

IC272-ASSIGNMENT-1

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ROLLNO: B19084

MOBILE NUMBER: 9440000900

Question1)

Statistical parameters of Temperature:

Mean:21.21489

Median:22.27273

Mode:12.72727

Minimum:7.67290

Maximum:31.37500

Standard Deviation:4.35582

Statistical parameters of Humidity:

Mean:83.47993

Median:91.38095

Mode:99.00000

Minimum:31.00000

Maximum:99.72000

Standard Deviation:18.21006

Statistical parameters of Pressure:

Mean:1009.00877

Median:1014.67783

Mode:789.39269

Minimum:452.09789

Maximum:1079.16200

Standard Deviation:46.98048

Statistical parameters of Rain:

Mean:10701.53837

Median:18.00000

Mode:0.00000

Minimum:0.00000

Maximum:82037.25000

Standard Deviation:24852.25529

Statistical parameters of Light Average:

Mean:4438.42845

Median:1656.88000

Mode:4488.91030

Minimum:0.00000

Maximum:54612.00000

Standard Deviation:7573.16281

Statistical parameters of Maximum Light:

Mean:21788.62328

Median:6634.00000

Mode:4000.00000

Minimum:2259.00000

Maximum:54612.00000

Standard Deviation:22064.99309

Statistical parameters of Moisture:

Mean:32.38605

Median:16.70420

Mode:0.00000

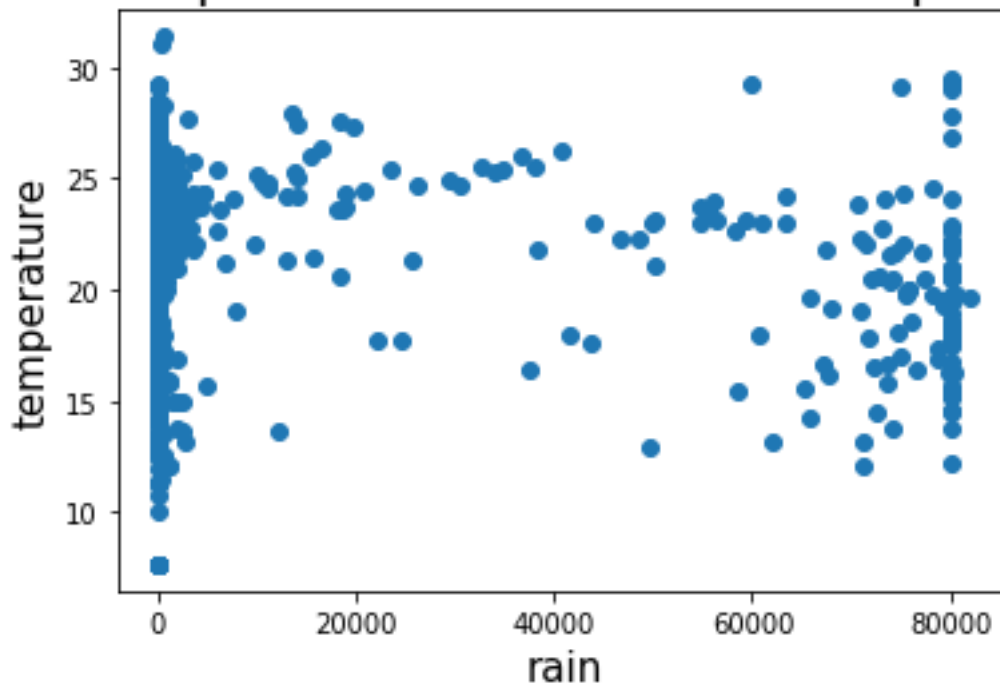
Minimum:0.00000

Maximum:100.00000

Standard Deviation:33.65324

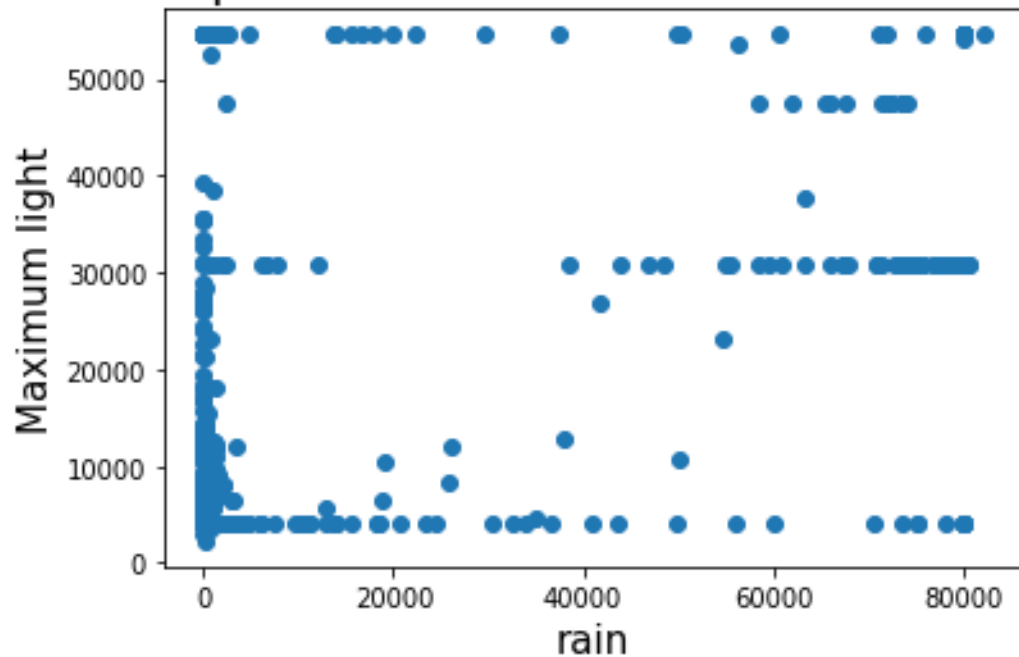
Question2a)

Scatter plot between rain and temperature



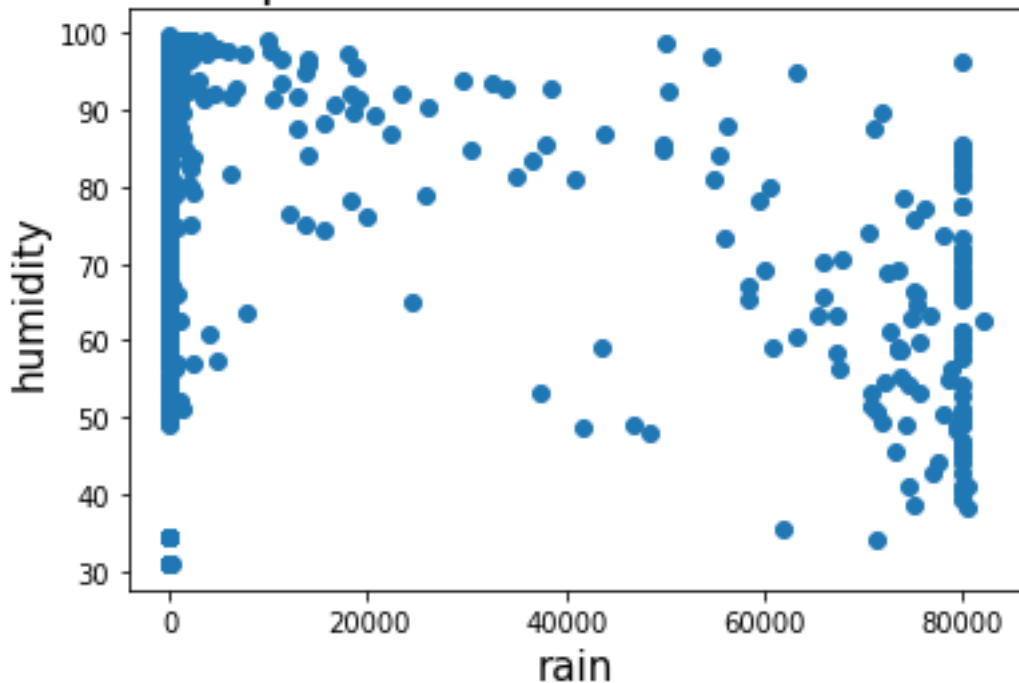
From the above scatterplot we infer that when it heavily rains or scarcely rains, the temperature hovers over a wide range of values. On the whole we observe that as the amount of rainfall increases, the temperature generally decreases.

