



FLOOD PREDICTION

USING MACHINE LEARNING

DOMAIN: MACHINE LEARNING
SDG : 13 – CLIMATE ACTION

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GUIDE : Mr. ASHOK P



OBJECTIVE:

- Our project is focused on predicting the rainfall and flood amount in a particular area.
- Disaster manager aims to reduce, or avoid, the potential losses from hazards, assure prompt and appropriate assistance to victims of disaster, and achieve rapid and effective recovery.

PROPOSED FRAMEWORK:

- Live weather forecasting using geostationary satellite are common now-a-days.
- Our ultimate goal is to help the researches ,students, investors to find the any **weather condition** by providing the details of climate that they wanted to predict earlier for making a **forethought decision** .
- This project is mainly focus on the data provided earlier . By using the ML model we will predict the weather and the situation accurately

MODULES

- 1) ML model preparation phase
- 2) DL – using LOGISTIC REGRESSION
- 3) Dataset collection
- 4) Training phase
- 5) Testing phase
- 6) Predicting phase

ALGORITHM:

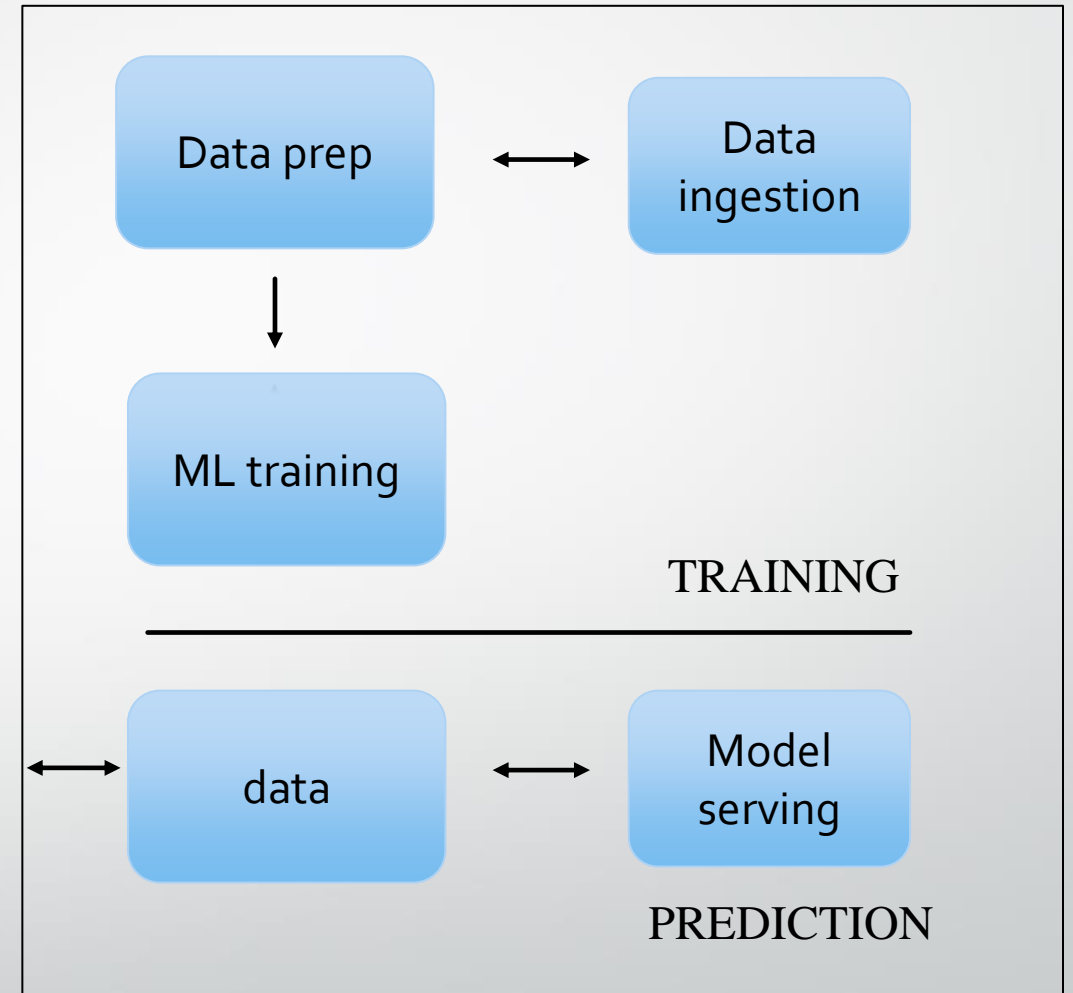
- Logistic regression becomes a classification technique only when a decision threshold is brought into the picture.
- The setting of the threshold value is a very important aspect of Logistic regression and is dependent on the classification problem itself.
- The decision for the value of the threshold value is majorly affected by the values of precision and recall.
- Ideally, we want both precision and recall to be 1, but this seldom is the case.

