In [153]: import pandas as pd import seaborn as sns

In [154]: data=pd.read_csv("/home/placement/Downloads/rainfall in india 1901-2015.csv")

In [155]: data.describe()

Out[155]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	
count	4116.000000	4112.000000	4113.000000	4110.000000	4112.000000	4113.000000	4111.000000	4109.000000	4112.000000	4110.000000	4109.0
mean	1958.218659	18.957320	21.805325	27.359197	43.127432	85.745417	230.234444	347.214334	290.263497	197.361922	95.!
std	33.140898	33.585371	35.909488	46.959424	67.831168	123.234904	234.710758	269.539667	188.770477	135.408345	99.!
min	1901.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.400000	0.000000	0.000000	0.100000	0.0
25%	1930.000000	0.600000	0.600000	1.000000	3.000000	8.600000	70.350000	175.600000	155.975000	100.525000	14.0
50%	1958.000000	6.000000	6.700000	7.800000	15.700000	36.600000	138.700000	284.800000	259.400000	173.900000	65.2
75%	1987.000000	22.200000	26.800000	31.300000	49.950000	97.200000	305.150000	418.400000	377.800000	265.800000	148.4
max	2015.000000	583.700000	403.500000	605.600000	595.100000	1168.600000	1609.900000	2362.800000	1664.600000	1222.000000	948.

In [156]: data.head(10)

Out[156]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ост	NOV	DEC	ANNUAL	Jan- Feb	Mar- May	Jun- Sep	Oct- Dec
0	ANDAMAN & NICOBAR ISLANDS	1901	49.2	87.1	29.2	2.3	528.8	517.5	365.1	481.1	332.6	388.5	558.2	33.6	3373.2	136.3	560.3	1696.3	980.3
1	ANDAMAN & NICOBAR ISLANDS	1902	0.0	159.8	12.2	0.0	446.1	537.1	228.9	753.7	666.2	197.2	359.0	160.5	3520.7	159.8	458.3	2185.9	716.7
2	ANDAMAN & NICOBAR ISLANDS	1903	12.7	144.0	0.0	1.0	235.1	479.9	728.4	326.7	339.0	181.2	284.4	225.0	2957.4	156.7	236.1	1874.0	690.6
3	ANDAMAN & NICOBAR ISLANDS	1904	9.4	14.7	0.0	202.4	304.5	495.1	502.0	160.1	820.4	222.2	308.7	40.1	3079.6	24.1	506.9	1977.6	571.0
4	ANDAMAN & NICOBAR ISLANDS	1905	1.3	0.0	3.3	26.9	279.5	628.7	368.7	330.5	297.0	260.7	25.4	344.7	2566.7	1.3	309.7	1624.9	630.8
5	ANDAMAN & NICOBAR ISLANDS	1906	36.6	0.0	0.0	0.0	556.1	733.3	247.7	320.5	164.3	267.8	128.9	79.2	2534.4	36.6	556.1	1465.8	475.9
6	ANDAMAN & NICOBAR ISLANDS	1907	110.7	0.0	113.3	21.6	616.3	305.2	443.9	377.6	200.4	264.4	648.9	245.6	3347.9	110.7	751.2	1327.1	1158.9
7	ANDAMAN & NICOBAR ISLANDS	1908	20.9	85.1	0.0	29.0	562.0	693.6	481.4	699.9	428.8	170.7	208.1	196.9	3576.4	106.0	591.0	2303.7	575.7
8	ANDAMAN & NICOBAR ISLANDS	1910	26.6	22.7	206.3	89.3	224.5	472.7	264.3	337.4	626.6	208.2	267.3	153.5	2899.4	49.3	520.1	1701.0	629.C
9	ANDAMAN & NICOBAR ISLANDS	1911	0.0	8.4	0.0	122.5	327.3	649.0	253.0	187.1	464.5	333.8	94.5	247.1	2687.2	8.4	449.8	1553.6	675.4

```
In [157]:
          data.info()
          <class 'pandas.core.frame.DataFrame'>
          RangeIndex: 4116 entries, 0 to 4115
          Data columns (total 19 columns):
               Column
                             Non-Null Count Dtype
           #
               SUBDIVISION 4116 non-null
           0
                                             object
                             4116 non-null
           1
               YEAR
                                             int64
               JAN
           2
                             4112 non-null
                                             float64
                                             float64
           3
               FEB
                             4113 non-null
           4
               MAR
                             4110 non-null
                                             float64
           5
                                             float64
               APR
                             4112 non-null
               MAY
                             4113 non-null
                                             float64
           7
               JUN
                             4111 non-null
                                             float64
           8
               JUL
                             4109 non-null
                                             float64
           9
               AUG
                             4112 non-null
                                             float64
               SEP
                             4110 non-null
                                             float64
           10
           11
                             4109 non-null
                                             float64
               0CT
                                             float64
           12
               NOV
                             4105 non-null
           13
               DEC
                             4106 non-null
                                             float64
               ANNUAL
                             4090 non-null
                                             float64
           14
           15
                                             float64
               Jan-Feb
                             4110 non-null
               Mar-May
                             4107 non-null
                                             float64
           16
               Jun-Sep
                             4106 non-null
                                             float64
           17
           18
               Oct-Dec
                             4103 non-null
                                             float64
          dtypes: float64(17), int64(1), object(1)
          memory usage: 611.1+ KB
In [158]: | data1=data.groupby(['SUBDIVISION']).count()
```

rainfall data - Jupyter Notebook In [159]: data1 Out[1591: Jan-Mar-Jun-Oct-OCT NOV DEC ANNUAL YEAR JAN FEB MAR APR MAY JUN JUL AUG SEP Feb Mav Sep Dec **SUBDIVISION ANDAMAN & NICOBAR** ISI ANDS ARUNACHAL PRADESH **ASSAM & MEGHALAYA BIHAR CHHATTISGARH COASTAL ANDHRA PRADESH COASTAL KARNATAKA EAST MADHYA PRADESH**

