In [34]:
```
import pandas as pd
```

In [35]:
```
data=pd.read_csv("/home/placement/Downloads/rainfall in india 1901-2015.csv")
```

In [36]:
```
data.describe()
```

Out[36]:

	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.(
mean	1958.218659	18.957320	21.805325	27.359197	43.127432	85.745417	230.234444	347.214334	290.263497	197.361922	95.5
std	33.140898	33.585371	35.909488	46.959424	67.831168	123.234904	234.710758	269.539667	188.770477	135.408345	99.5
min	1901.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.400000	0.000000	0.000000	0.100000	0.(
25%	1930.000000	0.600000	0.600000	1.000000	3.000000	8.600000	70.350000	175.600000	155.975000	100.525000	14.(
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	948.3

In [37]:
```
data.head(10)
```

Out[37]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	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	629.0
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

In [38]:
```
data1=data.groupby(['SUBDIVISION']).count()
```

In [39]:
```
data1
```

Out[39]:

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

SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	Jan-Feb	Mar-May	Jun-Sep	Oct-Dec
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 [40]:
```
data1=data.loc[(data.YEAR)>=2010]
```

In [41]:
```
data1
```

Out[41]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	Jan-Feb	Mar-May	Jun-Sep	
104	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
105	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
106	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
107	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
108	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
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
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	1533.7	7.9	196.2	1013.0	3
4112	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
4113	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
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	1395.0	69.3	76.7	958.5	2
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	1642.9	2.7	223.9	860.9	5

216 rows × 19 columns

In [42]:
```
data.tail()
```

Out[42]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	Jan-Feb	Mar-May	Jun-Sep	Oct Dec
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	1533.7	7.9	196.2	1013.0	316.6
4112	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	167.1
4113	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	177.6
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	1395.0	69.3	76.7	958.5	290.5
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	1642.9	2.7	223.9	860.9	555.4

In [43]:
```
data1=data.drop(['ANNUAL','Jan-Feb','Mar-May','Jun-Sep','Oct-Dec'],axis=1)
data1
```

Out[43]:

	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
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
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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	76.8	21.2	327.0	231.5	381.2	179.8	145.9	12.4	8.8
4113	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
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

In [44]:
```
data1['SUBDIVISION'].unique()
```

Out[44]:
```
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 [45]:
```
data2=data1.loc[(data1.SUBDIVISION =="ARUNACHAL PRADESH")]
```

In [46]:
```
data2
```

Out[46]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	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 [47]:
```
data2=data1.loc[(data1.SUBDIVISION =="WEST UTTAR PRADESH")]
```

In [48]:
```
data2
```

Out[48]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1127	WEST UTTAR PRADESH	1901	51.4	25.6	9.5	0.7	5.6	23.8	201.9	374.3	67.7	7.6	0.0	7.9
1128	WEST UTTAR PRADESH	1902	4.6	4.6	0.6	4.8	7.2	54.5	325.9	180.6	143.1	9.6	0.9	0.2
1129	WEST UTTAR PRADESH	1903	13.4	0.4	1.2	0.0	8.2	32.7	145.4	279.1	150.4	177.3	0.0	0.4
1130	WEST UTTAR PRADESH	1904	6.3	2.0	29.7	0.4	24.8	68.5	358.8	311.1	97.1	2.7	15.7	28.2
1131	WEST UTTAR PRADESH	1905	32.3	26.6	14.8	3.6	7.1	18.9	139.8	95.0	92.2	0.2	0.0	2.9
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1237	WEST UTTAR PRADESH	2011	2.1	10.4	3.9	2.8	29.6	175.9	215.9	232.3	101.7	0.7	0.5	1.5
1238	WEST UTTAR PRADESH	2012	14.5	0.1	1.4	4.7	0.3	4.0	145.1	149.1	67.8	0.5	0.1	2.0
1239	WEST UTTAR PRADESH	2013	20.4	69.5	3.5	1.6	2.1	190.6	233.9	287.1	52.2	61.2	1.7	8.9
1240	WEST UTTAR PRADESH	2014	48.3	29.4	22.6	5.3	11.0	22.0	151.6	81.0	84.7	14.6	0.0	16.3
1241	WEST UTTAR PRADESH	2015	31.6	7.2	66.8	21.0	8.1	72.0	194.2	143.5	26.5	6.9	2.0	3.0

115 rows × 14 columns

In [49]:
```
data2['ANNUAL RAIN']=data2.apply(lambda row: row.JAN+row.FEB,axis=1)
data2
```

```
/tmp/ipykernel_4206/2051294129.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[49]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL RAIN
1127	WEST UTTAR PRADESH	1901	51.4	25.6	9.5	0.7	5.6	23.8	201.9	374.3	67.7	7.6	0.0	7.9	77.0
1128	WEST UTTAR PRADESH	1902	4.6	4.6	0.6	4.8	7.2	54.5	325.9	180.6	143.1	9.6	0.9	0.2	9.2
1129	WEST UTTAR PRADESH	1903	13.4	0.4	1.2	0.0	8.2	32.7	145.4	279.1	150.4	177.3	0.0	0.4	13.8
1130	WEST UTTAR PRADESH	1904	6.3	2.0	29.7	0.4	24.8	68.5	358.8	311.1	97.1	2.7	15.7	28.2	8.3
1131	WEST UTTAR PRADESH	1905	32.3	26.6	14.8	3.6	7.1	18.9	139.8	95.0	92.2	0.2	0.0	2.9	58.9
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1237	WEST UTTAR PRADESH	2011	2.1	10.4	3.9	2.8	29.6	175.9	215.9	232.3	101.7	0.7	0.5	1.5	12.5
1238	WEST UTTAR PRADESH	2012	14.5	0.1	1.4	4.7	0.3	4.0	145.1	149.1	67.8	0.5	0.1	2.0	14.6
1239	WEST UTTAR PRADESH	2013	20.4	69.5	3.5	1.6	2.1	190.6	233.9	287.1	52.2	61.2	1.7	8.9	89.9
1240	WEST UTTAR PRADESH	2014	48.3	29.4	22.6	5.3	11.0	22.0	151.6	81.0	84.7	14.6	0.0	16.3	77.7
1241	WEST UTTAR PRADESH	2015	31.6	7.2	66.8	21.0	8.1	72.0	194.2	143.5	26.5	6.9	2.0	3.0	38.8

115 rows × 15 columns

In [50]:
```
cor=data2.corr()
cor
```

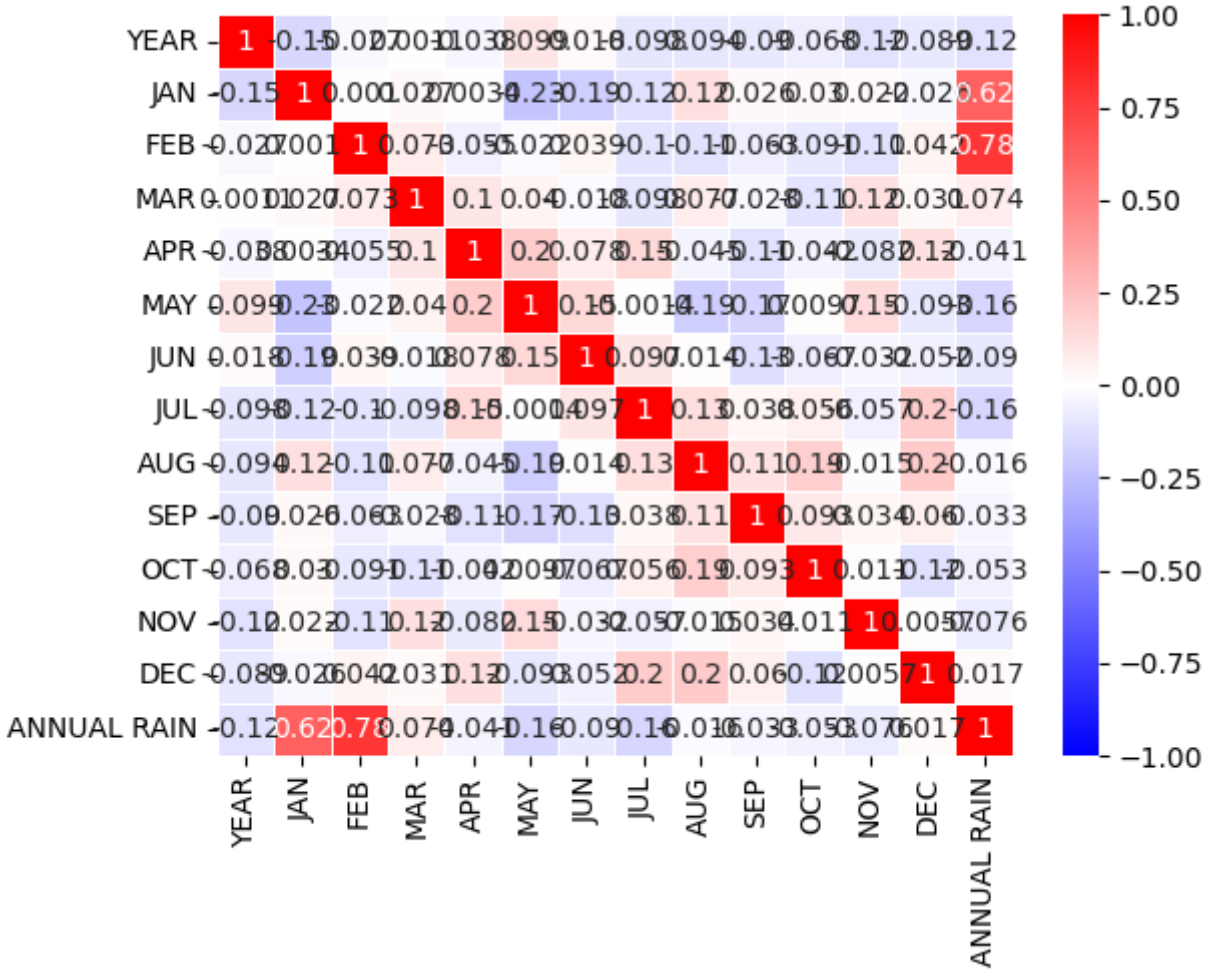
```
/tmp/ipykernel_4206/3832707278.py:1: FutureWarning: The default value of numeric_only in DataFrame.corr is
deprecated. In a future version, it will default to False. Select only valid columns or specify the value o
f numeric_only to silence this warning.
  cor=data2.corr()
```

Out[50]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	D
YEAR	1.000000	-0.151477	-0.027154	0.001077	-0.037929	0.098737	0.017675	-0.097726	-0.094312	-0.090260	-0.067663	-0.116877	-0.088
JAN	-0.151477	1.000000	0.000998	0.026757	0.003411	-0.233214	-0.194359	-0.124483	0.119128	0.026497	0.029876	0.021611	-0.025
FEB	-0.027154	0.000998	1.000000	0.072981	-0.055467	-0.021976	0.038536	-0.103138	-0.114651	-0.062933	-0.091443	-0.114629	0.042
MAR	0.001077	0.026757	0.072981	1.000000	0.100221	0.040063	-0.018415	-0.097884	0.076997	-0.027844	-0.107434	0.117782	0.031
APR	-0.037929	0.003411	-0.055467	0.100221	1.000000	0.198381	0.077597	0.148862	-0.044934	-0.109566	-0.041652	-0.081692	0.121
MAY	0.098737	-0.233214	-0.021976	0.040063	0.198381	1.000000	0.151575	-0.001401	-0.189047	-0.171479	0.009665	0.147860	-0.092
JUN	0.017675	-0.194359	0.038536	-0.018415	0.077597	0.151575	1.000000	0.097256	0.014149	-0.125302	-0.067454	-0.031963	-0.051
JUL	-0.097726	-0.124483	-0.103138	-0.097884	0.148862	-0.001401	0.097256	1.000000	0.131602	0.037997	0.055548	-0.057425	0.202
AUG	-0.094312	0.119128	-0.114651	0.076997	-0.044934	-0.189047	0.014149	0.131602	1.000000	0.112312	0.193332	-0.014765	0.204
SEP	-0.090260	0.026497	-0.062933	-0.027844	-0.109566	-0.171479	-0.125302	0.037997	0.112312	1.000000	0.093080	0.034118	0.059
OCT	-0.067663	0.029876	-0.091443	-0.107434	-0.041652	0.009665	-0.067454	0.055548	0.193332	0.093080	1.000000	0.010648	-0.120
NOV	-0.116877	0.021611	-0.114629	0.117782	-0.081692	0.147860	-0.031963	-0.057425	-0.014765	0.034118	0.010648	1.000000	0.005
DEC	-0.088781	-0.025909	0.042421	0.031215	0.121188	-0.092974	-0.051552	0.202466	0.204356	0.059919	-0.120363	0.005679	1.000
ANNUAL RAIN	-0.115193	0.620695	0.784671	0.073808	-0.041374	-0.161803	-0.090272	-0.158035	-0.016044	-0.032917	-0.053176	-0.076479	0.017

In [51]:
```
import seaborn as sns
sns.heatmap(cor,vmax=1,vmin=-1,annot=True,linewidth=.5,cmap='bwr')
```

Out[51]: <Axes: >



In [52]:
```
data2['NEM']=data2.apply(lambda row: row.OCT + row.NOV + row.DEC,axis=1)
```

```
/tmp/ipykernel_4206/2857767736.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['NEM']=data2.apply(lambda row: row.OCT + row.NOV + row.DEC,axis=1)
```

In [53]:
```
data2
```

Out[53]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL RAIN	NEM
1127	WEST UTTAR PRADESH	1901	51.4	25.6	9.5	0.7	5.6	23.8	201.9	374.3	67.7	7.6	0.0	7.9	77.0	15.5
1128	WEST UTTAR PRADESH	1902	4.6	4.6	0.6	4.8	7.2	54.5	325.9	180.6	143.1	9.6	0.9	0.2	9.2	10.7
1129	WEST UTTAR PRADESH	1903	13.4	0.4	1.2	0.0	8.2	32.7	145.4	279.1	150.4	177.3	0.0	0.4	13.8	177.7
1130	WEST UTTAR PRADESH	1904	6.3	2.0	29.7	0.4	24.8	68.5	358.8	311.1	97.1	2.7	15.7	28.2	8.3	46.6
1131	WEST UTTAR PRADESH	1905	32.3	26.6	14.8	3.6	7.1	18.9	139.8	95.0	92.2	0.2	0.0	2.9	58.9	3.1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1237	WEST UTTAR PRADESH	2011	2.1	10.4	3.9	2.8	29.6	175.9	215.9	232.3	101.7	0.7	0.5	1.5	12.5	2.7
1238	WEST UTTAR PRADESH	2012	14.5	0.1	1.4	4.7	0.3	4.0	145.1	149.1	67.8	0.5	0.1	2.0	14.6	2.6
1239	WEST UTTAR PRADESH	2013	20.4	69.5	3.5	1.6	2.1	190.6	233.9	287.1	52.2	61.2	1.7	8.9	89.9	71.8
1240	WEST UTTAR PRADESH	2014	48.3	29.4	22.6	5.3	11.0	22.0	151.6	81.0	84.7	14.6	0.0	16.3	77.7	30.9
1241	WEST UTTAR PRADESH	2015	31.6	7.2	66.8	21.0	8.1	72.0	194.2	143.5	26.5	6.9	2.0	3.0	38.8	11.9

115 rows × 16 columns

In [54]:
```
cor=data2.corr()
cor
```

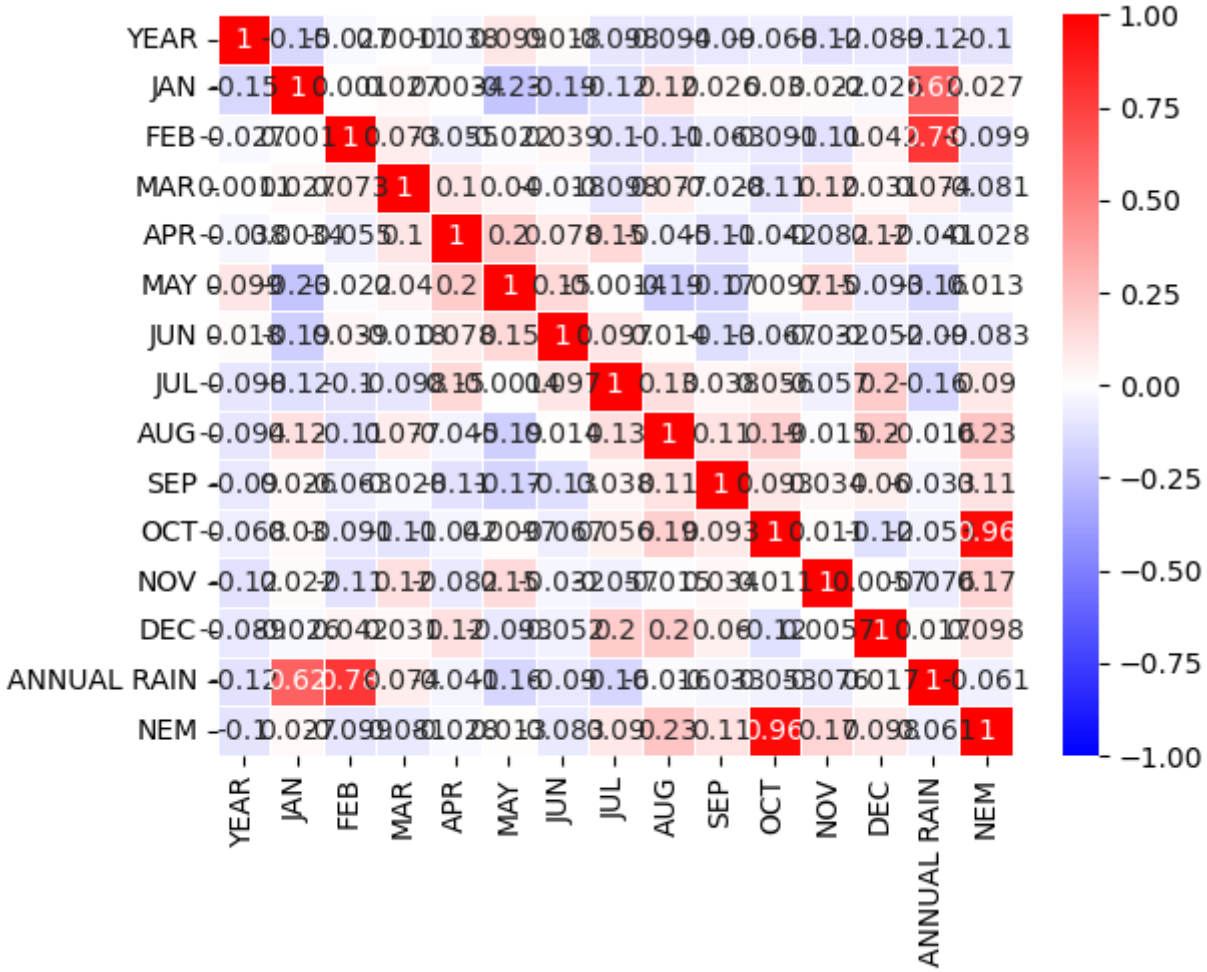
```
/tmp/ipykernel_4206/3832707278.py:1: FutureWarning: The default value of numeric_only in DataFrame.corr is
deprecated. In a future version, it will default to False. Select only valid columns or specify the value o
f numeric_only to silence this warning.
  cor=data2.corr()
```

