SNS COLLEGE OF TECHNOLOGY

Coimbatore - 35

23BAT613 – Artificial Intelligence for Managers

Unit II – Unboxing ML & Its Applications

Presented by

Ms.S.D.Shamini

Design Thinker

Redesigning Common Mind & Business Towards Excellence

1st Indian Institution to Implement & Patent Design Thinking FrameWork

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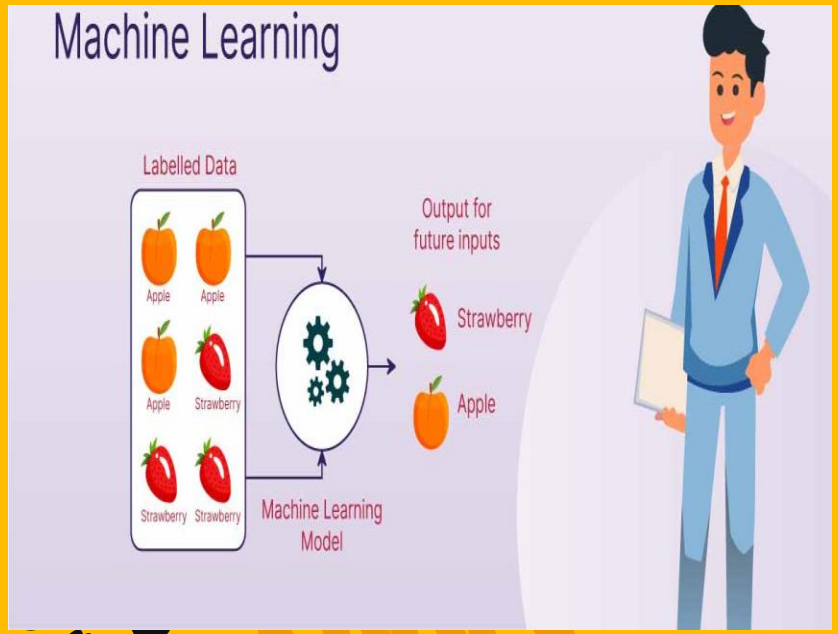
Build an Entrepreneurial Mindset through our Design Thinking FrameWork

Guess the Topic!!!

