Missing Clinical Data Imputation

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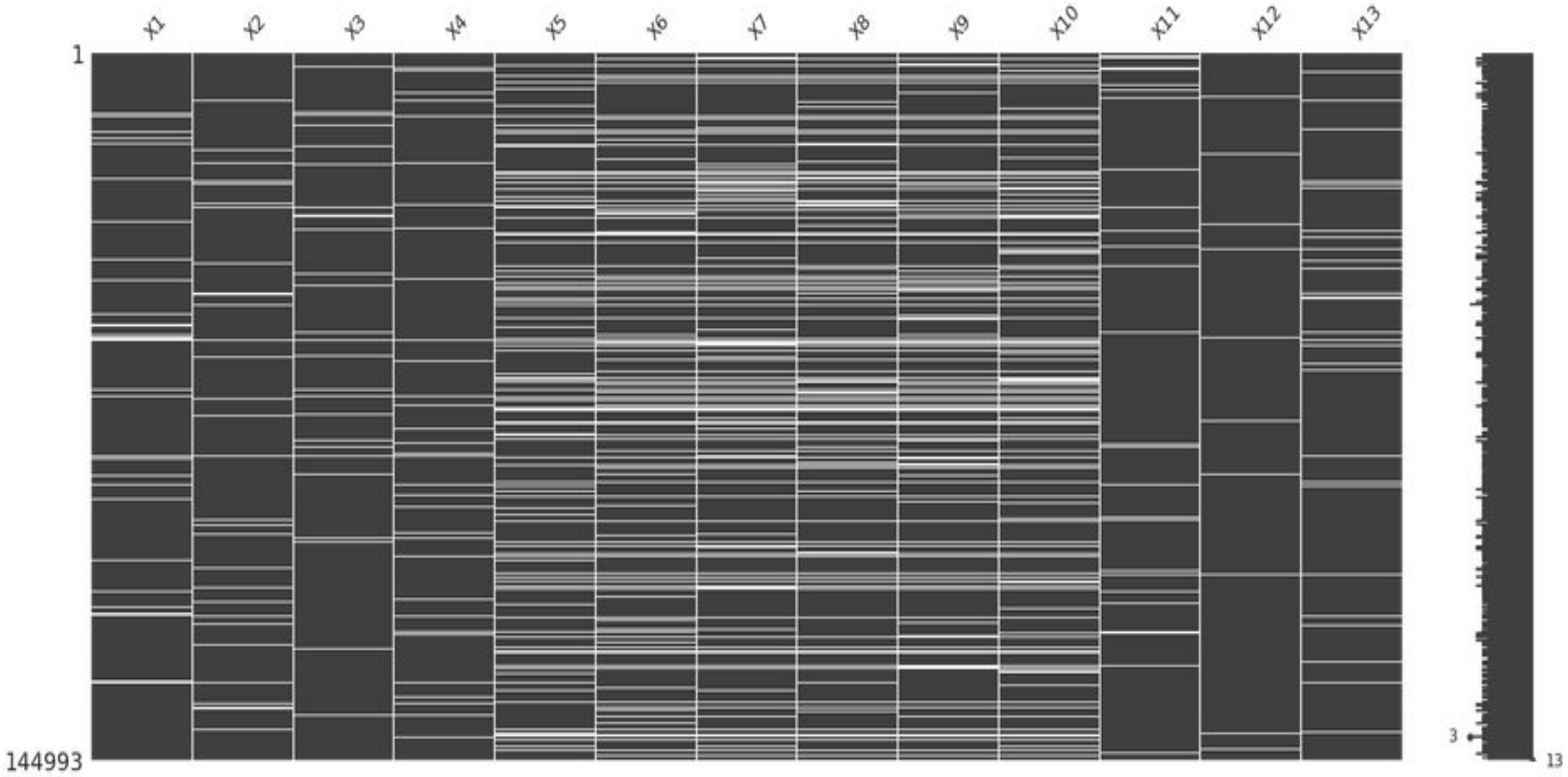
DATASET



