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Author

Dr. Krishna Karoo

Abstract

Data science has emerged as a critical field driving innovation and decision-making across industries. At its core, data science relies on efficient data manipulation, rigorous statistical analysis, sophisticated machine learning model development, and compelling data visualization. This research paper argues for the indispensable role of Python programming in facilitating these core data science activities. We will explore Python's key advantages, including its comprehensive ecosystem of libraries, ease of learning, versatility, and robust community support, demonstrating why it has become the de facto language for data scientists worldwide. Furthermore, we will analyze its suitability for various stages of the data science pipeline, from data acquisition and preprocessing to model deployment and reporting, solidifying its necessity in the modern data science landscape.