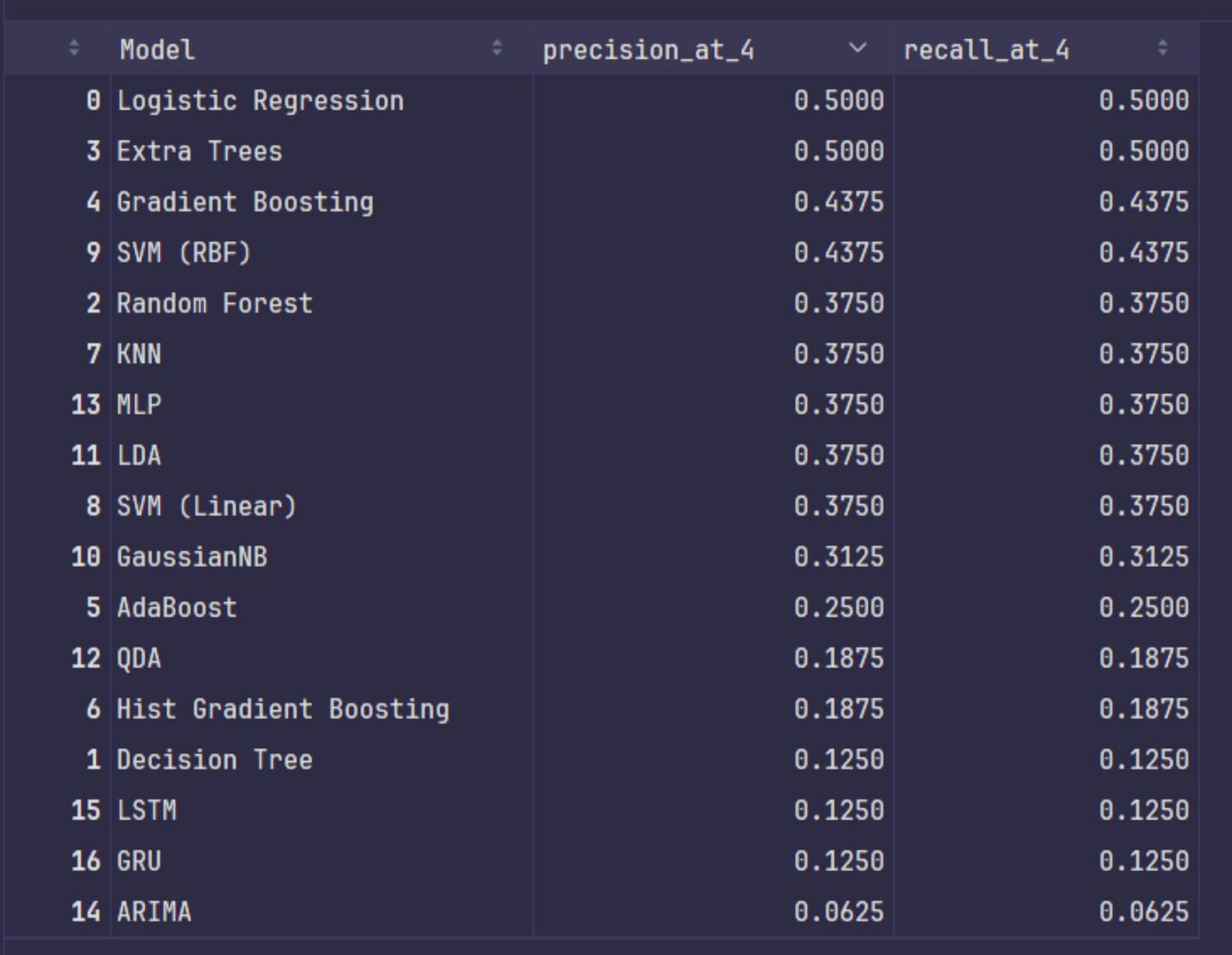
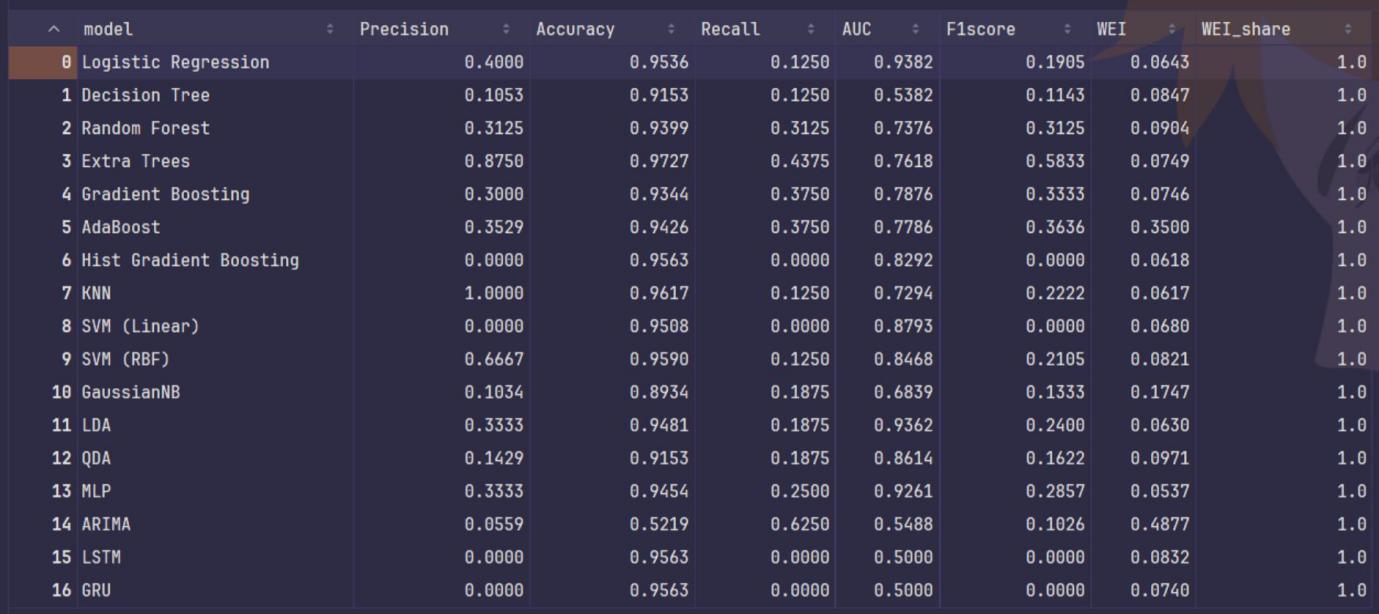