Supervised Learning



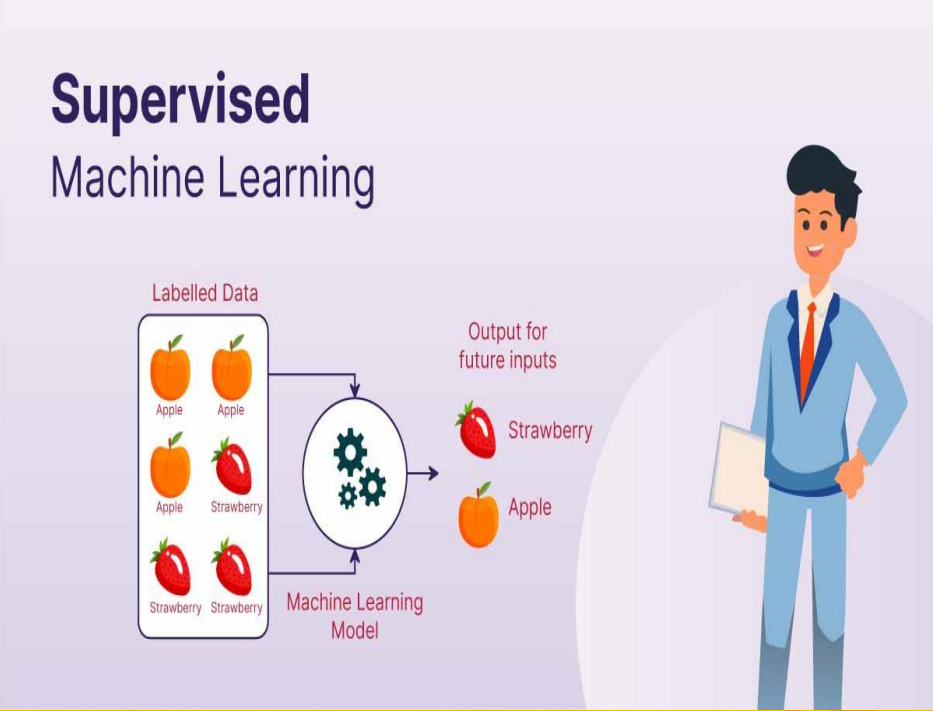
Recap

- Reason to study Supervised Learning
- Supervised Learning

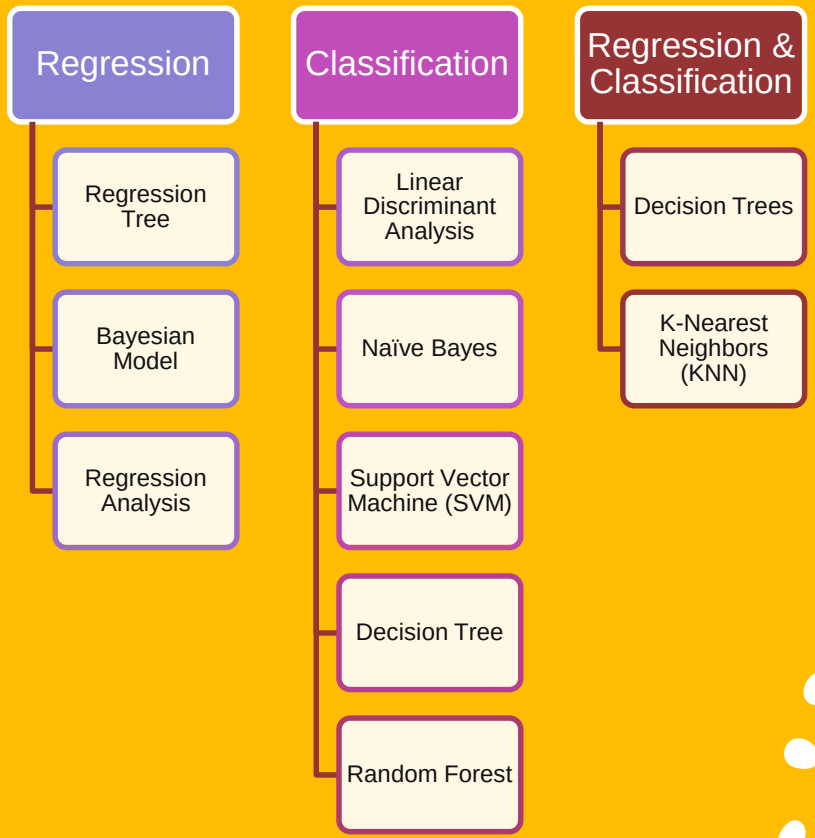
Discussion about….

- Reason to study Supervised Learning
- Supervised Learning
- Supervised Learning Algorithms
- Supervised Learning – Classification
- Supervised Learning – Regression
- Application of Supervised Learning

Reason to study Supervised Learning



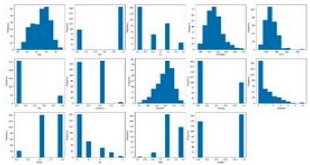
Supervised Learning Algorithms

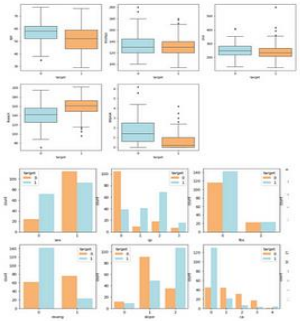


Supervised Learning - Classification

Exploratory Data Analysis (EDA)

1) **Histogram:** df.plot(kind = 'hist')
2) **Box Plot:** sns.boxplot()
3) **Grouped Bar Chart:** sns.countplot()

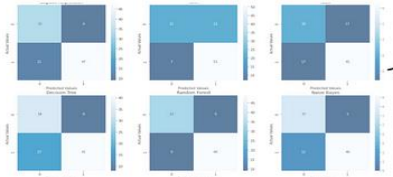




Model Evaluation

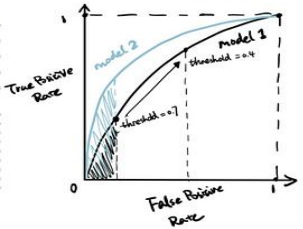
Confusion Matrix

confusion_matrix(y_test, y_pred)

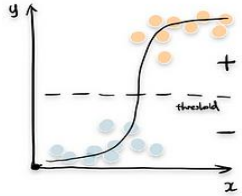


ROC & AUC

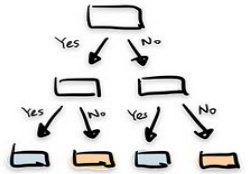
metrics.auc(fpr, tpr)



