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4. Advanced Accuracy prediction in inflation rate using Extreme Gradient boosting Algorithm in comparison with KNN K-Nearest neighbour Algorithm.

Introduction:

Para 1:

Definition: The prediction of accuracy in inflation rate using Extreme Gradient Boosting algorithm in comparison with K-Nearest Neighbour algorithm. (P. Sonkiya, V Bajpai, A Bansal, 2021).

Importance: Governments use inflation rate to determine tax policies, spending and subsidies. (S Lim, SJ Kim, 2021).

Applications:

→ Government Budgeting and Fiscal Policies (C. Arnold, 2022).

→ Machine learning and AI in economics. (Y Kaynak, 2020)

→ International Trade and Exchange Rates (J Zheng, 2023)

Para 2:

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

Google Scholar - 1200

IEEE explore - 25

2. Most Cited.

* the price-inflation nexus (S ping, 2023).
* Recent advances in inflation (P Andre, 2021)
* The impact of inflation on the Financial secton development (K Batsaynek, 2021).
* Effect of inflation rate and investment on economic growth (EJ IDolon, 2022).

3. Most cited websites.

"Effect of inflation rate and investment on economic growth" (EJ IDolan, 2022).

Para 3:

1. Handling of numeric data and sensitivity to irrelavant features

2. Existing Experience in this research.

→ I learnt about Extreme gradient boosting algorithm from coursera and the great learning

→ After that I had discussion with my guide and came to a conclusion for providing better accuracy in inflation rate.

3. Aim of study:

→ prediction of inflation rate using ml algorithms.

→ Improving the accuracy.

Materials and Methodology:

Para 1: study setting : SJMATS, SSE

No. of groups: 2

i) Group 1: Extreme gradient boosting algorithm

ii) Group 2: K-Nearest neighbours

Total sample size: 240

Dataset: Inflation and Economic Indicators

website: kaggle.com.

Para 2: Sample preparation of Group 1

Extreme gradient Boosting algorithm

→ pre-processing datasets.

→ applying XGBoost algorithm

→ calculate accuracy.

Para 3: Sample preparation of Group 2:

K-Nearest Neighbour Algorithm

→ pre-processing dataset

→ applying K-Nearest neighbour Algorithm

→ calculate accuracy.

Para 4: → Testing setup: → Google collab

→ is intel 12th gen processor

→ 8 gb RAM

→ windows OS.

→ Testing Procedure:

→ pre-processing the dataset

→ Train all algorithm with 80% of dataset

→ use 20% of data with testing

Para 5: Data collection

Dataset: Economic_Indicators & Inflation (Kaggle

Para 6: statistical software: SPSS

Independent variables: unemployment_rate, GDP.

Dependent Variables: Accuracies, Inflation rate.

Analysis Done: Yes.

Results and Discussion:

Para 1: In this study we observed that XGB -oost has better prediction capacity than K-Ne -arst Neighbour algorithm.

Para 2: The graph represents the comparison of inflation rate using XGBoost algorithm in comparison with K-Nearest Neighbours algorithm

→ XG Boost haves high accuracy.

Para 3: Data collection:

site: www.kaggle.com.

Para 4: statistical software: SPSS

Independent variable: unemployment rate, GDP.

dependent variable: Accuracy, Inflation rate.

Analysis done: yes.

→ comparison of XGBoost and Random Forest algorithm.

Limitations: The only limitation is small size

Future scope: Accuracy improved using XG Boost algorithm.

Conclusion:

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

→ The accuracy of extreme gradient boosting is higher than K-Nearest Neighbour.

→ The proposed algorithm Extreme gradient boosting has 90.28% of accuracy over K-Nearest Neighbou

→ algorithm has 69.87%

Group Statistics

	Groups	N	Mean	Std. Deviation	Std. Error Mean
Accuracy	XGBoost Algorithm	10	90.2880	1.71360	.54189
	K-Nearest Neighbours Algorithm	10	69.8790	1.97990	.62610

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	.133	.719	24.647	18	.000	20.40900	.82804	18.66936	22.14864
	Equal variances not assumed			24.647	17.637	.000	20.40900	.82804	18.66679	22.15121