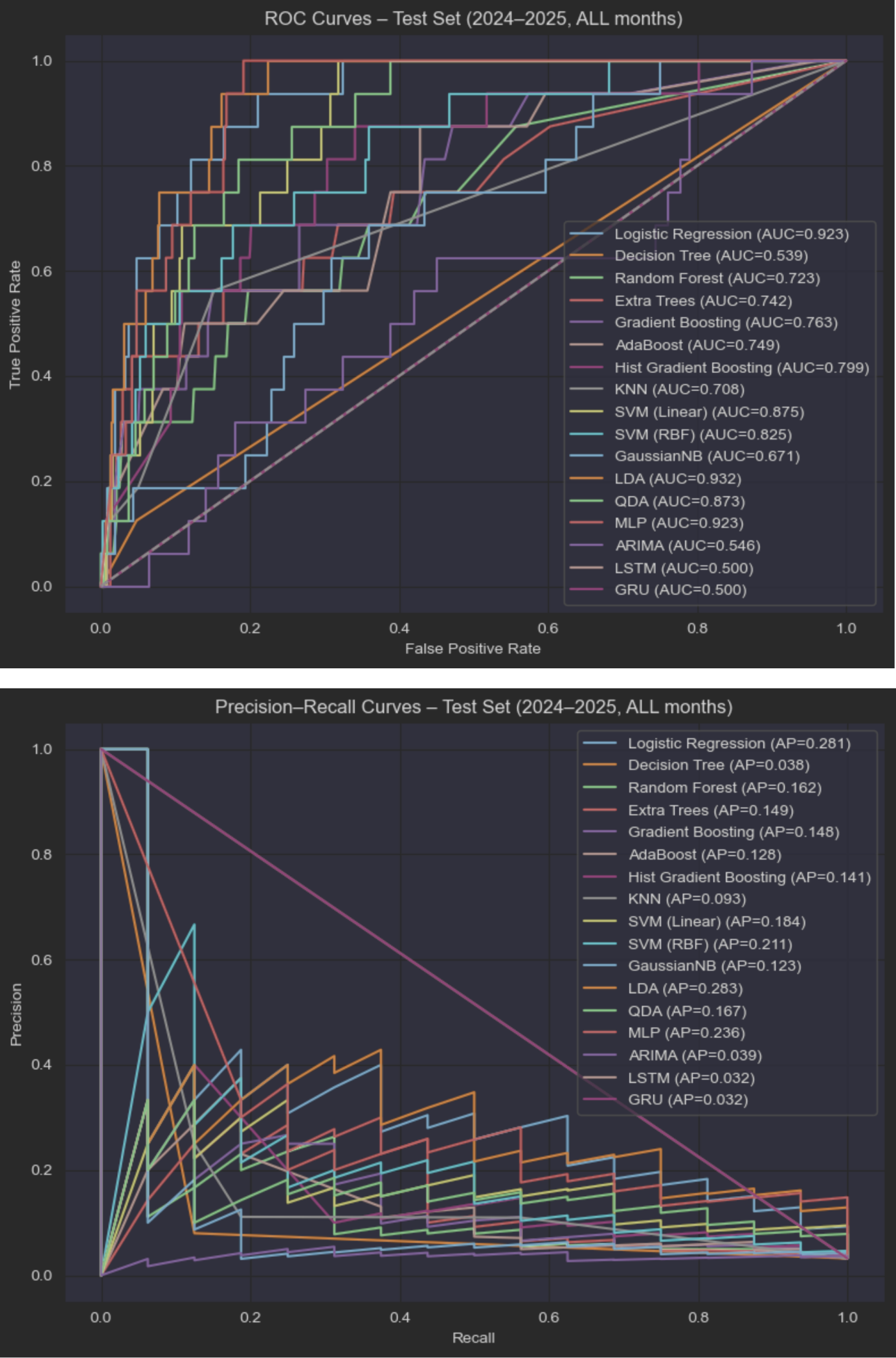
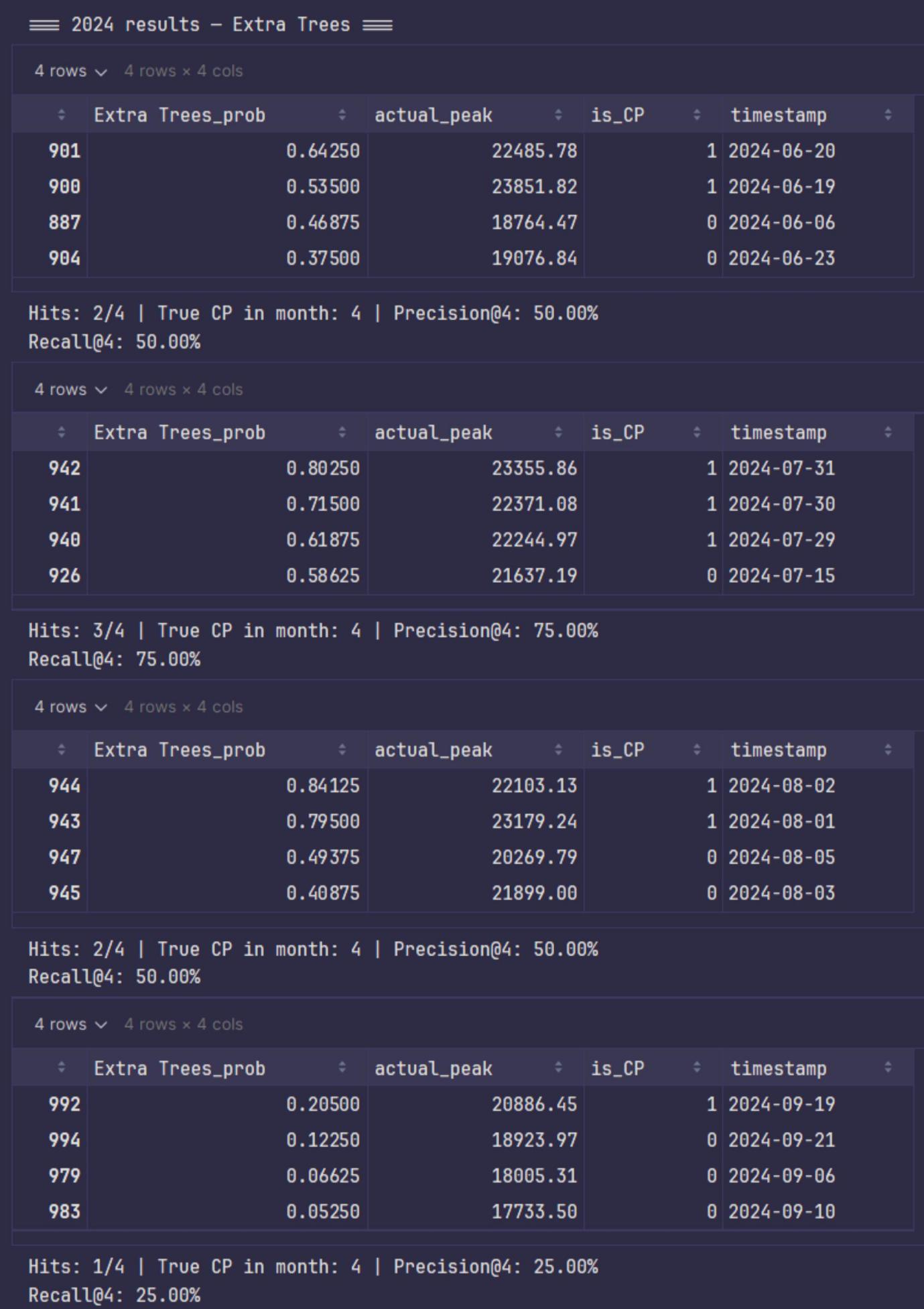
Below are raw outputs of supervised learning models on ECA







