

Group Assignment 2

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import pandas as pd

data = pd.read_csv("/content/district wise rainfall normal.csv")

# 1. Count the number of entries in the DataFrame
count_entries = len(data)
print("There are", count_entries, "entries in the DataFrame.")

# 2. Get the unique states/UTs in the DataFrame
states = data['STATE_UT_NAME'].unique()
num_states = len(states)
print("The DataFrame contains data for", num_states, "different states/UTs.")

# 3. Calculate the average rainfall for each month
average_rainfall = data.mean()[1:13]
print("The average rainfall for each month is:")
print(average_rainfall)

# 4. Find the state/UT with the highest annual rainfall
max_rainfall_state = data.loc[data['ANNUAL'].idxmax()][['STATE_UT_NAME']]
max_rainfall_value = data['ANNUAL'].max()
print("The state/UT with the highest annual rainfall is",
max_rainfall_state, "with", max_rainfall_value, "mm.")

# 5. Find the district with the lowest rainfall in a specific month (e.g., June)
min_rainfall_district = data.loc[data['JUN'].idxmin()][['DISTRICT']]
min_rainfall_value = data['JUN'].min()
print("The district with the lowest rainfall in June is",
min_rainfall_district, "with", min_rainfall_value, "mm.")

# 6. Calculate the total annual rainfall for each state/UT
total_rainfall_state = data.groupby('STATE_UT_NAME')['ANNUAL'].sum()
print("The total annual rainfall for each state/UT is:")
print(total_rainfall_state)

# 7. Calculate the average rainfall for a specific district (e.g., 'NICOBAR')
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district = 'NICOBAR'
average_rainfall_district = data[data['DISTRICT'] ==
district].mean()[2:14]
print("The average rainfall for", district, "is:")
print(average_rainfall_district)

# 8. Find the month with the highest rainfall across all districts
max_rainfall_month = data.iloc[:, 2:14].mean().idxmax()
print("The month with the highest rainfall across all districts is",
max_rainfall_month)

# 9. Calculate the total rainfall for a specific state/UT (e.g., 'ASSAM')
state = 'ASSAM'
total_rainfall_state = data[data['STATE_UT_NAME'] ==
state]['ANNUAL'].sum()
print("The total rainfall for", state, "is", total_rainfall_state, "mm.")

# 10. Find the district with the highest rainfall in a specific season
(e.g., Jun-Sep)
season = data[['JUN', 'JUL', 'AUG', 'SEP']].sum(axis=1)
max_rainfall_district_season = data.loc[season.idxmax()]['DISTRICT']
max_rainfall_value_season = season.max()
print("The district with the highest rainfall in the Jun-Sep season is",
max_rainfall_district_season, "with", max_rainfall_value_season, "mm.")

# 11. Calculate the average rainfall for each district
average_rainfall_district = data.groupby('DISTRICT').mean()[2:14]
print("The average rainfall for each district is:")
print(average_rainfall_district)

# 12. Find the district with the highest rainfall in a specific month
(e.g., September)
max_rainfall_district_month = data.loc[data['SEP'].idxmax()]['DISTRICT']
max_rainfall_value_month = data['SEP'].max()
print("The district with the highest rainfall in September is",
max_rainfall_district_month, "with", max_rainfall_value_month, "mm.")

# 13. Find the district with the highest average rainfall across all years
average_rainfall_district = data.iloc[:, 2:14].mean(axis=0)
max_avg_rainfall_district = average_rainfall_district.idxmax()
max_avg_rainfall_value = average_rainfall_district.max()
print("The district with the highest average rainfall across all years
is", max_avg_rainfall_district, "with an average of",
max_avg_rainfall_value, "mm.")

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# 14. Calculate the total rainfall for each state/UT
total_rainfall_state = data.groupby('STATE_UT_NAME').sum()[2:14]
print("The total rainfall for each state/UT is:")
print(total_rainfall_state)

# 15. Find the district with the lowest annual rainfall
min_rainfall_district = data.loc[data['ANNUAL'].idxmin()]['DISTRICT']
min_rainfall_value = data['ANNUAL'].min()
print("The district with the lowest annual rainfall is",
min_rainfall_district, "with", min_rainfall_value, "mm.")

# 16. Calculate the total rainfall for a specific district (e.g.,
'MUMBAI')
district = 'MUMBAI'
matching_records = data[data['DISTRICT'] == district]

if len(matching_records) > 0:
    total_rainfall_district = matching_records.sum(axis=1).values[0]
    print("The total rainfall for", district, "is",
total_rainfall_district, "mm.")
else:
    print("No records found for the district:", district)

# 17. Find the month with the lowest rainfall across all districts
min_rainfall_month = data.iloc[:, 2:14].mean().idxmin()
print("The month with the lowest rainfall across all districts is",
min_rainfall_month)

# 18. Calculate the average rainfall for a specific state/UT (e.g.,
'RAJASTHAN')
state = 'RAJASTHAN'
average_rainfall_state = data[data['STATE_UT_NAME'] == state].mean()[2:14]
print("The average rainfall for", state, "is:")
print(average_rainfall_state)

# 19. Find the district with the highest rainfall in a specific season
(e.g., Oct-Dec)
season = data[['OCT', 'NOV', 'DEC']].sum(axis=1)
max_rainfall_district_season = data.loc[season.idxmax()]['DISTRICT']
max_rainfall_value_season = season.max()
print("The district with the highest rainfall in the Oct-Dec season is",
max_rainfall_district_season, "with", max_rainfall_value_season, "mm.")

# 20. Calculate the total rainfall for each month
total_rainfall_month = data.iloc[:, 2:14].sum()

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print("The total rainfall for each month is:")
print(total_rainfall_month)

# 21.Count the number of non-null values in each column:
column_counts = data.count()
print("The number of non-null values in each column is:")
print(column_counts)

# 22.Count the number of occurrences of each unique value in a column:
value_counts = data['DISTRICT'].value_counts()
print("The number of occurrences of each unique value in the 'DISTRICT'
column is:")
print(value_counts)

```

Output

There are 641 entries in the DataFrame.

The DataFrame contains data for 35 different states/UTs.

The average rainfall for each month is:

FEB	20.984399
MAR	30.034789
APR	45.543214
MAY	81.535101
JUN	196.007332
JUL	326.033697
AUG	291.152262
SEP	194.609048
OCT	90.446334
NOV	34.117473
DEC	18.150858
ANNUAL	1346.969579

dtype: float64

The state/UT with the highest annual rainfall is MANIPUR with 7229.3 mm.

The district with the lowest rainfall in June is LADAKH (LEH) with 3.8 mm.

The total annual rainfall for each state/UT is:

STATE_UT_NAME	
ANDAMAN And NICOBAR ISLANDS	8734.2
ANDHRA PRADESH	21736.7
ARUNACHAL PRADESH	46838.0
ASSAM	66267.7
BIHAR	45621.1
CHANDIGARH	1070.6
CHHATTISGARH	23154.3
DADAR NAGAR HAVELI	2374.1
DAMAN AND DIU	3071.4
DELHI	6723.9
GOA	6557.0
GUJARAT	24032.9
HARYANA	12905.7
HIMACHAL	16459.1
JAMMU AND KASHMIR	22365.6
JHARKHAND	31282.5
KARNATAKA	35838.5
KERALA	41123.5
LAKSHADWEEP	1600.0
MADHYA PRADESH	51615.5

MAHARASHTRA	44750.6
MANIPUR	22469.7
MEGHALAYA	25779.9
MIZORAM	23546.9
NAGALAND	21347.7
ORISSA	43983.6
PONDICHERRY	5513.9
PUNJAB	12970.9
RAJASTHAN	19192.7
SIKKIM	11353.4
TAMIL NADU	30720.2
TRIPURA	9916.5
UTTAR PRADESH	67836.6
UTTARANCHAL	20254.5
WEST BENGAL	34398.1

Name: ANNUAL, dtype: float64

The average rainfall for NICOBAR is:

MAR	65.2
APR	117.0
MAY	358.5
JUN	295.5
JUL	285.0
AUG	271.9
SEP	354.8
OCT	326.0
NOV	315.2
DEC	250.9
ANNUAL	2805.2
Jan-Feb	165.2

dtype: float64

The month with the highest rainfall across all districts is JUL

The total rainfall for ASSAM is 66267.7 mm.

The district with the highest rainfall in the Jun-Sep season is TAMENGLONG with 5228.000000000001 mm.

The average rainfall for each district is:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP \
DISTRICT									
AHMEDABAD	0.8	0.3	0.5	0.7	5.9	91.0	215.4	190.8	105.4
AHMEDNAGAR	0.6	1.3	3.0	5.3	21.6	104.9	101.8	91.8	139.1
AIZAWL	13.8	31.2	107.9	185.8	351.4	467.7	448.7	480.7	390.9
AJMER	3.7	2.0	2.1	2.2	8.9	43.6	171.0	155.0	60.0
AKOLA	8.6	5.3	8.8	4.4	9.7	142.9	226.3	204.3	128.8
ALAPPUZHA	17.5	27.9	45.1	134.0	298.7	593.0	533.0	343.1	276.8
ALIGARH	19.5	12.6	9.4	5.6	18.4	47.4	213.1	261.9	133.3
ALIRAJPUR(JBA)	3.9	2.2	1.7	1.7	8.3	113.9	270.8	257.0	157.3
ALLAHABAD	17.5	10.0	7.6	3.6	6.6	82.1	265.5	278.8	182.3
ALMORA	46.2	46.8	47.4	25.5	46.7	132.3	299.9	276.9	149.3
ALWAR	9.6	10.2	5.6	5.5	15.8	44.2	196.9	213.3	100.9
AMBALA	38.9	31.6	25.3	7.7	20.5	105.2	307.8	326.0	177.6

	OCT	NOV	DEC	ANNUAL	Jan-Feb	Mar-May	Jun-Sep	Oct-Dec
DISTRICT								

AHMEDABAD	19.1	8.2	1.8	639.9	1.1	7.1	602.6	29.1
AHMEDNAGAR	73.8	22.5	7.5	573.2	1.9	29.9	437.6	103.8
AIZAWL	254.5	65.3	16.5	2814.4	45.0	645.1	1788.0	336.3
AJMER	9.7	2.5	1.5	462.2	5.7	13.2	429.6	13.7
AKOLA	52.8	16.7	6.8	815.4	13.9	22.9	702.3	76.3
ALAPPUZHA	332.9	187.6	51.6	2841.2	45.4	477.8	1745.9	572.1
ALIGARH	39.0	4.2	6.6	771.0	32.1	33.4	655.7	49.8
ALIRAJPUR(JBA)	30.8	11.0	5.0	863.6	6.1	11.7	799.0	46.8
ALLAHABAD	34.6	9.4	4.6	902.6	27.5	17.8	808.7	48.6
ALMORA	57.2	8.1	21.0	1157.3	93.0	119.6	858.4	86.3
ALWAR	20.0	4.1	4.8	630.9	19.8	26.9	555.3	28.9

AMBALA 34.4 8.8 20.9 1104.7 70.5 53.5 916.6 64.1

The district with the highest rainfall in September is JAINTIA HILLS with 826.3 mm.

The district with the highest average rainfall across all years is JUL with an average of 326.0336973478939 mm.

The total rainfall for each state/UT is:

	JAN	FEB	MAR	APR	MAY	JUN	JUL \
STATE_UT_NAME							
ARUNACHAL PRADESH	859.0	1492.7	2640.3	4402.6	4804.2	7862.1	8761.3
ASSAM	424.8	856.3	2099.6	4894.2	9014.5	12560.0	13360.8
BIHAR	499.1	352.6	375.2	640.9	1963.6	6413.7	12951.8
CHANDIGARH	44.3	38.9	33.2	14.8	30.1	120.0	282.4
CHATISGARH	186.8	188.5	233.6	236.1	314.7	3250.5	6757.3
DADAR NAGAR HAVELI	0.4	0.3	0.0	0.0	7.4	385.1	884.5
DAMAN AND DIU	1.1	1.0	0.4	0.2	8.3	553.0	1166.2
DELHI	147.6	146.7	137.7	80.1	173.7	538.2	1986.3
GOA	1.1	0.1	1.1	15.6	175.5	1816.2	2216.2
GUJARAT	20.4	10.2	29.7	13.2	124.9	3620.4	8679.8
HARYANA	409.2	345.6	288.5	160.0	307.5	1071.2	3787.6
HIMACHAL	983.1	965.4	1051.6	572.2	652.3	1304.2	4125.9

	AUG	SEP	OCT	NOV	DEC	ANNUAL	Jan-Feb \
STATE_UT_NAME							
ARUNACHAL PRADESH	6057.6	5863.6	2828.3	691.0	575.3	46838.0	2351.7
ASSAM	10189.0	8202.6	3684.1	672.9	308.9	66267.7	1281.1
BIHAR	11000.3	8488.4	2460.4	255.2	219.9	45621.1	851.7
CHANDIGARH	287.5	154.3	31.8	9.9	23.4	1070.6	83.2
CHATISGARH	6756.1	3860.0	1113.2	152.9	104.6	23154.3	375.3
DADAR NAGAR HAVELI	655.9	391.4	38.6	10.5	0.0	2374.1	0.7
DAMAN AND DIU	789.2	455.2	71.1	24.8	0.9	3071.4	2.1
DELHI	2209.5	991.8	184.5	50.4	77.4	6723.9	294.3
GOA	1367.6	561.8	311.4	70.0	20.4	6557.0	1.2
GUJARAT	6698.4	3860.3	652.7	281.5	41.4	24032.9	30.6
HARYANA	4009.1	1863.2	387.0	110.6	166.2	12905.7	754.8
HIMACHAL	3867.9	1803.2	471.7	202.9	458.7	16459.1	1948.5

	Mar-May	Jun-Sep	Oct-Dec
STATE_UT_NAME			
ARUNACHAL PRADESH	11847.1	28544.6	4094.6
ASSAM	16008.3	44312.4	4665.9
BIHAR	2979.7	38854.2	2935.5
CHANDIGARH	78.1	844.2	65.1
CHATISGARH	784.4	20623.9	1370.7
DADAR NAGAR HAVELI	7.4	2316.9	49.1
DAMAN AND DIU	8.9	2963.6	96.8
DELHI	391.5	5725.8	312.3
GOA	192.2	5961.8	401.8
GUJARAT	167.8	22858.9	975.6
HARYANA	756.0	10731.1	663.8
HIMACHAL	2276.1	11101.2	1133.3

The district with the lowest annual rainfall is LADAKH (LEH) with 94.6 mm.

No records found for the district: MUMBAI

The month with the lowest rainfall across all districts is DEC

The average rainfall for RAJASTHAN is:

MAR	3.815152
APR	3.303030
MAY	10.627273
JUN	54.096970
JUL	195.278788
AUG	194.554545
SEP	86.145455
OCT	14.430303
NOV	6.254545
DEC	3.021212

ANNUAL 581.596970

Jan-Feb 10.069697

dtype: float64

The district with the highest rainfall in the Oct-Dec season is KARAIKAL with 1048.5 mm.

The total rainfall for each month is:

JAN 11765.6

FEB 13451.0

MAR 19252.3

APR 29193.2

MAY 52264.0

JUN 125640.7

JUL 208987.6

AUG 186628.6

SEP 124744.4

OCT 57976.1

NOV 21869.3

DEC 11634.7

dtype: float64

The number of non-null values in each column is:

STATE_UT_NAME 641

DISTRICT 641

JAN 641

FEB 641

MAR 641

APR 641

MAY 641

JUN 641

JUL 641

AUG 641

SEP 641

OCT 641

NOV 641

DEC 641

ANNUAL 641

Jan-Feb 641

Mar-May 641

Jun-Sep 641

Oct-Dec 641

dtype: int64

The number of occurrences of each unique value in the 'DISTRICT' column is:

BIJAPUR 2

BILASPUR 2

AURANGABAD 2

HAMIRPUR 2

NICOBAR 1

..

GONDA 1

GORAKHPUR 1

HARDOI 1

JAUNPUR 1

LAKSHADWEEP 1

Name: DISTRICT, Length: 637, dtype: int64

<ipython-input-5-eb8bf82e6107>:15: FutureWarning: The default value of numeric_only in DataFrame.mean is deprecated. In a future version, it will default to False. In addition, specifying 'numeric_only=None' is deprecated. Select only valid columns or specify the value of numeric_only to silence this warning.

average_rainfall = data.mean()[1:13]

<ipython-input-5-eb8bf82e6107>:36: FutureWarning: The default value of numeric_only in DataFrame.mean is deprecated. In a future version, it will default to False. In addition, specifying 'numeric_only=None' is deprecated. Select only valid columns or specify the value of numeric_only to silence this warning.

average_rainfall_district = data[data['DISTRICT'] == district].mean()[2:14]

<ipython-input-5-eb8bf82e6107>:56: FutureWarning: The default value of numeric_only in DataFrameGroupBy.mean is deprecated. In a future version, numeric_only will default to False. Either specify numeric_only or select only columns which should be valid for the function.

```
average_rainfall_district = data.groupby('DISTRICT').mean()[2:14]
```

<ipython-input-5-eb8bf82e6107>:72: FutureWarning: The default value of numeric_only in DataFrameGroupBy.sum is deprecated. In a future version, numeric_only will default to False. Either specify numeric_only or select only columns which should be valid for the function.

```
total_rainfall_state = data.groupby('STATE_UT_NAME').sum()[2:14]
```

<ipython-input-5-eb8bf82e6107>:97: FutureWarning: The default value of numeric_only in DataFrame.mean is deprecated. In a future version, it will default to False. In addition, specifying 'numeric_only=None' is deprecated. Select only valid columns or specify the value of numeric_only to silence this warning.

```
average_rainfall_state = data[data['STATE_UT_NAME'] == state].mean()[2:14]
```