EAST RAJASTHAN

GUJARAT REGION

HARYANA DELHI &

HIMACHAL PRADESH

JAMMU & KASHMIR

CHANDIGARH

JHARKHAND

KONKAN & GOA

LAKSHADWEEP

MATATHWADA

MADHYA MAHARASHTRA

NAGA MANI MIZO TRIPURA

KERALA

EAST UTTAR PRADESH

GANGETIC WEST BENGAL

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	DEC	ANNUAL	Jan- Feb	Mar- May	Jun- Sep	Oct- Dec
SUBDIVISION																		
NORTH INTERIOR KARNATAKA	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
ORISSA	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
PUNJAB	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
RAYALSEEMA	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
SAURASHTRA & KUTCH	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
SOUTH INTERIOR KARNATAKA	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
SUB HIMALAYAN WEST BENGAL & SIKKIM	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
TAMIL NADU	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
TELANGANA	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
UTTARAKHAND	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
VIDARBHA	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
WEST MADHYA PRADESH	115	115	114	115	115	115	115	115	115	115	115	115	115	114	114	115	115	115
WEST RAJASTHAN	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
WEST UTTAR PRADESH	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115

In [160]: data1=data.loc[(data.YEAR)>=2010]

In [161]: data1

Out[161]:

SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	DEC	ANNUAL	Jan- Feb	Mar- May	Jun- Sep	(
ANDAMAN & NICOBAR ISLANDS	2010	101.7	8.0	0.7	12.5	319.0	448.9	521.9	563.8	263.3	402.4	268.5	246.4	3157.1	109.8	332.2	1797.8	9
ANDAMAN & NICOBAR ISLANDS	2011	265.9	84.8	272.8	111.4	326.5	383.2	583.2	441.5	757.1	212.3	150.8	238.5	3828.0	350.7	710.7	2165.0	6
ANDAMAN & NICOBAR ISLANDS	2012	119.9	45.6	30.9	55.8	533.9	458.2	317.3	369.6	868.9	209.7	300.5	187.3	3497.6	165.6	620.5	2014.0	6
ANDAMAN & NICOBAR ISLANDS	2013	67.1	37.6	43.0	46.3	509.3	777.0	564.8	336.7	473.6	455.8	354.2	92.3	3757.8	104.7	598.6	2152.1	9
ANDAMAN & NICOBAR ISLANDS	2014	41.9	8.6	0.0	11.1	238.0	416.6	467.6	321.6	412.9	402.6	201.2	100.4	2622.4	50.5	249.1	1618.7	7
LAKSHADWEEP	2011	5.1	2.8	3.1	85.9	107.2	153.6	350.2	254.0	255.2	117.4	184.3	14.9	1533.7	7.9	196.2	1013.0	3
LAKSHADWEEP	2012	19.2	0.1	1.6	76.8	21.2	327.0	231.5	381.2	179.8	145.9	12.4	8.8	1405.5	19.3	99.6	1119.5	1
LAKSHADWEEP	2013	26.2	34.4	37.5	5.3	88.3	426.2	296.4	154.4	180.0	72.8	78.1	26.7	1426.3	60.6	131.1	1057.0	1
LAKSHADWEEP	2014	53.2	16.1	4.4	14.9	57.4	244.1	116.1	466.1	132.2	169.2	59.0	62.3	1395.0	69.3	76.7	958.5	2
LAKSHADWEEP	2015	2.2	0.5	3.7	87.1	133.1	296.6	257.5	146.4	160.4	165.4	231.0	159.0	1642.9	2.7	223.9	860.9	5
	ANDAMAN & NICOBAR ISLANDS LAKSHADWEEP LAKSHADWEEP LAKSHADWEEP LAKSHADWEEP	ANDAMAN & NICOBAR ISLANDS LAKSHADWEEP 2011 LAKSHADWEEP 2012 LAKSHADWEEP 2013 LAKSHADWEEP 2014	ANDAMAN & NICOBAR 2010 101.7 ISLANDS 2011 265.9 ISLANDS 2012 119.9 ISLANDS 2013 67.1 ISLANDS 2014 41.9 ISLANDS 2014 41.9 ISLANDS 2014 41.9 ISLANDS 2014 55.1 LAKSHADWEEP 2013 26.2 LAKSHADWEEP 2014 53.2	ANDAMAN & NICOBAR ISLANDS 2010 101.7 8.0 ISLANDS 2011 265.9 84.8 ISLANDS 2012 119.9 45.6 ISLANDS 2013 67.1 37.6 ISLANDS 2014 41.9 8.6 ISLANDS 2014 41.9 8.6 ISLANDS 2014 51.1 2.8 LAKSHADWEEP 2012 19.2 0.1 LAKSHADWEEP 2013 26.2 34.4 LAKSHADWEEP 2014 53.2 16.1	ANDAMAN & NICOBAR ISLANDS 2010 101.7 8.0 0.7 ISLANDS 2011 265.9 84.8 272.8 ISLANDS 2012 119.9 45.6 30.9 ISLANDS 2013 67.1 37.6 43.0 ISLANDS 2014 41.9 8.6 0.0 ISLANDS 2014 41.9 8.6 0.0 ISLANDS 2011 5.1 2.8 3.1 LAKSHADWEEP 2012 19.2 0.1 1.6 LAKSHADWEEP 2013 26.2 34.4 37.5 LAKSHADWEEP 2014 53.2 16.1 4.4	ANDAMAN & NICOBAR ISLANDS 2010 101.7 8.0 0.7 12.5 15.4 NDAMAN & NICOBAR ISLANDS 2011 265.9 84.8 272.8 111.4 15.4 NDAMAN & NICOBAR ISLANDS 2012 119.9 45.6 30.9 55.8 15.4 NDAMAN & NICOBAR ISLANDS 2013 67.1 37.6 43.0 46.3 15.4 NDAMAN & NICOBAR ISLANDS 2014 41.9 8.6 0.0 11.1 15.1 15.1 2.8 3.1 85.9 LAKSHADWEEP 2012 19.2 0.1 1.6 76.8 LAKSHADWEEP 2013 26.2 34.4 37.5 5.3 LAKSHADWEEP 2014 53.2 16.1 4.4 14.9	ANDAMAN & NICOBAR ISLANDS 2010 101.7 8.0 0.7 12.5 319.0 ANDAMAN & NICOBAR ISLANDS 