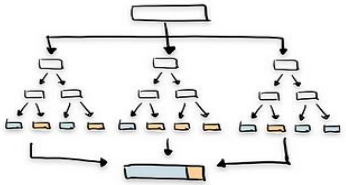
Logistic Regression



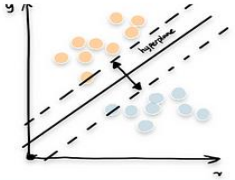
Decision Tree



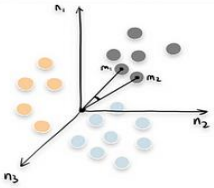
Random Forest



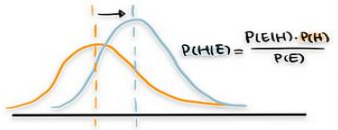
Support Vector Machine



K Nearest Neighbour



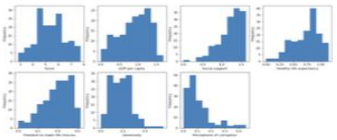
Naive Bayes



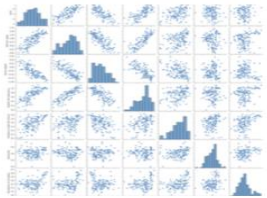
Supervised Learning - Regression

Exploratory Data Analysis (EDA)

Histogram: df.plot(kind = 'hist')

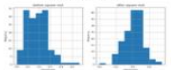


Pairplot: sns.pairplot()

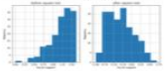


Feature Engineering

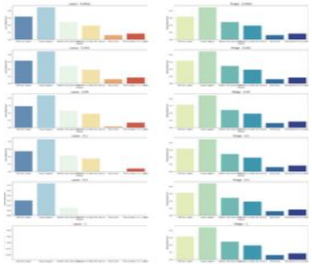
Log Transform
np.log()



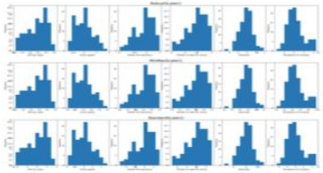
Square Root Transform
np.sqrt()



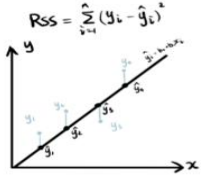
Feature Importance
coef_.ravel()



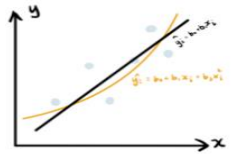
Feature Scaling
StandardScaler(), RobustScaler(), MinMaxScaler()



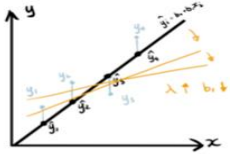
Linear Regression



Polynomial Regression



Regression with Regularization Techniques



Lasso Regression

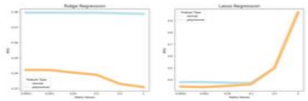
$$\sum_{i=1}^{n} (y_i - \hat{y}_i)^2 + \lambda |b_i|$$

Ridge Regression

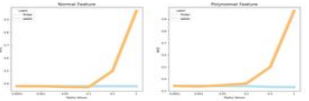
$$\sum_{i=1}^{n} (y_i - \hat{y}_i)^2 + \lambda (b_i)^2$$

