In [2]:
```
import pandas as pd
```

In [3]:
```
data=pd.read_csv("/home/placement/Downloads/arunachal.csv")#read csv file
```

In [4]:
```
data.describe()
```

Out[4]:

	Unnamed: 0	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
count	91.00000	91.000000	90.000000	90.000000	89.000000	91.000000	91.000000	90.000000	90.000000	91.000000	91.000000
mean	155.00000	1962.747253	48.598889	93.966667	154.446067	262.990110	364.651648	659.556667	711.963333	502.163736	433.273626
std	26.41338	27.695003	34.687078	46.258375	87.918484	113.395773	181.095447	311.642230	356.372598	275.716730	204.991358
min	110.00000	1916.000000	1.800000	6.100000	28.500000	94.700000	101.800000	239.400000	233.000000	172.400000	152.500000
25%	132.50000	1938.500000	20.075000	65.625000	101.700000	180.600000	237.150000	425.675000	442.150000	301.100000	282.150000
50%	155.00000	1964.000000	45.400000	87.600000	141.700000	245.400000	314.600000	545.750000	613.000000	411.600000	384.300000
75%	177.50000	1986.500000	65.150000	120.400000	189.600000	335.300000	447.050000	840.400000	922.075000	669.200000	521.150000
max	200.00000	2009.000000	164.500000	208.500000	605.600000	595.100000	1168.600000	1609.900000	2362.800000	1664.600000	1222.000000

In [5]:
```
data.info()#data present in csv file and null values
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 91 entries, 0 to 90
Data columns (total 20 columns):
 #   Column       Non-Null Count  Dtype  
---  ------       --------------  -----  
 0   Unnamed: 0   91 non-null     int64  
 1   SUBDIVISION  91 non-null     object 
 2   YEAR         91 non-null     int64  
 3   JAN          90 non-null     float64
 4   FEB          90 non-null     float64
 5   MAR          89 non-null     float64
 6   APR          91 non-null     float64
 7   MAY          91 non-null     float64
 8   JUN          90 non-null     float64
 9   JUL          90 non-null     float64
 10  AUG          91 non-null     float64
 11  SEP          91 non-null     float64
 12  OCT          89 non-null     float64
 13  NOV          89 non-null     float64
 14  DEC          89 non-null     float64
 15  ANNUAL       85 non-null     float64
 16  Jan-Feb      90 non-null     float64
 17  Mar-May      89 non-null     float64
 18  Jun-Sep      89 non-null     float64
 19  Oct-Dec      88 non-null     float64
dtypes: float64(17), int64(2), object(1)
memory usage: 14.3+ KB
```

In [6]:
```
data.tail()#display top 5 rows default
```

Out[6]:

	Unnamed: 0	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	Jan-Feb	Mar-May	J S
86	196	ARUNACHAL PRADESH	2005	48.4	167.6	229.5	195.3	179.8	269.3	430.8	400.0	243.6	139.3	28.6	3.3	2335.5	216.0	604.6	134
87	197	ARUNACHAL PRADESH	2006	6.0	103.7	63.3	202.7	321.7	520.4	382.2	227.6	263.2	77.2	69.7	21.7	2259.6	109.7	587.7	139
88	198	ARUNACHAL PRADESH	2007	13.4	97.4	48.1	292.4	250.4	530.2	761.0	364.6	529.3	102.6	24.3	6.9	3020.7	110.8	590.9	218
89	199	ARUNACHAL PRADESH	2008	76.7	39.7	122.6	192.4	185.0	423.6	456.1	439.3	189.7	115.1	1.7	2.6	2244.4	116.4	499.9	150
90	200	ARUNACHAL PRADESH	2009	18.0	92.8	72.1	132.7	189.9	259.1	329.9	370.3	152.5	82.9	33.9	15.9	1749.9	110.8	394.7	111

In [7]:
```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 91 entries, 0 to 90
Data columns (total 20 columns):
 #   Column       Non-Null Count  Dtype  
---  ------       --------------  -----  
 0   Unnamed: 0   91 non-null     int64  
 1   SUBDIVISION  91 non-null     object 
 2   YEAR         91 non-null     int64  
 3   JAN          90 non-null     float64
 4   FEB          90 non-null     float64
 5   MAR          89 non-null     float64
 6   APR          91 non-null     float64
 7   MAY          91 non-null     float64
 8   JUN          90 non-null     float64
 9   JUL          90 non-null     float64
 10  AUG          91 non-null     float64
 11  SEP          91 non-null     float64
 12  OCT          89 non-null     float64
 13  NOV          89 non-null     float64
 14  DEC          89 non-null     float64
 15  ANNUAL       85 non-null     float64
 16  Jan-Feb      90 non-null     float64
 17  Mar-May      89 non-null     float64
 18  Jun-Sep      89 non-null     float64
 19  Oct-Dec      88 non-null     float64
dtypes: float64(17), int64(2), object(1)
memory usage: 14.3+ KB
```