2011 265.9 84.8 272.8 111.4 326.5 ISLANDS NICOBAR ISLANDS 2012 119.9 45.6 30.9 55.8 533.9 ISLANDS NICOBAR ISLANDS 2013 67.1 37.6 43.0 46.3 509.3 ISLANDS NICOBAR ISLANDS 2014 41.9 8.6 0.0 11.1 238.0 ISLANDS NICOBAR ISLANDS 2014 21.9 2.8 3.1 85.9 107.2 LAKSHADWEEP 2012 19.2 0.1 1.6 76.8 21.2 LAKSHADWEEP 2013 26.2 34.4 37.5 5.3 88.3 LAKSHADWEEP 2014 53.2 16.1 4.4 14.9 57.4	ANDAMAN & NICOBAR ISLANDS ANDAMAN & NICOBAR ISL	ANDAMAN & NICOBAR ISLANDS 2010 101.7 8.0 0.7 12.5 319.0 448.9 521.9 265.9 84.8 272.8 111.4 326.5 383.2 583.2 261.4 265.9 84.8 272.8 111.4 326.5 383.2 583.2 261.4 265.9 265.0	ANDAMAN & NICOBAR ISLANDS 2010 265.9 84.8 272.8 111.4 326.5 383.2 583.2 441.5 ISLANDS 2011 265.9 84.8 272.8 111.4 326.5 383.2 583.2 441.5 SANDAMAN & NICOBAR ISLANDS 2012 119.9 45.6 30.9 55.8 533.9 458.2 317.3 369.6 ISLANDS 2013 67.1 37.6 43.0 46.3 509.3 777.0 564.8 336.7 ISLANDS 2014 41.9 8.6 0.0 11.1 238.0 416.6 467.6 321.6 ISLANDS 2014 41.9 8.6 0.0 11.1 238.0 416.6 467.6 321.6 ISLANDS 2014 55.1 2.8 3.1 85.9 107.2 153.6 350.2 254.0 LAKSHADWEEP 2012 19.2 0.1 1.6 76.8 21.2 327.0 231.5 381.2 LAKSHADWEEP 2013 26.2 34.4 37.5 5.3 88.3 426.2 296.4 154.4 LAKSHADWEEP 2014 53.2 16.1 4.4 14.9 57.4 244.1 116.1 466.1	ANDAMAN & NICOBAR ISLANDS 2010 101.7 8.0 0.7 12.5 319.0 448.9 521.9 563.8 263.3 263.3 263.4 263.1 265.9 84.8 272.8 111.4 326.5 383.2 583.2 441.5 757.1 15LANDS 2012 119.9 45.6 30.9 55.8 533.9 458.2 317.3 369.6 868.9 15LANDS 2013 67.1 37.6 43.0 46.3 509.3 777.0 564.8 336.7 473.6 1SLANDS 2014 41.9 8.6 20.0 11.1 238.0 416.6 467.6 321.6 412.9 15LANDS 2014 41.9 8.6 20.0 11.1 238.0 416.6 467.6 321.6 412.9 15LANDS 2014 41.9 57.4 244.1 41.9 2012 153.2 163.0 163	ANDAMAN & NICOBAR 2010 101.7 8.0 0.7 12.5 319.0 448.9 521.9 563.8 263.3 402.4 NICOBAR 1SLANDS 2011 265.9 84.8 272.8 111.4 326.5 383.2 583.2 441.5 757.1 212.3 ANDAMAN & NICOBAR 2012 119.9 45.6 30.9 55.8 533.9 458.2 317.3 369.6 868.9 209.7 ISLANDS 2013 67.1 37.6 43.0 46.3 509.3 777.0 564.8 336.7 473.6 455.8 NICOBAR 1SLANDS 2014 41.9 8.6 0.0 11.1 238.0 416.6 467.6 321.6 412.9 402.6 NICOBAR 1SLANDS 2014 41.9 8.6 0.0 11.1 238.0 416.6 467.6 321.6 412.9 402.6 NICOBAR 1SLANDS 2014 41.9 8.6 3.1 85.9 107.2 153.6 350.2 254.0 255.2 117.4 LAKSHADWEEP 2012 19.2 0.1 16.6 76.8 21.2 327.0 231.5 381.2 179.8 145.9 LAKSHADWEEP 2013 26.2 34.4 37.5 5.3 88.3 426.2 296.4 154.4 180.0 72.8 LAKSHADWEEP 2014 53.2 16.1 4.4 14.9 57.4 244.1 116.1 466.1 132.2 169.2	ANDAMAN & NICOBAR ISLANDS 2010 265.9 84.8 272.8 111.4 326.5 383.2 583.2 441.5 757.1 212.3 150.8 NICOBAR ISLANDS 2011 265.9 84.8 272.8 111.4 326.5 383.2 583.2 441.5 757.1 212.3 150.8 NICOBAR ISLANDS 2012 119.9 45.6 30.9 55.8 533.9 458.2 317.3 369.6 868.9 209.7 300.5 SANDAMAN & NICOBAR ISLANDS 2013 67.1 37.6 43.0 46.3 509.3 777.0 564.8 336.7 473.6 455.8 354.2 SANDAMAN & NICOBAR ISLANDS 2014 41.9 8.6 0.0 11.1 238.0 416.6 467.6 321.6 412.9 402.6 201.2 SANDAMAN & NICOBAR ISLANDS 2014 41.9 8.6 0.0 11.1 238.0 416.6 467.6 321.6 412.9 402.6 201.2 SANDAMAN & NICOBAR ISLANDS 2014 41.9 8.6 0.0 11.1 238.0 416.6 467.6 350.2 254.0 255.2 117.4 184.3 SANDAMAN & NICOBAR ISLANDS 2014 41.9 57.8 35.9 107.2 153.6 350.2 254.0 255.2 117.4 184.3 SANDAMAN & NICOBAR ISLANDS 2014 53.2 14.4 37.5 5.3 88.3 426.2 296.4 154.4 180.0 72.8 78.1 SANDAMAN & NICOBAR ISLANDWEEP 2013 26.2 34.4 37.5 5.3 88.3 426.2 296.4 154.4 180.0 72.8 78.1 SANDAMAN & NICOBAR ISLANDWEEP 2014 53.2 16.1 4.4 14.9 57.4 244.1 116.1 466.1 132.2 169.2 59.0	ANDAMAN & NICOBAR ISLANDS ANDAMAN & NICOBAR ISLANDS 2010 265.9 84.8 272.8 111.4 326.5 383.2 583.2 441.5 757.1 212.3 150.8 238.5 181.4 NICOBAR ISLANDS ANDAMAN & NICOBAR 2012 119.9 45.6 30.9 55.8 533.9 458.2 317.3 369.6 868.9 209.7 300.5 187.3 181.4 NICOBAR ISLANDS ANDAMAN & NICOBAR 2013 67.1 37.6 43.0 46.3 509.3 777.0 564.8 336.7 473.6 455.8 354.2 92.3 181.4 NICOBAR ISLANDS ANDAMAN & NICOBAR 2014 41.9 8.6 0.0 11.1 238.0 416.6 467.6 321.6 412.9 402.6 201.2 100.4 181.4 NICOBAR 181.4 NI	ANDAMAN & NICOBAR ISLANDS ANDAMAN & NICOBAR ISL	ANDAMAN & NICOBAR ISLANDS 101.7 8.0 0.7 12.5 319.0 448.9 521.9 563.8 263.3 402.4 268.5 246.4 3157.1 109.8 100.00 10	ANDAMAN & NICOBAR SULVE	ANDAMAN & NICOBAR SULU 10.1.7