Model Evaluation

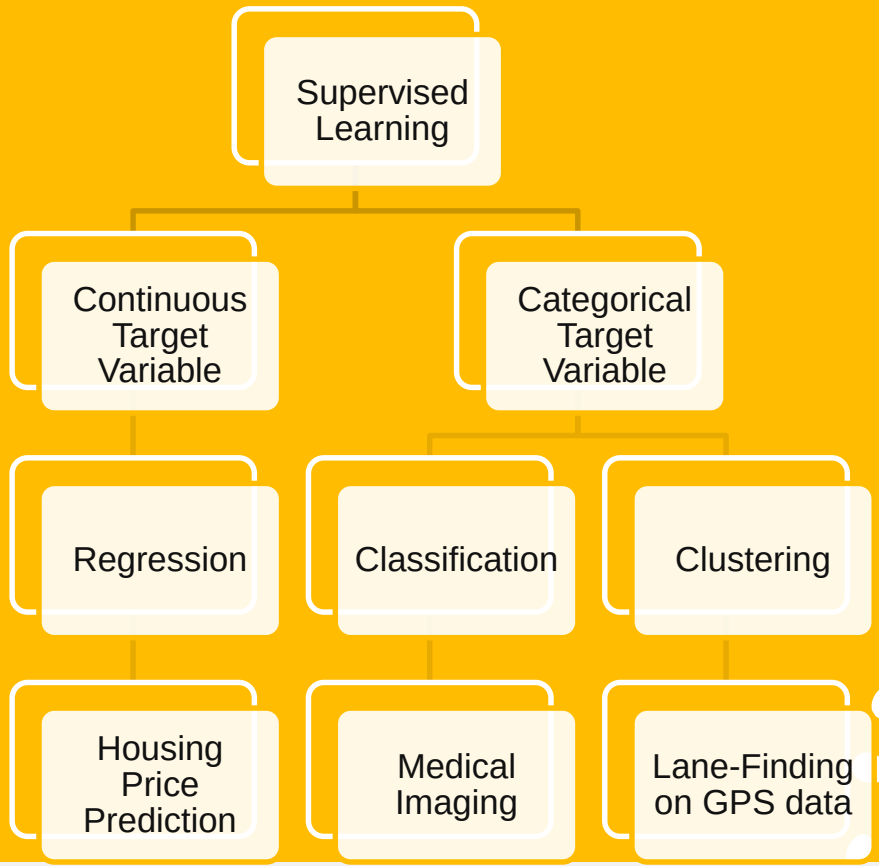
Ridge vs Lasso



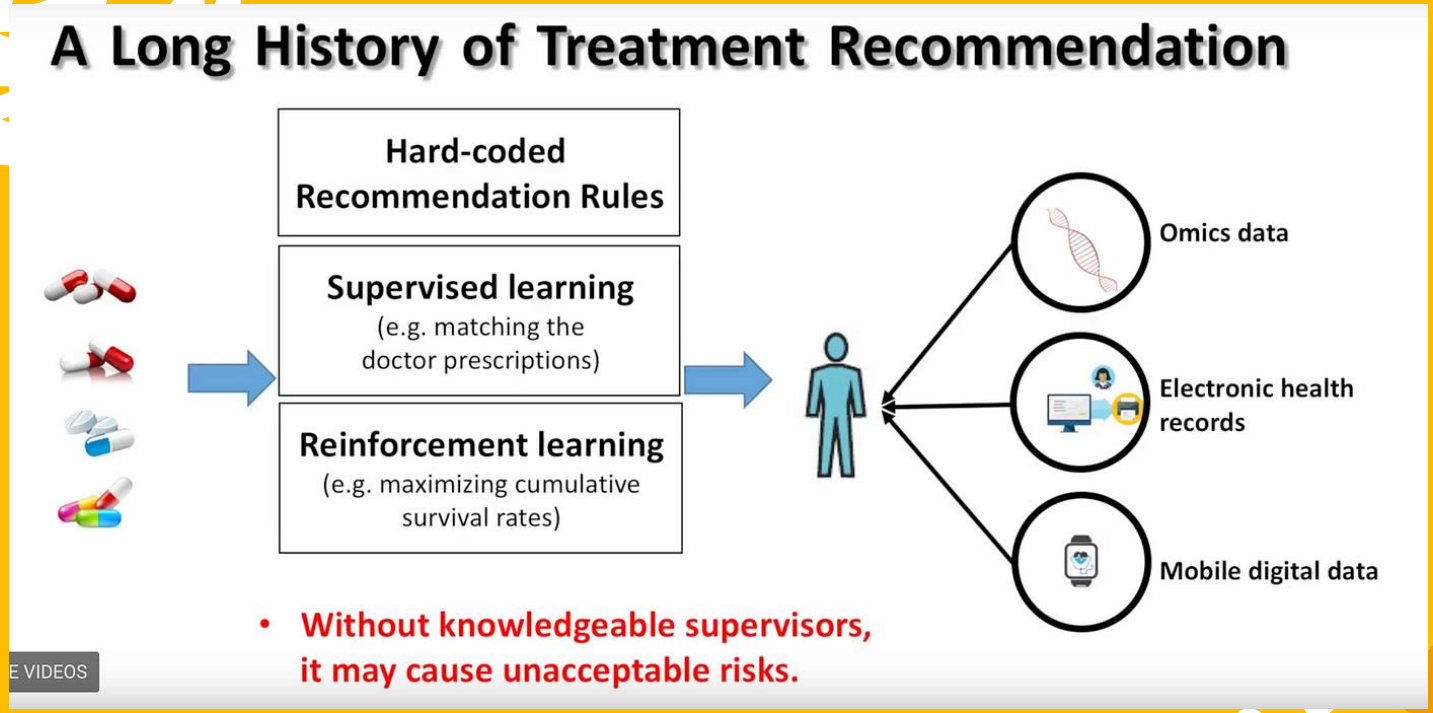
Normal vs. Polynomial



Application of Supervised Learning



Supervised Learning Application



Knowledge Check

What is the primary characteristic of supervised learning?

- ✗ A) Learning from labeled data
- ✗ B) Learning without any guidance
- ✗ C) Learning from unstructured data
- ✗ D) Learning from feedback only
- ✗ **Answer: Learning from labeled data**

Summary

Reason to study Supervised Learning

- Supervised Learning
- Supervised Learning Algorithms
- Supervised Learning – Classification
- Supervised Learning – Regression
- Application of Supervised Learning

References

- https://stl.tech/blog/introduction-to-machine-learning-and-its-applications/
- https://www.geeksforgeeks.org/types-of-machine-learning/

Thanks!

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