Scatter plot between rain and Maximum light

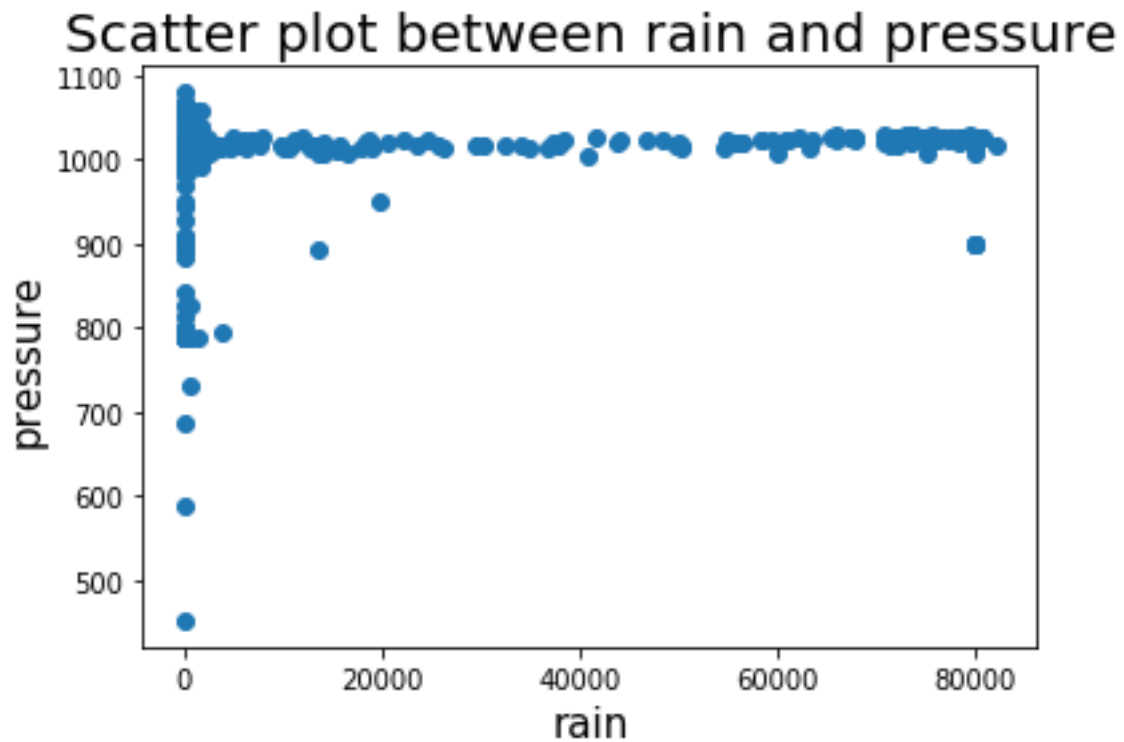


From the above scatterplot we infer that rain and maximum light are scarcely dependent on each other. Maximum light is generally too less or too high and mostly unpredictable based on rain.

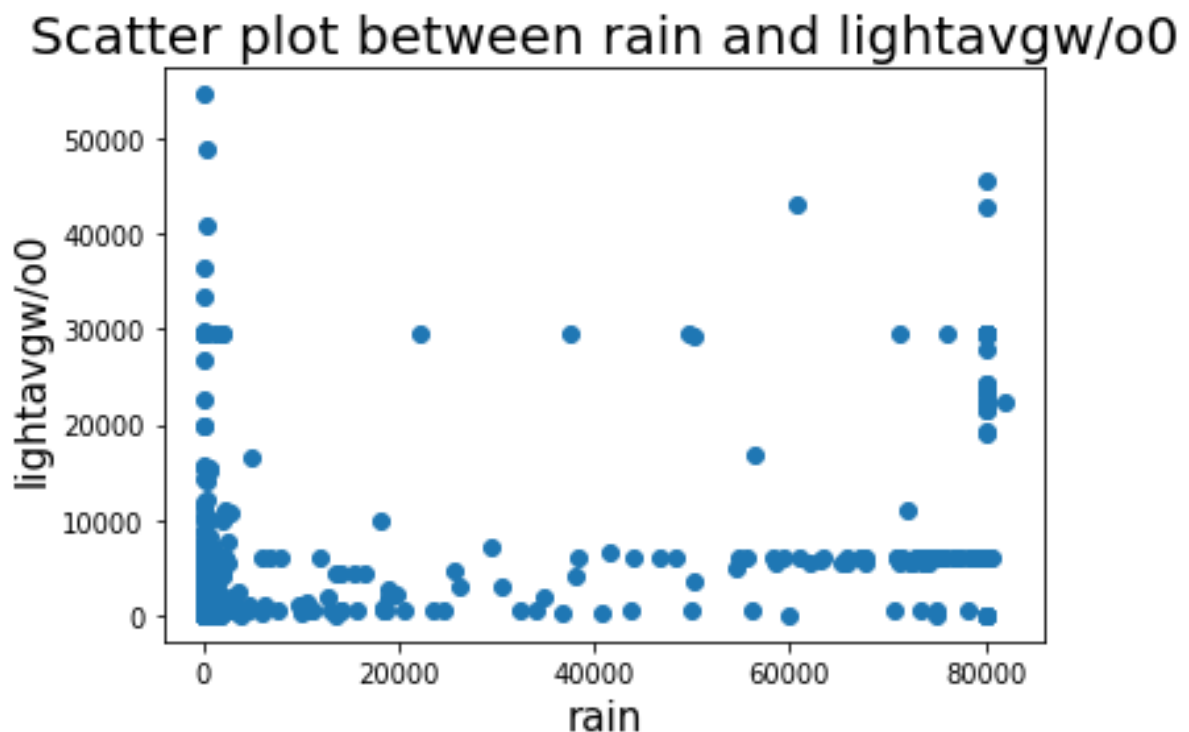
Scatter plot between rain and humidity



From the above scatterplot we infer that as amount of rain increases, the humidity gradually decreases, but the rate of decrease is less. It may be because rain absorbs the water vapor from the atmosphere and pours down.