DATASET

Analyte	% Missing Values
X1	5.31
X2	5.47
X3	5.53
X4	5.39
X5	16.53
X6	19.15
X7	19.29
X8	18.62
X9	18.84
X10	19.42
X11	4.88
X12	4.83
X13	6.85

Methods Used for Imputation:

1) Mean Imputation
2) Back Fill
3) Back Fill Front Fill
4) 4Mean BackFrontFill
5) Multiple Imputation by Chained Equations with KNN Regressor and Linear Regressor
6) Deep Learning
7) K-Nearest Neighbors

1) Mean imputation

	col1	col2	col3	col4	col5
0	2	5.0	3.0	6	NaN
1	9	NaN	9.0	0	7.0
2	19	17.0	NaN	9	NaN

mean() →

	col1	col2	col3	col4	col5
0	2.0	5.0	3.0	6.0	7.0
1	9.0	11.0	9.0	0.0	7.0
2	19.0	17.0	6.0	9.0	7.0

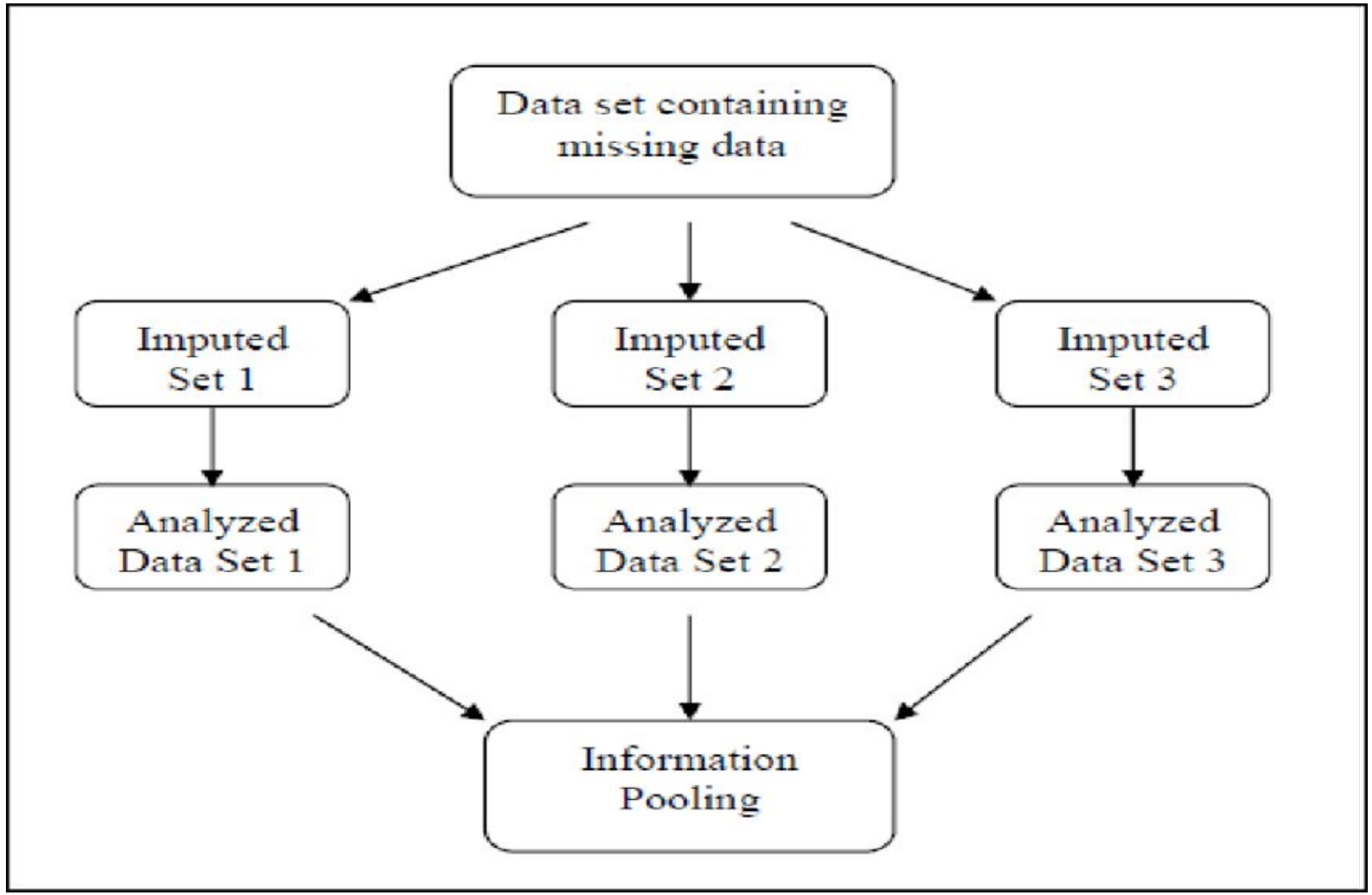
2) Back Fill

```
0    300
1    NaN
2    150
```

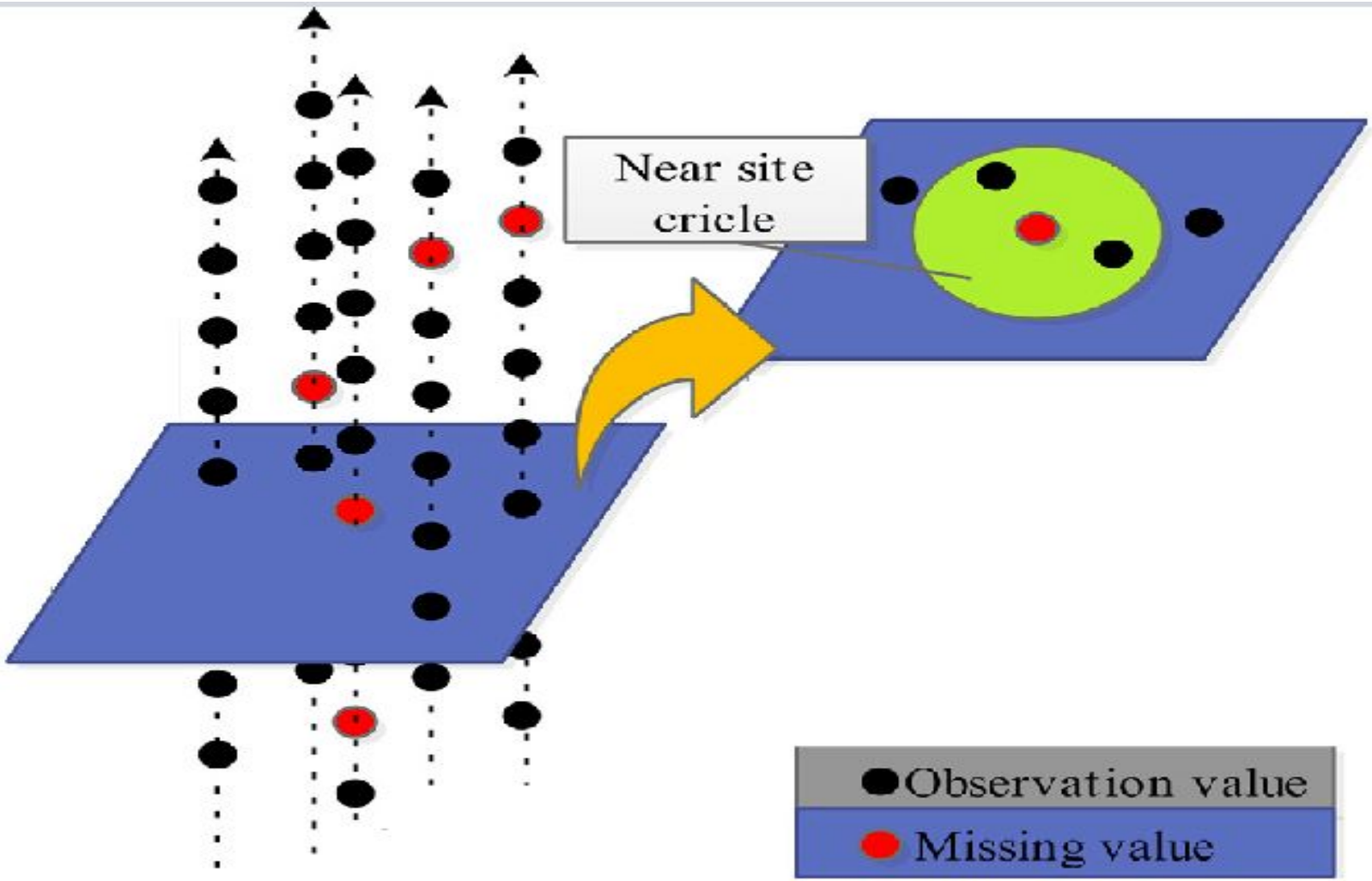
↓

```
0    300
1    150
2    150
```

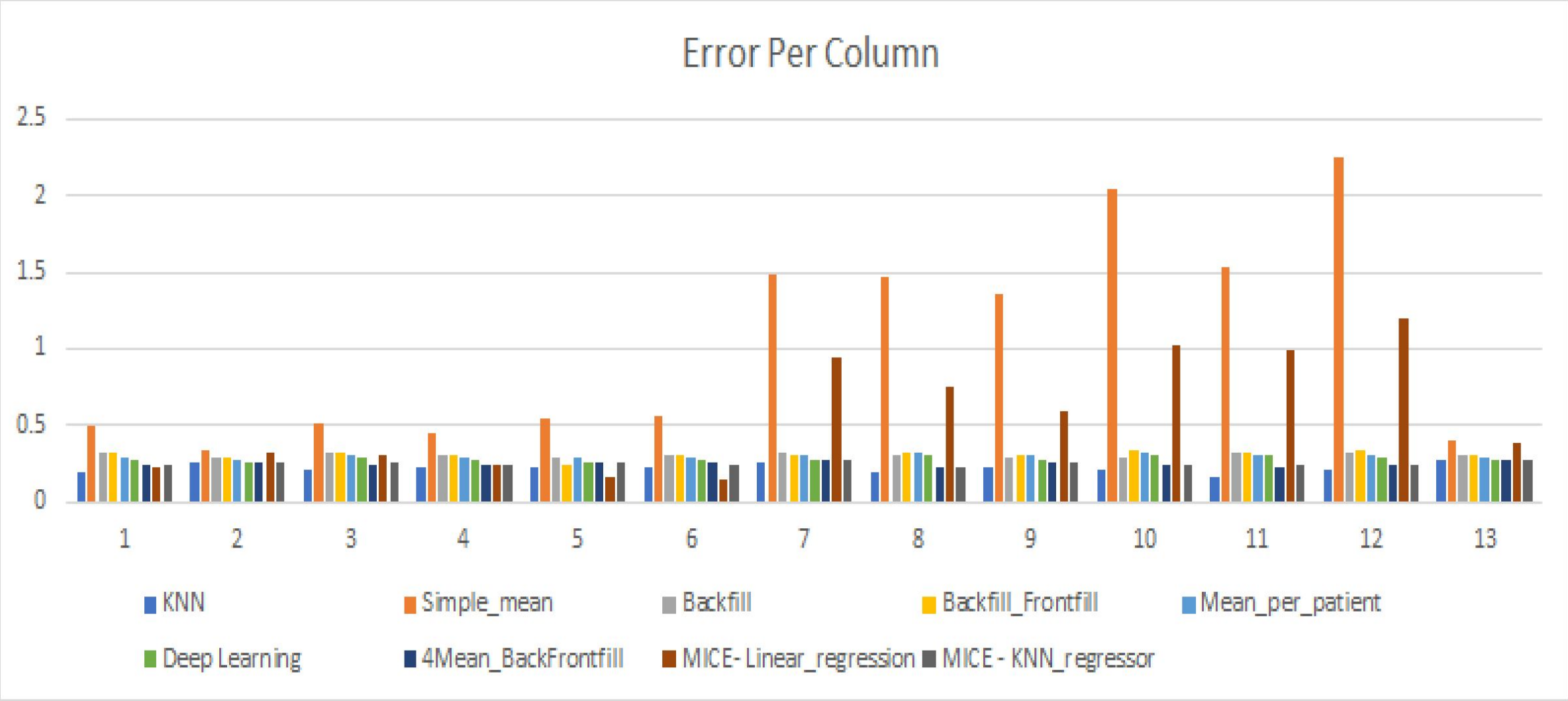
MICE


Data set containing missing data
Imputed Set 1
Imputed Set 2
Imputed Set 3
Analyzed Data Set 1
Analyzed Data Set 2
Analyzed Data Set 3
Information Pooling

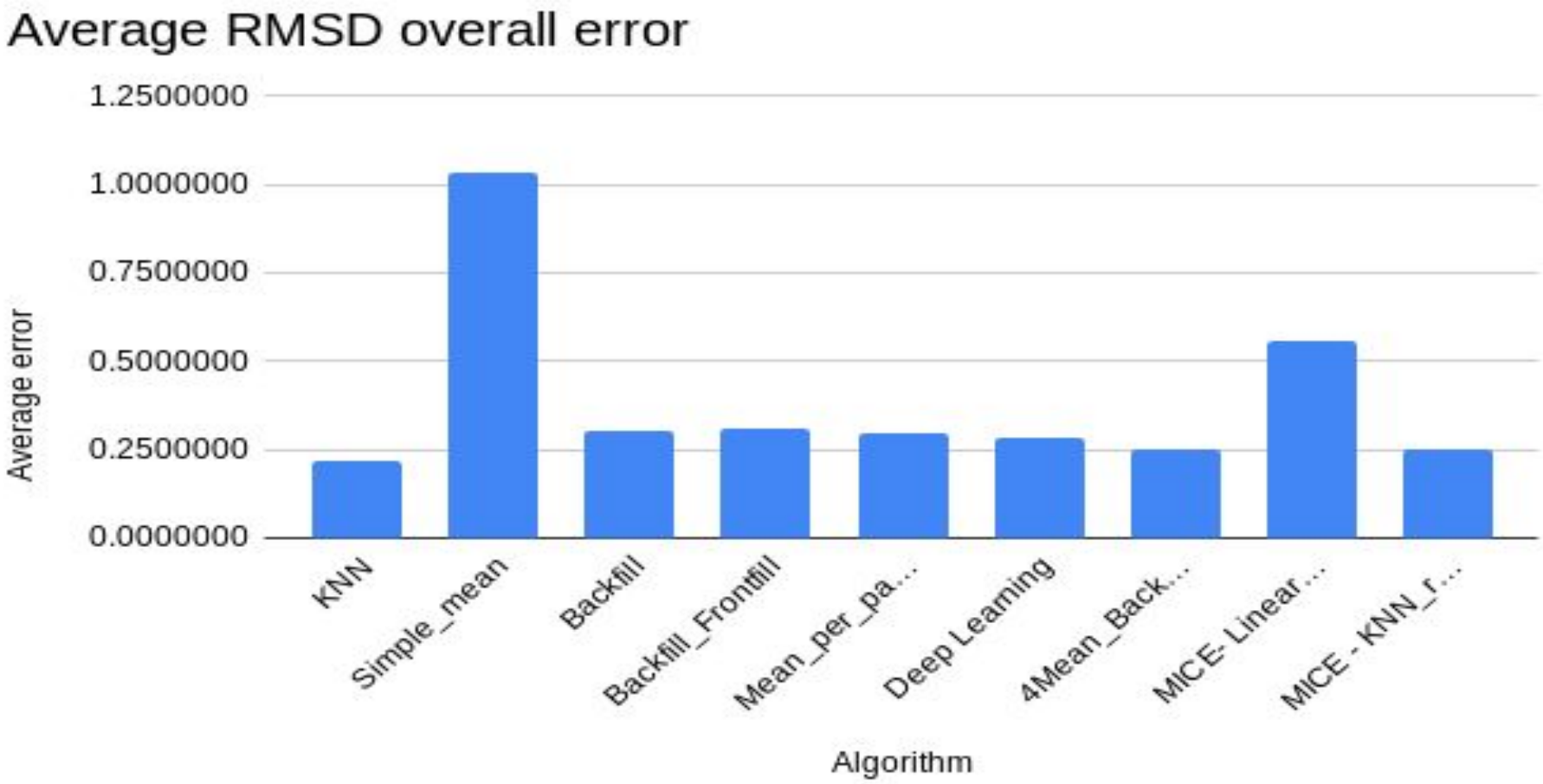
KNN



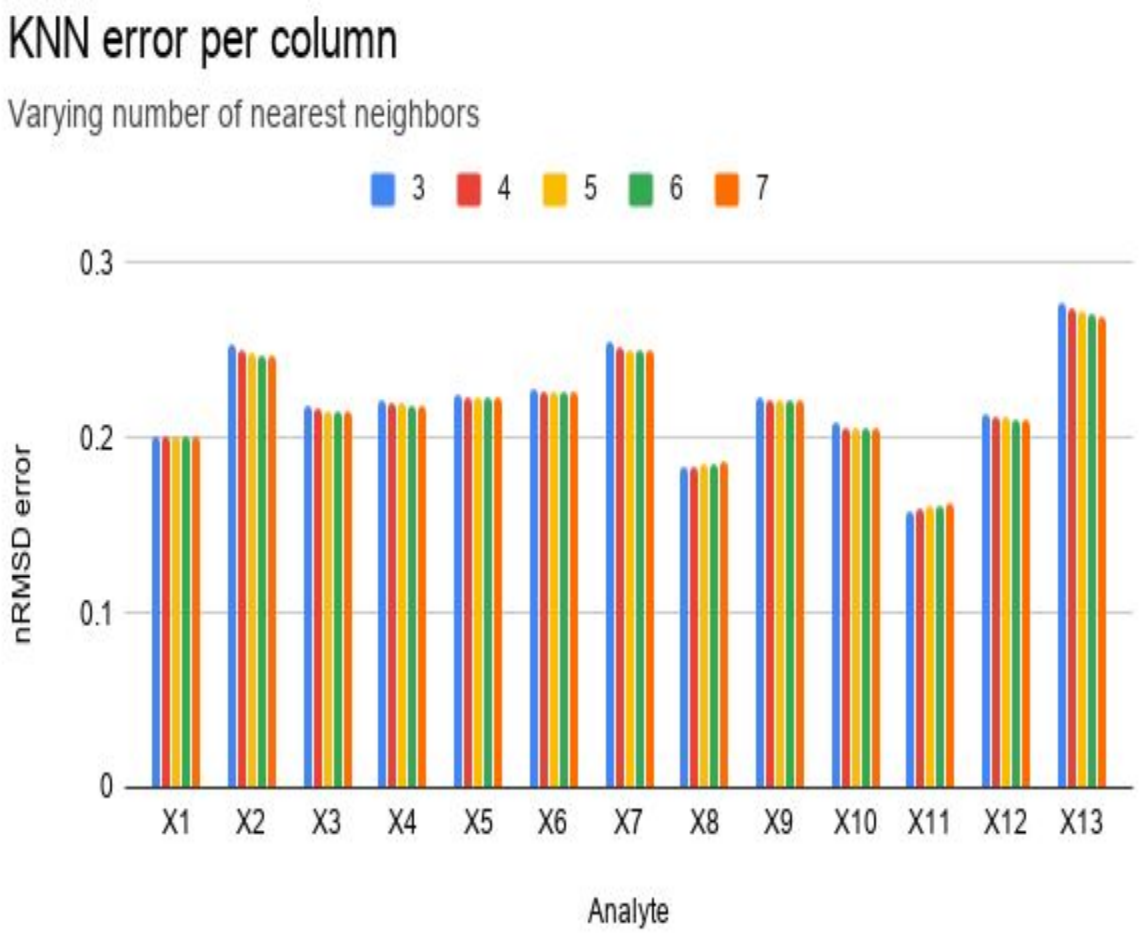
Error Results Per Column



Overall error



KNN Implementation analysis



Conclusion

- In the training dataset, we vary K, the number of nearest neighbors to tune the KNN algorithm, using mean to impute missing values. We chose optimal value of K=5 which results in minimal error. The total error we got 0.2185.

- In testing dataset we got an average nRSMD error of 0.2209.

Leaderboard Results

- Our model performed better compared to 3D-MICE
- We rank 8 on the leaderboard