216 rows × 19 columns

```
In [162]: data.tail()

Out[162]:

SUBDIVISION YEAR JAN EER MAR APR MAY JUN JUI AUG SEP OCT NOV DEC ANNUAL Jan- Mar- Jun- Oct
```

AUG DEC ANNUAL SUBDIVISION YEAR JAN FEB MAR APR NOV MAY JUN JUL SEP OCT Feb May Sep Dec 2.8 85.9 107.2 153.6 350.2 254.0 255.2 117.4 184.3 14.9 1533.7 7.9 196.2 1013.0 4111 LAKSHADWEEP 2011 5.1 3.1 316.6 LAKSHADWEEP 4112 2012 19.2 0.1 1.6 76.8 21.2 327.0 231.5 381.2 179.8 145.9 12.4 8.8 1405.5 19.3 99.6 1119.5 167.1 LAKSHADWEEP 26.2 34.4 88.3 426.2 296.4 154.4 180.0 78.1 26.7 60.6 131.1 1057.0 177.6 4113 2013 37.5 5.3 72.8 1426.3 4114 LAKSHADWEEP 53.2 16.1 62.3 2014 4.4 14.9 57.4 244.1 116.1 466.1 132.2 169.2 59.0 1395.0 69.3 76.7 958.5 290. 4115 LAKSHADWEEP 2015 2.2 0.5 87.1 133.1 296.6 257.5 146.4 160.4 165.4 231.0 159.0 1642.9 2.7 223.9 860.9 555.4 3.7

In [163]: datal=data.drop(['ANNUAL','Jan-Feb','Mar-May','Jun-Sep','Oct-Dec'],axis=1)

```
In [164]: | data1
Out[164]:
                                SUBDIVISION YEAR JAN
                                                       FEB MAR
                                                                   APR
                                                                        MAY
                                                                              JUN
                                                                                    JUL
                                                                                         AUG
                                                                                               SEP
                                                                                                     OCT
                                                                                                           NOV
                                                                                                                 DEC
               0 ANDAMAN & NICOBAR ISLANDS
                                            1901
                                                  49.2
                                                        87.1
                                                             29.2
                                                                    2.3 528.8
                                                                             517.5 365.1 481.1 332.6
                                                                                                    388.5
                                                                                                          558.2
                                                                                                                 33.6
                                                             12.2
               1 ANDAMAN & NICOBAR ISLANDS
                                             1902
                                                   0.0
                                                       159.8
                                                                    0.0 446.1 537.1 228.9 753.7
                                                                                              666.2 197.2 359.0 160.5
               2 ANDAMAN & NICOBAR ISLANDS
                                             1903 12.7 144.0
                                                              0.0
                                                                    1.0 235.1 479.9 728.4 326.7 339.0 181.2 284.4
                                                                                                                225.0
               3 ANDAMAN & NICOBAR ISLANDS
                                             1904
                                                   9.4
                                                        14.7
                                                              0.0
                                                                  202.4 304.5
                                                                             495.1 502.0 160.1 820.4
                                                                                                    222.2
                                                                                                          308.7
                                                                                                                 40.1
                 ANDAMAN & NICOBAR ISLANDS
                                             1905
                                                   1.3
                                                         0.0
                                                              3.3
                                                                   26.9 279.5 628.7
                                                                                   368.7 330.5 297.0
                                                                                                    260.7
                                                                                                           25.4 344.7
            4111
                              LAKSHADWEEP
                                             2011
                                                   5.1
                                                         2.8
                                                              3.1
                                                                   85.9
                                                                       107.2 153.6 350.2 254.0 255.2 117.4 184.3
                                                                                                                 14.9
            4112
                              LAKSHADWEEP
                                             2012
                                                  19.2
                                                         0.1
                                                              1.6
                                                                         21.2
                                                                             327.0 231.5 381.2 179.8 145.9
                                                                                                           12.4
                                                                                                                  8.8
                                                                   76.8
            4113
                              LAKSHADWEEP
                                             2013 26.2
                                                        34.4
                                                             37.5
                                                                             426.2 296.4 154.4 180.0
                                                                                                           78.1
                                                                    5.3
                                                                         88.3
                                                                                                     72.8
                                                                                                                 26.7
            4114
                              LAKSHADWEEP
                                             2014
                                                  53.2
                                                        16.1
                                                              4.4
                                                                   14.9
                                                                         57.4
                                                                             244.1 116.1 466.1 132.2
                                                                                                    169.2
                                                                                                           59.0
                                                                                                                 62.3
            4115
                              LAKSHADWEEP
                                             2015
                                                   2.2
                                                         0.5
                                                              3.7
                                                                   87.1 133.1 296.6 257.5 146.4 160.4 165.4 231.0 159.0
           4116 rows × 14 columns
           data1['SUBDIVISION'].unique()
In [165]:
Out[165]: array(['ANDAMAN & NICOBAR ISLANDS', 'ARUNACHAL PRADESH',
                    'ASSAM & MEGHALAYA', 'NAGA MANI MIZO TRIPURA',
                    'SUB HIMALAYAN WEST BENGAL & SIKKIM', 'GANGETIC WEST BENGAL',
                    'ORISSA', 'JHARKHAND', 'BIHAR', 'EAST UTTAR PRADESH',
                    'WEST UTTAR PRADESH', 'UTTARAKHAND', 'HARYANA DELHI & CHANDIGARH',
                    'PUNJAB', 'HIMACHAL PRADESH', 'JAMMU & KASHMIR', 'WEST RAJASTHAN',
                    'EAST RAJASTHAN', 'WEST MADHYA PRADESH', 'EAST MADHYA PRADESH',
                    'GUJARAT REGION', 'SAURASHTRA & KUTCH', 'KONKAN & GOA',
                    'MADHYA MAHARASHTRA', 'MATATHWADA', 'VIDARBHA', 'CHHATTISGARH',
                    'COASTAL ANDHRA PRADESH', 'TELANGANA', 'RAYALSEEMA', 'TAMIL NADU',
                    'COASTAL KARNATAKA', 'NORTH INTERIOR KARNATAKA',
                    'SOUTH INTERIOR KARNATAKA', 'KERALA', 'LAKSHADWEEP'], dtype=object)
```

In [166]: data2=data1.loc[(data1.SUBDIVISION == "ARUNACHAL PRADESH")]

In [167]: data2

Out[167]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	DEC
110	ARUNACHAL PRADESH	1916	48.1	69.8	71.1	316.1	424.6	1124.9	NaN	629.7	333.9	NaN	NaN	NaN
111	ARUNACHAL PRADESH	1917	21.4	164.5	NaN	269.6	107.9	823.8	909.1	628.4	411.5	199.3	63.5	0.0
112	ARUNACHAL PRADESH	1918	10.4	11.0	191.2	144.6	861.1	1609.9	1303.0	692.6	515.8	125.2	7.8	13.7
113	ARUNACHAL PRADESH	1919	34.5	67.8	28.5	256.9	420.6	973.6	999.0	286.7	628.7	948.3	40.7	8.6
114	ARUNACHAL PRADESH	1920	14.0	196.3	605.6	364.7	173.6	840.6	535.4	896.5	376.7	103.3	0.0	0.0
202	ARUNACHAL PRADESH	2011	40.0	51.3	174.5	240.8	219.6	288.4	531.4	277.6	286.7	51.9	16.2	15.2
203	ARUNACHAL PRADESH	2012	57.8	35.8	134.2	403.4	187.4	645.8	638.9	316.0	724.9	248.1	22.0	26.2
204	ARUNACHAL PRADESH	2013	18.5	40.5	115.1	175.1	335.8	290.0	329.6	230.2	316.1	164.1	13.3	14.6
205	ARUNACHAL PRADESH	2014	19.0	101.9	80.3	86.7	299.0	415.8	392.4	599.6	343.0	35.1	20.1	10.2
206	ARUNACHAL PRADESH	2015	30.8	47.5	97.5	287.1	238.9	637.9	329.3	595.5	374.2	65.2	33.8	29.8

97 rows × 14 columns

In [168]:	data2.isna().	sum()
In [168]: Out[168]:		0 0 1 1 2 0 0 1 1
	_	0
	OCT	2
	NOV	2
	DEC	2
	dtype: int64	

/tmp/ipykernel_4469/2025866100.py:1: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row indexer,col indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html #returning-a-view-versus-a-copy (https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)

data2['ANNUAL RAIN']=data2.apply(lambda row: row.JAN + row.FEB,axis=1)