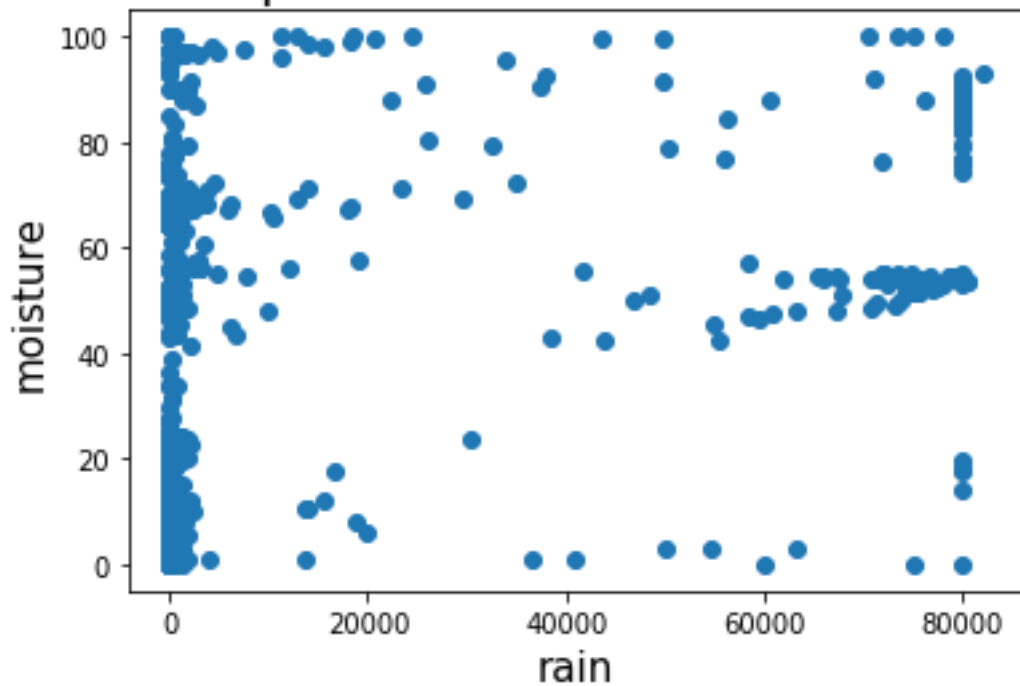


From the above scatterplot we infer that atmospheric pressure (in mb) is generally independent of rain. It is around 1000mb or 1atm. It drops when there is absolutely no rain.



From the above scatterplot we infer that average light during the daytime generally is between 0-10000 lux irrespective of the amount of rainfall because sunlight is independent of rain. So it rarely increases.

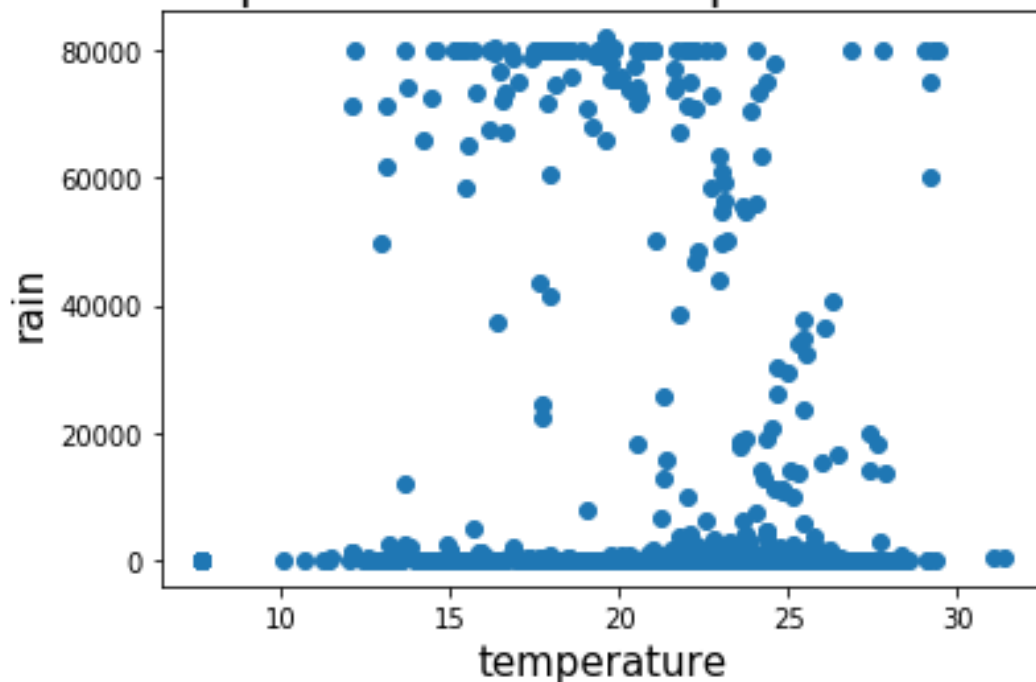
Scatter plot between rain and moisture



From the above scatterplot we infer that if moisture in atmosphere is high then there is more rainfall.

Question2b)

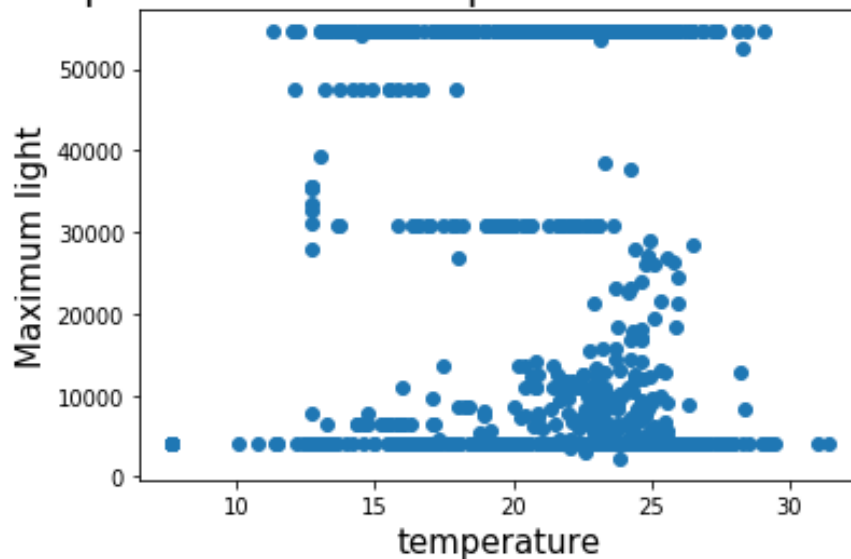
Scatter plot between temperature and rain



From the above scatterplot we infer that the rainfall is mostly between 0-

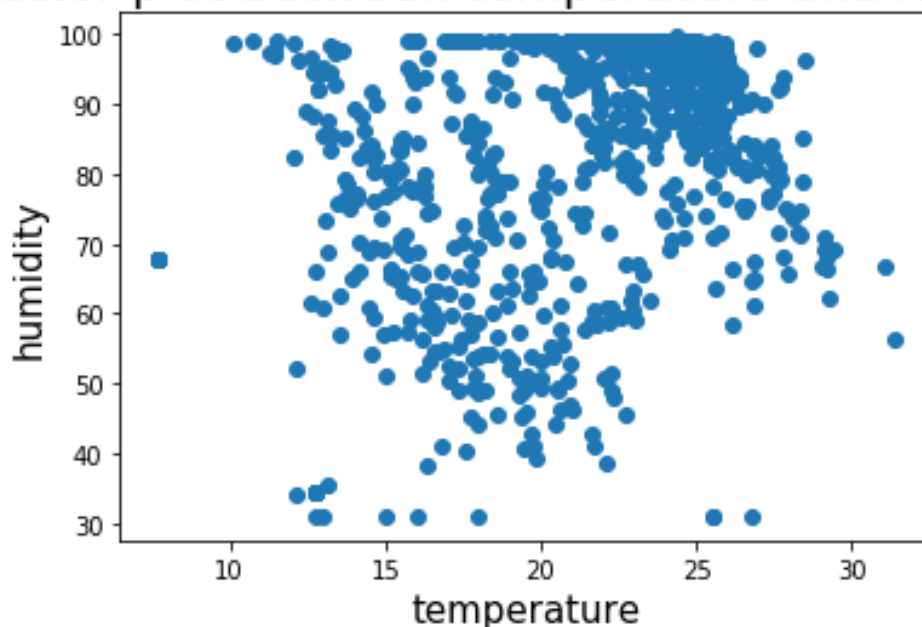
5000ml over the range of temperatures. Occasionally, there is a heavy downpour between 15-20deg Celsius.