ARCHITECTURE:



USER INTERFACE

MACHINE LEARNING ARCHITECTURE



LITERATURE SURVEY:

- 1. Real-time WSN Based Early Flood Detection and Control Monitoring System
Author: Tibin Mathew Thekkil - Dr.N.Prabakaran
- 2. Flood Detection using Sensor Network and Notification via SMS and Public Network
Author: Mohamed Ibrahim
Khalaf alfahadiwy - Azizah Suliman
- 3. Department of Civil and Environmental Engineering, Hong Kong Polytechnic University, Hong Kong, China
- 4. Department of Computer Science, Norwegian University of Science and Technology, Trondheim, Norway;

ARCHITECTURAL SURVEY:

AUTHORS	NAME OF PUBLISHERS AND JOURNAL NAME	YEAR	METHODS USED IN THIS PAPER
Vivien Deparday, C.M . Gevaert, Giuseppe Molinaro, Robert Soden, Simone Balog-Way	Department of Earth Observation ScienceUT-I-ITC-ACQUA Department of Earth Observation Science	2019	Faculty of Geo-Information Science and Earth Observation
Vinay Chamola, Senior Member, IEEE, Vikas Hassija, Sakshi Gupta, Adit Goyal, Mohsen Guizani, Fellow, IEEE	Disaster and pandemic management using machine	2020	<u>Machine Learning</u> , <u>Disaster management</u> , <u>Pandemic management</u> , <u>Healthcare</u> , <u>Crowd evacuation</u> , <u>Social distancing</u> .



LONG TERM GOAL:

- Web application with flood map
- Analyzing the flood pathway

CODE:

The screenshot shows a Google Colaboratory notebook with the following components:

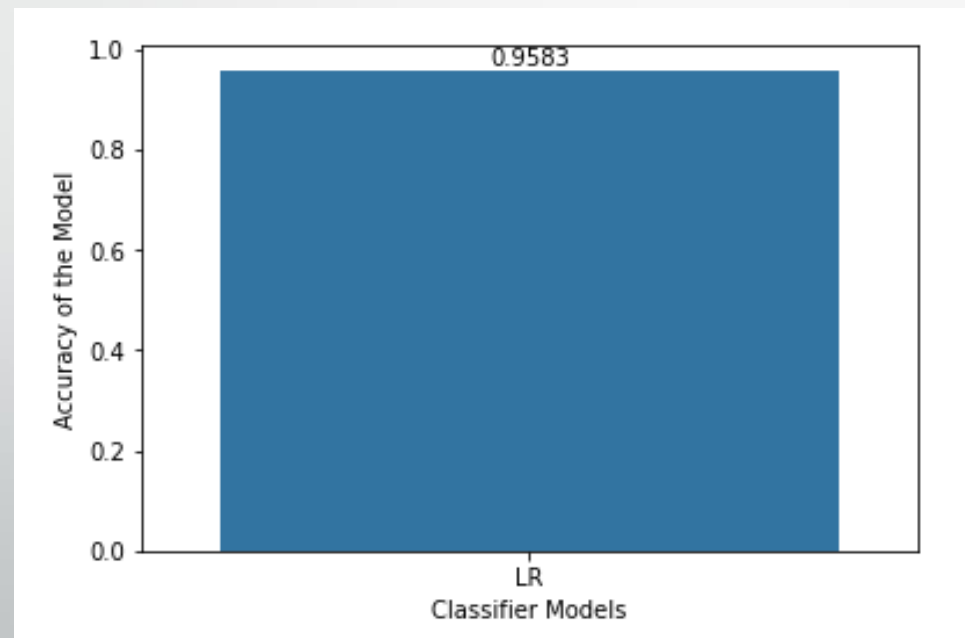
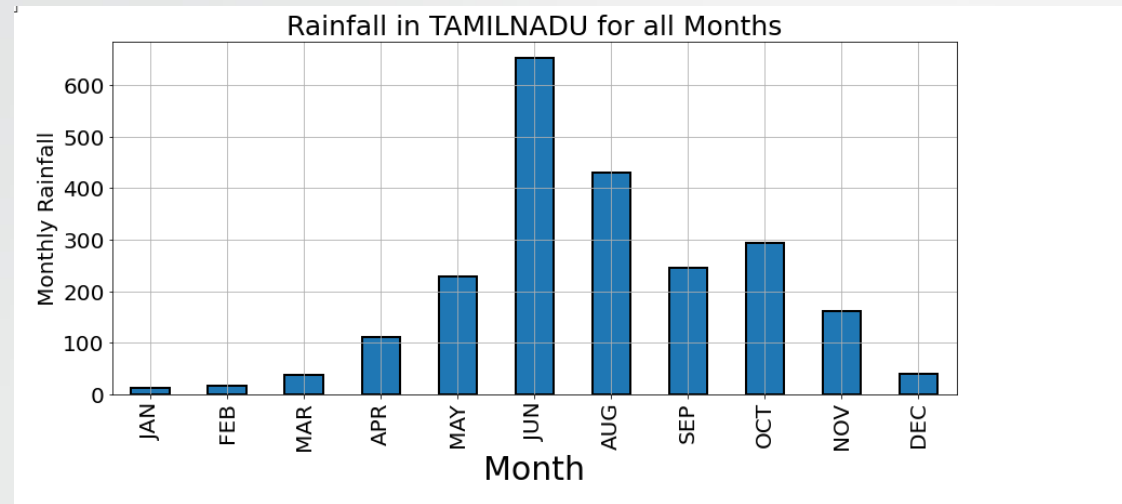
- Browser Tabs:** ix-sendy, Untitled, python, https://g, python, Indexing, Untitled, Welcom, https://r, Inbox (1), +.
- Address Bar:** colab.research.google.com/?utm_source=scs-index#scrollTo=Pls7WXWMxJr2
- Header:** Welcome To Colaboratory, File Edit View Insert Runtime Tools Help, Cannot save changes, Share, Settings, User Profile.
- Toolbar:** + Code, + Text, Copy to Drive, RAM/Disk usage, Editing mode.
- Code Cells:**
 - Cell [39]: `# Ignoring Warnings.
import warnings
warnings.filterwarnings('ignore')`
 - Cell [40]: `import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)
data = pd.read_csv('/content/TAMILNADU.csv')
print(data)`
 - Cell [41]: `data.head()`
- Data Preview:** A table with 118 rows and 16 columns. The columns are SUBDIVISION, YEAR, JAN, FEB, ..., NOV, DEC, ANNUAL RAINFALL, and FLOODS. The data shows rainfall and flood status for various years in Tamil Nadu.
- Status Bar:** 0s completed at 6:38 AM.
- Windows Taskbar:** Search bar, task icons (File Explorer, Edge, etc.), system tray (26°C, 07:08, 30-12-2021).

	SUBDIVISION	YEAR	JAN	FEB	...	NOV	DEC	ANNUAL RAINFALL	FLOODS
0	TAMILNADU	1901	28.7	44.7	...	350.8	48.4	3248.6	YES
1	TAMILNADU	1902	6.7	2.6	...	158.3	121.5	3326.6	YES
2	TAMILNADU	1903	3.2	18.6	...	157.0	59.0	3271.2	YES
3	TAMILNADU	1904	23.7	3.0	...	33.9	3.3	3129.7	YES
4	TAMILNADU	1905	1.2	22.3	...	74.4	0.2	2741.6	NO
...
113	TAMILNADU	2014	4.6	10.3	...	99.5	47.2	3046.4	YES
114	TAMILNADU	2015	3.1	5.8	...	223.6	79.4	2600.6	NO
115	TAMILNADU	2016	2.4	3.8	...	125.4	23.6	2176.6	NO
116	TAMILNADU	2017	1.9	6.8	...	92.5	38.1	2117.1	NO
117	TAMILNADU	2018	29.1	52.1	...	125.4	65.1	4473.0	YES