Out[169]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	DEC	ANNUAL RAIN
110	ARUNACHAL PRADESH	1916	48.1	69.8	71.1	316.1	424.6	1124.9	NaN	629.7	333.9	NaN	NaN	NaN	117.9
111	ARUNACHAL PRADESH	1917	21.4	164.5	NaN	269.6	107.9	823.8	909.1	628.4	411.5	199.3	63.5	0.0	185.9
112	ARUNACHAL PRADESH	1918	10.4	11.0	191.2	144.6	861.1	1609.9	1303.0	692.6	515.8	125.2	7.8	13.7	21.4
113	ARUNACHAL PRADESH	1919	34.5	67.8	28.5	256.9	420.6	973.6	999.0	286.7	628.7	948.3	40.7	8.6	102.3
114	ARUNACHAL PRADESH	1920	14.0	196.3	605.6	364.7	173.6	840.6	535.4	896.5	376.7	103.3	0.0	0.0	210.3
202	ARUNACHAL PRADESH	2011	40.0	51.3	174.5	240.8	219.6	288.4	531.4	277.6	286.7	51.9	16.2	15.2	91.3
203	ARUNACHAL PRADESH	2012	57.8	35.8	134.2	403.4	187.4	645.8	638.9	316.0	724.9	248.1	22.0	26.2	93.6
204	ARUNACHAL PRADESH	2013	18.5	40.5	115.1	175.1	335.8	290.0	329.6	230.2	316.1	164.1	13.3	14.6	59.0
205	ARUNACHAL PRADESH	2014	19.0	101.9	80.3	86.7	299.0	415.8	392.4	599.6	343.0	35.1	20.1	10.2	120.9
206	ARUNACHAL PRADESH	2015	30.8	47.5	97.5	287.1	238.9	637.9	329.3	595.5	374.2	65.2	33.8	29.8	78.3

97 rows × 15 columns

In [170]: cor=data2.corr()
cor

/tmp/ipykernel_4469/3832707278.py:1: FutureWarning: The default value of numeric_only in DataFrame.corr is
deprecated. In a future version, it will default to False. Select only valid columns or specify the value o
f numeric_only to silence this warning.
 cor=data2.corr()

Out[170]:

	YEA	R JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	С
YE	AR 1.00000	0 -0.176300	-0.213918	-0.157302	-0.253946	-0.401934	-0.626889	-0.494607	-0.394066	-0.396480	-0.325208	-0.096053	-0.070
;	AN -0.17630	0 1.000000	0.083391	0.099054	0.256921	0.217524	0.208187	0.071617	0.193102	0.189419	0.169379	0.162395	0.286
F	EB -0.21391	.8 0.083391	1.000000	0.321564	0.205643	-0.027577	0.111802	0.140842	0.063751	0.154883	-0.024632	0.159914	0.050
N	AR -0.15730	0.099054	0.321564	1.000000	0.307354	0.023099	0.111475	0.047547	0.058362	0.054761	-0.137731	-0.048569	0.065
P	PR -0.25394	6 0.256921	0.205643	0.307354	1.000000	0.097526	0.290472	0.238319	0.132668	0.198362	0.054994	0.295455	0.329
N	IAY -0.40193	0.217524	-0.027577	0.023099	0.097526	1.000000	0.398268	0.510852	0.367445	0.246939	0.141720	0.040734	0.093
	UN -0.62688	9 0.208187	0.111802	0.111475	0.290472	0.398268	1.000000	0.540408	0.426753	0.354854	0.217141	0.124429	0.054
	UL -0.49460	0.071617	0.140842	0.047547	0.238319	0.510852	0.540408	1.000000	0.218016	0.380741	0.173107	-0.137416	0.091
A	UG -0.39406	6 0.193102	0.063751	0.058362	0.132668	0.367445	0.426753	0.218016	1.000000	0.259420	0.293511	0.062165	0.008
5	EP -0.39648	0.189419	0.154883	0.054761	0.198362	0.246939	0.354854	0.380741	0.259420	1.000000	0.241075	-0.040257	0.080
C	CT -0.32520	0.169379	-0.024632	-0.137731	0.054994	0.141720	0.217141	0.173107	0.293511	0.241075	1.000000	-0.047687	-0.013
N	OV -0.09605	3 0.162395	0.159914	-0.048569	0.295455	0.040734	0.124429	-0.137416	0.062165	-0.040257	-0.047687	1.000000	0.312
	EC -0.07089	9 0.286771	0.050085	0.065364	0.329066	0.093530	0.054968	0.091248	0.008145	0.080062	-0.013078	0.312240	1.000
ANNU R	AIN -0.26638	0.634568	0.823093	0.303373	0.305907	0.102578	0.205328	0.150018	0.159491	0.228071	0.077537	0.216585	0.202

```
In [171]: import seaborn as sns
            sns.heatmap(cor,vmax=1,vmin=-1,annot=True,linewidths=.5,cmap='bwr')
Out[171]: <Axes: >
                                                                                           - 1.00
                             1 0.180.2±0.1€0.25-0.40.6±0.490.390.4-0.3±0.096.07-0.27
                       JAN -0.18 1 0.0803.0990.260.220.210.0720.190.190.170.160.290.63
                                                                                           - 0.75
                       FEB -0.20.083 1 0.320.240.028.110.140.0640.150.026.160.050.82
                      MAR -0.16.0990.32 1 0.310.0230.110.048.05@.0550.1-0.0490650.3
                                                                                           - 0.50
                       APR -0.250.260.210.31 1 0.0980.290.240.13 0.20.0550.3 0.330.31
                                                                                           - 0.25
                       MAY -0.4 0.220.0208020.098 1 0.4 0.510.370.250.140.040.0940.1
                       JUN -0.6 0.210.110.110.29 0.4 1 0.540.430.350.220.120.0550.21
                                                                                           - 0.00
                       JUL -0.40.0720.140.0480.240.510.54 1 0.220.380.170.19.0910.15
                      AUG -0.390.190.064.0580.130.370.430.22 1 0.260.290.0620080.16
                                                                                          - -0.25
                       SEP - 0.4 0.190.150.0550.2 0.250.350.380.26 1 0.240.040.080.23
                       OCT -0.330.170.0250.19.0550.140.220.170.290.24 1-0.048.0103078
                                                                                           - -0.50
                      NOV -0.096.160.160.0490.30.04D.120.16.0620.040.0481 0.310.22
                                                                                           - -0.75
                       DEC -0.07 D.290.050.0650.330.094.0550.090100801.040.016.31 1 0.2
             ANNUAL RAIN -0.270.630.82 0.3 0.31 0.1 0.210.150.160.230.0780.22 0.2
                                                                                            -1.00
                                                     N
                                                         Ŋ
                                                             AUG
                                                 MAY
                                                                                 ANNUAL RAIN
```

