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AI ALGORITHMS
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1
INTRODUCTION
This dissertation explores five commonly used algorithms in Artificial Intelligence (AI): Linear Regression, K-Nearest Neighbors (KNN), Decision Trees, Support Vector Machines (SVM), and K-Means Clustering. These algorithms are fundamental to the field of AI, offering versatile and powerful methods for predictive modeling, classification, and clustering. By examining their theoretical foundations, practical implementations, and real-world applications, this work aims to provide a comprehensive understanding of these algorithms, highlighting their significance and utility in solving complex problems across various domains.
2
1. LINEAR REGRESSION
**Linear Regression is a supervised learning algorithm used to model the relationship between a dependent variable and one** or more independent variables by fitting a linear equation to observed data.
2. K-NEAREST NEIGHBOURS (KNN)
K-Nearest Neighbors (KNN) is a supervised learning algorithm used for classification and regression. It classifies a sample **based on the majority class among its k-nearest neighbors.**
3
3. DECISION TREES
Decision Trees are a non-parametric supervised learning method used for classification and regression. They partition the **data into subsets based on feature values and make predictions**

by traversing the tree from the root to a leaf.
4
4 SUPPORT VECTOR MACHINES (SVM)
Support Vector Machines (SVM) are supervised learning algorithms used for classification and regression. They work by **finding the hyperplane that best separates the data into classes** with the maximum margin.
5. K-Means Clustering
K-Means Clustering is an unsupervised learning algorithm **used to partition a dataset into k clusters, where each data point belongs to the cluster with the nearest mean.**
5
CONCLUSION
In conclusion, this dissertation has provided a comprehensive analysis of five widely used algorithms in Artificial Intelligence: Linear Regression, K-Nearest Neighbors (KNN), Decision Trees, Support Vector Machines (SVM), and K-Means Clustering. Each algorithm's theoretical underpinnings, practical applications, and strengths have been thoroughly examined. Their pivotal roles in predictive modeling, classification, and clustering underscore their importance in the AI landscape. By understanding these algorithms, researchers and practitioners can better harness their potential to address complex challenges, driving advancements in technology and contributing to the growing impact of AI in various fields.
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