In [1]: import pandas as pd

In [2]: data=pd.read\_csv("/home/placement/Downloads/rainfall in india 1901-2015.csv")

In [3]: data.describe()

Out[3]:

	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	65.1
75%	1987.000000	22.200000	26.800000	31.300000	49.950000	97.200000	305.150000	418.400000	377.800000	265.800000	148.
max	2015.000000	583.700000	403.500000	605.600000	595.100000	1168.600000	1609.900000	2362.800000	1664.600000	1222.000000	948.:

In [4]: data.head(10)

Out[4]:

	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.C
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.£
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	629.0
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

4

```
In [5]: 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
                                   object
 1
                  4116 non-null
                                  int64
     YEAR
                  4112 non-null
                                  float64
 2
     JAN
 3
     FEB
                  4113 non-null
                                  float64
 4
                  4110 non-null
                                  float64
     MAR
 5
    APR
                  4112 non-null
                                  float64
 6
                                  float64
    MAY
                  4113 non-null
 7
     JUN
                  4111 non-null
                                  float64
 8
     JUL
                  4109 non-null
                                  float64
 9
     AUG
                  4112 non-null
                                  float64
 10
    SEP
                  4110 non-null
                                  float64
    0CT
                  4109 non-null
                                  float64
 11
    NOV
 12
                  4105 non-null
                                  float64
 13
    DEC
                  4106 non-null
                                  float64
 14
    ANNUAL
                  4090 non-null
                                  float64
 15
    Jan-Feb
                  4110 non-null
                                  float64
    Mar-May
                  4107 non-null
                                  float64
 16
 17
    Jun-Sep
                  4106 non-null
                                  float64
 18 Oct-Dec
                                  float64
                  4103 non-null
dtypes: float64(17), int64(1), object(1)
memory usage: 611.1+ KB
```

In	[6]:	data.isna().s	um()
0ut	t[6]:	SUBDIVISION	0
		YEAR	0
		JAN	4
		FEB	3
		MAR	6
		APR	4
		MAY	3
		JUN	5
		JUL	7
		AUG	4
		SEP	6
		0CT	7
		NOV	11
		DEC	10
		ANNUAL	26
		Jan-Feb	6
		Mar-May	9
		Jun-Sep	10
		Oct-Dec	13
		dtype: int64	

Out[7]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ост	NOV	DEC	ANNUAL	Jan- Feb	Mar- May	Jun- Sep	Oct- Dec
SUBDIVISION																		
ANDAMAN & NICOBAR ISLANDS	110	110	110	108	108	109	108	108	108	107	108	108	107	104	110	107	107	107
ARUNACHAL PRADESH	97	96	96	95	97	97	96	96	97	97	95	95	95	91	96	95	95	94
ASSAM & MEGHALAYA	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
BIHAR	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
CHHATTISGARH	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
COASTAL ANDHRA PRADESH	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
COASTAL KARNATAKA	115	114	115	115	115	115	115	115	115	115	115	115	115	114	114	115	115	115
EAST MADHYA PRADESH	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
EAST RAJASTHAN	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
EAST UTTAR PRADESH	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
GANGETIC WEST BENGAL	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
<b>GUJARAT REGION</b>	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
HARYANA DELHI & CHANDIGARH	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
HIMACHAL PRADESH	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
JAMMU & KASHMIR	115	115	115	115	115	115	115	114	115	115	115	114	114	114	115	115	114	114
JHARKHAND	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
KERALA	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
KONKAN & GOA	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
LAKSHADWEEP	114	112	113	112	112	112	112	111	112	111	111	108	110	103	111	110	110	108
MADHYA MAHARASHTRA	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
MATATHWADA	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ост	NOV	DEC	ANNUAL	Jan- Feb	Mar- May	Jun- Sep	Oct- Dec
SUBDIVISION																		
NAGA MANI MIZO TRIPURA	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
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 [ ]:

In	[8]:	data.isna().s	um()
0ut	:[8]:	SUBDIVISION	0
		YEAR	0
		JAN	4
		FEB	3
		MAR	6
		APR	4
		MAY	3
		JUN	5
		JUL	7
		AUG	4
		SEP	6
		0CT	7
		NOV	11
		DEC	10
		ANNUAL	26
		Jan-Feb	6
		Mar-May	9
		Jun-Sep	10
		Oct-Dec	13
		dtype: int64	

In [9]: data=data.loc[(data.YEAR<2010)]
 data</pre>

## Out[9]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	DEC	ANNUAL	Jan- Feb	Mar- May	Jun- Sep	
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	ç
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	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	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	5
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	6
4105	LAKSHADWEEP	2005	17.6	11.1	0.0	37.0	92.8	248.5	378.9	102.4	278.0	164.2	218.3	26.6	1575.4	28.7	129.8	1007.8	4
4106	LAKSHADWEEP	2006	20.1	0.0	33.0	0.3	327.9	286.9	172.3	150.7	318.5	119.1	158.9	10.9	1598.6	20.1	361.2	928.4	2
4107	LAKSHADWEEP	2007	2.5	4.2	0.2	22.2	166.2	573.4	427.4	294.7	457.5	256.1	47.6	109.6	2361.6	6.7	188.6	1753.0	4
4108	LAKSHADWEEP	2008	5.5	19.8	120.7	15.8	180.4	254.6	363.9	206.6	108.9	252.9	67.6	130.1	1726.8	25.3	316.9	934.0	4
4109	LAKSHADWEEP	2009	4.7	1.5	0.1	18.1	162.1	401.2	266.4	185.0	145.1	87.4	166.2	132.3	1570.1	6.2	180.3	997.7	3

3900 rows × 19 columns

localhost:8888/notebooks/rainfall in india.ipynb

In [10]: data.tail(5)

Out[10]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	DEC	ANNUAL	Jan- Feb	Mar- May	Jun- Sep	Oc <sup>-</sup> De
4105	LAKSHADWEEP	2005	17.6	11.1	0.0	37.0	92.8	248.5	378.9	102.4	278.0	164.2	218.3	26.6	1575.4	28.7	129.8	1007.8	409.
4106	LAKSHADWEEP	2006	20.1	0.0	33.0	0.3	327.9	286.9	172.3	150.7	318.5	119.1	158.9	10.9	1598.6	20.1	361.2	928.4	288.
4107	LAKSHADWEEP	2007	2.5	4.2	0.2	22.2	166.2	573.4	427.4	294.7	457.5	256.1	47.6	109.6	2361.6	6.7	188.6	1753.0	413.
4108	LAKSHADWEEP	2008	5.5	19.8	120.7	15.8	180.4	254.6	363.9	206.6	108.9	252.9	67.6	130.1	1726.8	25.3	316.9	934.0	450.
4109	LAKSHADWEEP	2009	4.7	1.5	0.1	18.1	162.1	401.2	266.4	185.0	145.1	87.4	166.2	132.3	1570.1	6.2	180.3	997.7	385.

Out[11]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	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
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
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
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
4105	LAKSHADWEEP	2005	17.6	11.1	0.0	37.0	92.8	248.5	378.9	102.4	278.0	164.2	218.3	26.6
4106	LAKSHADWEEP	2006	20.1	0.0	33.0	0.3	327.9	286.9	172.3	150.7	318.5	119.1	158.9	10.9
4107	LAKSHADWEEP	2007	2.5	4.2	0.2	22.2	166.2	573.4	427.4	294.7	457.5	256.1	47.6	109.6
4108	LAKSHADWEEP	2008	5.5	19.8	120.7	15.8	180.4	254.6	363.9	206.6	108.9	252.9	67.6	130.1
4109	LAKSHADWEEP	2009	4.7	1.5	0.1	18.1	162.1	401.2	266.4	185.0	145.1	87.4	166.2	132.3

3900 rows × 14 columns

```
In [12]: data['SUBDIVISION'].unique()
Out[12]: 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 [13]:
         [(data.SUBDIVISION=="ARUNACHAL PRADESH")]
Out[13]: [0
                   False
                   False
          1
          2
                   False
          3
                   False
          4
                   False
                   . . .
          4105
                   False
          4106
                   False
          4107
                   False
          4108
                   False
          4109
                   False
          Name: SUBDIVISION, Length: 3900, dtype: booll
```

In [14]	data.isna().s	um()
Out[14]	SUBDIVISION	0
	YEAR	0
	JAN	3
	FEB	3
	MAR	6
	APR	4
	MAY	3
	JUN	5
	JUL	7
	AUG	4
	SEP	6
	OCT	7
	NOV	11
	DEC	10
	dtype: int64	

In [15]: data['ANNUAL RAIN']=data.apply(lambda row: row.JAN + row.FEB,axis=1)
data

Out[15]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	DEC	ANNUAL RAIN
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	136.3
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	159.8
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	156.7
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	24.1
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	1.3
4105	LAKSHADWEEP	2005	17.6	11.1	0.0	37.0	92.8	248.5	378.9	102.4	278.0	164.2	218.3	26.6	28.7
4106	LAKSHADWEEP	2006	20.1	0.0	33.0	0.3	327.9	286.9	172.3	150.7	318.5	119.1	158.9	10.9	20.1
4107	LAKSHADWEEP	2007	2.5	4.2	0.2	22.2	166.2	573.4	427.4	294.7	457.5	256.1	47.6	109.6	6.7
4108	LAKSHADWEEP	2008	5.5	19.8	120.7	15.8	180.4	254.6	363.9	206.6	108.9	252.9	67.6	130.1	25.3
4109	LAKSHADWEEP	2009	4.7	1.5	0.1	18.1	162.1	401.2	266.4	185.0	145.1	87.4	166.2	132.3	6.2

3900 rows × 15 columns

In [16]: cor=data.corr()
cor

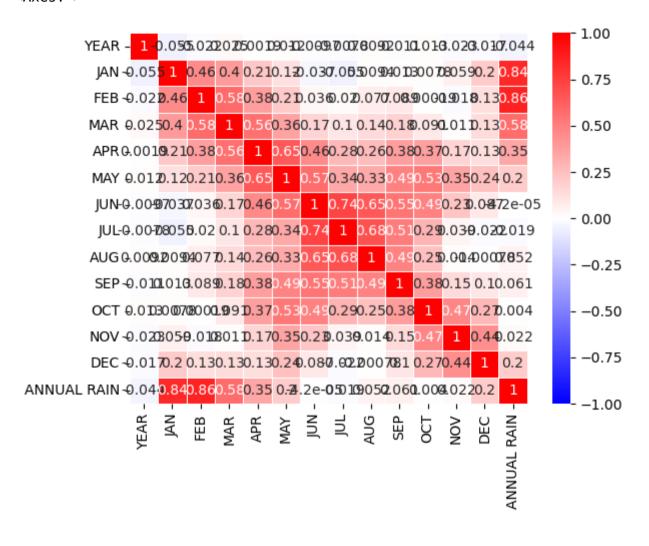
/tmp/ipykernel\_6057/4173678507.py:1: FutureWarning: The default value of numeric\_only in DataFrame.corr is
deprecated. In a future version, it will default to False. Select only valid columns or specify the value o
f numeric\_only to silence this warning.
 cor=data.corr()

## Out[16]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	DEC
YEAR	1.000000	-0.054943	-0.021814	0.024663	0.001913	0.011656	-0.009702	-0.007850	0.009194	-0.011112	0.012884	-0.022893	-0.016688
JAN	-0.054943	1.000000	0.455875	0.396914	0.212725	0.124277	-0.037364	-0.054524	0.009423	0.013421	0.007817	0.059402	0.204835
FEB	-0.021814	0.455875	1.000000	0.582844	0.380745	0.209002	0.035763	0.020171	0.076897	0.088929	0.000194	-0.018420	0.132406
MAR	0.024663	0.396914	0.582844	1.000000	0.557110	0.362911	0.166572	0.100786	0.142062	0.178439	0.090809	0.010802	0.133862
APR	0.001913	0.212725	0.380745	0.557110	1.000000	0.654300	0.458790	0.276126	0.259701	0.381239	0.374406	0.165955	0.132704
MAY	0.011656	0.124277	0.209002	0.362911	0.654300	1.000000	0.571162	0.337946	0.329925	0.489130	0.531166	0.353077	0.242401
JUN	-0.009702	-0.037364	0.035763	0.166572	0.458790	0.571162	1.000000	0.740511	0.653670	0.546800	0.488370	0.228539	0.086661
JUL	-0.007850	-0.054524	0.020171	0.100786	0.276126	0.337946	0.740511	1.000000	0.682643	0.509115	0.294710	0.039455	-0.021688
AUG	0.009194	0.009423	0.076897	0.142062	0.259701	0.329925	0.653670	0.682643	1.000000	0.491390	0.248026	0.014371	-0.000775
SEP	-0.011112	0.013421	0.088929	0.178439	0.381239	0.489130	0.546800	0.509115	0.491390	1.000000	0.382860	0.146776	0.100946
ОСТ	0.012884	0.007817	0.000194	0.090809	0.374406	0.531166	0.488370	0.294710	0.248026	0.382860	1.000000	0.471935	0.273467
NOV	-0.022893	0.059402	-0.018420	0.010802	0.165955	0.353077	0.228539	0.039455	0.014371	0.146776	0.471935	1.000000	0.439804
DEC	-0.016688	0.204835	0.132406	0.133862	0.132704	0.242401	0.086661	-0.021688	-0.000775	0.100946	0.273467	0.439804	1.000000
ANNUAL RAIN	-0.043822	0.843335	0.862754	0.577039	0.350765	0.196634	-0.000042	-0.018607	0.052000	0.061076	0.004041	0.021506	0.196512

localhost:8888/notebooks/rainfall in india.ipynb

```
In [17]: import seaborn as sns
sns.heatmap(cor,vmax=1,vmin=-1,annot=True,linewidths=.5,cmap='bwr')
Out[17]: <Axes: >
```



In [18]: data['SWM']=data.apply(lambda row: row.JUN + row.JUL + row.AUG + row.SEP,axis=1)
 data

Out[18]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ост	NOV	DEC	ANNUAL RAIN	SWM
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	136.3	1696.3
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	159.8	2185.9
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	156.7	1874.0
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	24.1	1977.6
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	1.3	1624.9
4105	LAKSHADWEEP	2005	17.6	11.1	0.0	37.0	92.8	248.5	378.9	102.4	278.0	164.2	218.3	26.6	28.7	1007.8
4106	LAKSHADWEEP	2006	20.1	0.0	33.0	0.3	327.9	286.9	172.3	150.7	318.5	119.1	158.9	10.9	20.1	928.4
4107	LAKSHADWEEP	2007	2.5	4.2	0.2	22.2	166.2	573.4	427.4	294.7	457.5	256.1	47.6	109.6	6.7	1753.0
4108	LAKSHADWEEP	2008	5.5	19.8	120.7	15.8	180.4	254.6	363.9	206.6	108.9	252.9	67.6	130.1	25.3	934.0
4109	LAKSHADWEEP	2009	4.7	1.5	0.1	18.1	162.1	401.2	266.4	185.0	145.1	87.4	166.2	132.3	6.2	997.7

3900 rows × 16 columns

In [19]: data['NEM']=data.apply(lambda row: row.OCT + row.NOV,axis=1)
 data

Out[19]:

SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	DEC	ANNUAL RAIN	SWM	NEM
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	136.3	1696.3	946.7
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	159.8	2185.9	556.2
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	156.7	1874.0	465.6
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	24.1	1977.6	530.9
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	1.3	1624.9	286.1
LAKSHADWEEP	2005	17.6	11.1	0.0	37.0	92.8	248.5	378.9	102.4	278.0	164.2	218.3	26.6	28.7	1007.8	382.5
LAKSHADWEEP	2006	20.1	0.0	33.0	0.3	327.9	286.9	172.3	150.7	318.5	119.1	158.9	10.9	20.1	928.4	278.0
LAKSHADWEEP	2007	2.5	4.2	0.2	22.2	166.2	573.4	427.4	294.7	457.5	256.1	47.6	109.6	6.7	1753.0	303.7
LAKSHADWEEP	2008	5.5	19.8	120.7	15.8	180.4	254.6	363.9	206.6	108.9	252.9	67.6	130.1	25.3	934.0	320.5
LAKSHADWEEP	2009	4.7	1.5	0.1	18.1	162.1	401.2	266.4	185.0	145.1	87.4	166.2	132.3	6.2	997.7	253.6
	ANDAMAN & NICOBAR ISLANDS   LAKSHADWEEP  LAKSHADWEEP  LAKSHADWEEP  LAKSHADWEEP	ANDAMAN & NICOBAR ISLANDS 1901  ANDAMAN & NICOBAR ISLANDS 1902  ANDAMAN & NICOBAR ISLANDS 1903  ANDAMAN & NICOBAR ISLANDS 1904  ANDAMAN & NICOBAR ISLANDS 1905  LAKSHADWEEP 2005  LAKSHADWEEP 2006  LAKSHADWEEP 2007  LAKSHADWEEP 2008	ANDAMAN & NICOBAR ISLANDS 1901 49.2  ANDAMAN & NICOBAR 1902 0.0  ANDAMAN & NICOBAR 1903 12.7  ANDAMAN & NICOBAR 1904 9.4  ANDAMAN & NICOBAR 1905 1.3  ANDAMAN & NICOBAR 1905 1.3  LAKSHADWEEP 2005 17.6  LAKSHADWEEP 2006 20.1  LAKSHADWEEP 2007 2.5  LAKSHADWEEP 2008 5.5	ANDAMAN & NICOBAR ISLANDS 1901 49.2 87.1  ANDAMAN & NICOBAR ISLANDS 1902 0.0 159.8  ANDAMAN & NICOBAR ISLANDS 1903 12.7 144.0  ANDAMAN & NICOBAR ISLANDS 1904 9.4 14.7  ANDAMAN & NICOBAR ISLANDS 1905 1.3 0.0   LAKSHADWEEP 2005 17.6 11.1  LAKSHADWEEP 2006 20.1 0.0  LAKSHADWEEP 2007 2.5 4.2  LAKSHADWEEP 2008 5.5 19.8	ANDAMAN & NICOBAR ISLANDS 1901 49.2 87.1 29.2 ANDAMAN & NICOBAR ISLANDS 1902 0.0 159.8 12.2 ANDAMAN & NICOBAR ISLANDS 1903 12.7 144.0 0.0 ANDAMAN & NICOBAR ISLANDS 1904 9.4 14.7 0.0 ANDAMAN & NICOBAR