In [175]: data2['SWM']=data2.apply(lambda row: row.JUN + row.JUL + row.AUG + row.SEP,axis=1)

/tmp/ipykernel_4469/3904998083.py:1: SettingWithCopyWarning:

A value is trying to be set on a copy of a slice from a DataFrame.

Try using .loc[row indexer,col indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html #returning-a-view-versus-a-copy (https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)

data2['SWM']=data2.apply(lambda row: row.JUN + row.JUL + row.AUG + row.SEP,axis=1)

In [176]: data2

Out[176]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ост	NOV	DEC	ANNUAL RAIN	SWM
110	ARUNACHAL PRADESH	1916	48.1	69.8	71.1	316.1	424.6	1124.9	NaN	629.7	333.9	NaN	NaN	NaN	117.9	NaN
111	ARUNACHAL PRADESH	1917	21.4	164.5	NaN	269.6	107.9	823.8	909.1	628.4	411.5	199.3	63.5	0.0	185.9	2772.8
112	ARUNACHAL PRADESH	1918	10.4	11.0	191.2	144.6	861.1	1609.9	1303.0	692.6	515.8	125.2	7.8	13.7	21.4	4121.3
113	ARUNACHAL PRADESH	1919	34.5	67.8	28.5	256.9	420.6	973.6	999.0	286.7	628.7	948.3	40.7	8.6	102.3	2888.0
114	ARUNACHAL PRADESH	1920	14.0	196.3	605.6	364.7	173.6	840.6	535.4	896.5	376.7	103.3	0.0	0.0	210.3	2649.2
202	ARUNACHAL PRADESH	2011	40.0	51.3	174.5	240.8	219.6	288.4	531.4	277.6	286.7	51.9	16.2	15.2	91.3	1384.1
203	ARUNACHAL PRADESH	2012	57.8	35.8	134.2	403.4	187.4	645.8	638.9	316.0	724.9	248.1	22.0	26.2	93.6	2325.6
204	ARUNACHAL PRADESH	2013	18.5	40.5	115.1	175.1	335.8	290.0	329.6	230.2	316.1	164.1	13.3	14.6	59.0	1165.9
205	ARUNACHAL PRADESH	2014	19.0	101.9	80.3	86.7	299.0	415.8	392.4	599.6	343.0	35.1	20.1	10.2	120.9	1750.8
206	ARUNACHAL PRADESH	2015	30.8	47.5	97.5	287.1	238.9	637.9	329.3	595.5	374.2	65.2	33.8	29.8	78.3	1936.9

97 rows × 16 columns

```
In [177]: data2['NEM']=data2.apply(lambda row: row.OCT + row.NOV + row.DEC,axis=1)

/tmp/ipykernel_4469/2671544100.py:1: SettingWithCopyWarning:
    A value is trying to be set on a copy of a slice from a DataFrame.
    Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html
#returning-a-view-versus-a-copy (https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#retu
rning-a-view-versus-a-copy)
    data2['NEM']=data2.apply(lambda row: row.OCT + row.NOV + row.DEC,axis=1)
```

In [178]: data2

Out[178]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ост	NOV	DEC	ANNUAL RAIN	SWM	NEM
110	ARUNACHAL PRADESH	1916	48.1	69.8	71.1	316.1	424.6	1124.9	NaN	629.7	333.9	NaN	NaN	NaN	117.9	NaN	NaN
111	ARUNACHAL PRADESH	1917	21.4	164.5	NaN	269.6	107.9	823.8	909.1	628.4	411.5	199.3	63.5	0.0	185.9	2772.8	262.8
112	ARUNACHAL PRADESH	1918	10.4	11.0	191.2	144.6	861.1	1609.9	1303.0	692.6	515.8	125.2	7.8	13.7	21.4	4121.3	146.7
113	ARUNACHAL PRADESH	1919	34.5	67.8	28.5	256.9	420.6	973.6	999.0	286.7	628.7	948.3	40.7	8.6	102.3	2888.0	997.6
114	ARUNACHAL PRADESH	1920	14.0	196.3	605.6	364.7	173.6	840.6	535.4	896.5	376.7	103.3	0.0	0.0	210.3	2649.2	103.3
202	ARUNACHAL PRADESH	2011	40.0	51.3	174.5	240.8	219.6	288.4	531.4	277.6	286.7	51.9	16.2	15.2	91.3	1384.1	83.3
203	ARUNACHAL PRADESH	2012	57.8	35.8	134.2	403.4	187.4	645.8	638.9	316.0	724.9	248.1	22.0	26.2	93.6	2325.6	296.3
204	ARUNACHAL PRADESH	2013	18.5	40.5	115.1	175.1	335.8	290.0	329.6	230.2	316.1	164.1	13.3	14.6	59.0	1165.9	192.0
205	ARUNACHAL PRADESH	2014	19.0	101.9	80.3	86.7	299.0	415.8	392.4	599.6	343.0	35.1	20.1	10.2	120.9	1750.8	65.4
206	ARUNACHAL PRADESH	2015	30.8	47.5	97.5	287.1	238.9	637.9	329.3	595.5	374.2	65.2	33.8	29.8	78.3	1936.9	128.8