DATA SET:

```
DATA SET - Notepad
File Edit Format View Help
TAMIL NADU,1975,6.00,4.30,34.80,20.80,80.80,46.80,129.10,121.30,147.80,165.30,130.30,36.40,923.60,10.30,136.30,445.00,332.00
TAMIL NADU,1976,1.20,0.20,8.40,50.10,33.80,48.60,64.00,129.90,83.70,137.60,244.90,56.60,858.90,1.40,92.30,326.10,439.10
TAMIL NADU,1977,1.40,24.80,10.40,45.50,104.10,50.60,55.40,128.30,118.60,347.50,346.80,12.60,1246.00,26.20,160.00,353.00,706.90
TAMIL NADU,1978,1.40,11.20,10.90,35.90,55.20,29.40,78.20,55.40,137.20,151.40,234.60,198.10,998.80,12.60,102.00,300.20,584.10
TAMIL NADU,1979,0.70,43.50,12.50,15.30,35.10,60.20,75.20,80.20,183.10,132.60,416.70,48.20,1103.40,44.20,62.90,398.70,597.50
TAMIL NADU,1980,0.10,0.00,15.40,45.90,69.20,37.70,64.90,64.20,76.30,122.30,166.20,47.00,709.10,0.10,130.40,243.00,335.50
TAMIL NADU,1981,8.90,1.30,21.70,23.70,87.20,57.00,117.00,91.80,200.50,258.00,106.40,72.50,1045.90,10.10,132.60,466.30,436.80
TAMIL NADU,1982,0.20,0.10,8.60,25.20,58.80,49.80,52.50,44.50,93.40,114.00,200.80,30.90,678.60,0.30,92.50,240.10,345.70
TAMIL NADU,1983,0.20,0.20,1.90,5.50,86.90,72.90,77.90,132.00,154.60,138.70,94.50,242.60,1007.70,0.40,94.20,437.30,475.70
TAMIL NADU,1984,34.50,131.30,101.70,45.40,21.60,43.60,149.50,38.00,151.30,134.80,113.50,58.50,1023.80,165.90,168.70,382.40,306.80
TAMIL NADU,1985,89.70,5.20,11.90,43.90,33.40,108.80,81.20,129.70,161.60,107.30,233.30,57.40,1063.50,94.90,89.30,481.20,398.10
TAMIL NADU,1986,65.50,39.00,16.10,20.90,62.70,63.40,66.90,115.20,142.30,170.50,133.40,57.10,953.00,104.40,99.70,387.70,361.00
TAMIL NADU,1987,8.00,1.20,28.70,20.00,50.50,70.50,26.10,82.80,127.00,236.70,136.90,175.00,963.50,9.20,99.20,306.40,548.60
TAMIL NADU,1988,0.20,3.80,27.40,94.60,59.10,41.10,102.60,149.80,136.10,71.80,117.60,33.10,837.20,4.00,181.10,429.70,222.40
TAMIL NADU,1989,2.70,0.00,27.90,40.80,53.60,57.40,154.90,39.70,137.30,148.60,154.00,39.80,856.50,2.70,122.20,389.20,342.40
TAMIL NADU,1990,84.80,10.20,36.20,24.30,94.90,28.90,40.00,80.10,119.60,194.10,144.00,46.10,903.20,95.00,155.30,268.70,384.20
TAMIL NADU,1991,24.20,4.60,9.70,37.40,29.50,128.10,54.70,71.70,114.00,225.10,234.40,21.40,954.80,28.90,76.60,368.50,480.90
TAMIL NADU,1992,3.10,0.20,0.00,22.50,58.30,66.40,77.90,59.90,157.30,123.90,297.20,52.10,918.70,3.30,80.80,361.40,473.20
TAMIL NADU,1993,0.10,7.00,9.90,11.20,46.60,68.20,60.30,88.80,96.70,214.50,315.90,163.10,1082.30,7.10,67.70,314.00,693.50
TAMIL NADU,1994,7.00,27.60,5.50,48.30,66.60,38.60,75.30,66.10,84.20,230.60,229.10,27.00,905.90,34.60,120.50,264.20,486.60
TAMIL NADU,1995,23.80,3.30,16.70,39.50,139.00,64.60,86.70,121.10,94.00,143.10,107.90,3.70,843.40,27.10,195.20,366.40,254.70