ISLANDS 1905 1.3 0.0 3.3 ISLANDS ISLANDS 1905 1.3 0.0 3.3 ISLANDS 17.6 11.1 0.0 LAKSHADWEEP 2006 20.1 0.0 33.0 LAKSHADWEEP 2007 2.5 4.2 0.2 LAKSHADWEEP 2008 5.5 19.8 120.7	ANDAMAN & NICOBAR ISLANDS 1901 49.2 87.1 29.2 2.3 ANDAMAN & NICOBAR ISLANDS 1902 0.0 159.8 12.2 0.0 ANDAMAN & NICOBAR ISLANDS 1903 12.7 144.0 0.0 1.0 ANDAMAN & NICOBAR ISLANDS 1904 9.4 14.7 0.0 202.4 ANDAMAN & NICOBAR ISLANDS 1905 1.3 0.0 3.3 26.9 ISLANDS 1905 17.6 11.1 0.0 37.0 LAKSHADWEEP 2006 20.1 0.0 33.0 0.3 LAKSHADWEEP 2007 2.5 4.2 0.2 22.2 LAKSHADWEEP 2008 5.5 19.8 120.7 15.8	ANDAMAN & NICOBAR ISLANDS 1901 49.2 87.1 29.2 2.3 528.8 ANDAMAN & NICOBAR ISLANDS 1902 0.0 159.8 12.2 0.0 446.1 ANDAMAN & NICOBAR ISLANDS 1903 12.7 144.0 0.0 1.0 235.1 ANDAMAN & NICOBAR ISLANDS 1904 9.4 14.7 0.0 202.4 304.5 ANDAMAN & NICOBAR ISLANDS 1905 1.3 0.0 3.3 26.9 279.5 ANDAMAN & NICOBAR ISLANDS 1905 1.3 0.0 3.3 26.9 279.5 LAKSHADWEEP 2005 17.6 11.1 0.0 37.0 92.8 LAKSHADWEEP 2006 20.1 0.0 33.0 0.3 327.9 LAKSHADWEEP 2007 2.5 4.2 0.2 22.2 166.2 LAKSHADWEEP 2008 5.5 19.8 120.7 15.8 180.4	ANDAMAN & NICOBAR ISLANDS 1902 49.2 87.1 29.2 2.3 528.8 517.5  ANDAMAN & NICOBAR ISLANDS 1902 0.0 159.8 12.2 0.0 446.1 537.1 100 100 100 100 100 100 100 100 100 1	ANDAMAN & NICOBAR ISLANDS 1902 49.2 87.1 29.2 2.3 528.8 517.5 365.1 ANDAMAN & NICOBAR ISLANDS 1902 0.0 159.8 12.2 0.0 446.1 537.1 228.9 ANDAMAN & NICOBAR ISLANDS 1903 12.7 144.0 0.0 1.0 235.1 479.9 728.4 ANDAMAN & NICOBAR ISLANDS 1904 9.4 14.7 0.0 202.4 304.5 495.1 502.0 ANDAMAN & NICOBAR ISLANDS 1905 1.3 0.0 3.3 26.9 279.5 628.7 368.7 ANDAMAN & NICOBAR ISLANDS 1905 1.3 0.0 3.3 26.9 279.5 628.7 368.7 ANDAMAN & NICOBAR ISLANDS 1905 1.3 0.0 3.3 26.9 279.5 628.7 368.7 ANDAMAN & NICOBAR ISLANDS 1905 1.3 0.0 37.0 92.8 248.5 378.9 LAKSHADWEEP 2005 17.6 11.1 0.0 37.0 92.8 248.5 378.9 LAKSHADWEEP 2007 2.5 4.2 0.2 22.2 166.2 573.4 427.4 LAKSHADWEEP 2008 5.5 19.8 120.7 15.8 180.4 254.6 363.9	ANDAMAN & NICOBAR ISLANDS 1902 49.2 87.1 29.2 2.3 528.8 517.5 365.1 481.1 ANDAMAN & NICOBAR ISLANDS 1902 120.0 120	ANDAMAN & NICOBAR 1901 49.2 87.1 29.2 2.3 528.8 517.5 365.1 481.1 332.6 ANDAMAN & NICOBAR 1SLANDS 1902 5.0 159.8 12.2 0.0 446.1 537.1 22.9 753.7 666.2 ANDAMAN & NICOBAR 1SLANDS 1903 12.7 144.0 0.0 1.0 235.1 479.9 728.4 326.7 339.0 ANDAMAN & NICOBAR 1SLANDS 1904 9.4 14.7 0.0 202.4 304.5 495.1 502.0 160.1 820.4 ANDAMAN & NICOBAR 1SLANDS 1904 14.7 0.0 202.4 304.5 295.1 502.0 160.1 820.4 ANDAMAN & NICOBAR 1SLANDS 1905 1.3 0.0 3.3 26.9 279.5 628.7 368.7 369.5 297.0 160.1 160	ANDAMAN & NICOBAR ISLANDS 1902 49.2 87.1 29.2 2.3 528.8 517.5 365.1 481.1 332.6 388.5 ANDAMAN & NICOBAR ISLANDS 1902 50.0 159.8 12.2 50.0 446.1 537.1 228.9 753.7 666.2 197.2 50.0 50.0 50.0 50.0 50.0 50.0 50.0 50	ANDAMAN & NICOBAR ISLANDS 1902 49.2 87.1 29.2 2.3 528.8 517.5 365.1 481.1 332.6 388.5 558.2 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 ANDAMAN & NICOBAR ISLANDS 1903 12.7 144.0 0.0 1.0 202.4 304.5 1903 120.4 304.5 1903 120.4 304.7 120.4 304.7 120.4 304.5 12	ANDAMAN & NICOBAR ISLANDS 1902 49.2 87.1 29.2 2.3 528.8 517.5 365.1 481.1 332.6 388.5 558.2 33.6 ANDAMAN & NICOBAR ISLANDS 1903 12.7 144.0 0.0 12.0 12.0 12.0 12.0 12.0 12.0 12.	ANDAMAN & NICOBAR ISLANDS 1901 49.2 87.1 29.2 2.3 52.8 517.5 365.1 481.1 332.6 388.5 558.2 33.6 136.3 ANDAMAN & NICOBAR ISLANDS 1902 0.0 159.8 12.2 0.0 446.1 537.1 228.9 753.7 666.2 197.2 359.0 160.5 159.8 ANDAMAN & NICOBAR ISLANDS 1903 12.7 144.0 0.0 1.0 235.1 479.9 728.4 326.7 339.0 181.2 284.4 225.0 156.7 ANDAMAN & NICOBAR ISLANDS 1904 0.4 14.7 0.0 202.4 304.5 495.1 502.0 160.1 820.4 222.2 308.7 40.1 241.1 ANDAMAN & NICOBAR ISLANDS 1905 1.3 0.0 3.3 26.9 279.5 628.7 368.7 368.7 330.5 297.0 260.7 25.4 344.7 1.3 ANDAMAN & NICOBAR ISLANDS 1905 1.3 0.0 3.3 26.9 279.5 628.7 388.7 389.5 297.0 260.7 25.4 344.7 1.3 ANDAMAN & NICOBAR ISLANDS 1905 1.3 0.0 3.3 26.9 279.5 628.7 389.5 102.4 278.0 164.2 218.3 26.6 28.7 LAKSHADWEEP 2005 17.6 11.1 0.0 33.0 0.3 327.9 286.9 172.3 180.5 190.4 120.5	ANDAMAN & NICOBAR ISLANDS 1902 0.0 159.8 12.2 20.0 25.3 52.8 517.5 365.1 26.0 26.0 26.0 26.0 26.0 26.0 26.0 26.0

3900 rows × 17 columns

In [20]: cor=data.corr()
cor

/tmp/ipykernel\_6057/4173678507.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=data.corr()

## Out[20]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	DEC
YEAR	1.000000	-0.054943	-0.021814	0.024663	0.001913	0.011656	-0.009702	-0.007850	0.009194	-0.011112	0.012884	-0.022893	-0.016688
JAN	-0.054943	1.000000	0.455875	0.396914	0.212725	0.124277	-0.037364	-0.054524	0.009423	0.013421	0.007817	0.059402	0.204835
FEB	-0.021814	0.455875	1.000000	0.582844	0.380745	0.209002	0.035763	0.020171	0.076897	0.088929	0.000194	-0.018420	0.132406
MAR	0.024663	0.396914	0.582844	1.000000	0.557110	0.362911	0.166572	0.100786	0.142062	0.178439	0.090809	0.010802	0.133862
APR	0.001913	0.212725	0.380745	0.557110	1.000000	0.654300	0.458790	0.276126	0.259701	0.381239	0.374406	0.165955	0.132704
MAY	0.011656	0.124277	0.209002	0.362911	0.654300	1.000000	0.571162	0.337946	0.329925	0.489130	0.531166	0.353077	0.242401
JUN	-0.009702	-0.037364	0.035763	0.166572	0.458790	0.571162	1.000000	0.740511	0.653670	0.546800	0.488370	0.228539	0.086661
JUL	-0.007850	-0.054524	0.020171	0.100786	0.276126	0.337946	0.740511	1.000000	0.682643	0.509115	0.294710	0.039455	-0.021688
AUG	0.009194	0.009423	0.076897	0.142062	0.259701	0.329925	0.653670	0.682643	1.000000	0.491390	0.248026	0.014371	-0.000775
SEP	-0.011112	0.013421	0.088929	0.178439	0.381239	0.489130	0.546800	0.509115	0.491390	1.000000	0.382860	0.146776	0.100946
ОСТ	0.012884	0.007817	0.000194	0.090809	0.374406	0.531166	0.488370	0.294710	0.248026	0.382860	1.000000	0.471935	0.273467
NOV	-0.022893	0.059402	-0.018420	0.010802	0.165955	0.353077	0.228539	0.039455	0.014371	0.146776	0.471935	1.000000	0.439804
DEC	-0.016688	0.204835	0.132406	0.133862	0.132704	0.242401	0.086661	-0.021688	-0.000775	0.100946	0.273467	0.439804	1.000000
ANNUAL RAIN	-0.043822	0.843335	0.862754	0.577039	0.350765	0.196634	-0.000042	-0.018607	0.052000	0.061076	0.004041	0.021506	0.196512
SWM	-0.005001	-0.027833	0.056244	0.165630	0.399782	0.499693	0.893689	0.907044	0.838638	0.698207	0.413606	0.122769	0.038595
NEM	-0.001738	0.033729	-0.008462	0.067830	0.335680	0.531871	0.443082	0.221070	0.176459	0.332487	0.909983	0.795018	0.395008

localhost:8888/notebooks/rainfall in india.ipynb

In [21]: import seaborn as sns

```
sns.heatmap(cor,vmax=1,vmin=-1,annot=True,linewidths=.5,cmap='bwr')
Out[21]: <Axes: >
                                                                                                      1.00
                                   . 0 -50.50 2020 (2.50 0 0.59 0 20 <del>0</del>0 90 0 7080 920 0 10 10 10 0 -2030 -1070 404 9 0.50 0 1 7
                         JAN-9.05 1 0.460.40.2 10.1-12.0-207005 100 9.40 0.20 07.20 5 20.2 0.8-10.0 1280 34
                                                                                                     - 0.75
                         FEB-9.020246 1 0.50.380.20.036.02.070708990001.9108130.80.0660085
                        MAR 0.0250.40.58 1 0.5 0.360.170.10.140.16.0901010.130.5 0.10.068
                                                                                                     - 0.50
                         APR0-00109210.380.56
                                               1 0.650.460.280.260.380.370.170.130.350.40.34
                         MAY 0.010.120.210.30.65 1 0.5 0.340.330.440.5 0.350.240.2 0.50.53
                                                                                                     - 0.25
                         JUNO.009.0007036.170.40.57 1 0.740.650.550.450.26.08.2e-0.850.44
                         JULO-0907.80505.020.10.280.340.74 1 0.680.5 0.29.03090-202010.9 0.22
                                                                                                     - 0.00
                        AUG0-00092094970.140.260.310.650.68 1 0.450.26.601400070850.840.18
                         SEP-0.0010108089.180.380.490.530.510.49
                                                                   1 0.380.150.10.0610.70.33
                                                                                                      -0.25
                         OCT 0.00300.7080001990.370.530.490.290.250.38 1
                                                                            4 0.20.004.410.91
                        NOV-9.0230509028010.170.350.26.0309014.150.47 1 0.44.020.120.8
                                                                                                       -0.50
                        DEC-9.0170.20.130.130.130.24.0807.002020007081.0.270.44 1 0.20.0390.4
              ANNUAL RAIN-9.040.840.860.550.350-42.2e-00.61090.5020.6010.00402.20.2
                                                                                                     - -0.75
                        SWM-9.0-0050208056.170.4
                        NEMO-000.0/840008668.340
                                                      0.440.220.180.330.910.8 0.40.016.34 1
                                                                                                      -1.00
                                                       \overline{\mathbb{N}}
                                                          亘
                                                               AUG
                                                   MAY
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In [ ]:

ANNUAL