Artificial Intelligence & Machine Learning

Introduction to AI/ML.

A powerful set of tools for solving complex problems.

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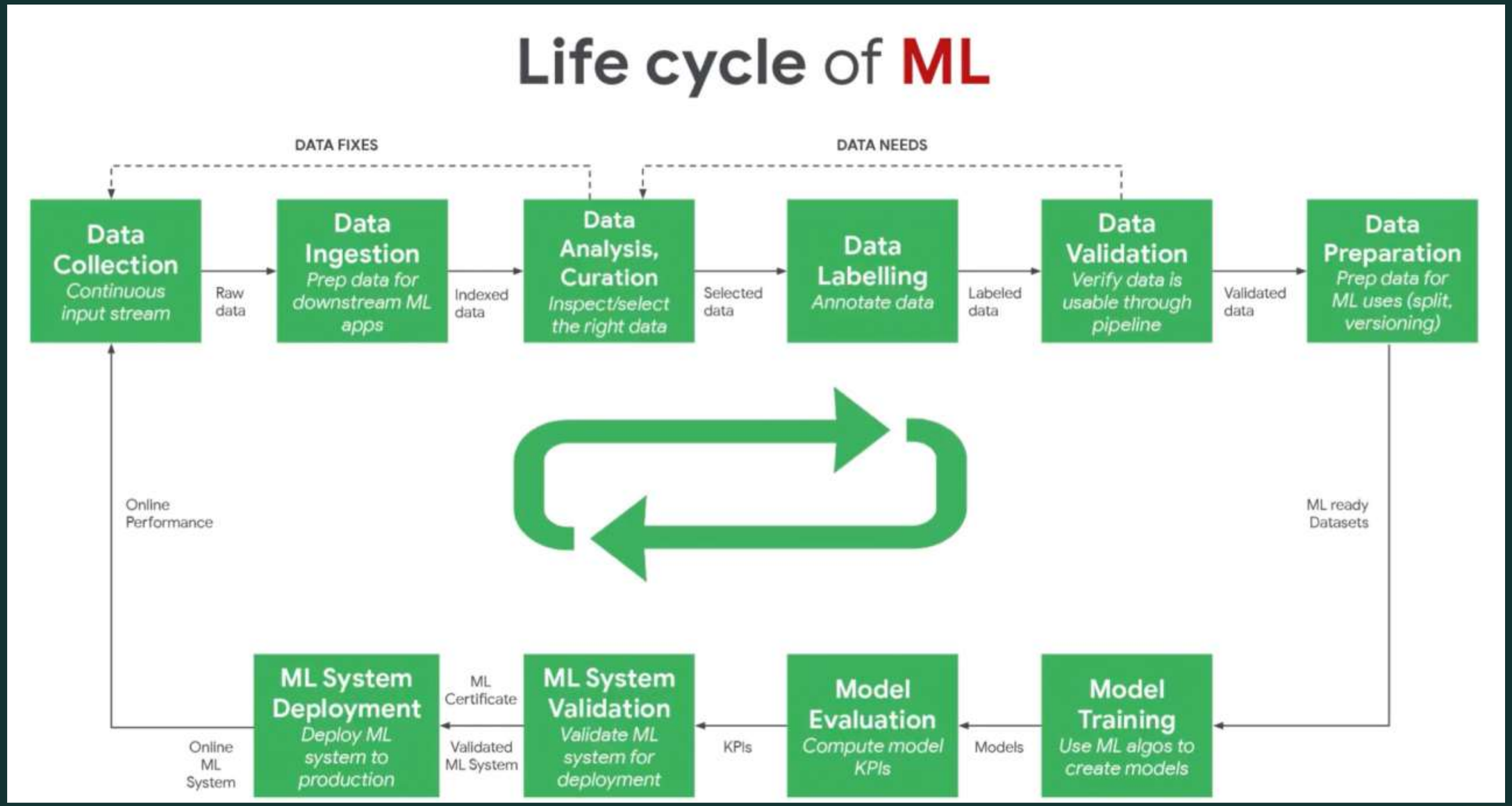
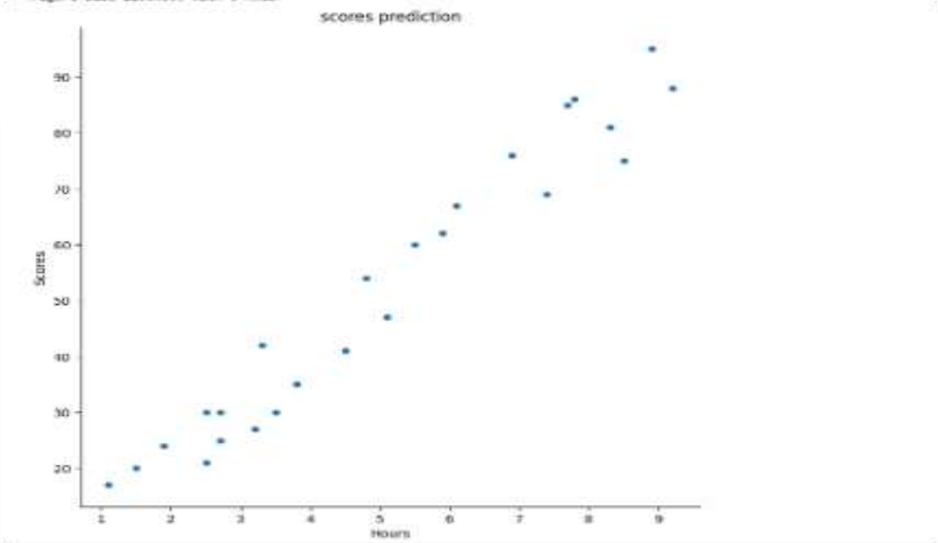
WORKFLOW AI / ML





Exploratory Data Analysis

1 **Understanding Data**

Analyze relationships between features.

