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Project No:- SSE/26/10/314-4

Title-4:-

Assessing the Predictive Accuracy of K-Nearest Neighbors vs Support Vector Machines for Job Rescission Forecasting.

Introduction:-

Paragraph-1:-

1) **Definition:**

This study compares the predictive performance of K-Nearest Neighbors and Support Vector Machines (SVM) in forecasting Job rescission events in the industry. Job rescission refers to withdrawal of employment offers before an employee starts working.

2) **Importance in Today's World:-**

In the current dynamic economic environments industries face uncertainties that can lead to the rescission of job offers. Accurately forecasting such events is vital for organizations to maintain their reputation and for job candidates to manage their career expectations effectively.

Applications of Research:

Policy Formulation:

Utilizing insights from predictive analyses to craft policies that address underlying causes of job rescissions.

Human Resources Analytics:

Implementing predictive models to monitor and forecast job offer rescissions, aiding HR departments in decision-making processes.

Paragraph-2:-

i) Total Number of articles Published in Past 5 years.

→ A systematic literature review covering from 2012 to April 2023 identified 52 relevant peer-reviewed studies on machine learning techniques for predicting employee turnover. this indicates a growing interest and substantial research output in this area over the past decade. Continuously assessing the effectiveness of retention strategies through predictive analytics.

Paragraph - 3:-

1) Existing Experience in Research:

While direct studies on job rescission forecasting are limited, research comparing K-NN and SVM in related predictive tasks provides valuble insights:

→ Time series Forecasting.

→ Employee Turnover Prediction

2) Aim of Study!

To evaluate and compare the predictive accuracy of K-nearest Neighbors and Support Vector Machines in forecasting job offer rescissions, identifying the more effective model for this specific application.

Materials and Methods!-

Paragraph-1!-

Study setting- SIMATS [SIMATS Engineering]

No.of Groups : 2

Group 1: KNN

Group 2: SVM

* This step took advantage of the data exploration and Quality verification made earlier to create the final data:

2) Most Cited Articles and Findings :-

One Notable study is "Performance evaluation of support vector machine. classification approaches in data mining," which has been widely cited for its comprehensive analysis of support vector machine across various domains.

3) Best Study in our Opinion :-

Machine Learning for Recession Prediction and Dynamic Asset Allocation

- Alexandor James
- Yaser S.
- ABU-Mostafa
- Xiao Qiao

- Published on May 12, 2023
- By the University of Hong Kong

Paragraph-2:-

Same Groups:-

Pseudo Code:-

K-Nearest Neighbors:-

→ Import Libraries
→ Load data
→ Preprocess data
→ split data
→ train model
→ Compare Model
→ Result.

Paragraph-3:-

Pseudo Code for Support Vector Machine (SVM):-

→ Import Libraries
→ Process the data
→ Split the dataset into features
→ Compute models
→ Update weights
→ Compare Nodes
→ Result.

Paragraph-4

Testing Setup :-

→ Data Preparation
→ Feature Engineering
→ Data Splitting
→ Model Training
→ Class Validation
→ Comparision

Data Collection :- * Kaggle * IEEE Explorer

Results & Discussion :-

→ Computational Efficiency: SVM has demonstrated faster processing times compared to KNN in certain applications, making it more suitable for large datasets.

Limitations :-

→ Data Dependency
→ Generalizability

Future Scope :-

→ Domain-Specific Research
→ Hybrid Models
→ Real-Time Prediction System

Conclusion :-

Evaluating the accuracy of K-Nearest Neighbours and Support Vector Machines in forecasting job rescission is essential for improving workforce stability and planning.

Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
ACCURACY	KNN	10	94.4960	.98524	.31156
	SVM	10	94.7200	.76056	.24051

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
ACCURACY	Equal variances assumed	.858	.366	-.569	18	.576	-.22400	.39359	-1.05090	.60290
	Equal variances not assumed			-.569	16.916	.577	-.22400	.39359	-1.05472	.60672