From the results and plots, we can see that the extra tree model can perform best in predicting. So, we choose to evaluate that model.



For 2024’s results, the model can achieve an average precision of 50% and an average recall of 50%. While in the previous algorithm, it cannot be evaluated on ECA, so almost every metric is 0.

Original

Accuracy Recall

Precision

Limited to September

0

0

0

June-

Monte Carlo

0

0

0

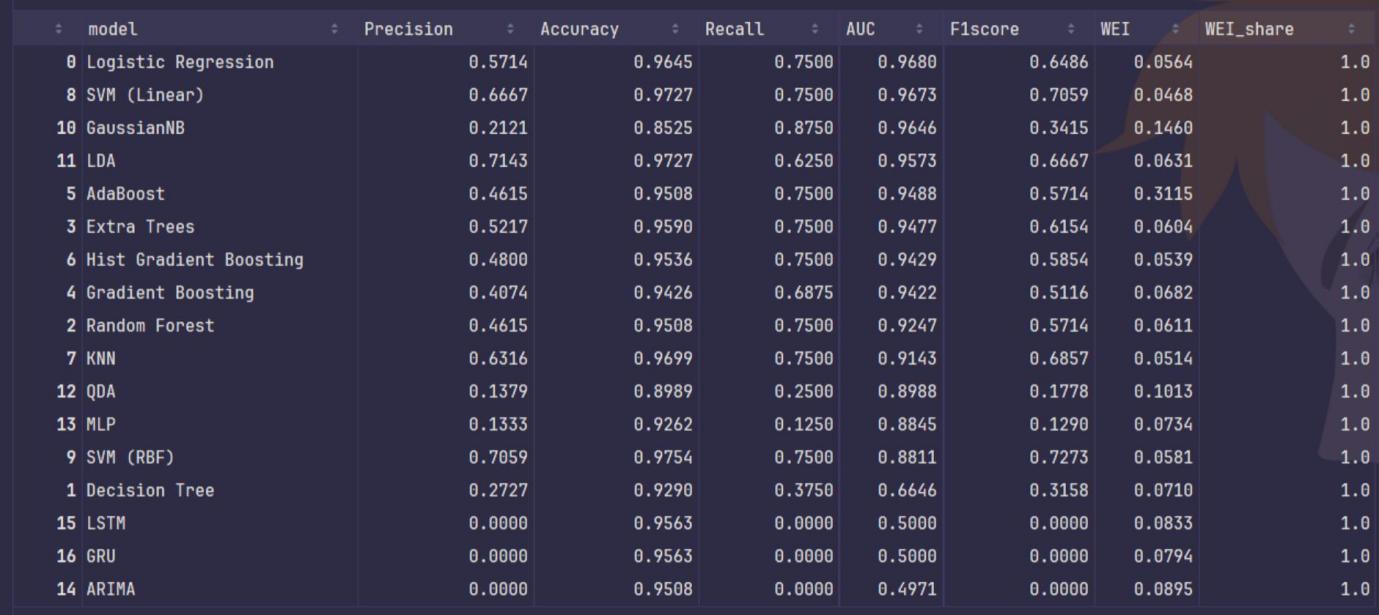
