

```
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	
count	4116.000000	4112.000000	4113.000000	4110.000000	4112.000000	4113.000000	4111.000000	4109.000000	4112.000000	4110.000000
mean	1958.218659	18.957320	21.805325	27.359197	43.127432	85.745417	230.234444	347.214334	290.263497	197.365417
std	33.140898	33.585371	35.909488	46.959424	67.831168	123.234904	234.710758	269.539667	188.770477	135.408980
min	1901.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.400000	0.000000	0.000000	0.100000
25%	1930.000000	0.600000	0.600000	1.000000	3.000000	8.600000	70.350000	175.600000	155.975000	100.520000
50%	1958.000000	6.000000	6.700000	7.800000	15.700000	36.600000	138.700000	284.800000	259.400000	173.900000
75%	1987.000000	22.200000	26.800000	31.300000	49.950000	97.200000	305.150000	418.400000	377.800000	265.800000
max	2015.000000	583.700000	403.500000	605.600000	595.100000	1168.600000	1609.900000	2362.800000	1664.600000	1222.000000

```
In [4]: data.head(10)
```

Out[4]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	Jan-Feb	Mar-May	Ju Se
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
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
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
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
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
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
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
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
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
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

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

```
In [6]: data.isna().sum()
```

```
Out[6]: SUBDIVISION    0  
        YEAR          0  
        JAN           4  
        FEB           3  
        MAR           6  
        APR           4  
        MAY           3  
        JUN           5  
        JUL           7  
        AUG           4  
        SEP           6  
        OCT           7  
        NOV          11  
        DEC           10  
        ANNUAL        26  
        Jan-Feb        6  
        Mar-May        9  
        Jun-Sep        10  
        Oct-Dec        13  
        dtype: int64
```

```
In [7]: data1=data.groupby(['SUBDIVISION']).count()  
data1
```

Out[7]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	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
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

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	Jan- Feb	Mar- May	Jun- Sep	Oct- Dec
SUBDIVISION																		
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
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

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	Jan-Feb	Mar-May	Jun-Sep	Oct-Dec
SUBDIVISION																		
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 [8]: data.isna().sum()
```

```
Out[8]: SUBDIVISION      0
YEAR                    0
JAN                     4
FEB                     3
MAR                     6
APR                     4
MAY                     3
JUN                     5
JUL                     7
AUG                     4
SEP                     6
OCT                     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)]
```

```
In [10]: data
```

```
Out[10]:
```

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	Jan-Feb	Mar-May
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
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
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
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
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
...
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
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
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
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
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

3900 rows × 19 columns

```
In [11]: data.tail(5)
```


Out[11]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	Jan-Feb	Mar-May	Jun-Sep	Oct-Dec
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	100.0	100.0
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	90.0	90.0
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	170.0	170.0
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	1726.8	25.3	316.9	90.0	90.0
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	1570.1	6.2	180.3	90.0	90.0

```
In [12]: data=data.drop(['ANNUAL','Jan-Feb','Mar-May','Jun-Sep','Oct-Dec'],axis=1)
data
```

Out[12]:

	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
...
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 [13]: data['SUBDIVISION'].unique()
```

```
Out[13]: 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 [14]: [(data.SUBDIVISION=="ARUNACHAL PRADESH")]
```

```
Out[14]: [0      False
          1      False
          2      False
          3      False
          4      False
          ...
         4105    False
         4106    False
         4107    False
         4108    False
         4109    False
          Name: SUBDIVISION, Length: 3900, dtype: bool]
```

```
In [15]: data.isna().sum()
```

```
Out[15]: 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 [16]: data['ANNUAL RAIN']=data.apply(lambda row: row.JAN + row.FEB,axis=1)  
data
```

Out[16]:

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

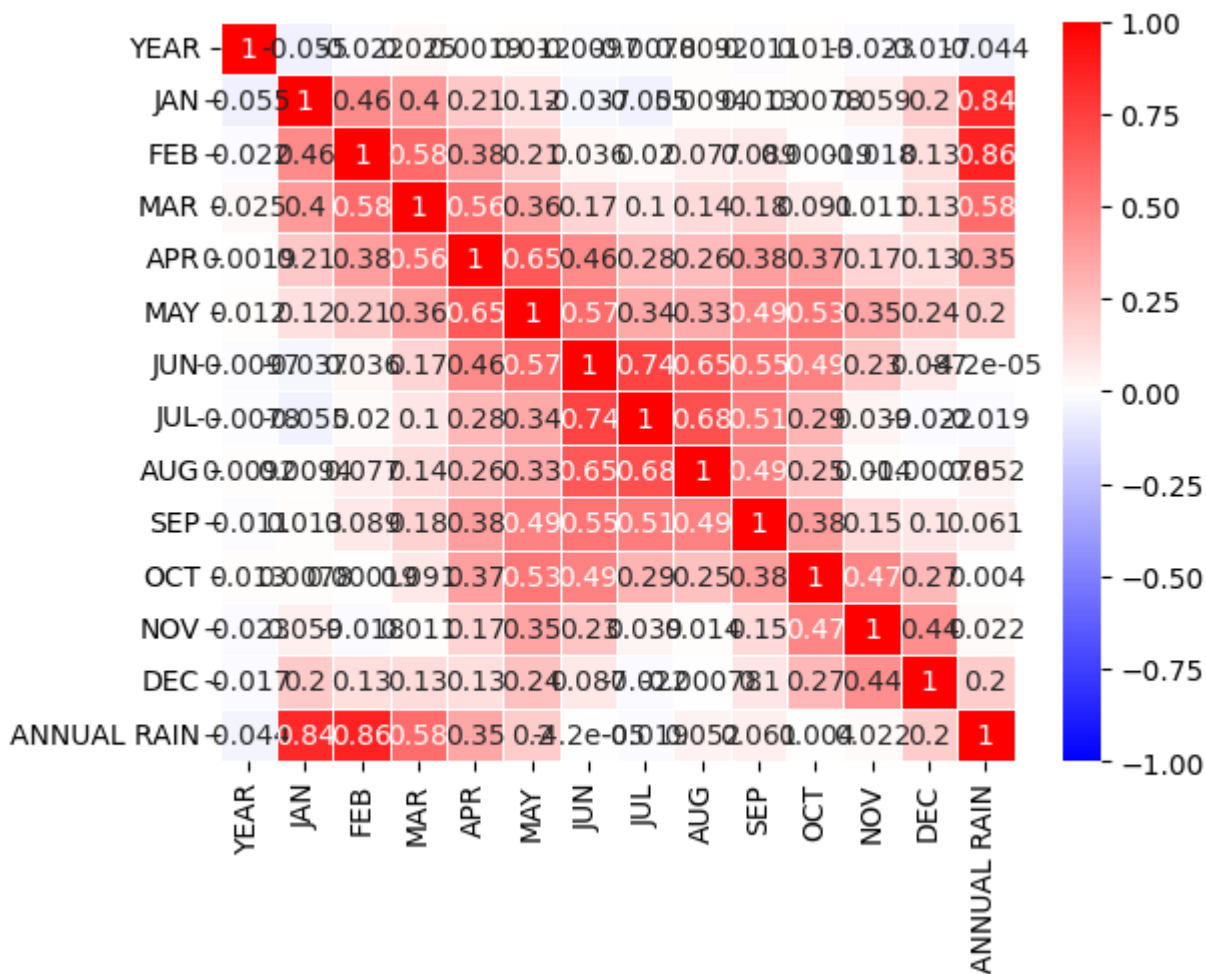
In [17]: `data1 = data.drop(['SUBDIVISION'],axis=1)`In [18]: `cor = data1.corr()
cor`

Out[18]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
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
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
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
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
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
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
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
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
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
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
OCT	0.012884	0.007817	0.000194	0.090809	0.374406	0.531166	0.488370	0.294710	0.248026	0.382860	1.000000	0.471935
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
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
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

```
In [24]: import seaborn as sns
sns.heatmap(cor,vmax=1,vmin=-1,annot=True,linewidth=.5,cmap='bwr')
```

Out[24]: <Axes: >



```
In [20]: data['SWM'] = data.apply(lambda row: row.JUN + row.JUL + row.SEP,axis = 1)
data
```

Out[20]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	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	1215.2
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	1432.2
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	1547.3
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	1817.5
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	1.3	1294.4
...
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	905.4
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	20.1	777.7
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	1458.3
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	727.4
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	6.2	812.7

3900 rows × 16 columns

