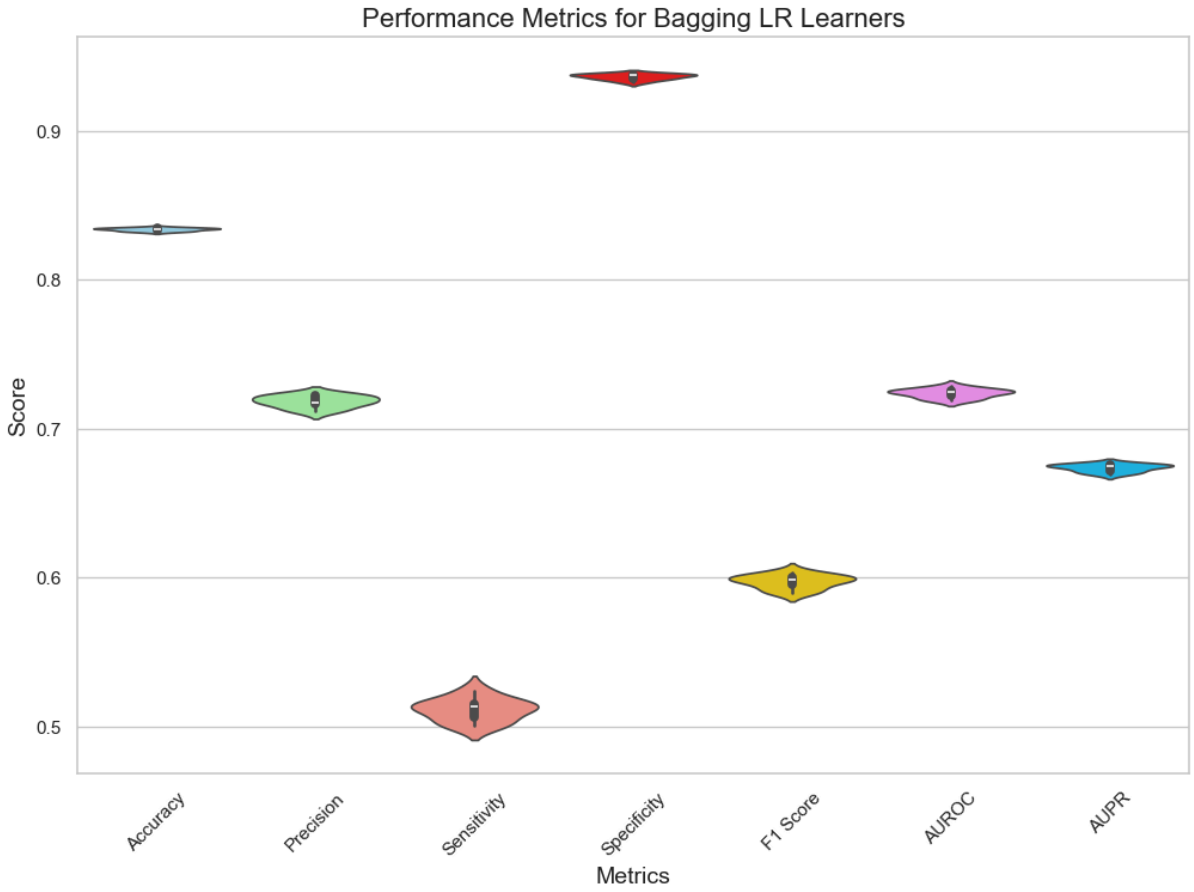


Violin Curve For the First Dataset

Output:

	Accuracy	Sensitivity	Specificity	Precision	F1 Score	AUROC	AUPR
LR	0.8159451± 0.002525	0.57670 ± 0.01620	0.902080 ± 0.007656	0.679987 ± 0.011428	0.623820 ± 0.006398	0.739393 ± 0.004916	0.684375 ± 0.003808
Voting ensemble	0.816182	0.576408	0.902510	0.680380	0.624093	0.739459	0.684462
Stacking ensemble	0.806955	0.557641	0.896718	0.660317	0.604651	0.727179	0.667531

Adult Dataset:

