# Rainfall Prediction System

# Guided By:

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# Presented By:

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# Outline

- Introduction
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- Types of graph used
- Methodology
- Results
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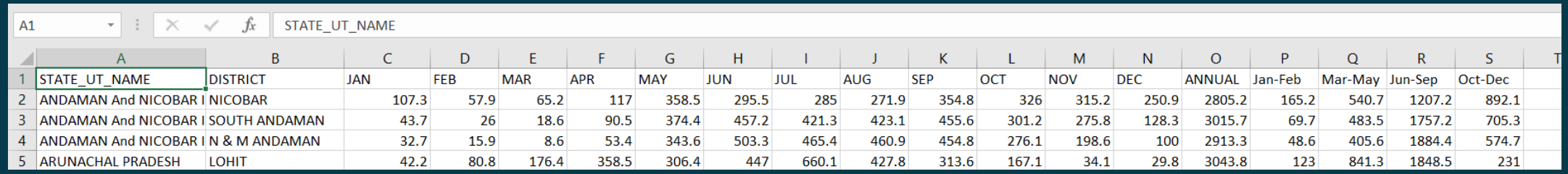
# Introduction

- Monsoon prediction is clearly of great importance for India.
- Indian meteorological department provides forecasting data required for project.
- In this project we have worked on long term predictions of rainfall.
- The main motive of the project is to predict the amount of rainfall in a particular division or state well in advance.
- We predict the amount of rainfall using past data.

# Data Sets Used

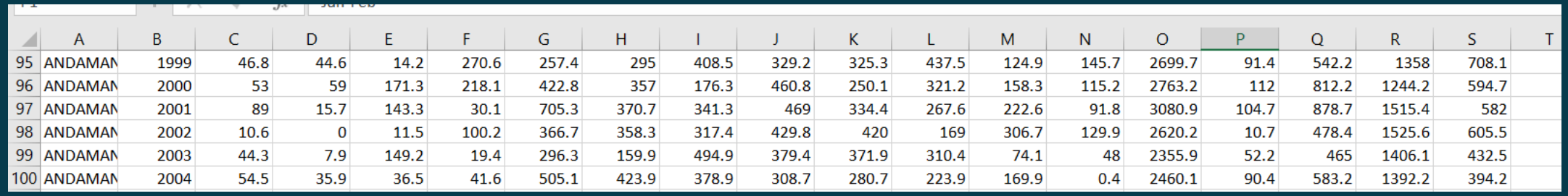
- Dataset1(Fig.1) This dataset has average rainfall from 1951-2015 for each district, for every month.



| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | STATE_UT_NAME | DISTRICT | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | ANNUAL | Jan-Feb | Mar-May | Jun-Sep | Oct-Dec |
| 2 | ANDAMAN And NICOBAR I | NICOBAR | 107.3 | 57.9 | 65.2 | 117 | 358.5 | 295.5 | 285 | 271.9 | 354.8 | 326 | 315.2 | 250.9 | 2805.2 | 165.2 | 540.7 | 1207.2 | 892.1 |
| 3 | ANDAMAN And NICOBAR I | SOUTH ANDAMAN | 43.7 | 26 | 18.6 | 90.5 | 374.4 | 457.2 | 421.3 | 423.1 | 455.6 | 301.2 | 275.8 | 128.3 | 3015.7 | 69.7 | 483.5 | 1757.2 | 705.3 |
| 4 | ANDAMAN And NICOBAR I | N & M ANDAMAN | 32.7 | 15.9 | 8.6 | 53.4 | 343.6 | 503.3 | 465.4 | 460.9 | 454.8 | 276.1 | 198.6 | 100 | 2913.3 | 48.6 | 405.6 | 1884.4 | 574.7 |
| 5 | ARUNACHAL PRADESH | LOHIT | 42.2 | 80.8 | 176.4 | 358.5 | 306.4 | 447 | 660.1 | 427.8 | 313.6 | 167.1 | 34.1 | 29.8 | 3043.8 | 123 | 841.3 | 1848.5 | 231 |

FIG.1

- Dataset2(Fig.2) This dataset has average rainfall for every year from 1901-2015 for each state.



| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 95 | ANDAMAN | 1999 | 46.8 | 44.6 | 14.2 | 270.6 | 257.4 | 295 | 408.5 | 329.2 | 325.3 | 437.5 | 124.9 | 145.7 | 2699.7 | 91.4 | 542.2 | 1358 | 708.1 |
| 96 | ANDAMAN | 2000 | 53 | 59 | 171.3 | 218.1 | 422.8 | 357 | 176.3 | 460.8 | 250.1 | 321.2 | 158.3 | 115.2 | 2763.2 | 112 | 812.2 | 1244.2 | 594.7 |
| 97 | ANDAMAN | 2001 | 89 | 15.7 | 143.3 | 30.1 | 705.3 | 370.7 | 341.3 | 469 | 334.4 | 267.6 | 222.6 | 91.8 | 3080.9 | 104.7 | 878.7 | 1515.4 | 582 |
| 98 | ANDAMAN | 2002 | 10.6 | 0 | 11.5 | 100.2 | 366.7 | 358.3 | 317.4 | 429.8 | 420 | 169 | 306.7 | 129.9 | 2620.2 | 10.7 | 478.4 | 1525.6 | 605.5 |
| 99 | ANDAMAN | 2003 | 44.3 | 7.9 | 149.2 | 19.4 | 296.3 | 159.9 | 494.9 | 379.4 | 371.9 | 310.4 | 74.1 | 48 | 2355.9 | 52.2 | 465 | 1406.1 | 432.5 |
| 100 | ANDAMAN | 2004 | 54.5 | 35.9 | 36.5 | 41.6 | 505.1 | 423.9 | 378.9 | 308.7 | 280.7 | 223.9 | 169.9 | 0.4 | 2460.1 | 90.4 | 583.2 | 1392.2 | 394.2 |

FIG.2

# Predicting total monsoon rainfall (1901 - 2015)

- Predicted by using its correlation with observed parameters value.
- The predictions keep changing with time if new data is been updated.
- Regression based model is used to simple analyze and visualize the overall rainfall.

# Types of rainfall prediction

- One would like to make:

  - ❖Long term prediction: Long term prediction means to predict total monsoon rainfall a few weeks or months in advance.

  - ❖Short term prediction: Short term prediction means to predict rainfall over different locations a few days in advance.

# Types of graph used

- Bar graphs showing distribution of amount of rainfall.
- Distribution of amount of rainfall yearly, monthly, groups of months.
- Distribution of rainfall in subdivisions, districts form each month, groups of months.

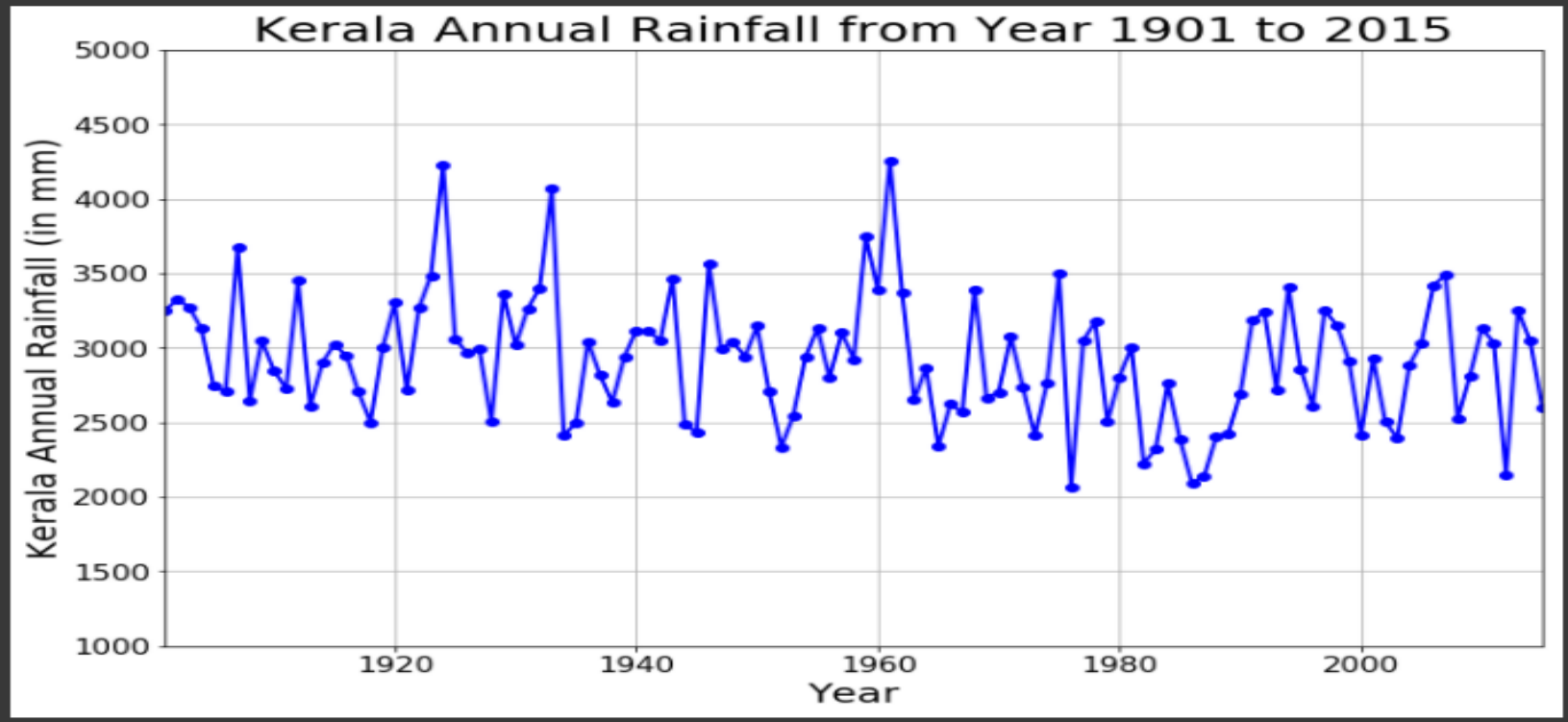
# Methodology

- Converting data in to the correct format to conduct experiments.
- Make a good analysis of data and observe variation in the patterns of rainfall.
- By using various approaches we try to find where the rain will appear most.

# Result's

# Kerala Annual Rainfall from year 1901 to 2015

```
ax=Kerala.groupby("YEAR").mean()['ANNUAL'].plot(ylim=(1000,5000),color='b',marker='o',linestyle='-',linewidth=2,figsize=(12,8));
#Kerala['MA10'] = Kerala.groupby('YEAR').mean()['ANNUAL'].rolling(10).mean()
#Kerala.MA10.plot(color='r',linewidth=4)
plt.xlabel('Year',fontsize=20)
plt.ylabel('Kerala Annual Rainfall (in mm)',fontsize=20)
plt.title('Kerala Annual Rainfall from Year 1901 to 2015',fontsize=25)
ax.tick_params(labelsize=15)
plt.grid()
plt.ioff()
```



# Conclusions

- Various visualizations of data are observed which helps in implementing the approaches for prediction.
- Prediction of amount of rainfall for both the types of dataset.
- Observations indicates machine learning models won’t work well for prediction of rainfall due to fluctuations in rainfall.