0.5

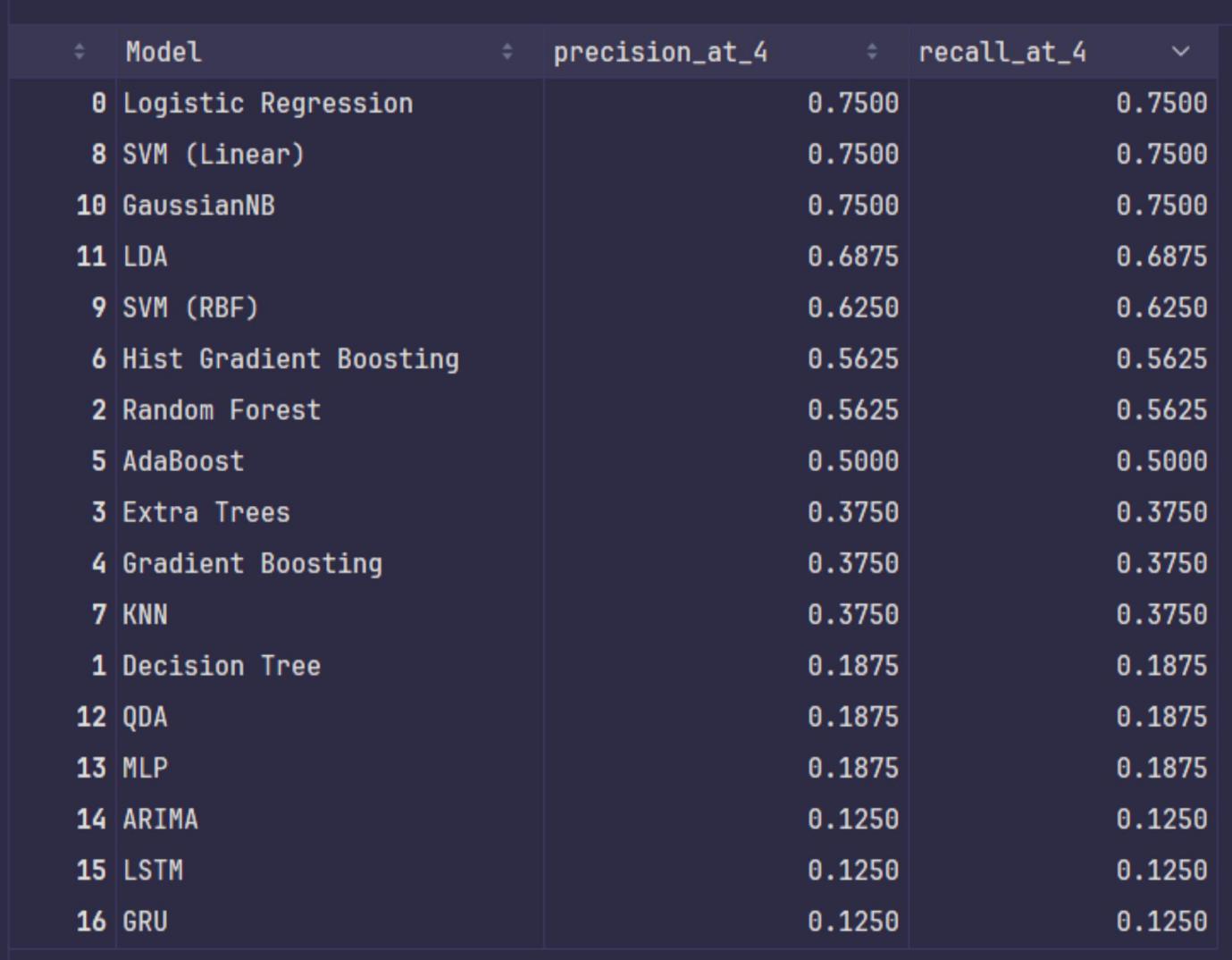
0

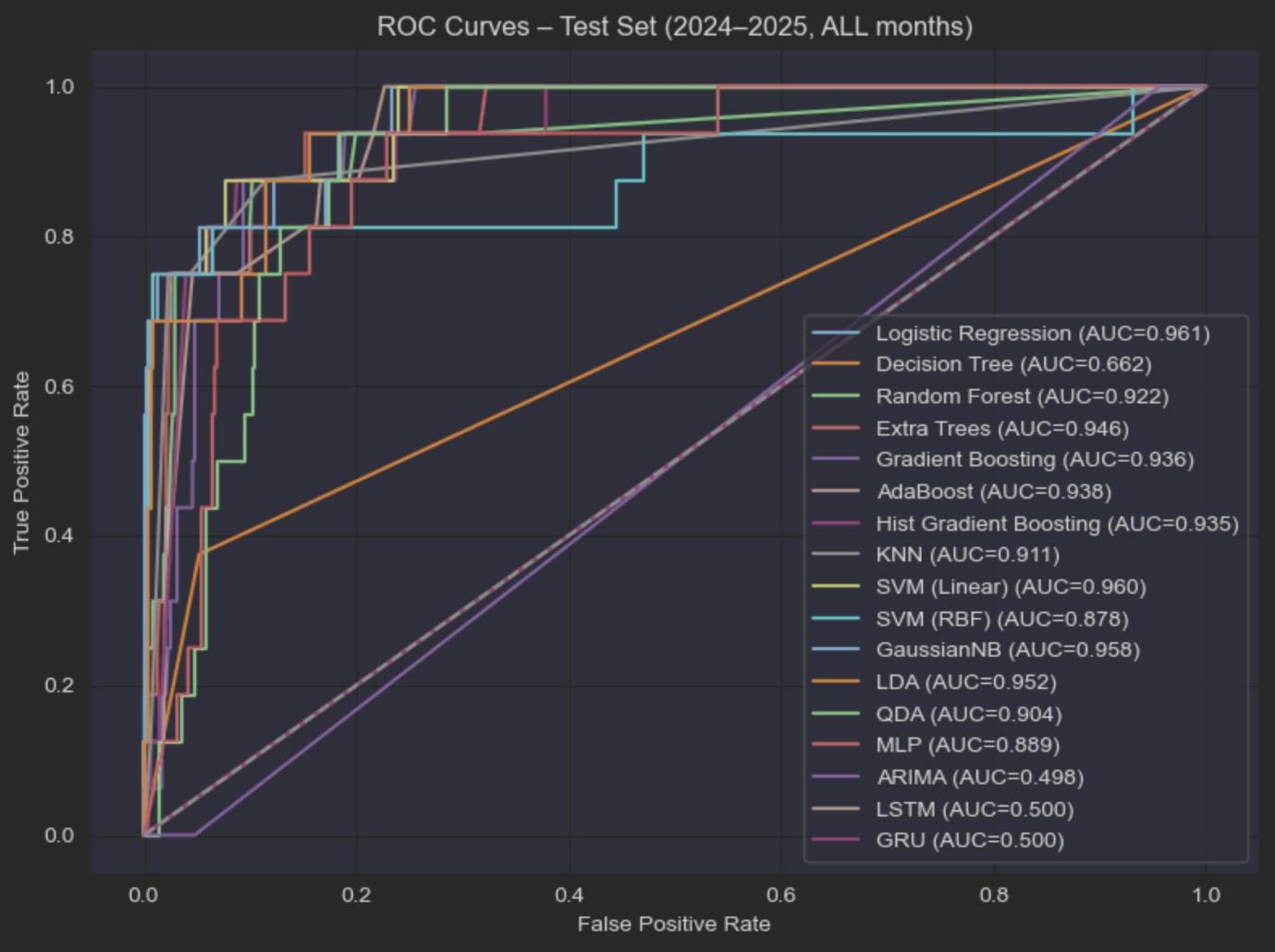
0

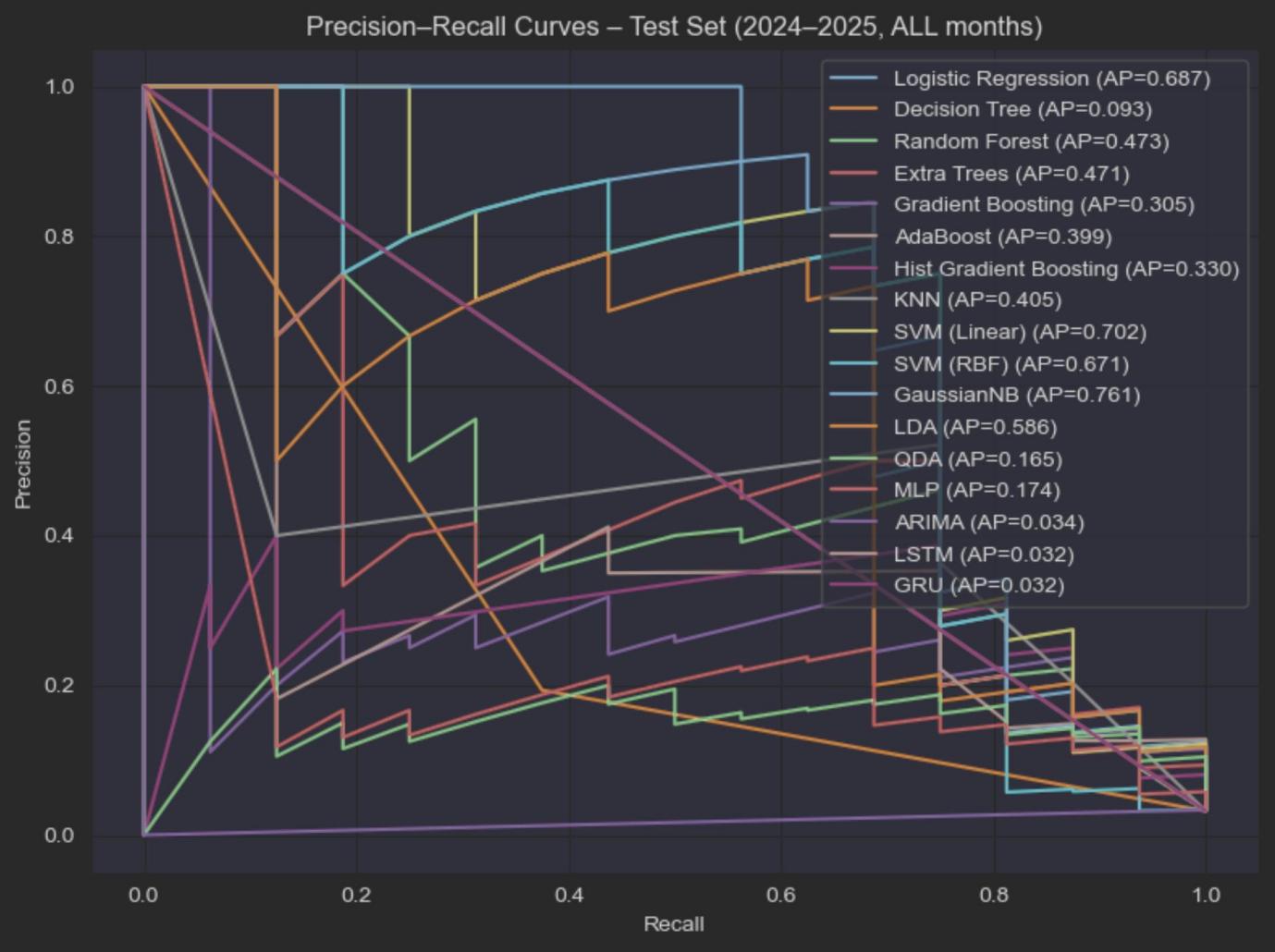
This showed that the supervised model can perform much better than the old ones.