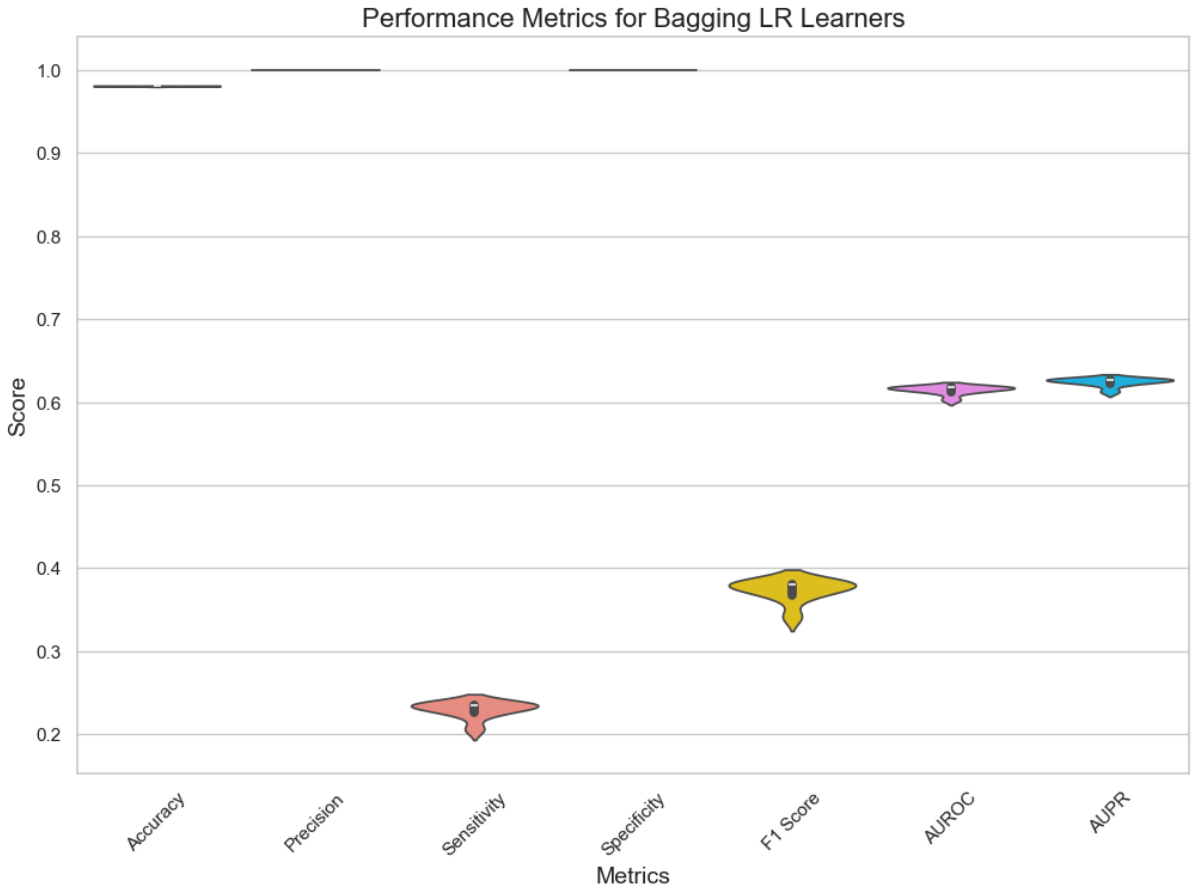


Violin Curve For the Second Dataset

Output:

Accuracy	Sensitivity	Specificity	Precision	F1 Score	AUROC	AUPR
LR	0.83380534 ± 0.00096282	0.51115829 ± 0.00716373	0.93629170± 0.00184061	0.71824490± 0.00379507	0.5972164± 0.0043456	0.7237249± 0.0028638
Voting ensemble	0.833965	0.508705	0.937281	0.720385	0.596317	0.722993
Stacking ensemble	0.834067	0.515499	0.935258	0.716647	0.599654	0.725378

Credit Card Dataset:



Violin Curve For the Third Dataset

Output:

	Accuracy	Sensitivity	Specificity	Precision	F1 Score	AUROC	AUPR
LR	0.98083 ± 0.000233	0.229847 ± 0.0093707	1.0 ± 0.0	1.0 ± 0.0	0.373686 ± 0.012559	0.61492 ± 0.00468	0.62450± 0.00456
Voting ensemble	0.980971	0.235294	1.000000	1.000000	0.380952	0.617647	0.627162
Stacking ensemble	0.980971	0.235294	1.000000	1.000000	0.380952	0.617647	0.627162