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| Name Of The Student | Vaishnavi G |
| Internship Project Topic | Build a Classification Model for Drug Trials Dataset |
| Name of the Organization | TCS iON |
| Name of the Industry Mentor | Himdweep Walia |
| Name of the Institute | SRM Institute of Science and Technology |

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| Date | Day # | Hours Spent |
| 4/11/2022 | 24 | 5 hours |
| Activities done during the day:  **Logistic Regression in machine learning:**  **What is Logistic Regression?**     * Logistic regression is one of the most common machine learning algorithms used for binary classification. * It predicts the probability of occurrence of a binary outcome using a logistic function. * It is a special case of linear regression as it predicts the probabilities of outcome using log function.   **Type of Logistic Regression:**  On the basis of the categories, Logistic Regression can be classified into three types:   * **Binomial:**   In binomial Logistic regression, there can be only two possible types of the dependent variables, such as 0 or 1, Pass or Fail, etc.   * **Multinomial:**   In multinomial Logistic regression, there can be 3 or more possible unordered types of the dependent variable, such as "cat", "dogs", or "sheep"   * **Ordinal:**   In ordinal Logistic regression, there can be 3 or more possible ordered types of dependent variables, such as "low", "Medium", or "High".  **Difference between Linear Regression vs Logistic Regression**     * Linear Regression is used when our dependent variable is continuous in nature for example weight, height, numbers, etc. and in contrast, Logistic Regression is used when the dependent variable is binary or limited for example: yes and no, true and false, 1 or 2, etc. * Linear regression uses the ordinary least square method to minimize the error and arrives at the best possible solution, and the Logistic regression achieves the best outcomes by using the maximum likelihood method.   **What is the Sigmoid Function?**    It is a mathematical function having a characteristic that can take any real value and map it to between 0 to 1 shaped like the letter “S”. The sigmoid function also called a logistic function.     |  | | --- | | Y = 1 / 1+e -z |   **Code in Python:**  You can find the dataset here Dataset. First of all, before proceeding we first import all the libraries that we need to use in our algorithm   |  | | --- | | import numpy as np  import matplotlib.pyplot as plt  from matplotlib.colors import ListedColormap  import pandas as pd  from sklearn.model\_selection import train\_test\_split  from sklearn.preprocessing import StandardScaler  from sklearn.metrics import accuracy\_score  from sklearn.linear\_model import LogisticRegression |   After initializing all the libraries that we need in our algorithm know we have to import our dataset with the help of the pandas library and split our dataset into training and testing set with the help of the train\_test\_split library.   |  | | --- | | dataset = pd.read\_csv(r'dataset.csv')  x = dataset.iloc[:,[2,3]].values  y = dataset.iloc[;, 4].values  x\_train, x\_test, y\_train, y\_test = train\_test\_split(x,y, test\_size=0.2, random\_state=0) |   As we divide our dataset on the basis of train and test split know we have to scale our feature dataset with the help of StandardScaler library and apply logistic regression on the training set and check the accuracy sore with the help of accuracy\_score library.   |  | | --- | | # Feature Scaling  sc = StandardScaler()  x\_train = sc.fit\_transform(x\_train)  x\_test = sc.transform(x\_test)  # Fitting logistic regression to the training set  Classifier = LogisticRegression(random\_state=0)  Classifier.fit(x\_train, y\_train)  # Predicting the test results  y\_pred = classifier.predict(x\_test)  print("Accuracy score: ", accuracy\_score(y\_test, y\_pred))  # Accuracy score : 0.9125 |   We have successfully applied logistic regression on the training set  Reference:  [https://machinelearningmastery.com/logistic-regression-for-machine-learning//](https://machinelearningmastery.com/logistic-regression-for-machine-learning/)  [https://www.geeksforgeeks.org/understanding-logistic-regression//](https://www.geeksforgeeks.org/understanding-logistic-regression/) | | |