Scatter plot between temperature and Maximum light



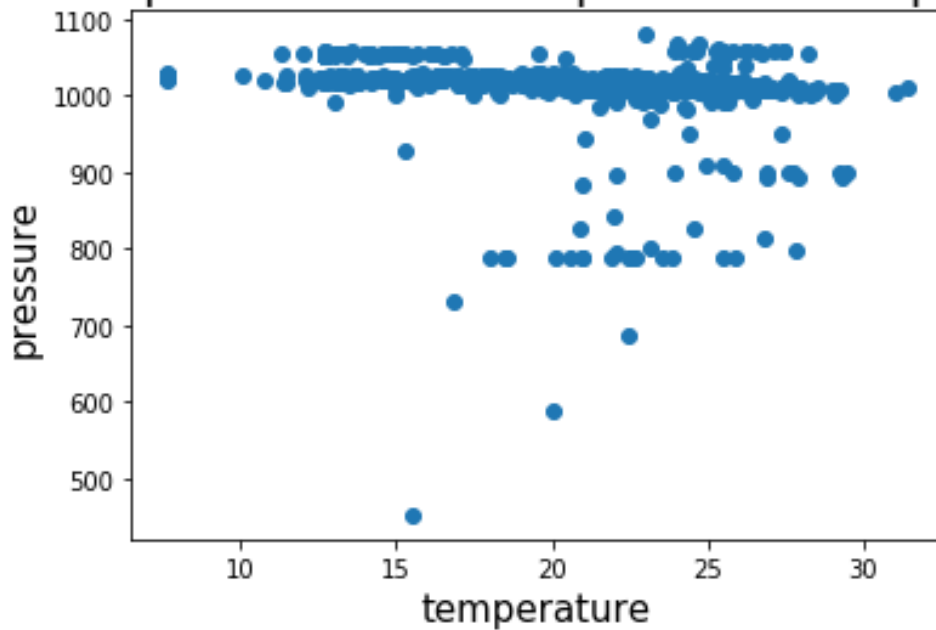
From the above scatterplot we infer that generally as the temperature increases, the maximum light increases to a certain extent.

Scatter plot between temperature and humidity



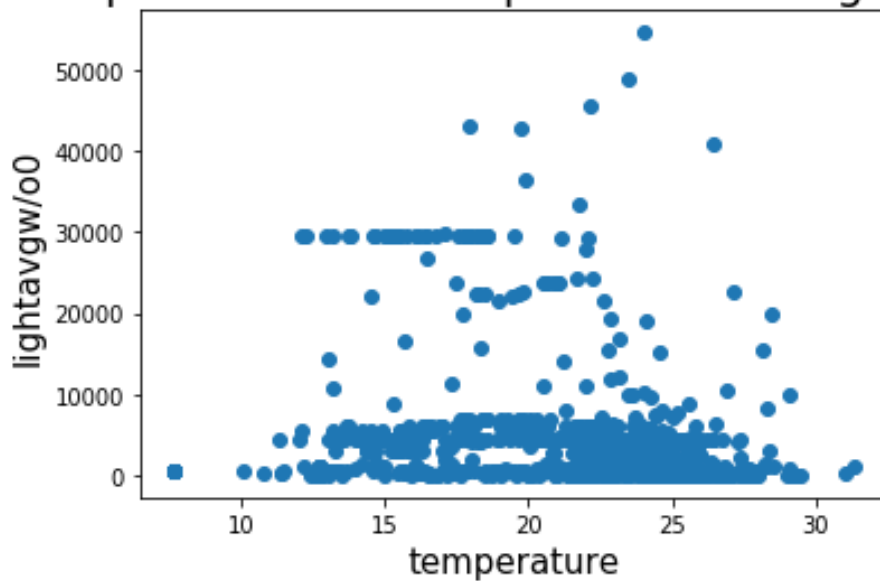
From the above scatterplot we infer that the humidity assumes a wide range of values in the temperature range 12-27 deg Celsius.

Scatter plot between temperature and pressure



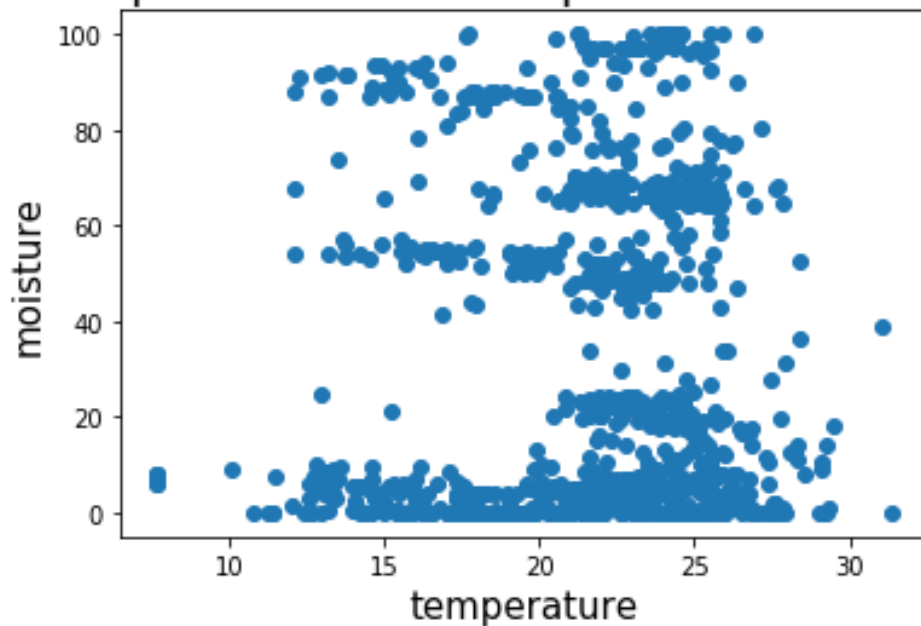
From the above scatterplot we infer that atmospheric pressure (in mb) is generally independent of temperature. It is around 1000mb or 1atm or sometimes lower.

Scatter plot between temperature and lightavgw/o0



From the above scatterplot we infer that average light during the daytime generally is between 0-8000 lux and it occasionally increases.

Scatter plot between temperature and moisture



Moisture assumes a wide range of values mostly between 0-25%.

Question3a)

The correlation coefficient of rain with temperature is -0.10889

The correlation coefficient of rain with humidity is -0.43492

The correlation coefficient of rain with Maximum Light is 0.31284

The correlation coefficient of rain with Average Light is 0.52749

The correlation coefficient of rain with pressure is 0.07078

The correlation coefficient of rain with moisture is 0.42693

Hence we can conclude that as amount of rainfall increases, temperature and humidity decrease (negatively correlated), and the other parameters increase (positively correlated). Also, pressure is almost independent of temperature as the correlation coefficient is 0.07. Out of all given parameters, average light is strongly related to rain (0.52).

Question3b)

The correlation coefficient of temperature with rain is -0.10889

The correlation coefficient of temperature with pressure is -0.18139

The correlation coefficient of temperature with Maximum light is -0.14588

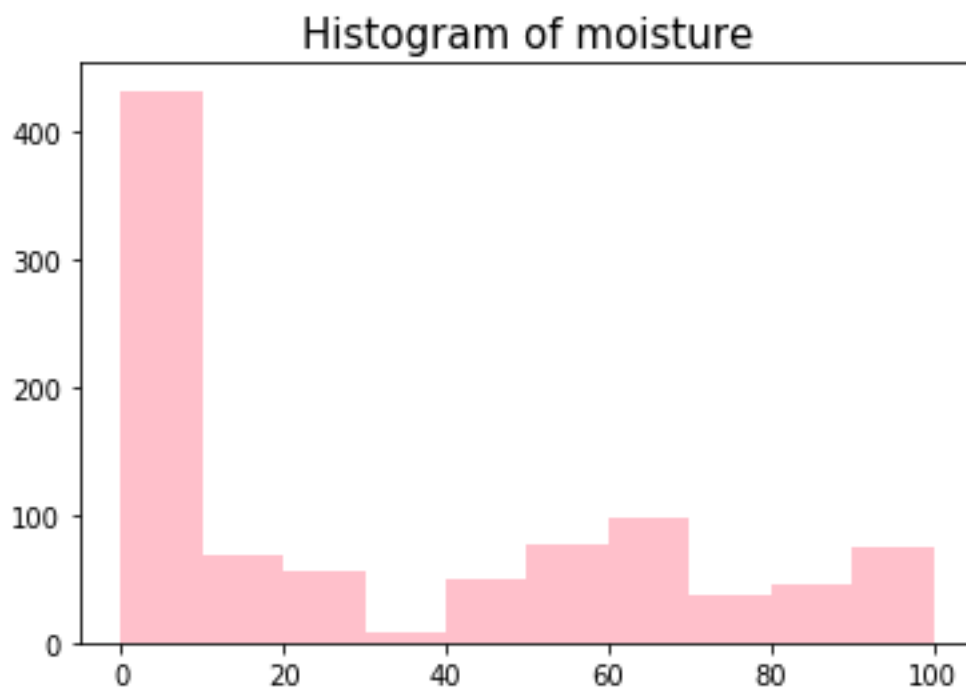
The correlation coefficient of temperature with humidity is 0.40157

The correlation coefficient of temperature with Average light is -0.18140

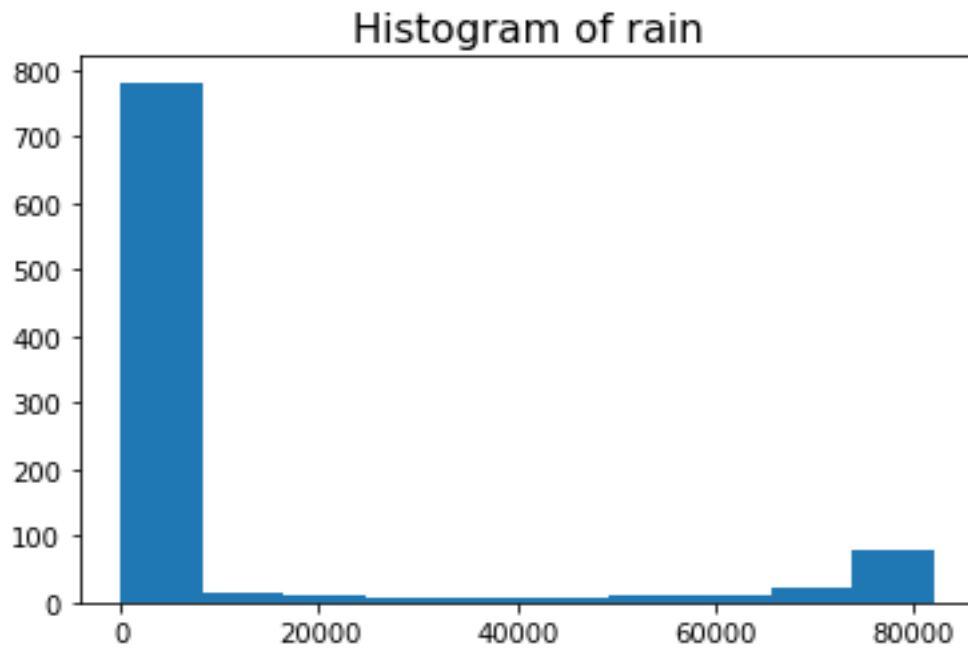
The correlation coefficient of temperature with Moisture is 0.08066

Hence we can conclude that humidity and moisture are positively correlated to temperature and the other parameters are negatively correlated. Also, rain, pressure, maximum light, and average light are scarcely related to temperature. Moisture is almost independent of temperature as its correlation coefficient is almost 0. Out of all given parameters, humidity is strongly related to temperature (0.4).

Question4)

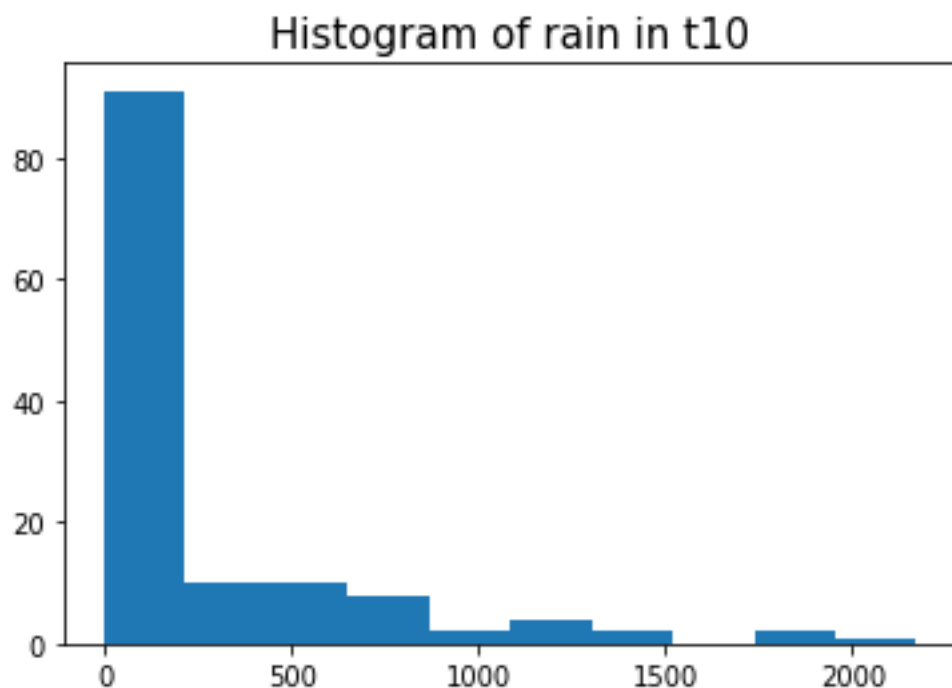


From the histogram we conclude that in approximately 400 locations around the IIT Mandi campus, the moisture content is around 0-10%. In other areas it varies over a wide range of values.

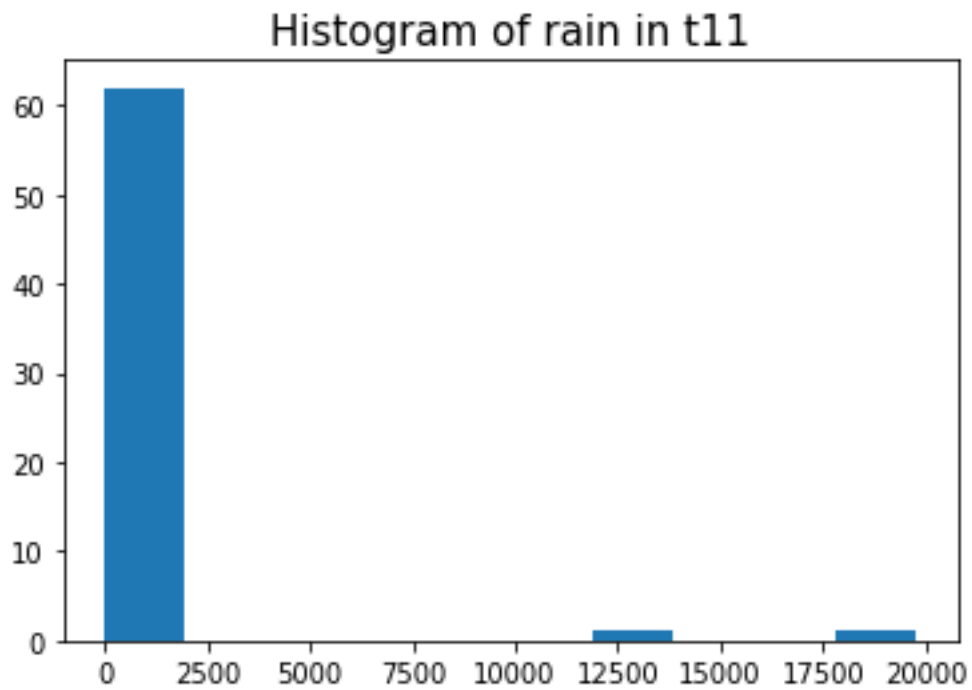


From the histogram we conclude that in approximately 800 locations (almost all stations) the amount of rainfall is between 0-8000 ml. Around 50 stations receive heavy rain 80000ml. Very few areas receive intermediate rainfall.

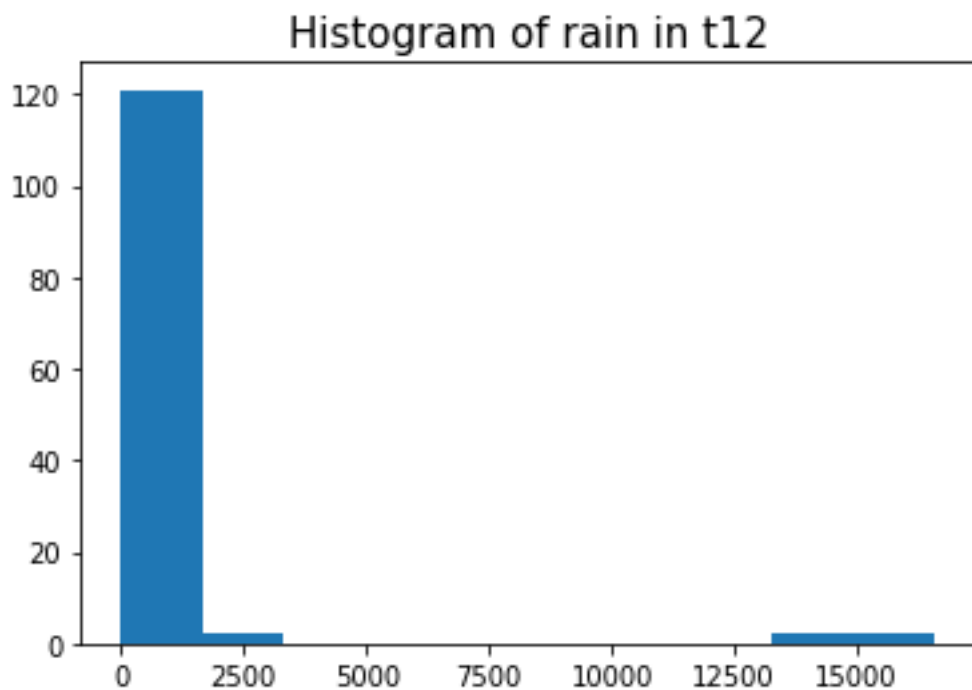
Question5)



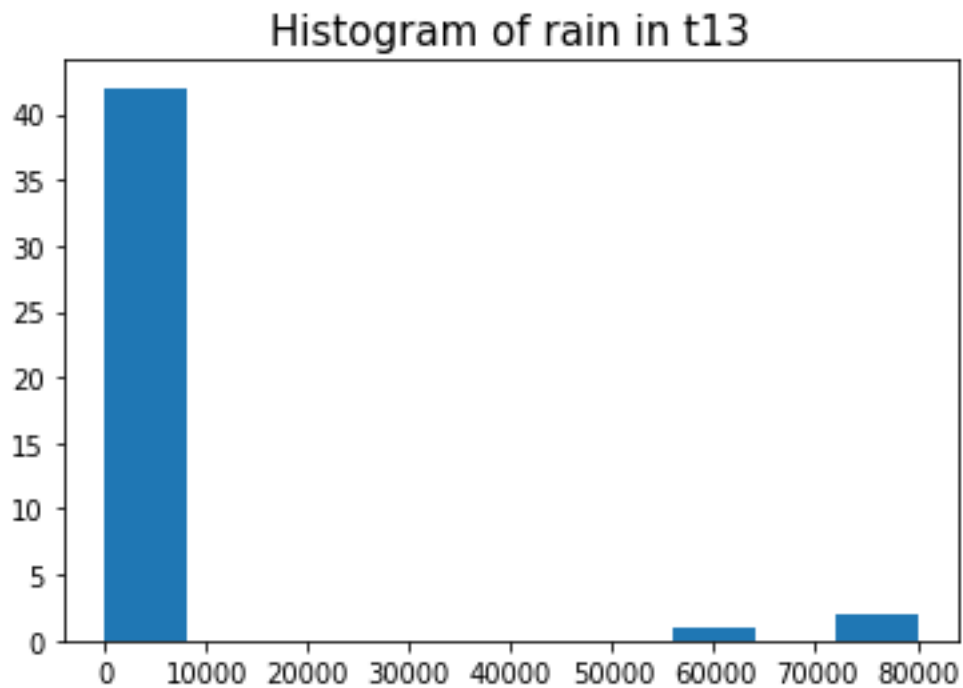
In t10 station, most of the time, the rainfall is in between 0-250 ml.



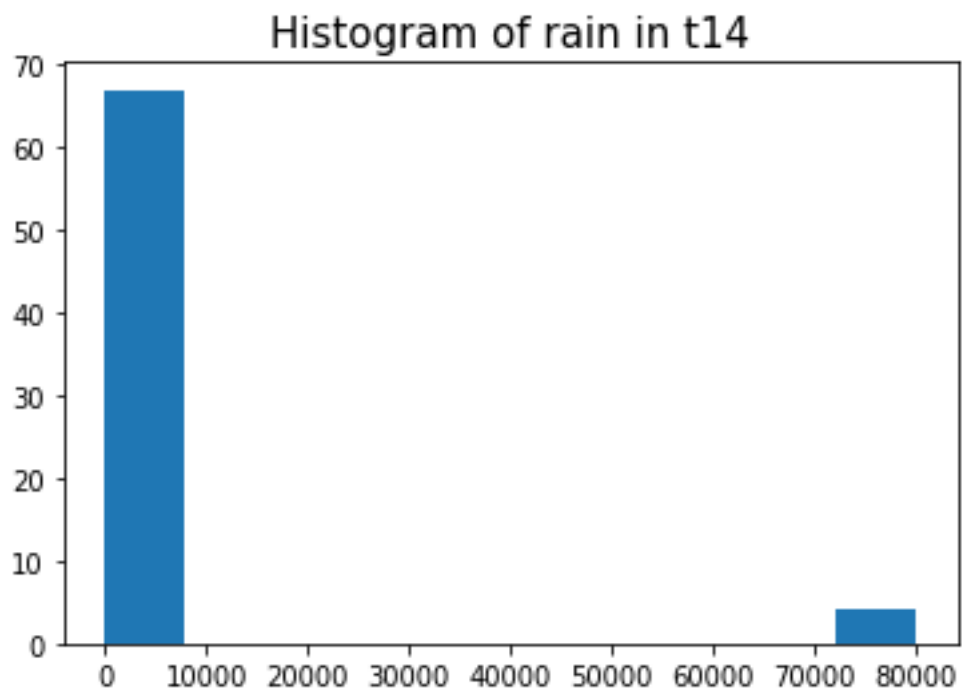
In t11 station, on almost all days, the rainfall is between 0-2000ml. There is rarely a heavy downpour.



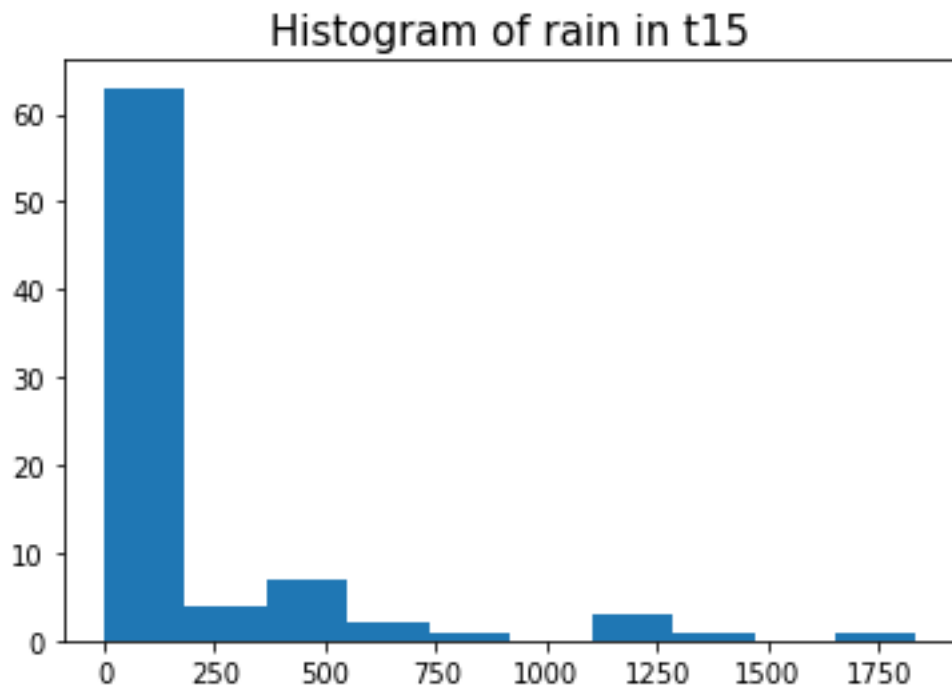
In t12 station, on almost all days, the rainfall is between 0-2000ml. There is rarely a heavy downpour of 15000ml.



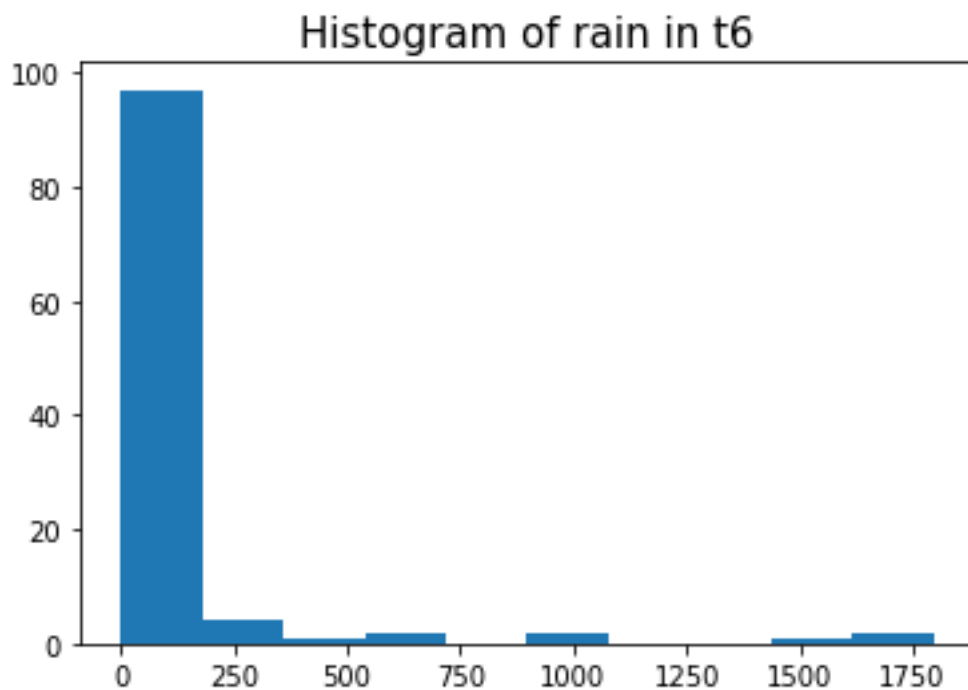
In t13, there is higher rainfall(0-8000ml) compared to the previous stations. Occasionally there is a downpour of 60000-80000 ml.



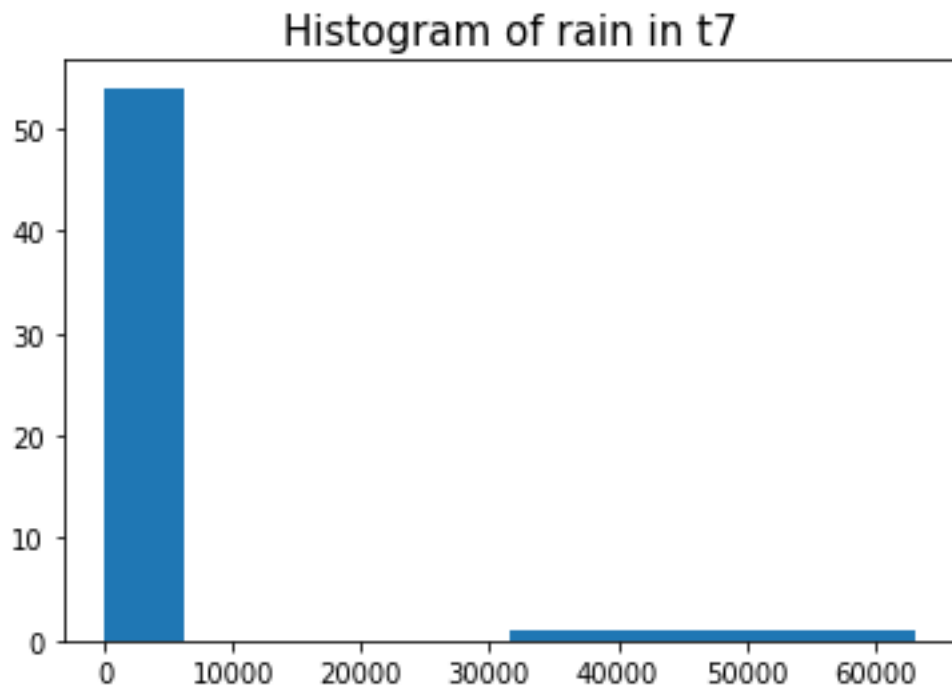
In t14, there is higher rainfall(0-8000ml) compared to the previous stations. Occasionally there is a downpour of 70000-80000 ml.



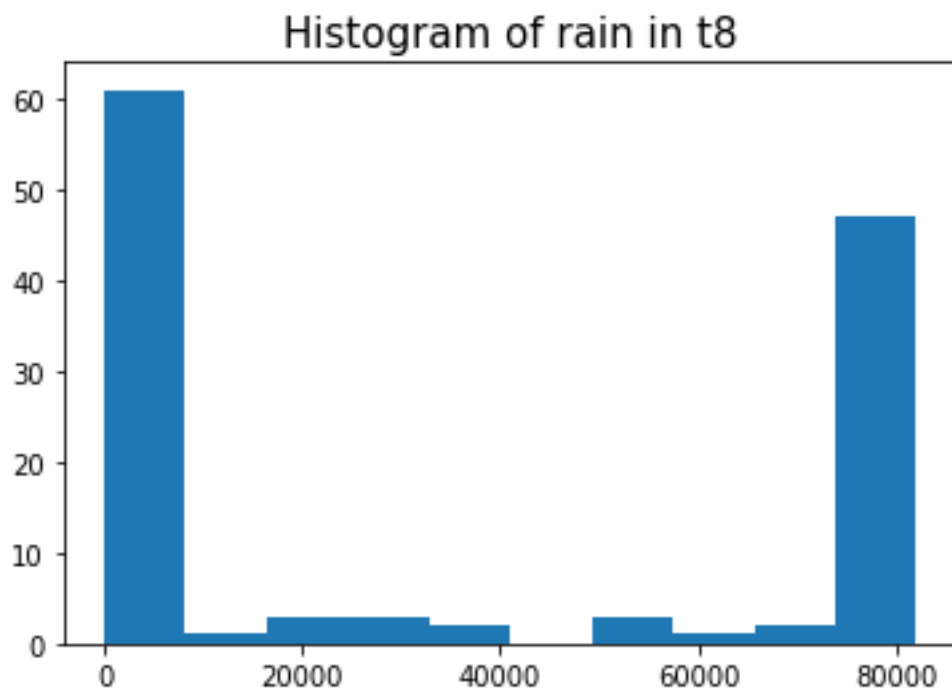
In t15 there is comparatively less rain, generally around 200 ml most of the days. Sometimes it rains more heavily also.



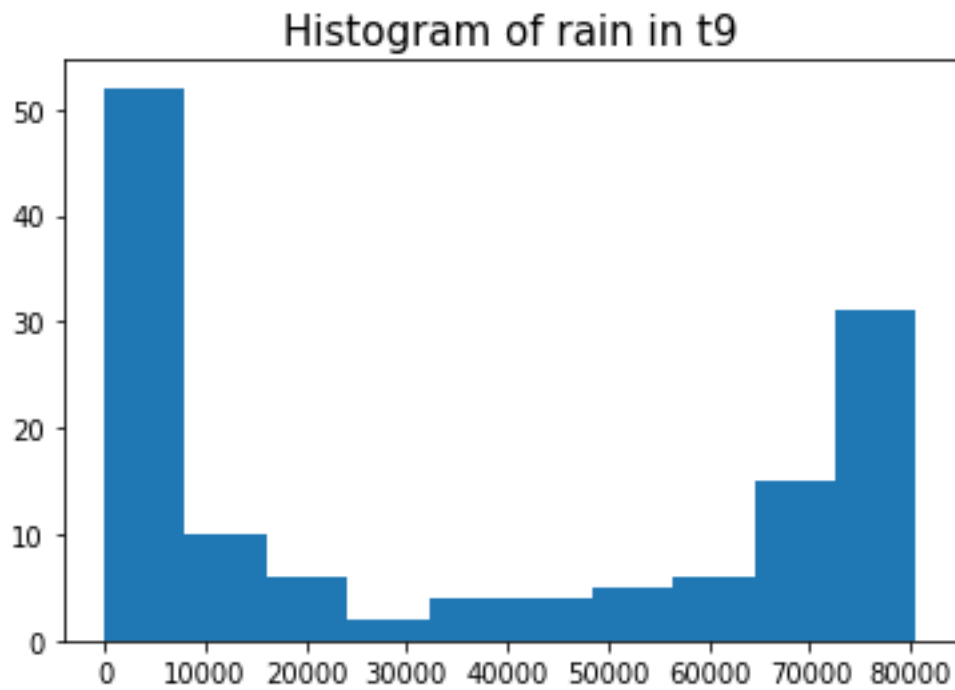
In t15 there is comparatively less rain, generally around 200 ml most of the days. Sometimes it rains more heavily also.



In t7, there is higher rainfall(0-8000ml) compared to the previous stations. Occasionally there is a downpour of 4000-6000 ml.



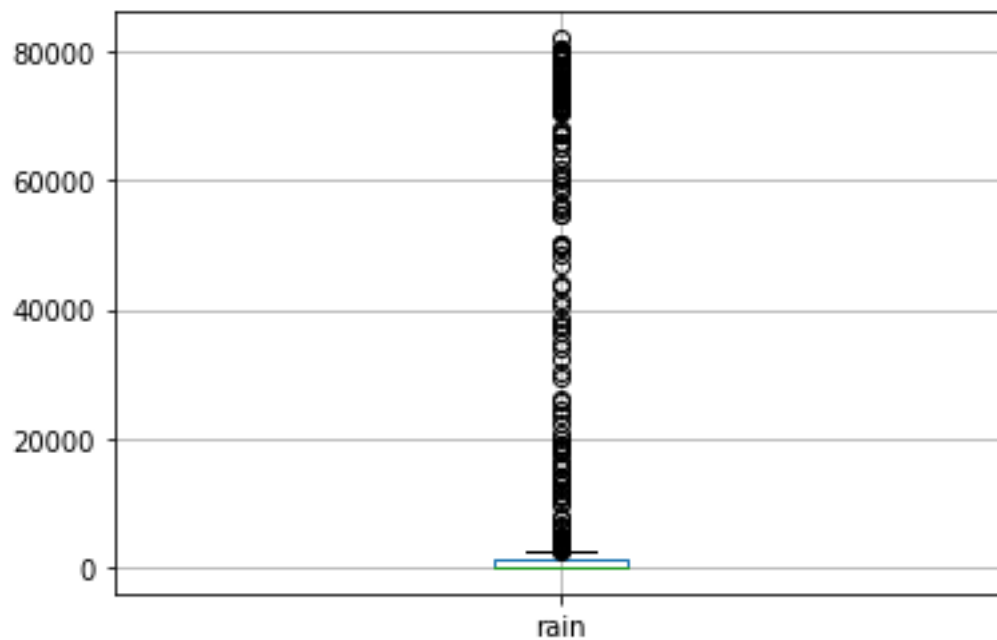
In station t8, we observe that most of the days rainfall is between 0-8000ml or around 80000ml. Hence it rains more frequently here.



Compared to other stations, t9 experiences a wide range of rainfall from 0-80,000ml. Generally 0-8,000 and 70,000-80,000ml.

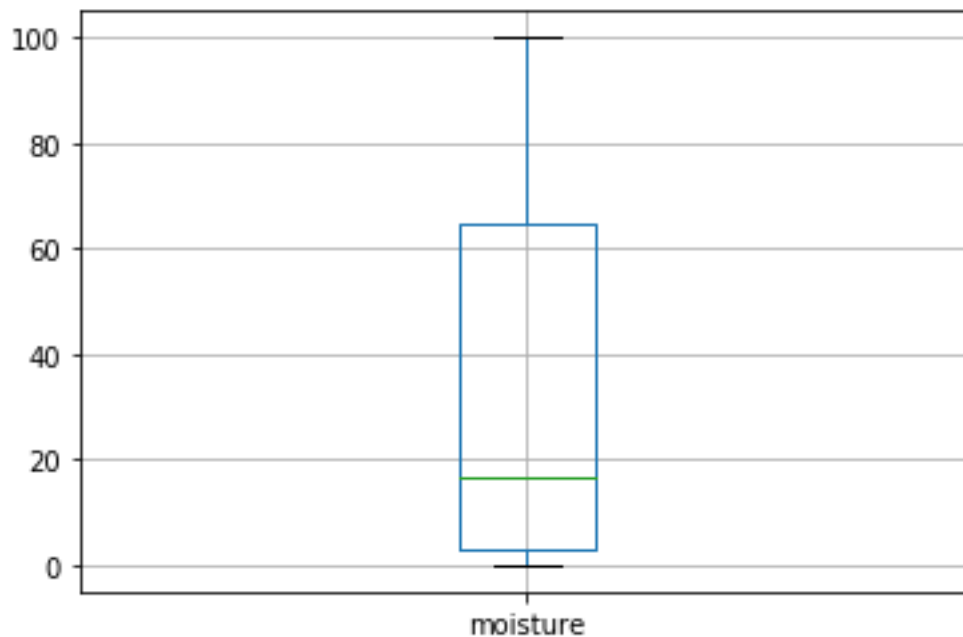
Question6)

Boxplot of rain



The above boxplot suggests that 75% of the time (Upper Quartile), rain is less than 2000ml and 50% of the time less than 500ml (it appears close to 0 because the scale is too large). Many dark circles in the boxplot (outliers) suggest that rain often exceeds 5000ml (approximately upper whisker which is $Q3 + 1.5IQR$). Thus we can conclude that the stations experience a wide range of rainfall.

Boxplot of moisture



From the above boxplot, we conclude that there are no outliers. The bottom whisker is at 0% and the top whisker is at 100% which are the minimum and maximum values in this case. Also 25% of the days, moisture is less than 5% (1st quartile) and 65% of the days, moisture is less than 65% (3rd quartile). During 50% of the days moisture content is less than 15%.