TAMIL NADU,1996,7.60,3.60,5.00,91.50,34.00,125.30,55.40,112.40,141.20,149.70,106.00,237.60,1069.40,11.30,130.50,434.30,493.30
TAMIL NADU,1997,7.70,0.20,2.30,42.00,49.20,50.40,63.50,56.40,116.00,169.50,258.10,135.20,950.50,7.90,93.50,286.30,562.80
TAMIL NADU,1998,6.90,5.70,4.10,23.60,55.80,43.00,101.90,152.90,121.80,124.70,242.00,197.40,1079.70,12.50,83.60,419.60,564.00
TAMIL NADU,1999,8.30,24.10,3.90,56.90,74.50,46.40,55.30,74.80,73.10,268.90,182.80,53.60,922.60,32.30,135.30,249.60,505.30
TAMIL NADU,2000,30.30,74.50,9.40,41.60,54.70,52.20,45.80,136.10,169.80,120.30,148.60,88.90,972.00,104.70,105.60,403.90,357.80
TAMIL NADU,2001,21.80,10.90,13.00,93.80,45.00,39.90,37.20,18.70,53.80,69.50,52.30,27.60,483.40,32.70,151.80,149.50,149.30
TAMIL NADU,2002,2.90,22.10,3.90,9.20,32.60,23.70,11.80,26.50,32.20,93.70,47.20,12.20,318.00,25.00,45.70,94.20,153.10
TAMIL NADU,2003,0.30,4.10,18.00,17.10,19.80,22.50,38.70,49.30,26.10,86.00,59.50,7.10,348.50,4.40,54.80,136.60,152.60
TAMIL NADU,2004,2.80,0.70,3.00,16.20,101.10,21.20,98.60,85.10,208.30,271.10,204.50,25.00,1037.60,3.50,120.30,413.20,500.60
TAMIL NADU,2005,4.10,11.10,24.40,128.00,80.60,35.70,87.90,93.30,117.90,280.50,353.40,148.50,1365.30,15.20,233.00,334.80,782.30
TAMIL NADU,2006,15.30,0.20,52.40,32.60,65.20,57.20,33.60,73.40,116.30,240.40,215.10,26.10,927.90,15.50,150.20,280.60,481.60
TAMIL NADU,2007,7.20,7.50,1.80,58.00,44.90,73.10,101.00,136.50,89.10,248.90,79.20,219.90,1067.20,14.70,104.70,399.70,548.00
TAMIL NADU,2008,11.70,29.10,164.70,31.50,53.70,51.10,73.10,126.50,70.70,242.70,298.50,50.10,1203.40,40.80,250.00,321.50,591.20
TAMIL NADU,2009,7.90,0.00,41.00,41.40,74.80,27.00,42.10,96.90,114.40,62.10,314.70,106.20,928.50,7.90,157.20,280.40,482.90
TAMIL NADU,2010,11.80,0.20,1.90,22.90,91.90,70.00,81.40,102.90,111.10,148.10,328.60,124.50,1095.20,11.90,116.70,365.40,601.20
TAMIL NADU,2011,4.30,11.20,8.00,91.50,33.40,56.00,45.50,128.90,76.00,200.40,230.50,41.00,926.50,15.50,132.80,306.40,471.80
TAMIL NADU,2012,3.00,0.10,2.50,35.50,41.90,30.10,46.50,98.00,84.90,235.20,44.50,14.00,636.10,3.10,79.90,259.50,293.60
TAMIL NADU,2013,3.90,30.90,30.00,20.30,42.00,54.60,42.70,110.70,113.50,127.90,112.30,53.20,741.90,34.80,92.20,321.50,293.40
TAMIL NADU,2014,7.40,6.10,8.10,8.30,139.10,47.80,50.60,117.70,98.90,252.20,110.80,66.00,913.00,13.40,155.50,315.10,428.90
TAMIL NADU,2015,8.30,2.30,21.70,108.80,112.40,62.40,43.50,81.60,98.40,132.60,379.80,152.80,1204.60,10.60,242.80,285.90,665.30
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OUTPUT:



APPLICATIONS:

- It can be used by the government to predict floods and rainfall analysis in vulnerable regions of the country.
- Effective -realtime flood forecasting models could be used for early warning and disaster prevention.



THANK YOU