97 rows × 17 columns

In [179]: cor=data2.corr()
cor

/tmp/ipykernel_4469/3832707278.py:1: FutureWarning: The default value of numeric_only in DataFrame.corr is
deprecated. In a future version, it will default to False. Select only valid columns or specify the value o
f numeric_only to silence this warning.
 cor=data2.corr()

Out[179]:

		YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	С
_	YEAR	1.000000	-0.176300	-0.213918	-0.157302	-0.253946	-0.401934	-0.626889	-0.494607	-0.394066	-0.396480	-0.325208	-0.096053	-0.070
	JAN	-0.176300	1.000000	0.083391	0.099054	0.256921	0.217524	0.208187	0.071617	0.193102	0.189419	0.169379	0.162395	0.286
	FEB	-0.213918	0.083391	1.000000	0.321564	0.205643	-0.027577	0.111802	0.140842	0.063751	0.154883	-0.024632	0.159914	0.050
	MAR	-0.157302	0.099054	0.321564	1.000000	0.307354	0.023099	0.111475	0.047547	0.058362	0.054761	-0.137731	-0.048569	0.065
	APR	-0.253946	0.256921	0.205643	0.307354	1.000000	0.097526	0.290472	0.238319	0.132668	0.198362	0.054994	0.295455	0.329
	MAY	-0.401934	0.217524	-0.027577	0.023099	0.097526	1.000000	0.398268	0.510852	0.367445	0.246939	0.141720	0.040734	0.093
	JUN	-0.626889	0.208187	0.111802	0.111475	0.290472	0.398268	1.000000	0.540408	0.426753	0.354854	0.217141	0.124429	0.054
	JUL	-0.494607	0.071617	0.140842	0.047547	0.238319	0.510852	0.540408	1.000000	0.218016	0.380741	0.173107	-0.137416	0.091
	AUG	-0.394066	0.193102	0.063751	0.058362	0.132668	0.367445	0.426753	0.218016	1.000000	0.259420	0.293511	0.062165	0.008
	SEP	-0.396480	0.189419	0.154883	0.054761	0.198362	0.246939	0.354854	0.380741	0.259420	1.000000	0.241075	-0.040257	0.080
	ОСТ	-0.325208	0.169379	-0.024632	-0.137731	0.054994	0.141720	0.217141	0.173107	0.293511	0.241075	1.000000	-0.047687	-0.013
	NOV	-0.096053	0.162395	0.159914	-0.048569	0.295455	0.040734	0.124429	-0.137416	0.062165	-0.040257	-0.047687	1.000000	0.312
	DEC	-0.070899	0.286771	0.050085	0.065364	0.329066	0.093530	0.054968	0.091248	0.008145	0.080062	-0.013078	0.312240	1.000
	ANNUAL RAIN	-0.266380	0.634568	0.823093	0.303373	0.305907	0.102578	0.205328	0.150018	0.159491	0.228071	0.077537	0.216585	0.202
	SWM	-0.673988	0.216206	0.164073	0.107053	0.314857	0.542453	0.827002	0.785438	0.636885	0.624761	0.321847	-0.000530	0.089
	NEM	-0.346587	0.249148	0.022546	-0.126769	0.175120	0.155996	0.241767	0.147792	0.299330	0.241386	0.946672	0.236428	0.223
4														

In [180]: import seaborn as sns

```
sns.heatmap(cor,vmax=1,vmin=-1,annot=True,linewidths=.5,cmap='bwr')
Out[180]: <Axes: >
                                                                                                - 1.00
                              1 0.1-80.2-10.1-60.2-50.4-0.6-30.4-30.3-90.4-0.3-0-3-0-0-0-0-0-3-5
                        JAN -0.18 10.0803099.260.220.20.070.190.190.170.160.290.600.220.25
                                                                                               - 0.75
                        FEB -0.20.0831 0.320.20.02031 D.10.064.1-0.02051 60.050.820.16.023
                       MAR -0.105099.32 1 0.30.029.10.04080508056.10.04090650.30.110.13
                                                                                               - 0.50
                        APR -0.250.260.210.31 10.098.290.240.130.20.0550.30.330.310.310.18
                        MAY -0.40.20.0280280981 0.4
                                                         .510.370.250.14.04010940.10.540.16
                                                                                               - 0.25
                        JUN -0.60.210.110.110.290.4 1 0.5 0.430.350.220.10.056.210.8 0.24
                        JUL -0.40.070.10.048.249.510.54 1 0.220.380.170.104090.150.750.15
                                                                                               - 0.00
                        AUG -0.3 0.19.0604058.130.370.430.22 1 0.260.29.06.200801160.640.3
                        SEP -0.40.190.16.0550.20.250.350.380.26 1 0.240.040.080.230.620.24
                                                                                                -0.25
                        OCT -0.3 b. 1-0.025.14.056.140.220.170.290.24 1 0.04080 030 78.320.95
                        NOV-9.0905160.1-6.049.30.040.120.104.062.04.0411 0.310-2200005.24
                                                                                                -0.50
                        DEC-9.070.290.06.065.36.0904050509.D08010-8.010331 1 0.20.089.22
              ANNUAL RAIN -0.270.630.82 0.30.310.10.210.150.160.26.076.220.2
                                                                                               - -0.75
                       SWM -0.60.220.160.110.310.54
                        NEM -0.35.26.026.13.180.160.240.150.30.240.950.240.220.160.32
                                                                                                 -1.00
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