2 **Identify Patterns**

Uncover insights and trends in data.

3 **Data Cleaning**

Address missing values and inconsistencies.

4 **Feature Engineering**

Transform data for better model performance.

Supervised Learning

Regression

Predicting continuous values.

Examples: predicting house prices, sales forecast.

Classification

Categorizing data into distinct classes.

Examples: identifying spam emails, classifying images.

Linear Regression

1

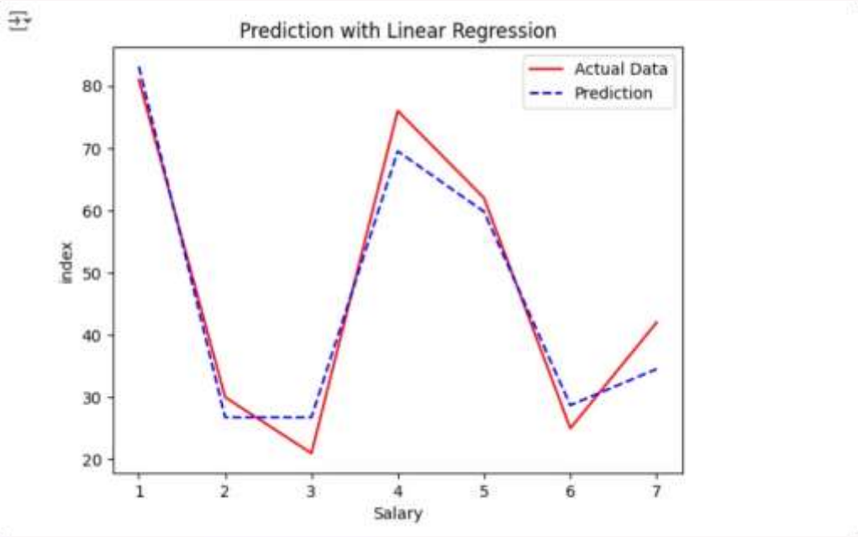
Simple Linear

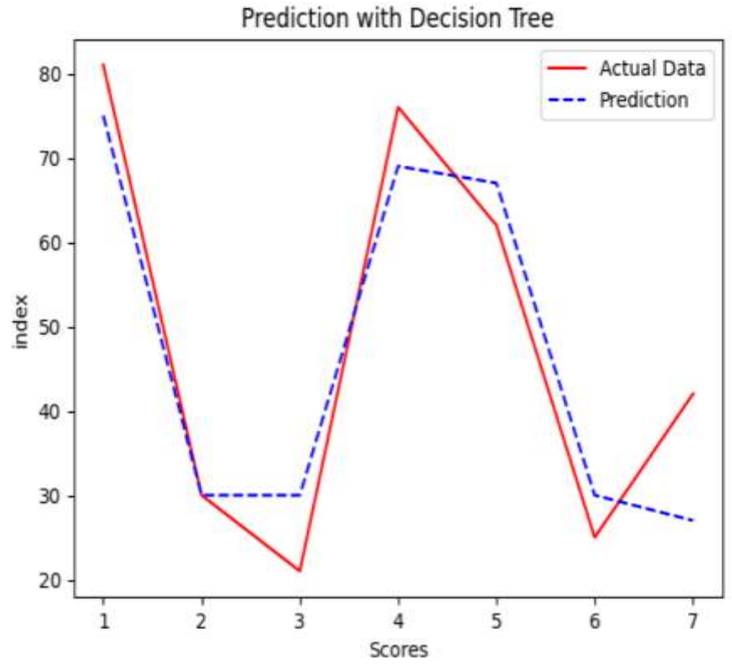
One input variable.

2

Multiple Linear

Multiple input variables.






```
# Importing metrics for the evaluation of the model
from sklearn.metrics import r2_score,mean_squared_error
```

```
# Calculate R square vale
rsq = r2_score(y_test,y_pred)
```

```
print('r square Linear Regression:',rsq)
```

```
r square Linear Regression: 0.9553509219739938
```

```
# Intecept and coeff of the line
print('Intercept of the Linear Regression model:',lr_model.intercept_)
print('Coefficient of the line Linear Regression:',lr_model.coef_)
```

```
Intercept of the Linear Regression model: 2.4803670915057623
Coefficient of the line Linear Regression: [9.71409219]
```

Then it is said to form a line with result in Linear Regression

$$y = 2.480367 + 9.714092\ x$$

with x is the value of hours of study

Decision Tree

Tree Structure

Decision-making branches based on features.

Splitting Criteria

Gini impurity, entropy, or information gain.

Leaf Nodes

Represent predictions or classifications.

Model Evaluation

Model	R-squered
Linear Regression	0.75
Decision Tree	0.88

Conclusion

- Decision Tree models are better than Linear Regression Model

-AI/ML empowers data-driven decision making.