Next, below are raw outputs of supervised learning models on RTO/TESLA

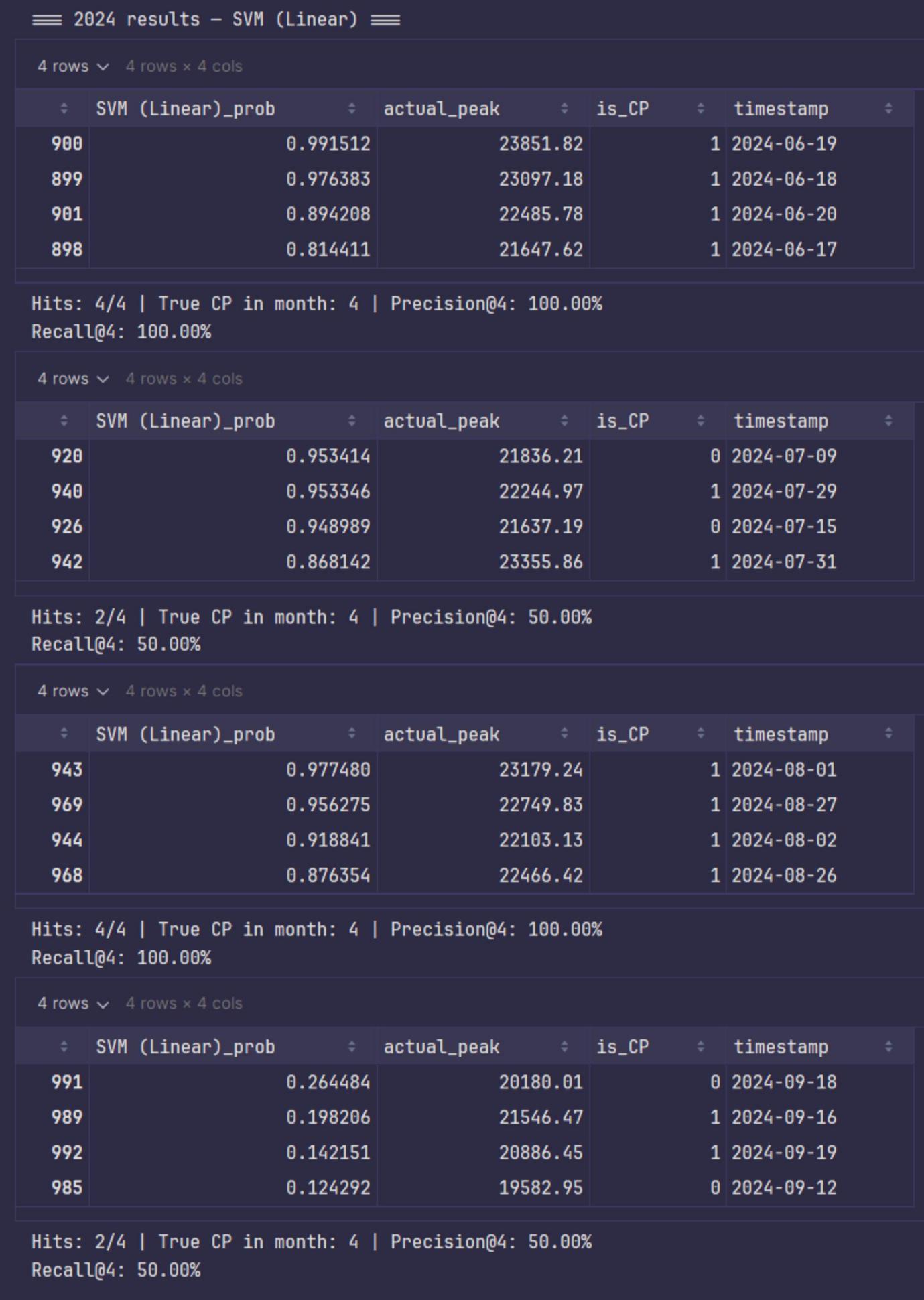








From the results and plots, we can see that the SVM (Linear) model performs best in predicting. So, we choose to evaluate that model.



