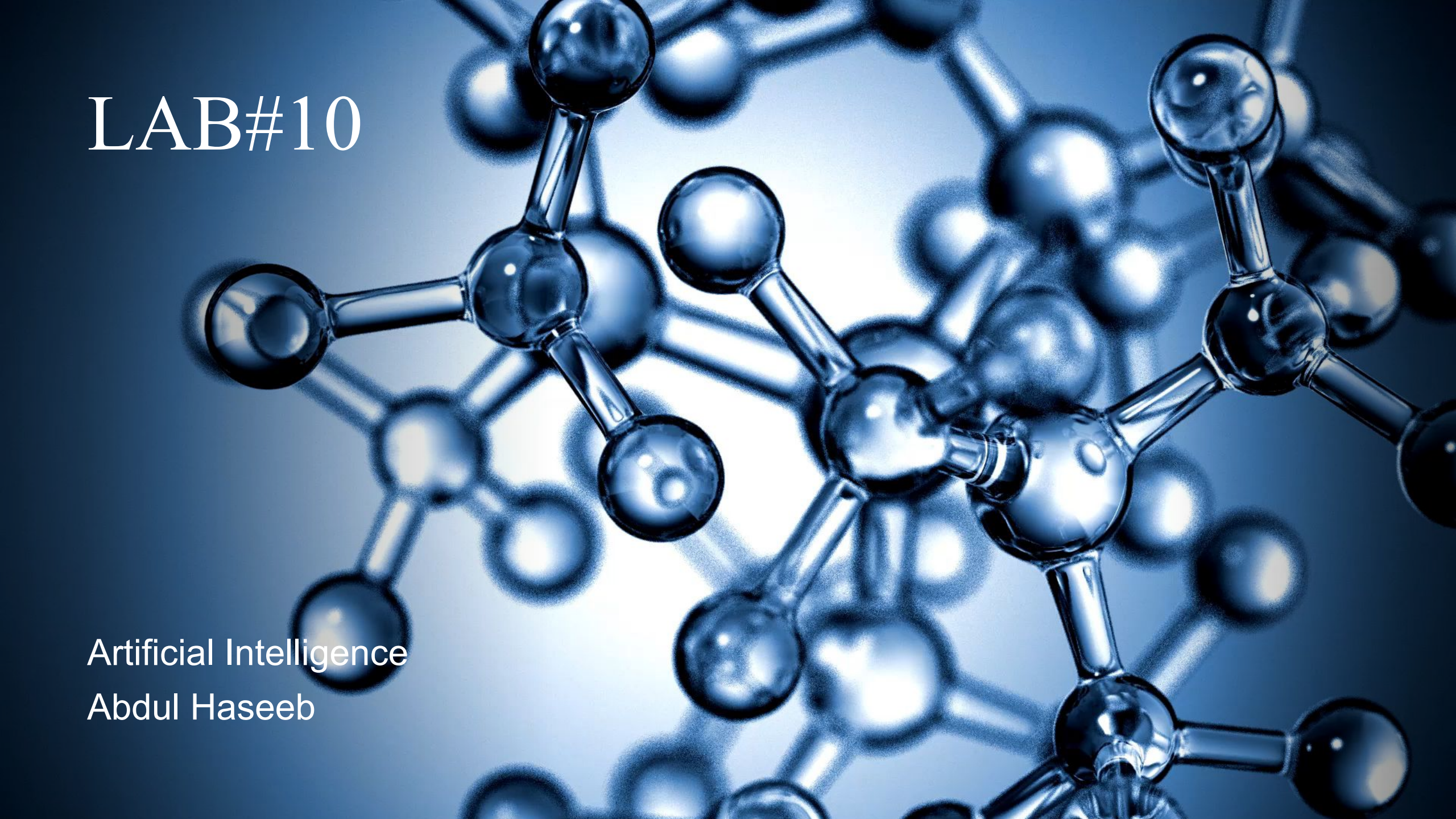
LAB#10



Artificial Intelligence

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Lab Objectives

- Implementation of Logistic Regression on PIMAS Diabetes Dataset
- Implementation of K means Algorithm
- Understanding PCA and Implementing it

PIMAS Diabetes Dataset

- **Lab Task#01**
  - Import and Explore PIMAS Diabetes Dataset
  - Generate a Bar chart for the count of patients those who have diabetes and those who doesn’t have
  - Find out those patients who are above 40 years of age and have diabetes.
  - Now Split the dataset into training and test data
  - Train two logistic Regression Models
    - One without Feature Scaling
    - One with feature scaling
  - Find out accuracy of both models
  - Perform prediction on any two samples from the test data

K-Means

- **Lab Task#02**
  - Load Iris dataset from sklearn
  - Train K-Means Algorithm on Iris dataset using the elbow method to find out the best possible number of clusters for this data
  - Find out the quality of clustering

Implement the following code to learn how you can visualize clustering with scatter diagram

```python
import matplotlib.pyplot as plt
from sklearn.cluster import KMeans
from sklearn.datasets import load_iris


# Load the Iris dataset
iris = load_iris()
X = iris.data

y = iris.target

# Create a KMeans model with 3 clusters
kmeans = KMeans(n_clusters=3, random_state=0).fit(X)

# Get the cluster labels
labels = kmeans.labels_

# Visualize the clusters
plt.scatter(X[:, 0], X[:, 1], c=labels)
plt.xlabel('Sepal Length (cm)')
plt.ylabel('Sepal Width (cm)')
plt.title('K-Means Clustering of Iris Dataset')
plt.show()
```