

Lab Activity I

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What is Machine Learning

- A branch of artificial intelligence called Machine Learning (ML) allows computers to learn from data and gradually get better at what they do without needing to be explicitly programmed.

What Makes Machine Learning Significant?

- Machine Learning (ML) algorithms make data-driven decisions and find patterns to assist in solving complex situations. They improve decision-making, accuracy, and efficiency across a range of sectors.

Healthcare: Personalized Treatment Plans

Problem Being Solved

Patients often respond differently to the same treatments due to genetic, environmental, and lifestyle differences, making one-size-fits-all approaches less effective.

Type of Machine Learning Used:

Supervised Learning (regression models) and Unsupervised Learning (clustering).

Impact of the Solution

Machine learning models analyze patient data, including genetic information, medical history, and treatment outcomes, to recommend personalized treatment plans. This leads to more effective therapies, reduced side effects, and improved patient satisfaction by tailoring treatments to individual needs.

Finance: Credit Scoring and Risk Assessment

Problem Being Solved

Traditional credit scoring methods can be limited and biased, often failing to accurately assess the risk of lending to certain demographics or small businesses.

Type of Machine Learning Used:

Supervised Learning (classification and regression).

Impact of the Solution

Machine learning models analyze diverse data sources like transaction history, social media activity, and alternative financial data to create more accurate and inclusive credit scores. This approach helps financial institutions reduce defaults, extend credit to underbanked populations, and improve decision-making in lending.

Marketing: Sentiment Analysis for Brand Management

Problem Being Solved

Understanding customer sentiment across social media, reviews, and other platforms is challenging due to the vast volume of data and varied expressions of opinions.

Type of Machine Learning Used:

Supervised Learning (classification) and Natural Language Processing (NLP).

Impact of the Solution

Machine learning algorithms analyze text data to gauge customer sentiment toward brands, products, or campaigns. This insight helps companies adjust their marketing strategies, address negative feedback promptly, and enhance their brand image, ultimately driving customer loyalty and sales growth.

Conclusion

Machine learning is revolutionizing various fields by providing solutions that are tailored, efficient, and data-driven:

- In Healthcare, personalized treatment plans are enhancing patient outcomes by considering individual differences.
- In Finance, advanced credit scoring models are improving risk assessment and financial inclusion.
- In Marketing, sentiment analysis is empowering brands to better understand and respond to customer needs.

These applications highlight the versatility of machine learning in solving complex problems, driving innovation, and creating significant impact across industries.