Name: J. Sai Chandu
Reg.No: 19221216
Dept: CSE
Guide: Dr.U. Balasubramani
Course_Code: SP3CHA21
Code: SSE_26-11-216-2

Title →2

2 Enhanced Accuracy prediction in inflation rate using Extreme Gradient Boosting algorithm in comparison with Gradient boosting algorithm

Introduction:

Para 1:

Definition: the prediction of inflation rate using Extreme gradient boosting algorithm in comparison with Gradient boosting algorithm. (Jinill P, 2020)

Importance: Inflation rate prediction is crucial for economic stability, helping policymakers and planning long-term investments to mitigate inflation rates. (Lutz Kilian, 2021)

Applications:

→Economic policy decisions (Brent Mayan, 2020)

→Interest Rate determination (Domenico Gi, 2021)

→Budget Forecasting (Jonas Striaukas, 2022)

→supply chain optimization (Oliver Coibion, 2020).

Para 2:

1. Total No. of articles published in this top over past 5 years.

Google scholar - 1220

IEEE explore - 34

2. Most cited

→ "The Role of expectations in inflation dynamics" (olivier, coiboion, Yuriy Gorodnichko, 2020).

→ "Inflation Forecasting in emerging markets" (Joshua chan, Gaary Koop, 2021).

→ "Forecasting Inflation in a Data-Rich Environment" (James H, Mark W. waston, 2023).

→ "Global inflation synchronization". (M. Ayhan Kose, christopher otrok, 2020).

3. Best among them.

"The Role of expectations in inflation dynamics" (olivier coiboion, yuriy Gorodnichko, 2020).

Para 3:

1. Handling of numeric data and sensitivity to in-relavant features.

2. Existing experience in this research.

- I learnt about XGBoost algorithm and GB algorithm from coursera and Great learning
- After I had discussion with my guide and came to a conclusion for providing better accuracy in inflation rate prediction.

3. Aim of study:

→ prediction of inflation rate

→ Improving the accuracy

Materials and Methodology: Improved accuracy in inflation rate prediction using XGBoost and Gradient boosting algorithm.

Materials and methods:

Para 1: study setting : SIMATS, SSE, 322

no.of groups: 2

i) Group 1: Extreme Gradient Boosting algorithm

ii) Group 2: Gradient Boosting algorithm

Sample size: 240

Dataset : Economic Indicators & Inflation (raggle.com)

Para 2:

→ Testing setup:

→ Google colab

→ is intel 12th gen processor

→ 8 GB RAM

→ windows OS

→ Testing Sample preparation of Group 1:

Extreme gradient boosting algorithm

→ preprocessing Dataset

→ applying XG Boost algorithm

→ calculate accuracy.

Para 3: Sample preparation of Group 2:

Gradient boosting algorithm

→ preprocessing Dataset

→ APplying Gradient boosting algorithm

→ calculate accuracy.

Para 4:

*Testing setup: → Google colab → is intel 12th gen

→ 8 GB RAM → windows OS

*Testing Procedure:

→ pre-processing of dataset

→ Train 80% of data

→ Test 20% of data

Para 5: Data collection

Economic indicators & Inflation (kaggle.com)

Para 6:

Statistical Software: SPSS

Independent variable : Game names. data values

dependent variable : acuracy.

Analysis Done: Yes

Results and Discussion:

Para 1: In this study we observed that XGBoost has better prediction than Gradient boosting Algn.

→ XG Boost haves high acuracy

→ prediction of inflation rate.

Para 2: the graph represents the comparison of Prediction of inflation rate using XGBoost and Gradient boosting algorithm.

Para 3: Data collection

Site: www.kaggle.com.

Para 4: Statistical software: SPSS

Indepent variable: Indicators of Economy

Dependent variable: Acuracy, Inflation rate.

Analysis Done: Yes

→ comparison of XGBoost and Gradient boosting algorithm.

Limitations: The only limitation is small size

Future scope: Accuracy improved using XGBoost algorithm.

Conclusion:

⇒ The overall model prediction of video inflation rate based on past information of data

→ The accuracy of XGBoost is higher as we compared to Gradient boosting algorithm

→ The proposed algorithm has 90.28% of accuracy over Gradient boosting algorithm has 77.76%

Group Statistics

	Groups	N	Mean	Std. Deviation	Std. Error Mean
Accuracy	XGBoost Algorithm	10	90.2880	1.71360	.54189
	Gradient Boosting Algorithm	10	77.7870	1.73406	.54836

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Accuracy	Equal variances assumed	.000	.989	16.241	18	.000	12.52100	.77093	10.90133	14.14067
	Equal variances not assumed			16.241	17.997	.000	12.52100	.77093	10.90131	14.14069