

## Report on Node2Vec and Logistic Regression for 7-Class Classification

### **Introduction:**

This report presents findings from our utilization of the Node2Vec algorithm along with logistic regression for performing 7-class classification using the CORA graph dataset. Our goal was to generate node embeddings using Node2Vec and then employ these embeddings as features for logistic regression-based classification.

### **Results:**

	precision	recall	f1-score	support
Case_Based	0.73	0.61	0.67	166
Genetic_Algorithms	0.88	0.87	0.88	210
Neural_Networks	0.70	0.85	0.77	366
Probabilistic_Methods	0.84	0.79	0.81	207
Reinforcement_Learning	0.86	0.71	0.78	128
Rule_Learning	0.69	0.56	0.62	98
Theory	0.62	0.63	0.63	174
accuracy			0.75	1349
macro avg	0.76	0.72	0.74	1349
weighted avg	0.76	0.75	0.75	1349

### **Discussion:**

Our logistic regression model exhibited reasonable performance on the test set, achieving an accuracy of 75.24%. Analysis of precision, recall, and F1-score metrics revealed varying performance across different classes. For instance, Genetic\_Algorithms displayed high precision, recall, and F1-score, indicating effective classification. However, Theory and Rule\_Learning exhibited lower metrics, suggesting classification challenges for these classes.

### **Conclusion:**

The integration of Node2Vec for generating node embeddings and logistic regression for classification proved effective for the 7-class classification task using the CORA graph dataset. Our attained accuracy and evaluation metrics offer insights into the model's performance across distinct classes.

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