Practical no. 3

**Aim**: Implements Multinomial Logistic Regression (Iris Dataset)

# Theory

Multinomial Logistic Regression, also known as Softmax Regression, is a type of logistic regression that can be used for multi-class classification problems. It is a generalization of the binary logistic regression model to handle multiple classes. In multinomial logistic regression, the input data is represented by a matrix X, where each row corresponds to an observation or instance, and each column corresponds to a feature or variable. The output is a multi-class label y, which takes on K possible values (K > 2).

# Material

* Sklearn
* LogisticRegression

# Program

from sklearn.datasets import load\_iris

from sklearn.model\_selection import train\_test\_split from sklearn.linear\_model import LogisticRegression from sklearn.metrics import accuracy\_score

# Load the Iris dataset iris = load\_iris()

# Split the dataset into training and testing sets

X\_train, X\_test, y\_train, y\_test = train\_test\_split(iris.data, iris.target,test\_size=0.2, random\_state=42)

# Create an instance of the logistic regression model

log\_reg = LogisticRegression(multi\_class='multinomial', solver='lbfgs') # Fit the model to the training data

log\_reg.fit(X\_train, y\_train)

# Make predictions on the testing data y\_pred = log\_reg.predict(X\_test)

# Calculate the accuracy of the model accuracy = accuracy\_score(y\_test, y\_pred) print("Accuracy:", accuracy)

# Output