For 2024’s results, the model can achieve an average precision of 75% and an average recall of 75%. For June and August, it can even achieve 100% accuracy.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Original | Limited to June- September | Monte Carlo |
| Accuracy | 0.333333333 | 0.333333333 | 0.428571429 |
| Recall | 0.6 | 0.6 | 0.6 |
| Precision | 0.428571429 | 0.428571429 | 0.6 |

While in the previous algorithm, both Recall and Precision are lower than in the new model. And the new model is even more accurate.

Though the models used for the datasets are different, we can find that the logistics regression model can achieve almost the second-best on both sides when evaluating normal power load, while maintaining the same precision and recall value when predicting 4CP. So, I think we can simply conclude that logistic regression is a better model in general evaluation.

**15/08 Update**

I tried to limit the training set to the top 10% of the whole dataset to make a relatively more balanced dataset. (Every month between June and September has 4 CP days, then it will be 16 in total. 16/365≈5%, assume all 4CP days are in these top 10%, then it will achieve a balance between the number of positive and negative labels.)

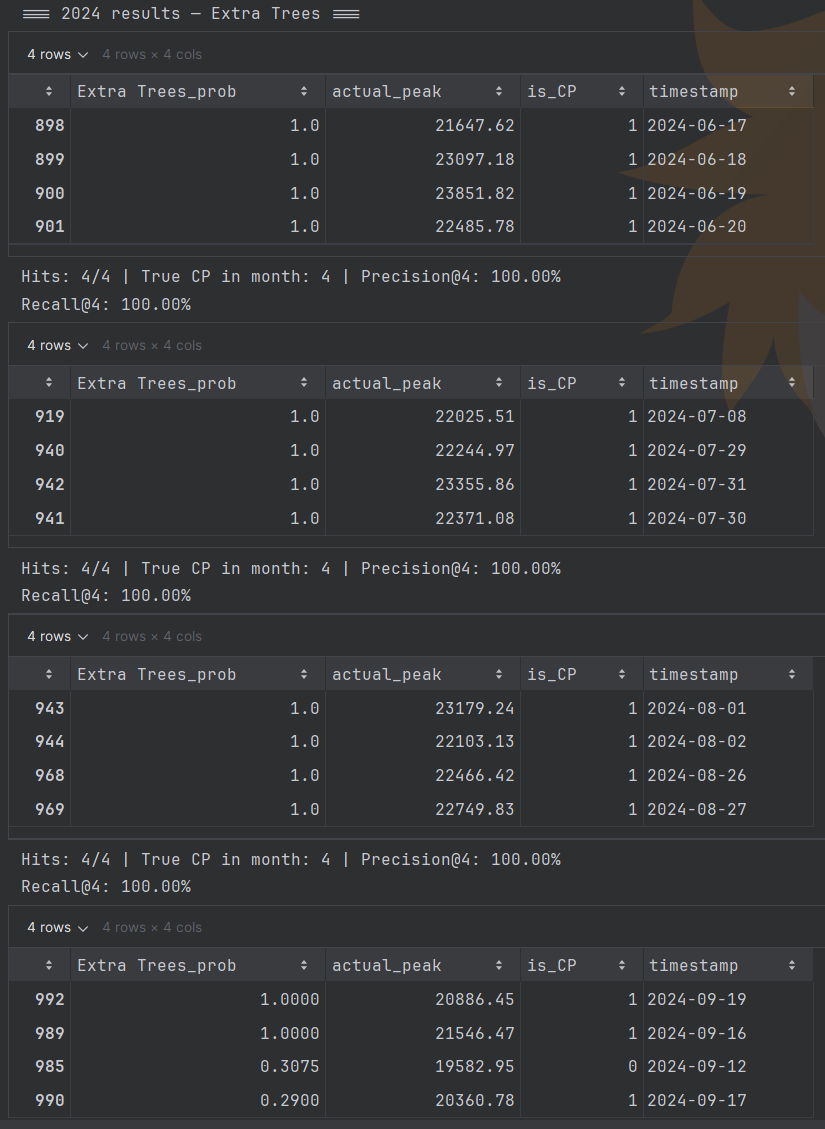
Then I found that this limitation on the training set can largely improve the performance of algorithms.

For models on TESLA/RTO:

A screenshot of a computer

AI-generated content may be incorrect.

Both Gradient Boosting and Extra Trees achieve 0.9375 in precision and recall predictions for 4 CP days. This is much higher than the previous results. (0.75)



Then, for the ECA

A screenshot of a computer

AI-generated content may be incorrect.

Extra Trees also achieve a higher result. (Previous highest is 0.5)

A screenshot of a computer

AI-generated content may be incorrect.

And the details also showed that it performed very well.

So, we can conclude that the extra trees model is suitable for evaluating all 3 situations (ECA/RTO/TESLA)