In [8]:
```
list(data.columns)#list of columns in data
```

Out[8]:
```
['Unnamed: 0',
 'SUBDIVISION',
 'YEAR',
 'JAN',
 'FEB',
 'MAR',
 'APR',
 'MAY',
 'JUN',
 'JUL',
 'AUG',
 'SEP',
 'OCT',
 'NOV',
 'DEC',
 'ANNUAL',
 'Jan-Feb',
 'Mar-May',
 'Jun-Sep',
 'Oct-Dec']
```

In [9]:
```
data1=data.drop(["Unnamed: 0"],axis=1)#delete a column
```

In [10]:
```
data1
```

Out[10]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	Jan-Feb	Mar-May	Jun-Sep	Oc De
0	ARUNACHAL PRADESH	1916	48.1	69.8	71.1	316.1	424.6	1124.9	NaN	629.7	333.9	NaN	NaN	NaN	NaN	117.9	811.8	NaN	Nal
1	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	NaN	185.9	NaN	2772.8	262.
2	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	5486.3	21.4	1196.9	4121.3	146.
3	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	4693.9	102.3	706.0	2888.0	997.
4	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	4106.7	210.3	1143.9	2649.2	103.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.
86	ARUNACHAL PRADESH	2005	48.4	167.6	229.5	195.3	179.8	269.3	430.8	400.0	243.6	139.3	28.6	3.3	2335.5	216.0	604.6	1343.7	171.
87	ARUNACHAL PRADESH	2006	6.0	103.7	63.3	202.7	321.7	520.4	382.2	227.6	263.2	77.2	69.7	21.7	2259.6	109.7	587.7	1393.5	168.
88	ARUNACHAL PRADESH	2007	13.4	97.4	48.1	292.4	250.4	530.2	761.0	364.6	529.3	102.6	24.3	6.9	3020.7	110.8	590.9	2185.1	133.
89	ARUNACHAL PRADESH	2008	76.7	39.7	122.6	192.4	185.0	423.6	456.1	439.3	189.7	115.1	1.7	2.6	2244.4	116.4	499.9	1508.7	119.
90	ARUNACHAL PRADESH	2009	18.0	92.8	72.1	132.7	189.9	259.1	329.9	370.3	152.5	82.9	33.9	15.9	1749.9	110.8	394.7	1111.8	132.

91 rows × 19 columns

In [11]:
```
data1.isna().sum()#no.of null values in data
```

Out[11]:
```
SUBDIVISION    0
YEAR           0
JAN            1
FEB            1
MAR            2
APR            0
MAY            0
JUN            1
JUL            1
AUG            0
SEP            0
OCT            2
NOV            2
DEC            2
ANNUAL         6
Jan-Feb        1
Mar-May        2
Jun-Sep        2
Oct-Dec        3
dtype: int64
```

In [17]:
```
data1=data1.fillna(data1.mean())#mean of data where null value present
```

In [13]:
```
data1
```

Out[13]:

	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
0	ARUNACHAL PRADESH	1916	48.1	69.8	71.100000	316.1	424.6	1124.9	711.963333	629.7	333.9	200.37191	36.257303	24.91573	3475.443529
1	ARUNACHAL PRADESH	1917	21.4	164.5	154.446067	269.6	107.9	823.8	909.100000	628.4	411.5	199.30000	63.500000	0.00000	3475.443529
2	ARUNACHAL PRADESH	1918	10.4	11.0	191.200000	144.6	861.1	1609.9	1303.000000	692.6	515.8	125.20000	7.800000	13.70000	5486.300000
3	ARUNACHAL PRADESH	1919	34.5	67.8	28.500000	256.9	420.6	973.6	999.000000	286.7	628.7	948.30000	40.700000	8.60000	4693.900000
4	ARUNACHAL PRADESH	1920	14.0	196.3	605.600000	364.7	173.6	840.6	535.400000	896.5	376.7	103.30000	0.000000	0.00000	4106.700000
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
86	ARUNACHAL PRADESH	2005	48.4	167.6	229.500000	195.3	179.8	269.3	430.800000	400.0	243.6	139.30000	28.600000	3.30000	2335.500000
87	ARUNACHAL PRADESH	2006	6.0	103.7	63.300000	202.7	321.7	520.4	382.200000	227.6	263.2	77.20000	69.700000	21.70000	2259.600000
88	ARUNACHAL PRADESH	2007	13.4	97.4	48.100000	292.4	250.4	530.2	761.000000	364.6	529.3	102.60000	24.300000	6.90000	3020.700000
89	ARUNACHAL PRADESH	2008	76.7	39.7	122.600000	192.4	185.0	423.6	456.100000	439.3	189.7	115.10000	1.700000	2.60000	2244.400000
90	ARUNACHAL PRADESH	2009	18.0	92.8	72.100000	132.7	189.9	259.1	329.900000	370.3	152.5	82.90000	33.900000	15.90000	1749.900000

91 rows × 19 columns

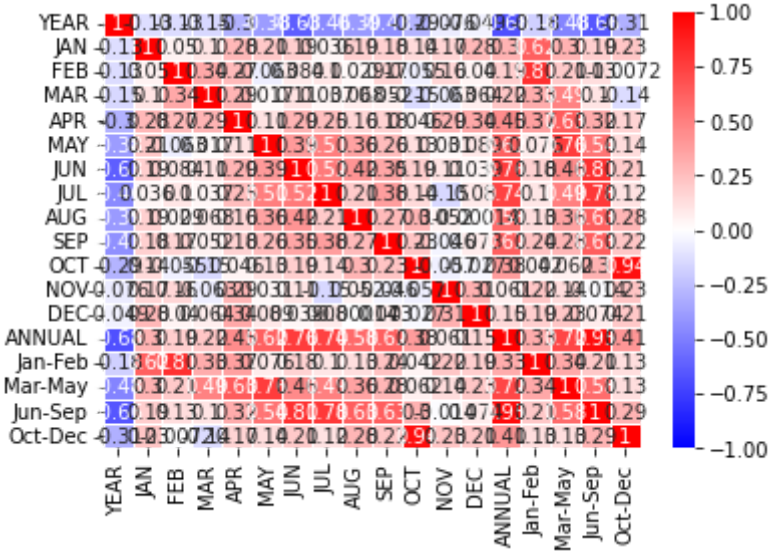
In [14]:
```
cor_mat=data1.corr()
cor_mat#correlation of data
```

Out[14]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	D
YEAR	1.000000	-0.129747	-0.134367	-0.151211	-0.301073	-0.384602	-0.629752	-0.458136	-0.394444	-0.431541	-0.289344	-0.076280	-0.048
JAN	-0.129747	1.000000	0.049703	0.102293	0.275434	0.213184	0.187787	0.035809	0.186374	0.180082	0.144590	0.165581	0.277
FEB	-0.134367	0.049703	1.000000	0.341841	0.268473	-0.063203	0.084120	0.101055	0.028858	0.168443	-0.054795	0.160783	0.040
MAR	-0.151211	0.102293	0.341841	1.000000	0.292034	0.016967	0.109636	0.037348	0.068452	0.052290	-0.148231	-0.063310	0.064
APR	-0.301073	0.275434	0.268473	0.292034	1.000000	0.114128	0.289865	0.251932	0.157620	0.176335	0.045969	0.288599	0.337
MAY	-0.384602	0.213184	-0.063203	0.016967	0.114128	1.000000	0.393266	0.506670	0.363992	0.258744	0.127820	0.031172	0.089
JUN	-0.629752	0.187787	0.084120	0.109636	0.289865	0.393266	1.000000	0.521139	0.415815	0.346802	0.192367	0.109367	0.038
JUL	-0.458136	0.035809	0.101055	0.037348	0.251932	0.506670	0.521139	1.000000	0.210298	0.380633	0.144446	-0.151307	0.079
AUG	-0.394444	0.186374	0.028858	0.068452	0.157620	0.363992	0.415815	0.210298	1.000000	0.269123	0.296349	0.052211	-0.000
SEP	-0.431541	0.180082	0.168443	0.052290	0.176335	0.258744	0.346802	0.380633	0.269123	1.000000	0.227094	-0.046211	0.072
OCT	-0.289344	0.144590	-0.054795	-0.148231	0.045969	0.127820	0.192367	0.144446	0.296349	0.227094	1.000000	-0.056580	-0.026
NOV	-0.076280	0.165581	0.160783	-0.063310	0.288599	0.031172	0.109367	-0.151307	0.052211	-0.046211	-0.056580	1.000000	0.311
DEC	-0.048730	0.277939	0.040145	0.064440	0.337215	0.089220	0.038968	0.079788	-0.000140	0.072701	-0.026836	0.311670	1.000
ANNUAL	-0.682590	0.301475	0.192391	0.219965	0.446343	0.621016	0.762945	0.739870	0.582262	0.622284	0.383344	0.060826	0.153
Jan-Feb	-0.181185	0.624899	0.810800	0.327051	0.371221	0.075552	0.175902	0.100006	0.131836	0.237243	0.041896	0.222685	0.194
Mar-May	-0.482071	0.303795	0.210505	0.488820	0.634120	0.759110	0.457520	0.492636	0.360978	0.281265	0.062413	0.140539	0.225
Jun-Sep	-0.662652	0.189225	0.129102	0.104851	0.323289	0.541487	0.810782	0.776939	0.632006	0.625144	0.298980	-0.014158	0.074
Oct-Dec	-0.305427	0.226541	-0.007182	-0.139970	0.168056	0.139581	0.210311	0.115344	0.282621	0.224471	0.944225	0.231111	0.214

In [15]:
```
import seaborn as sns#data of correlation in a graoh
sns.heatmap(cor_mat,vmax=1,vmin=-1,annot=True,linewidth=.5,cmap='bwr')#plotting of graph using seaborn
```

Out[15]: <AxesSubplot:>



In [16]:
```
data.isna().sum()
```

Out[16]:
```
Unnamed: 0     0
SUBDIVISION    0
YEAR           0
JAN            1
FEB            1
MAR            2
APR            0
MAY            0
JUN            1
JUL            1
AUG            0
SEP            0
OCT            2
NOV            2
DEC            2
ANNUAL         6
Jan-Feb        1
Mar-May        2
Jun-Sep        2
Oct-Dec        3
dtype: int64
```

In [ ]:
```

```