Out[54]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	D
YEAR	1.000000	-0.151477	-0.027154	0.001077	-0.037929	0.098737	0.017675	-0.097726	-0.094312	-0.090260	-0.067663	-0.116877	-0.088
JAN	-0.151477	1.000000	0.000998	0.026757	0.003411	-0.233214	-0.194359	-0.124483	0.119128	0.026497	0.029876	0.021611	-0.025
FEB	-0.027154	0.000998	1.000000	0.072981	-0.055467	-0.021976	0.038536	-0.103138	-0.114651	-0.062933	-0.091443	-0.114629	0.042
MAR	0.001077	0.026757	0.072981	1.000000	0.100221	0.040063	-0.018415	-0.097884	0.076997	-0.027844	-0.107434	0.117782	0.031
APR	-0.037929	0.003411	-0.055467	0.100221	1.000000	0.198381	0.077597	0.148862	-0.044934	-0.109566	-0.041652	-0.081692	0.121
MAY	0.098737	-0.233214	-0.021976	0.040063	0.198381	1.000000	0.151575	-0.001401	-0.189047	-0.171479	0.009665	0.147860	-0.092
JUN	0.017675	-0.194359	0.038536	-0.018415	0.077597	0.151575	1.000000	0.097256	0.014149	-0.125302	-0.067454	-0.031963	-0.051
JUL	-0.097726	-0.124483	-0.103138	-0.097884	0.148862	-0.001401	0.097256	1.000000	0.131602	0.037997	0.055548	-0.057425	0.202
AUG	-0.094312	0.119128	-0.114651	0.076997	-0.044934	-0.189047	0.014149	0.131602	1.000000	0.112312	0.193332	-0.014765	0.204
SEP	-0.090260	0.026497	-0.062933	-0.027844	-0.109566	-0.171479	-0.125302	0.037997	0.112312	1.000000	0.093080	0.034118	0.059
OCT	-0.067663	0.029876	-0.091443	-0.107434	-0.041652	0.009665	-0.067454	0.055548	0.193332	0.093080	1.000000	0.010648	-0.120
NOV	-0.116877	0.021611	-0.114629	0.117782	-0.081692	0.147860	-0.031963	-0.057425	-0.014765	0.034118	0.010648	1.000000	0.005
DEC	-0.088781	-0.025909	0.042421	0.031215	0.121188	-0.092974	-0.051552	0.202466	0.204356	0.059919	-0.120363	0.005679	1.000
ANNUAL RAIN	-0.115193	0.620695	0.784671	0.073808	-0.041374	-0.161803	-0.090272	-0.158035	-0.016044	-0.032917	-0.053176	-0.076479	0.017
NEM	-0.104621	0.027341	-0.099371	-0.080637	-0.027915	0.012944	-0.082860	0.089533	0.232820	0.110325	0.963395	0.170742	0.098

In [55]:
```
import seaborn as sns
sns.heatmap(cor,vmax=1,vmin=-1,annot=True,linewidth=.5,cmap='bwr')
```

Out[55]: <Axes: >



In [ ]: