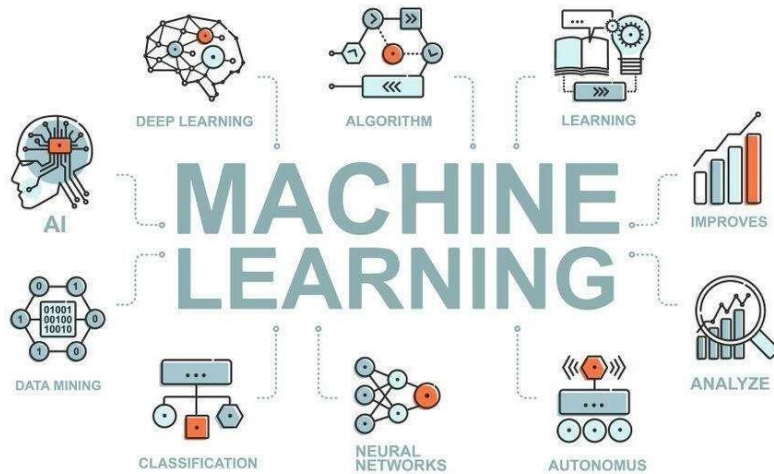


A TERM WORK REPORT ON

MACHINE LEARNING



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IPL SCORE PREDICTION USING DEEP LEARNING

INTRODUCTION:

Since the dawn of the IPL in 2008, it has attracted viewers all around the globe. A high level of uncertainty and last-minute nail-biters have urged fans to watch the matches. Within a short period, the IPL has become the highest revenue-generating league in cricket. In a cricket match, we often see the scoreline showing the probability of the team winning based on the current match situation. This prediction is usually done with the help of data analytics. Before, when there were no advancements in machine learning, predictions were usually based on intuition or some basic algorithms.



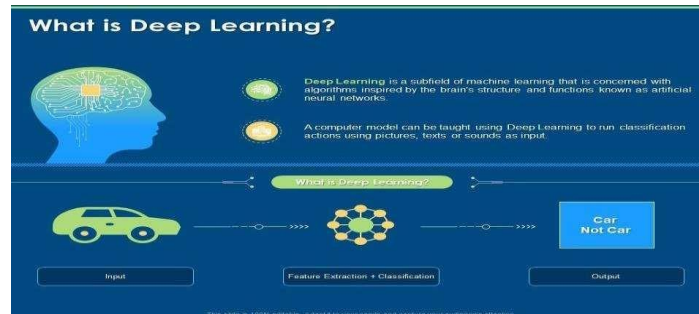
DEEP LEARNING:

Deep learning is a subset of [machine learning](#) that uses multi-layered [neural networks](#), called deep neural networks, to simulate the complex decision-making power of the human brain. Some form of deep learning powers most of the [artificial intelligence \(AI\)](#) in our lives today.



Why Deep Learning:

We humans can't easily identify patterns from huge data and thus here, [machine learning](#) and [deep learning](#) comes into play. It learns how the players and teams have performed against the opposite team previously and trains the model accordingly. Using only machine learning algorithm gives a moderate accuracy therefore we used deep learning which gives much better performance than our previous model and considers the attributes which can give accurate results.



Factors Influencing IPL Scores

- Team Composition:
The balance and strengths of a team's players can significantly impact their scoring potential.
- Pitch Conditions:
The nature of the pitch, whether it favors batters or bowlers, can greatly influence the scoring.
- Weather and Environment:
Factors like temperature, humidity, and wind can affect the ball's movement and impact scoring.
- Player Form
The current form and performance of key players can greatly influence a team's scoring ability.

Leveraging Historical Performance

- Data Collection
Gathering and organizing historical IPL data is the foundation for effective score prediction models.
- Feature Engineering
Extracting meaningful features from the data, such as player stats and team dynamics, is crucial.

- **Model Training**

Using historical data to train machine learning models can improve the accuracy of IPL score predictions.



IMPLEMENTATION

- ❖ **First, let's import all the necessary libraries:**

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn import preprocessing
import keras
import tensorflow as tf
```

- ❖ **Loading the dataset**

When dealing with cricket data. The dataset contains features like venue, date, batting and bowling team, names of batsman and bowler, wickets and more

- ❖ **Data Pre-processing**

Dropping unimportant features

- We have created a new dataframe by dropping several columns from the original DataFrame.
- The new DataFrame contains the remaining columns that we are going to train the predictive model.

- ❖ **Further Pre-Processing**

We have split the data frame into input features (X) and target features (y). Our target features is the total score.

❖ Label Encoding

- We have applied label encoding to your categorical features in X.
- We have created separate LabelEncoder objects for each categorical feature and encoded their values.
- We have created mappings to convert the encoded labels back to their original values, which can be helpful for interpreting the results.

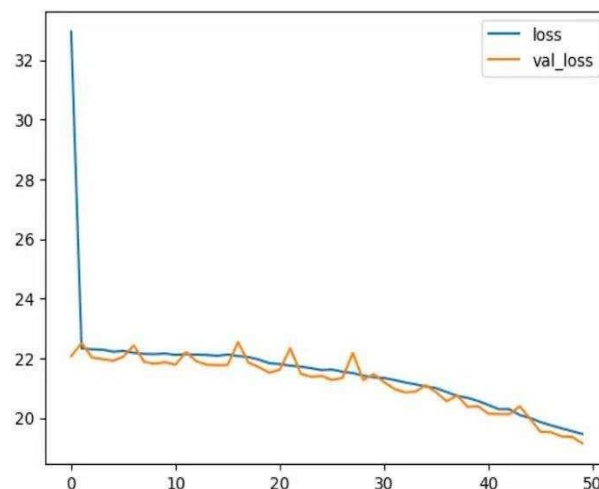
❖ Train Test Split

We have split the data into training and testing sets. The training set contains 70 percent of the dataset and rest 30 percent is in test set.

- X_train contains the training data for your input features.
- X_test contains the testing data for your input features.
- y_train contains the training data for your target variable.
- y_test contains the testing data for your target variable.

❖ Model Training

- We have trained the neural network model using the scaled training data.
- After the training, we have stored the training and validation loss values to our neural network during the training process.
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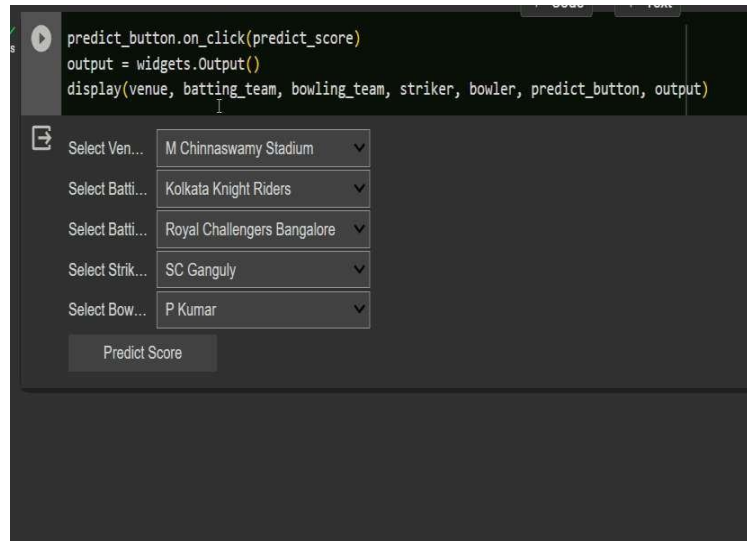
❖ Model Evaluation

- We have predicted using the trained neural network on the testing data.
- The variable predictions contains the predicted total run scores for the test set based on the model's learned patterns.

❖ Let's create an Interactive Widget

- We have created an interactive widget using ipywidgets to predict the score based on user input for venue, batting team, bowling team, striker, and bowler.
- We have created dropdown widgets to select values for venue, batting team, bowling team, striker, and bowler.

- Then, we have added a “Predicted Score” button widget. Whenever, the button will be clicked, the predict_score function will be called and then perform the following steps:
 - Decodes the user-selected values to their original categorical values.
 - Encodes and scales these values to match the format used in model training.
 - Uses the trained model to make a prediction based on the user’s input.
 - Displays the predicted score.



ADVANTAGES OF DEEP LEARNING

- Highly accurate predictions
- Ability to handle complex data

DISADVANTAGES

- Requires extensive computational resources
- Data-intensive

CONCLUSION:

In conclusion, deep learning stands as a transformative force in the realm of artificial intelligence, revolutionizing industries and reshaping the way we interact with technology. Its unparalleled ability to uncover complex patterns from vast datasets has propelled breakthroughs in areas such as healthcare, finance, and autonomous systems. The significance of deep learning lies not only in its practical applications but also in its potential to drive innovation, improve efficiency.