**Summary**

1. Data consists of 18 Economic indicators of past 181 months.
2. Quarterly GDP is converted to monthly using linear interpolation.
3. Logic applied – Using the economic indicators of a month, that month GDP is predicted.
4. Economic Indicators Used –

* **Electricity Consumption (YoY)**
* **PMI Manufacturing**
* **Total Power Generation**
* **M1 Money Supply**
* **M3 Money Supply**
* **Claims on the Private Sector**
* **Consumer Price Index**
* **Net Gold & Forex Reserve**
* **Food and Fashion-Total Trade Retail Sales**
* **Retail Sales – Total**
* **Sales of Accessories – Income**
* **Convenient Store Sales – Income**
* **Fuel Sales – Income**
* **New Vehicle Sales**
* **Used Vehicle Sales**
* **Workshop Income**
* **Motor Trade Sales at Current Prices s.a.**
* **Net Foreign Assets**

1. Machine Learning Models Used -

* **Elastic net**: Regularized linear regression that linearly combines L1 and L2 penalties of lasso and ridge methods. The L1 penalty regularizes the number of predictors used to prevent overfitting.
* **Support Vector Regression (SVR)**: Transforms data into a higher dimensional space (if using a kernel function), then identifies the hyperplane that maximizes the number of points lying within the associated decision boundaries while staying within the constraints of the specified error tolerance.
* **Random Forest**: Ensemble method that constructs a series of decision trees during training and outputs the mean prediction of the individual trees for prediction.
* **XGBoost**: Implementation of gradient boosted decision trees to optimize speed and performance. Includes a parameter for regularizing the number of predictors used to prevent over-fitting.

Results:

|  |  |  |  |
| --- | --- | --- | --- |
| **For GDP corresponding to 2021-06-30 (%YoY)** | | | |
| **Models** | **Predicted GDP** | **Last Year GDP** | **Percentage Change From Last Year** |
| Elastic net | 771483.65 | 648135.2 | 19.03 |
| Support Vector Regression (SVR) | 770957.58 | 18.95 |
| Random Forest | 753164.19 | 16.21 |
| XGBoost | 744179.94 | 14.82 |

|  |  |  |  |
| --- | --- | --- | --- |
| **For GDP corresponding to 2021-06-30 (%QoQ)** | | | |
| **Models** | **Predicted GDP** | **Last Quarter GDP** | **Percentage Change from Last Quarter** |
| Elastic net | 771483.65 | 740624.0 | 4.17 |
| Support Vector Regression (SVR) | 770957.58 | 4.10 |
| Random Forest | 753164.19 | 1.70 |
| XGBoost | 744179.94 | 0.48 |