```
In [21]: data['NEM']=data.apply(lambda row: row.OCT+row.NOV,axis=1)
data
```

Out[21]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL RAIN	SWM	NEM
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	1215.2	946.7
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	1432.2	556.2
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	1547.3	465.6
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	24.1	1817.5	530.9
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	1294.4	286.1
...
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	905.4	382.5
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	777.7	278.0
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	1458.3	303.7
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	727.4	320.5
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	812.7	253.6

3900 rows × 17 columns

In [22]:

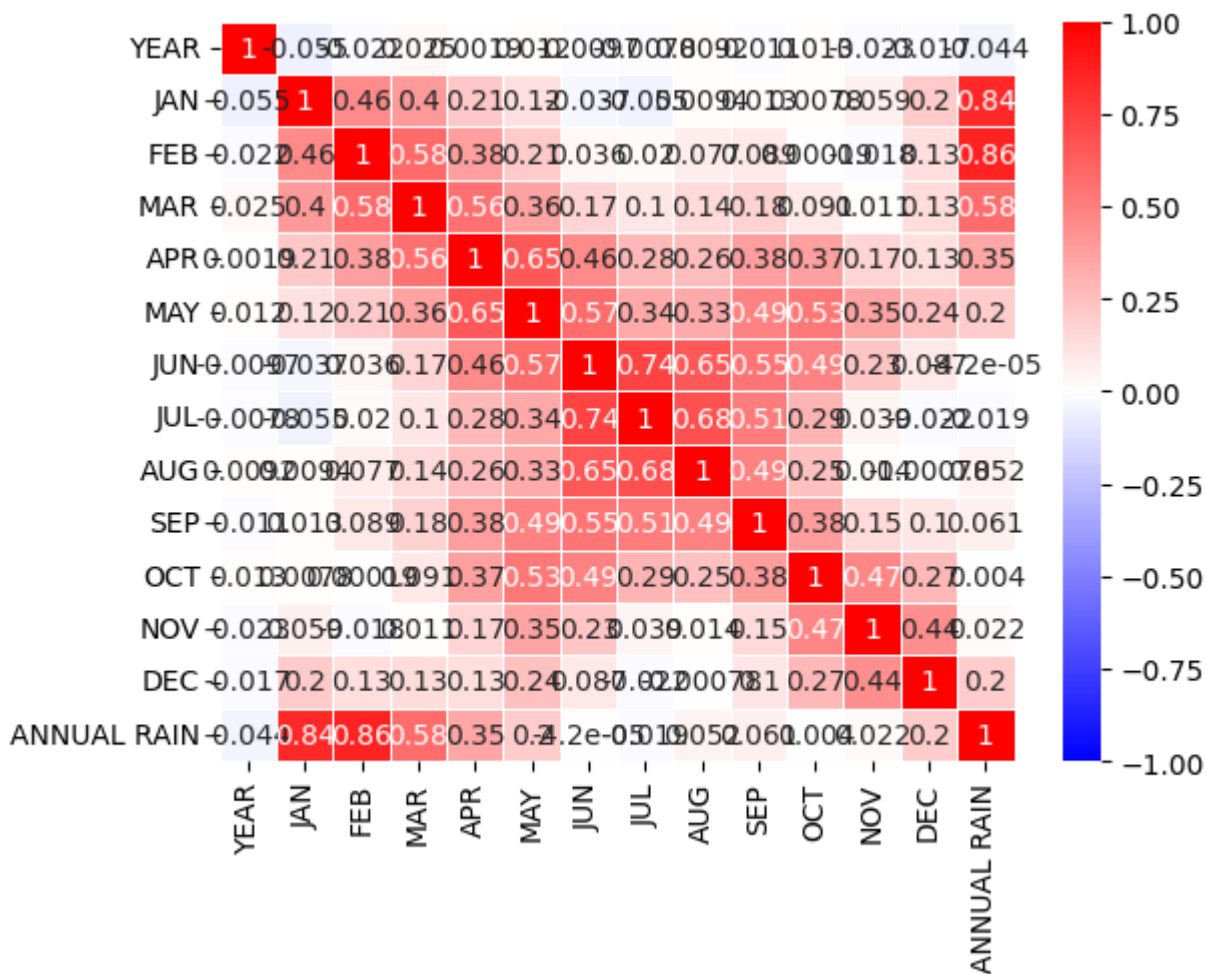
```
cor= data1.corr()  
cor
```


Out[22]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
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
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
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
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
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
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
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
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
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
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
OCT	0.012884	0.007817	0.000194	0.090809	0.374406	0.531166	0.488370	0.294710	0.248026	0.382860	1.000000	0.471935
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
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
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

```
In [23]: import seaborn as sns
sns.heatmap(cor,vmax=1,vmin=-1,annot=True,linewidth=.5,cmap='bwr')
```

Out[23]: <Axes: >



In []: