In [263]:
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [264]:
```
df = pd.read_csv('IndianWeatherRepository.csv')
```

In [265]:
```
df.to_string
```

Out[265]:
```
<bound method DataFrame.to_string of      country location_name          region  latitude  longitude      timezone  \
0      India    Ashoknagar  Madhya Pradesh     24.57      77.72  Asia/Kolkata
1      India        Raisen  Madhya Pradesh     23.33      77.80  Asia/Kolkata
2      India    Chhindwara  Madhya Pradesh     22.07      78.93  Asia/Kolkata
3      India         Betul  Madhya Pradesh     21.86      77.93  Asia/Kolkata
4      India   Hoshangabad  Madhya Pradesh     22.75      77.72  Asia/Kolkata
...      ...           ...             ...       ...        ...           ...
1088   India        Niwari   Uttar Pradesh     28.88      77.53  Asia/Kolkata
1089   India       Saitual         Mizoram     23.97      92.58  Asia/Kolkata
1090   India       Ranipet      Tamil Nadu     12.93      79.33  Asia/Kolkata
1091   India       Tenkasi      Tamil Nadu      8.97      77.30  Asia/Kolkata
1092   India        Pendra     Maharashtra     21.93      74.15  Asia/Kolkata

      last_updated_epoch         Time last_updated2  temperature_celsius  ...  \
0             1693286100  10:45:00 AM     8/29/2023                 27.5  ...
1             1693286100  10:45:00 AM     8/29/2023                 27.5  ...
2             1693286100  10:45:00 AM     8/29/2023                 26.3  ...
3             1693286100  10:45:00 AM     8/29/2023                 25.6  ...
4             1693286100  10:45:00 AM     8/29/2023                 27.2  ...
...                  ...          ...           ...                  ...  ...
1088          1693366200   9:00:00 AM     8/30/2023                 30.0  ...
1089          1693366200   9:00:00 AM     8/30/2023                 25.9  ...
1090          1693366200   9:00:00 AM     8/30/2023                 32.1  ...
1091          1693366200   9:00:00 AM     8/30/2023                 28.4  ...
1092          1693366200   9:00:00 AM     8/30/2023                 23.6  ...

      air_quality_us-epa-index air_quality_gb-defra-index  sunrise   sunset  \
0                            1                          2  5:59 AM  6:41 PM
1                            1                          1  6:00 AM  6:40 PM
2                            2                          2  5:56 AM  6:34 PM
3                            1                          1  6:00 AM  6:38 PM
4                            1                          1  6:01 AM  6:39 PM
...                        ...                        ...      ...      ...
1088                         2                          3  5:57 AM  6:44 PM
1089                         1                          1  5:00 AM  5:40 PM
1090                         1                          1  6:02 AM  6:25 PM
1091                         1                          1  6:12 AM  6:30 PM
1092                         1                          1  6:16 AM  6:52 PM

      moonrise  moonset      moon_phase  moon_illumination  Unnamed: 43  \
0      5:42 PM  3:38 AM  Waxing Gibbous                 93          NaN
1      5:39 PM  3:41 AM  Waxing Gibbous                 93          NaN
2      5:32 PM  3:39 AM  Waxing Gibbous                 93          NaN
3      5:36 PM  3:43 AM  Waxing Gibbous                 93          NaN
4      5:38 PM  3:42 AM  Waxing Gibbous                 93          NaN
...        ...      ...            ...                ...          ...
1088   6:34 PM  4:42 AM       Full Moon                 98          NaN
1089   5:26 PM  3:48 AM       Full Moon                 98          NaN
1090   6:05 PM  5:01 AM       Full Moon                 98          NaN
1091   6:09 PM  5:16 AM       Full Moon                 98          NaN
1092   6:38 PM  5:09 AM       Full Moon                 98          NaN

        last_updated
0     8/29/2023 10:45
1     8/29/2023 10:45
2     8/29/2023 10:45
3     8/29/2023 10:45
4     8/29/2023 10:45
...               ...
1088   8/30/2023 9:00
1089   8/30/2023 9:00
1090   8/30/2023 9:00
1091   8/30/2023 9:00
1092   8/30/2023 9:00

[1093 rows x 45 columns]>
```

In [266]:
```
df.head()
```

Out[266]:

	country	location_name	region	latitude	longitude	timezone	last_updated_epoch	Time	last_updated2	temperature_celsius	...	air_quality_us-epa-index	air
0	India	Ashoknagar	Madhya Pradesh	24.57	77.72	Asia/Kolkata	1693286100	10:45:00 AM	8/29/2023	27.5	...	1	
1	India	Raisen	Madhya Pradesh	23.33	77.80	Asia/Kolkata	1693286100	10:45:00 AM	8/29/2023	27.5	...	1	
2	India	Chhindwara	Madhya Pradesh	22.07	78.93	Asia/Kolkata	1693286100	10:45:00 AM	8/29/2023	26.3	...	2	
3	India	Betul	Madhya Pradesh	21.86	77.93	Asia/Kolkata	1693286100	10:45:00 AM	8/29/2023	25.6	...	1	
4	India	Hoshangabad	Madhya Pradesh	22.75	77.72	Asia/Kolkata	1693286100	10:45:00 AM	8/29/2023	27.2	...	1	

5 rows × 45 columns

In [267]:
```
df.drop(['country'], axis=1, inplace=True)
```

In [268]:
```
df
```

Out[268]:

	location_name	region	latitude	longitude	timezone	last_updated_epoch	Time	last_updated2	temperature_celsius	temperature_fahrenheit
0	Ashoknagar	Madhya Pradesh	24.57	77.72	Asia/Kolkata	1693286100	10:45:00 AM	8/29/2023	27.5	81.5
1	Raisen	Madhya Pradesh	23.33	77.80	Asia/Kolkata	1693286100	10:45:00 AM	8/29/2023	27.5	81.5
2	Chhindwara	Madhya Pradesh	22.07	78.93	Asia/Kolkata	1693286100	10:45:00 AM	8/29/2023	26.3	79.3
3	Betul	Madhya Pradesh	21.86	77.93	Asia/Kolkata	1693286100	10:45:00 AM	8/29/2023	25.6	78.1
4	Hoshangabad	Madhya Pradesh	22.75	77.72	Asia/Kolkata	1693286100	10:45:00 AM	8/29/2023	27.2	81.0
...	...	...	...	...	...	...	...	...	...	...
1088	Niwari	Uttar Pradesh	28.88	77.53	Asia/Kolkata	1693366200	9:00:00 AM	8/30/2023	30.0	86.0
1089	Saitual	Mizoram	23.97	92.58	Asia/Kolkata	1693366200	9:00:00 AM	8/30/2023	25.9	78.6
1090	Ranipet	Tamil Nadu	12.93	79.33	Asia/Kolkata	1693366200	9:00:00 AM	8/30/2023	32.1	89.8
1091	Tenkasi	Tamil Nadu	8.97	77.30	Asia/Kolkata	1693366200	9:00:00 AM	8/30/2023	28.4	83.1
1092	Pendra	Maharashtra	21.93	74.15	Asia/Kolkata	1693366200	9:00:00 AM	8/30/2023	23.6	74.5

1093 rows × 44 columns

In [269]:
```
df.drop(['last_updated_epoch'], axis=1, inplace=True)
```

In [270]:
```
df
```

Out[270]:

	location_name	region	latitude	longitude	timezone	Time	last_updated2	temperature_celsius	temperature_fahrenheit	condition_text	...	air
0	Ashoknagar	Madhya Pradesh	24.57	77.72	Asia/Kolkata	10:45:00 AM	8/29/2023	27.5	81.5	Partly cloudy	...	
1	Raisen	Madhya Pradesh	23.33	77.80	Asia/Kolkata	10:45:00 AM	8/29/2023	27.5	81.5	Sunny	...	
2	Chhindwara	Madhya Pradesh	22.07	78.93	Asia/Kolkata	10:45:00 AM	8/29/2023	26.3	79.3	Partly cloudy	...	
3	Betul	Madhya Pradesh	21.86	77.93	Asia/Kolkata	10:45:00 AM	8/29/2023	25.6	78.1	Cloudy	...	
4	Hoshangabad	Madhya Pradesh	22.75	77.72	Asia/Kolkata	10:45:00 AM	8/29/2023	27.2	81.0	Cloudy	...	
...	...	...	...	...	...	...	...	...	...	...	...	...
1088	Niwari	Uttar Pradesh	28.88	77.53	Asia/Kolkata	9:00:00 AM	8/30/2023	30.0	86.0	Mist	...	
1089	Saitual	Mizoram	23.97	92.58	Asia/Kolkata	9:00:00 AM	8/30/2023	25.9	78.6	Sunny	...	
1090	Ranipet	Tamil Nadu	12.93	79.33	Asia/Kolkata	9:00:00 AM	8/30/2023	32.1	89.8	Partly cloudy	...	
1091	Tenkasi	Tamil Nadu	8.97	77.30	Asia/Kolkata	9:00:00 AM	8/30/2023	28.4	83.1	Sunny	...	
1092	Pendra	Maharashtra	21.93	74.15	Asia/Kolkata	9:00:00 AM	8/30/2023	23.6	74.5	Sunny	...	

1093 rows × 43 columns

In [271]:
```
df.drop(['Unnamed: 43'], axis=1, inplace=True)
```

In [272]:
```
df
```

Out[272]:

	location_name	region	latitude	longitude	timezone	Time	last_updated2	temperature_celsius	temperature_fahrenheit	condition_text	...	air
0	Ashoknagar	Madhya Pradesh	24.57	77.72	Asia/Kolkata	10:45:00 AM	8/29/2023	27.5	81.5	Partly cloudy	...	
1	Raisen	Madhya Pradesh	23.33	77.80	Asia/Kolkata	10:45:00 AM	8/29/2023	27.5	81.5	Sunny	...	
2	Chhindwara	Madhya Pradesh	22.07	78.93	Asia/Kolkata	10:45:00 AM	8/29/2023	26.3	79.3	Partly cloudy	...	
3	Betul	Madhya Pradesh	21.86	77.93	Asia/Kolkata	10:45:00 AM	8/29/2023	25.6	78.1	Cloudy	...	
4	Hoshangabad	Madhya Pradesh	22.75	77.72	Asia/Kolkata	10:45:00 AM	8/29/2023	27.2	81.0	Cloudy	...	
...	...	...	...	...	...	...	...	...	...	...	...	...
1088	Niwari	Uttar Pradesh	28.88	77.53	Asia/Kolkata	9:00:00 AM	8/30/2023	30.0	86.0	Mist	...	
1089	Saitual	Mizoram	23.97	92.58	Asia/Kolkata	9:00:00 AM	8/30/2023	25.9	78.6	Sunny	...	
1090	Ranipet	Tamil Nadu	12.93	79.33	Asia/Kolkata	9:00:00 AM	8/30/2023	32.1	89.8	Partly cloudy	...	
1091	Tenkasi	Tamil Nadu	8.97	77.30	Asia/Kolkata	9:00:00 AM	8/30/2023	28.4	83.1	Sunny	...	
1092	Pendra	Maharashtra	21.93	74.15	Asia/Kolkata	9:00:00 AM	8/30/2023	23.6	74.5	Sunny	...	

1093 rows × 42 columns

In [273]:
```
df1 = df.copy()
```

In [274]:
```
df1.loc[:, "longitude"]= df1["longitude"].map('{:.1f}'.format)
```

In [275]:
```
df1
```

Out[275]:

	location_name	region	latitude	longitude	timezone	Time	last_updated2	temperature_celsius	temperature_fahrenheit	condition_text	...	air
0	Ashoknagar	Madhya Pradesh	24.57	77.7	Asia/Kolkata	10:45:00 AM	8/29/2023	27.5	81.5	Partly cloudy	...	
1	Raisen	Madhya Pradesh	23.33	77.8	Asia/Kolkata	10:45:00 AM	8/29/2023	27.5	81.5	Sunny	...	
2	Chhindwara	Madhya Pradesh	22.07	78.9	Asia/Kolkata	10:45:00 AM	8/29/2023	26.3	79.3	Partly cloudy	...	
3	Betul	Madhya Pradesh	21.86	77.9	Asia/Kolkata	10:45:00 AM	8/29/2023	25.6	78.1	Cloudy	...	
4	Hoshangabad	Madhya Pradesh	22.75	77.7	Asia/Kolkata	10:45:00 AM	8/29/2023	27.2	81.0	Cloudy	...	
...	...	...	...	...	...	...	...	...	...	...	...	...
1088	Niwari	Uttar Pradesh	28.88	77.5	Asia/Kolkata	9:00:00 AM	8/30/2023	30.0	86.0	Mist	...	
1089	Saitual	Mizoram	23.97	92.6	Asia/Kolkata	9:00:00 AM	8/30/2023	25.9	78.6	Sunny	...	
1090	Ranipet	Tamil Nadu	12.93	79.3	Asia/Kolkata	9:00:00 AM	8/30/2023	32.1	89.8	Partly cloudy	...	
1091	Tenkasi	Tamil Nadu	8.97	77.3	Asia/Kolkata	9:00:00 AM	8/30/2023	28.4	83.1	Sunny	...	
1092	Pendra	Maharashtra	21.93	74.2	Asia/Kolkata	9:00:00 AM	8/30/2023	23.6	74.5	Sunny	...	

1093 rows × 42 columns

In [276]:
```
df2=df1.copy()
df2.loc[:, "latitude"]= df1["latitude"].map('{:.1f}'.format)
```

In [277]:
```
df2
```

Out[277]:

	location_name	region	latitude	longitude	timezone	Time	last_updated2	temperature_celsius	temperature_fahrenheit	condition_text	...	air
0	Ashoknagar	Madhya Pradesh	24.6	77.7	Asia/Kolkata	10:45:00 AM	8/29/2023	27.5	81.5	Partly cloudy	...	
1	Raisen	Madhya Pradesh	23.3	77.8	Asia/Kolkata	10:45:00 AM	8/29/2023	27.5	81.5	Sunny	...	
2	Chhindwara	Madhya Pradesh	22.1	78,9	Asia/Kolkata	10:45:00 AM	8/29/2023	26,3	79,3	Partly cloudy	...	
3	Betul	Madhya Pradesh	21.9	77.9	Asia/Kolkata	10:45:00 AM	8/29/2023	25.6	78.1	Cloudy	...	
4	Hoshangabad	Madhya Pradesh	22.8	77.7	Asia/Kolkata	10:45:00 AM	8/29/2023	27.2	81.0	Cloudy	...	
...	...	...	...	...	...	...	...	...	...	...	...	...
1088	Niwari	Uttar Pradesh	28.9	77.5	Asia/Kolkata	9:00:00 AM	8/30/2023	30.0	86.0	Mist	...	
1089	Saitual	Mizoram	24.0	92.6	Asia/Kolkata	9:00:00 AM	8/30/2023	25.9	78.6	Sunny	...	
1090	Ranipet	Tamil Nadu	12.9	79.3	Asia/Kolkata	9:00:00 AM	8/30/2023	32.1	89.8	Partly cloudy	...	
1091	Tenkasi	Tamil Nadu	9.0	77.3	Asia/Kolkata	9:00:00 AM	8/30/2023	28.4	83.1	Sunny	...	
1092	Pendra	Maharashtra	21.9	74.2	Asia/Kolkata	9:00:00 AM	8/30/2023	23.6	74.5	Sunny	...	

1093 rows × 42 columns

In [278]:
```
df2.head(5)
```

Out[278]:

	location_name	region	latitude	longitude	timezone	Time	last_updated2	temperature_celsius	temperature_fahrenheit	condition_text	...	air_quality
0	Ashoknagar	Madhya Pradesh	24.6	77.7	Asia/Kolkata	10:45:00 AM	8/29/2023	27.5	81.5	Partly cloudy	...	
1	Raisen	Madhya Pradesh	23.3	77.8	Asia/Kolkata	10:45:00 AM	8/29/2023	27.5	81.5	Sunny	...	
2	Chhindwara	Madhya Pradesh	22.1	78.9	Asia/Kolkata	10:45:00 AM	8/29/2023	26.3	79.3	Partly cloudy	...	
3	Betul	Madhya Pradesh	21.9	77.9	Asia/Kolkata	10:45:00 AM	8/29/2023	25.6	78.1	Cloudy	...	
4	Hoshangabad	Madhya Pradesh	22.8	77.7	Asia/Kolkata	10:45:00 AM	8/29/2023	27.2	81.0	Cloudy	...	

5 rows × 42 columns

In [279]:
```
df2_mean=df2.groupby(['region'])['temperature_celsius', 'temperature_fahrenheit','air_quality_PM10','air_quality_us-epa-index',
```

```
C:\Users\com\AppData\Local\Temp\ipykernel_15520\3160935444.py:1: FutureWarning: Indexing with multiple keys (implicitly conve
rted to a tuple of keys) will be deprecated, use a list instead.
  df2_mean=df2.groupby(['region'])['temperature_celsius', 'temperature_fahrenheit','air_quality_PM10','air_quality_us-epa-ind
ex','air_quality_gb-defra-index'].mean()
```

In [280]:
```
df2_mean
```

Out[280]:

region	temperature_celsius	temperature_fahrenheit	air_quality_PM10	air_quality_us-epa-index	air_quality_gb-defra-index
Andaman and Nicobar Islands	27.550000	81.550000	5.900000	1.000000	1.000000
Andhra Pradesh	30.038462	86.073846	24.826154	1.800000	2.415385
Arunachal Pradesh	21.125000	70.025000	4.975000	1.000000	1.000000
Assam	30.135714	86.240476	49.216667	2.404762	4.880952
Bihar	31.798276	89.236207	71.220690	3.051724	6.603448
Chandigarh	29.000000	84.200000	151.150000	4.000000	10.000000
Chhattisgarh	28.528261	83.347826	33.252174	2.086957	2.934783
Dadra and Nagar Haveli	27.350000	81.200000	17.450000	1.000000	1.000000
Daman and Diu	27.625000	81.725000	25.075000	1.000000	1.500000
Delhi	30.500000	86.900000	84.050000	2.000000	2.500000
Goa	27.350000	81.250000	7.250000	1.000000	1.000000
Gujarat	28.182609	82.730435	28.080435	1.413043	1.673913
Haryana	31.660000	88.995000	111.760000	2.425000	4.550000
Himachal Pradesh	20.960000	69.730000	40.310000	2.200000	3.800000
Jammu and Kashmir	20.100000	68.177500	52.475000	2.425000	4.600000
Jharkhand	30.361111	86.647222	62.155556	2.777778	5.361111
Karnataka	27.225532	81.008511	4.785106	1.042553	1.063830
Kerala	28.260714	82.867857	9.860714	1.000000	1.071429
Lakshadweep	27.850000	82.150000	10.500000	1.000000	1.000000
Madhya Pradesh	26.946875	80.506250	23.665625	1.604167	1.916667
Maharashtra	27.342188	81.215625	17.287500	1.234375	1.609375
Manipur	27.775000	82.000000	8.300000	1.062500	1.062500
Mizoram	28.557143	83.378571	11.200000	1.142857	1.428571
Nagaland	27.741667	81.941667	14.350000	1.333333	1.583333
Orissa	30.881250	87.589583	62.168750	3.000000	6.479167
Puducherry	29.675000	85.425000	15.550000	1.000000	1.500000
Punjab	31.044737	87.889474	132.150000	3.868421	9.131579
Rajasthan	29.817808	85.669863	49.379452	1.438356	1.986301
Tamil Nadu	30.448214	86.810714	9.494643	1.035714	1.142857
Tripura	31.100000	87.975000	34.600000	2.500000	3.500000
Uttar Pradesh	31.026230	87.850820	72.686066	2.540984	4.745902
Uttarakhand	21.959091	71.531818	61.277273	2.545455	5.000000
West Bengal	31.207143	88.171429	137.652381	3.833333	8.238095

In [281]:
```
Top_10_mean=df2_mean.nlargest(n=10, columns=[ 'temperature_celsius', 'temperature_fahrenheit'])
```

In [282]:
```
Top_10_mean
```

Out[282]:

region	temperature_celsius	temperature_fahrenheit	air_quality_PM10	air_quality_us-epa-index	air_quality_gb-defra-index
Bihar	31.798276	89.236207	71.220690	3.051724	6.603448
Haryana	31.660000	88.995000	111.760000	2.425000	4.550000
West Bengal	31.207143	88.171429	137.652381	3.833333	8.238095
Tripura	31.100000	87.975000	34.600000	2.500000	3.500000
Punjab	31.044737	87.889474	132.150000	3.868421	9.131579
Uttar Pradesh	31.026230	87.850820	72.686066	2.540984	4.745902
Orissa	30.881250	87.589583	62.168750	3.000000	6.479167
Delhi	30.500000	86.900000	84.050000	2.000000	2.500000
Tamil Nadu	30.448214	86.810714	9.494643	1.035714	1.142857
Jharkhand	30.361111	86.647222	62.155556	2.777778	5.361111

In [283]:
```
df2_median




=df2.groupby(['region'])['temperature_celsius', 'temperature_fahrenheit','air_quality_PM10','air_quality_us-epa-index','air_qua
```

```
  File "C:\Users\com\AppData\Local\Temp\ipykernel_15520\1903581802.py", line 6
    =df2.groupby(['region'])['temperature_celsius', 'temperature_fahrenheit','air_quality_PM10','air_quality_us-epa-index','a
ir_quality_gb-defra-index'].median()
    ^
SyntaxError: invalid syntax
```

In [284]:
```
Top_10_median=df2_median.nlargest(n=10, columns=[ 'temperature_celsius', 'temperature_fahrenheit'])
```

In [285]:
```
Top_10_median
```

Out[285]:

region	temperature_celsius	temperature_fahrenheit	air_quality_PM10	air_quality_us-epa-index	air_quality_gb-defra-index
West Bengal	32.15	89.90	120.55	4.0	10.0
Bihar	31.95	89.50	63.20	3.0	6.0
Haryana	31.25	88.25	128.10	2.0	3.0
Uttar Pradesh	31.20	88.20	59.30	2.0	3.0
Tripura	31.20	88.15	34.75	2.5	3.5
Orissa	31.10	87.95	63.80	3.0	7.0
Delhi	30.50	86.90	86.05	2.0	2.5
Jharkhand	30.50	86.90	52.45	3.0	5.0
Punjab	30.50	86.90	131.40	4.0	10.0
Tamil Nadu	30.25	86.45	6.50	1.0	1.0

In [286]:
```
'temperature_celsius', 'temperature_fahrenheit','air_quality_PM10','air_quality_us-epa-index','air_quality_gb-defra-index'].max
```

```
C:\Users\com\AppData\Local\Temp\ipykernel_15520\3967594486.py:1: FutureWarning: Indexing with multiple keys (implicitly conve
rted to a tuple of keys) will be deprecated, use a list instead.
  df2_max=df2.groupby(['region'])['temperature_celsius', 'temperature_fahrenheit','air_quality_PM10','air_quality_us-epa-inde
x','air_quality_gb-defra-index'].max()
```

In [287]:
```
Top_10_max=df2_median.nlargest(n=10, columns=[ 'temperature_celsius', 'temperature_fahrenheit'])
```

In [288]:
```
df2_min=df2.groupby(['region'])['temperature_celsius', 'temperature_fahrenheit','air_quality_PM10','air_quality_us-epa-index',
```

```
C:\Users\com\AppData\Local\Temp\ipykernel_15520\1446844684.py:1: FutureWarning: Indexing with multiple keys (implicitly conve
rted to a tuple of keys) will be deprecated, use a list instead.
  df2_min=df2.groupby(['region'])['temperature_celsius', 'temperature_fahrenheit','air_quality_PM10','air_quality_us-epa-inde
x','air_quality_gb-defra-index'].min()
```

In [289]:
```
df2_min
```

Out[289]:

region	temperature_celsius	temperature_fahrenheit	air_quality_PM10	air_quality_us-epa-index	air_quality_gb-defra-index
Andaman and Nicobar Islands	27.3	81.1	5.8	1	1
Andhra Pradesh	26.0	78.8	2.7	1	1
Arunachal Pradesh	11.3	52.3	2.3	1	1
Assam	28.4	83.1	3.8	1	1
Bihar	29.0	84.2	21.6	2	2
Chandigarh	27.9	82.2	142.4	4	10
Chhattisgarh	25.2	77.4	17.6	1	2
Dadra and Nagar Haveli	26.4	79.5	17.3	1	1
Daman and Diu	26.5	79.7	17.3	1	1
Delhi	30.0	86.0	46.3	2	2
Goa	27.1	80.8	6.1	1	1
Gujarat	25.0	77.0	12.5	1	1
Haryana	27.7	81.9	28.3	1	1
Himachal Pradesh	18.5	65.3	21.2	2	2
Jammu and Kashmir	5.9	42.6	6.8	1	1
Jharkhand	26.1	79.0	16.8	1	2
Karnataka	23.9	75.0	1.4	1	1
Kerala	25.0	77.0	3.5	1	1
Lakshadweep	27.6	81.7	9.3	1	1
Madhya Pradesh	21.6	70.9	6.0	1	1
Maharashtra	23.6	74.5	2.6	1	1
Manipur	21.6	70.9	2.7	1	1
Mizoram	23.5	74.3	3.7	1	1
Nagaland	23.0	73.4	2.2	1	1
Orissa	25.0	77.0	11.5	1	1
Puducherry	28.5	83.3	9.5	1	1
Punjab	27.3	81.1	44.5	2	3
Rajasthan	25.5	77.9	8.2	1	1
Tamil Nadu	27.0	80.6	1.9	1	1
Tripura	29.0	84.2	19.7	2	2
Uttar Pradesh	26.5	79.7	22.0	1	1
Uttarakhand	2.9	37.2	4.2	1	1
West Bengal	20.1	68.2	23.4	2	2

In [290]:
```
Top_10_max
```

Out[290]:

region	temperature_celsius	temperature_fahrenheit	air_quality_PM10	air_quality_us-epa-index	air_quality_gb-defra-index
West Bengal	32.15	89.90	120.55	4.0	10.0
Bihar	31.95	89.50	63.20	3.0	6.0
Haryana	31.25	88.25	128.10	2.0	3.0
Uttar Pradesh	31.20	88.20	59.30	2.0	3.0
Tripura	31.20	88.15	34.75	2.5	3.5
Orissa	31.10	87.95	63.80	3.0	7.0
Delhi	30.50	86.90	86.05	2.0	2.5
Jharkhand	30.50	86.90	52.45	3.0	5.0
Punjab	30.50	86.90	131.40	4.0	10.0
Tamil Nadu	30.25	86.45	6.50	1.0	1.0

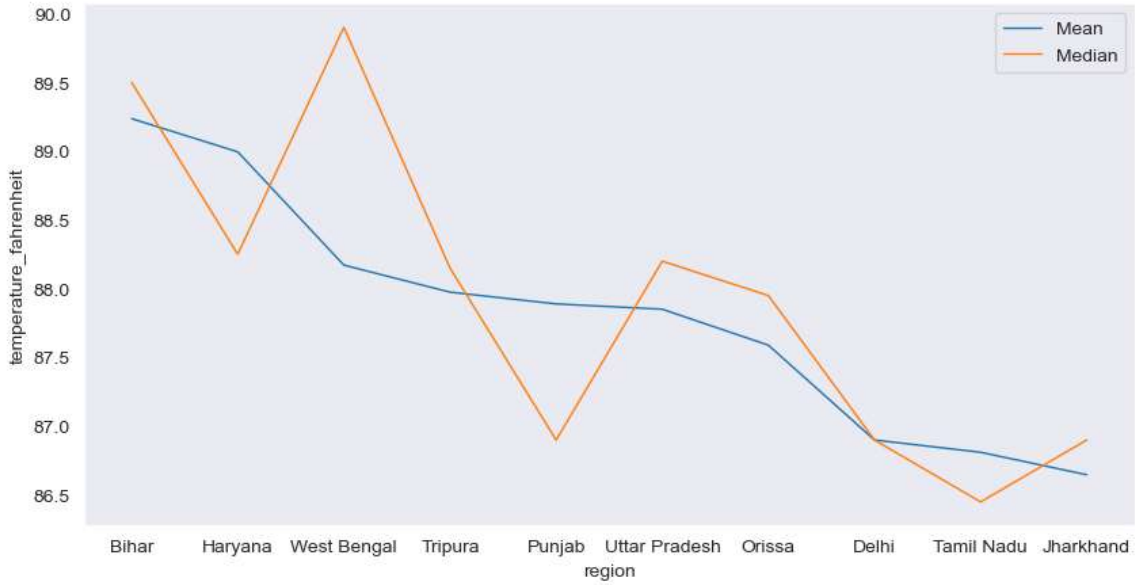
In [291]:
```
Top_10_min=df2_min.nlargest(n=10, columns=[ 'temperature_celsius', 'temperature_fahrenheit'])
```

In [292]:
```
Top_10_min
```

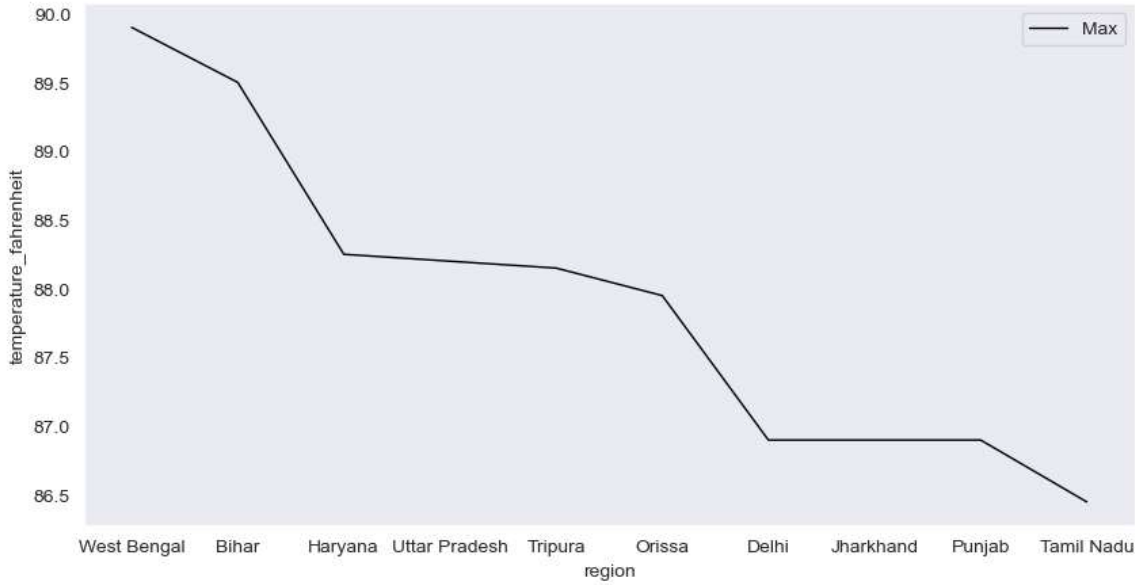
Out[292]:

region	temperature_celsius	temperature_fahrenheit	air_quality_PM10	air_quality_us-epa-index	air_quality_gb-defra-index
Delhi	30.0	86.0	46.3	2	2
Bihar	29.0	84.2	21.6	2	2
Tripura	29.0	84.2	19.7	2	2
Puducherry	28.5	83.3	9.5	1	1
Assam	28.4	83.1	3.8	1	1
Chandigarh	27.9	82.2	142.4	4	10
Haryana	27.7	81.9	28.3	1	1
Lakshadweep	27.6	81.7	9.3	1	1
Andaman and Nicobar Islands	27.3	81.1	5.8	1	1
Punjab	27.3	81.1	44.5	2	3

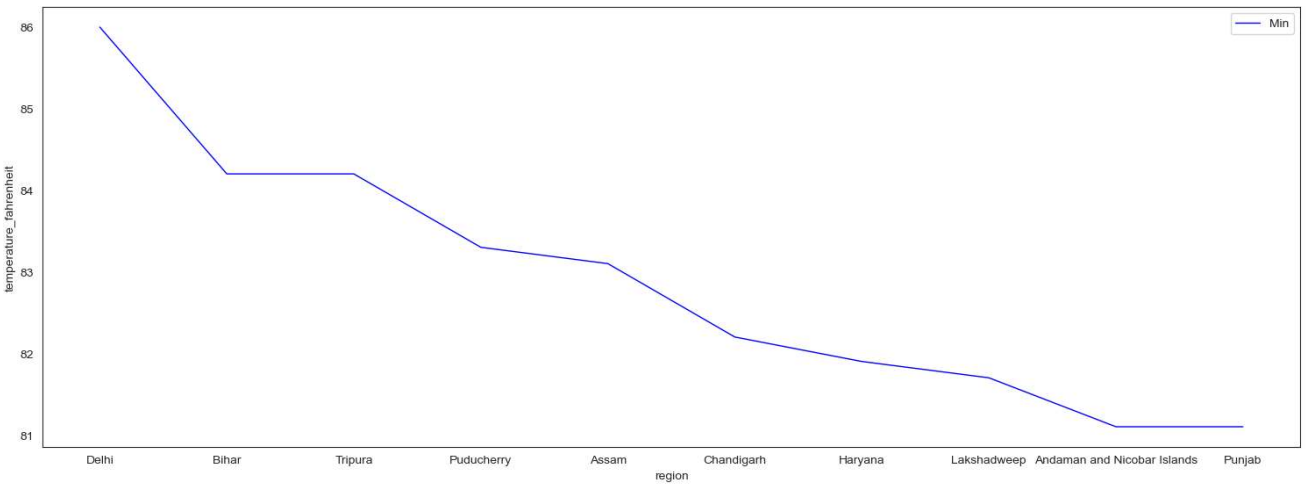
In [293]:
```
plt.figure(figsize = (10, 5))
sns.lineplot(x="region", y="temperature_fahrenheit", data=Top_10_mean, linewidth=1.0, label= 'Mean')
sns.lineplot(x="region",y="temperature_fahrenheit",data=Top_10_median, linewidth=1.0, label='Median')
sns.set_style("dark")
plt.show()
```



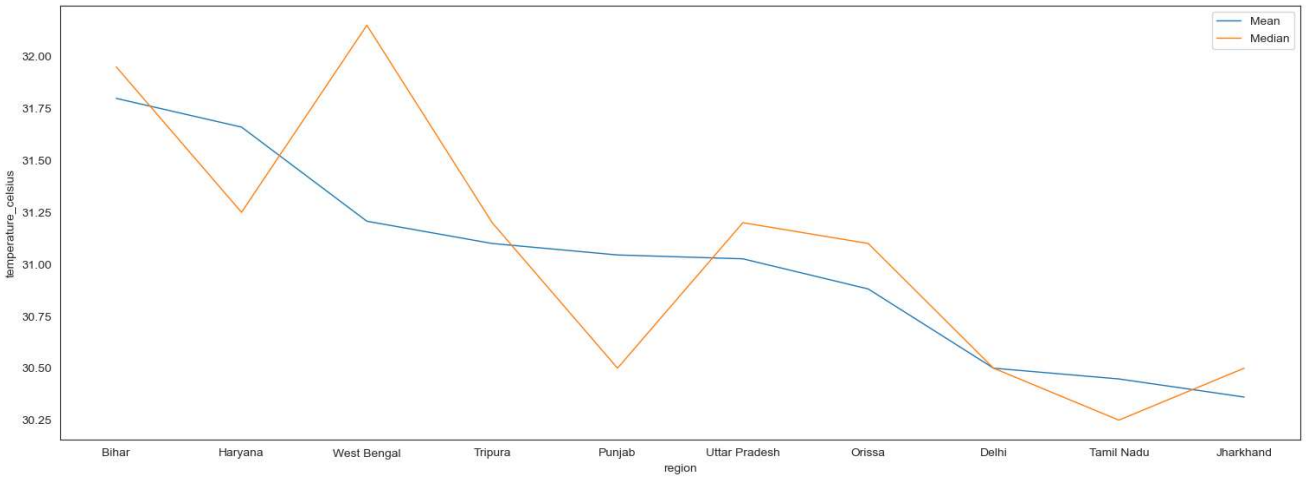
In [294]:
```
plt.figure(figsize=(10,5))
sns.lineplot(x="region",y="temperature_fahrenheit",data=Top_10_max, linewidth=1.0, label='Max',color='Black')

sns.set_style("white")
plt.show()
```



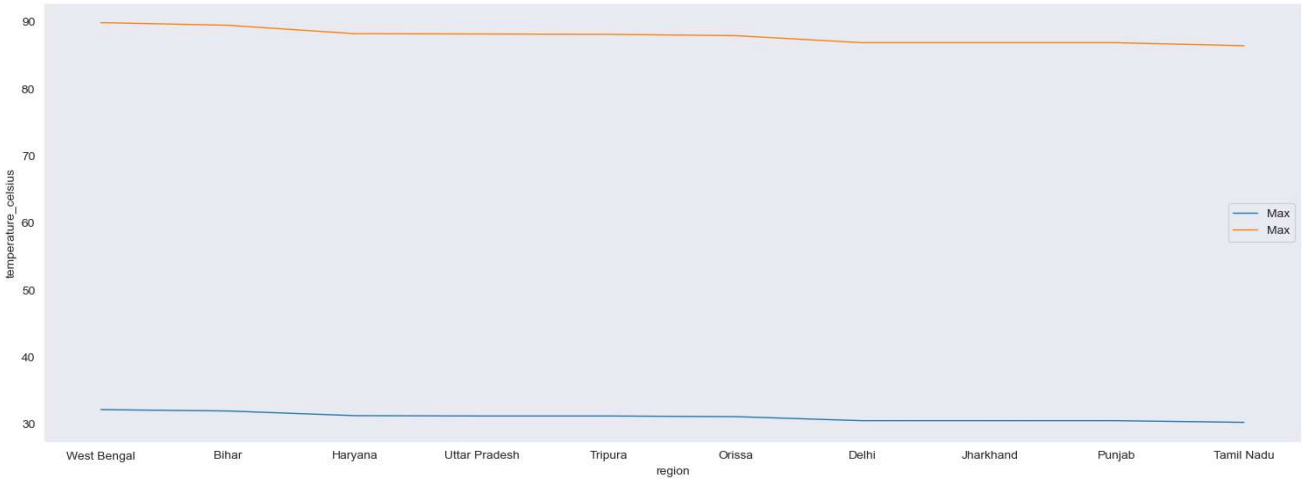
In [295]:
```
plt.figure(figsize=(18.5,6.5))
sns.lineplot(x="region",y="temperature_fahrenheit",data=Top_10_min, linewidth=1.0, label='Min',color='Blue')
sns.set_style("white")
plt.show()
```



In [296]:
```
plt.figure(figsize=(18.5,6.5))
sns.lineplot(x="region", y="temperature_celsius", data=Top_10_mean, linewidth=1.0, label= 'Mean')
sns.lineplot(x="region", y="temperature_celsius", data=Top_10_median, linewidth=1.0, label= 'Median')
sns.set_style("dark")
plt.show()
```



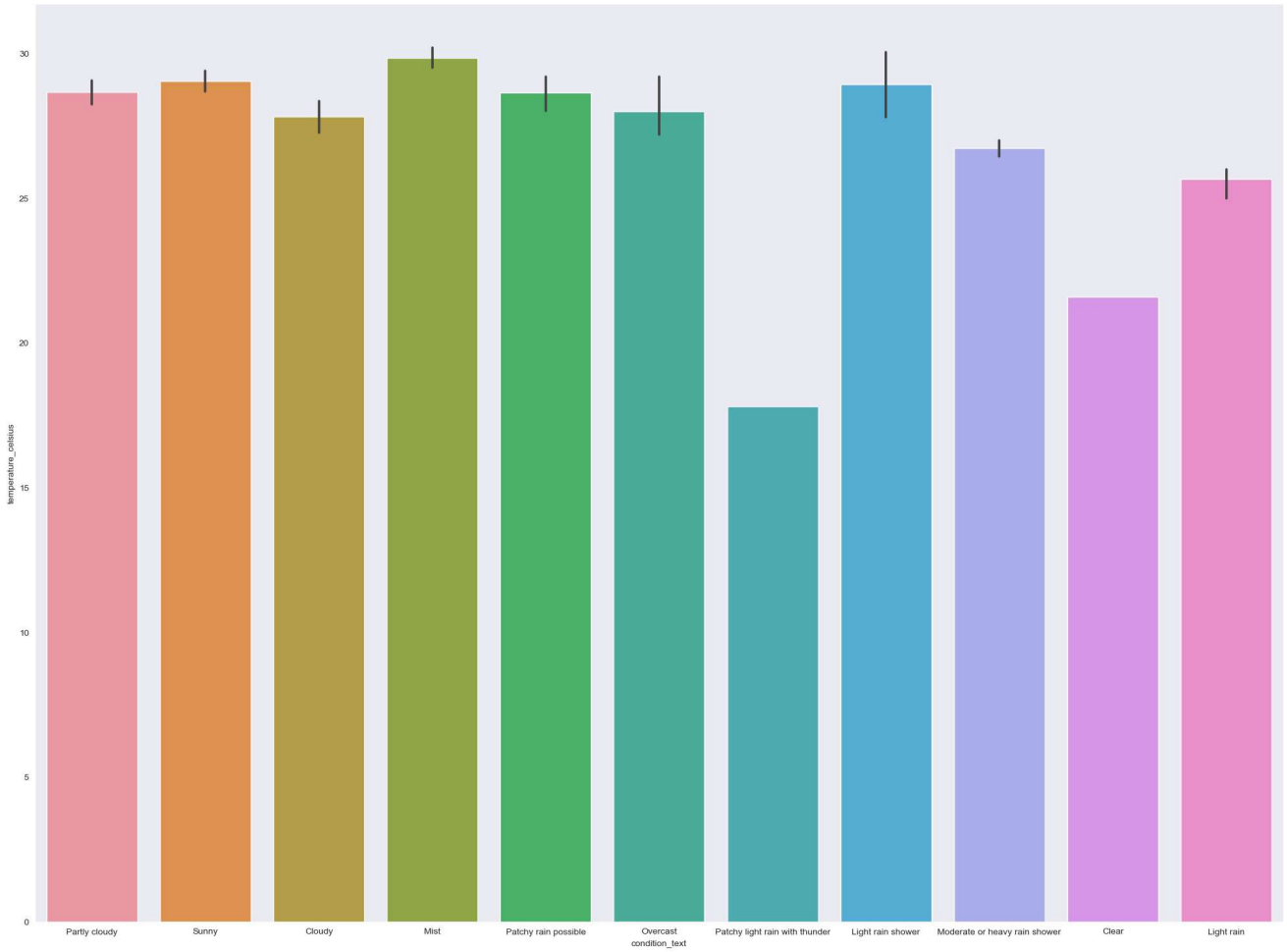
In [297]:
```
plt.figure(figsize=(18.5,6.5))
sns.lineplot(x="region", y="temperature_celsius", data=Top_10_max, linewidth=1.0, label= 'Max')
sns.lineplot(x="region", y="temperature_fahrenheit", data=Top_10_max, linewidth=1.0, label= 'Max')
sns.set_style("dark")
plt.show()
```



In [298]:
```
df.to_string
```

Out[298]:
```
<bound method DataFrame.to_string of      location_name          region  latitude  longitude      timezone  \
0       Ashoknagar  Madhya Pradesh     24.57      77.72  Asia/Kolkata
1           Raisen  Madhya Pradesh     23.33      77.80  Asia/Kolkata
2       Chhindwara  Madhya Pradesh     22.07      78.93  Asia/Kolkata
3            Betul  Madhya Pradesh     21.86      77.93  Asia/Kolkata
4      Hoshangabad  Madhya Pradesh     22.75      77.72  Asia/Kolkata
...            ...             ...       ...        ...           ...
1088       Niwari   Uttar Pradesh     28.88      77.53  Asia/Kolkata
1089      Saitual         Mizoram     23.97      92.58  Asia/Kolkata
1090      Ranipet      Tamil Nadu     12.93      79.33  Asia/Kolkata
1091      Tenkasi      Tamil Nadu      8.97      77.30  Asia/Kolkata
1092       Pendra     Maharashtra     21.93      74.15  Asia/Kolkata

             Time last_updated2  temperature_celsius  temperature_fahrenheit  \
0     10:45:00 AM     8/29/2023                 27.5                    81.5
1     10:45:00 AM     8/29/2023                 27.5                    81.5
2     10:45:00 AM     8/29/2023                 26.3                    79.3
3     10:45:00 AM     8/29/2023                 25.6                    78.1
4     10:45:00 AM     8/29/2023                 27.2                    81.0
...           ...           ...                  ...                     ...
1088   9:00:00 AM     8/30/2023                 30.0                    86.0
1089   9:00:00 AM     8/30/2023                 25.9                    78.6
1090   9:00:00 AM     8/30/2023                 32.1                    89.8
1091   9:00:00 AM     8/30/2023                 28.4                    83.1
1092   9:00:00 AM     8/30/2023                 23.6                    74.5

     condition_text  ...  air_quality_PM10  air_quality_us-epa-index  \
0     Partly cloudy  ...              18.5                         1
1             Sunny  ...              14.2                         1
2     Partly cloudy  ...              20.7                         2
3            Cloudy  ...               6.6                         1
4            Cloudy  ...              14.8                         1
...             ...  ...               ...                       ...
1088           Mist  ...              68.7                         2
1089          Sunny  ...              11.9                         1
1090  Partly cloudy  ...               3.6                         1
1091          Sunny  ...               3.9                         1
1092          Sunny  ...              12.1                         1

      air_quality_gb-defra-index  sunrise   sunset  moonrise  moonset  \
0                              2  5:59 AM  6:41 PM   5:42 PM  3:38 AM
1                              1  6:00 AM  6:40 PM   5:39 PM  3:41 AM
2                              2  5:56 AM  6:34 PM   5:32 PM  3:39 AM
3                              1  6:00 AM  6:38 PM   5:36 PM  3:43 AM
4                              1  6:01 AM  6:39 PM   5:38 PM  3:42 AM
...                          ...      ...      ...       ...      ...
1088                           3  5:57 AM  6:44 PM   6:34 PM  4:42 AM
1089                           1  5:00 AM  5:40 PM   5:26 PM  3:48 AM
1090                           1  6:02 AM  6:25 PM   6:05 PM  5:01 AM
1091                           1  6:12 AM  6:30 PM   6:09 PM  5:16 AM
1092                           1  6:16 AM  6:52 PM   6:38 PM  5:09 AM

          moon_phase  moon_illumination     last_updated
0     Waxing Gibbous                 93  8/29/2023 10:45
1     Waxing Gibbous                 93  8/29/2023 10:45
2     Waxing Gibbous                 93  8/29/2023 10:45
3     Waxing Gibbous                 93  8/29/2023 10:45
4     Waxing Gibbous                 93  8/29/2023 10:45
...              ...                ...              ...
1088       Full Moon                 98   8/30/2023 9:00
1089       Full Moon                 98   8/30/2023 9:00
1090       Full Moon                 98   8/30/2023 9:00
1091       Full Moon                 98   8/30/2023 9:00
1092       Full Moon                 98   8/30/2023 9:00

[1093 rows x 42 columns]>
```

In [299]:
```
plt.figure(figsize=(25,18.5))
sns.barplot(data=df2, x='condition_text', y='temperature_celsius')
plt.show()
```



In [314]:
```
df2_sunrise=df2 ['sunrise'].str.replace('AM','')
```

In [315]:
```
df2_sunset=df2 ['sunset'].str.replace('PM','')
df2_moonrise=df2 ['moonrise'].str.replace('PM','')
df2_moonset=df2 ['moonset'].str.replace('AM','')
```

In [336]:
```
df2_sunset
```

Out[336]:
```
0       6:41
1       6:40
2       6:34
3       6:38
4       6:39
        ...
1088    6:44
1089    5:40
1090    6:25
1091    6:30
1092    6:52
Name: sunset, Length: 1093, dtype: object
```

In [344]:
```
Top_10_sunrise=df2_sunrise.head(10)
Top_10_sunset=df2_sunset.head(10)
Top_10_moonrise=df2_moonrise.head(10)
Top_10_moonset=df2_moonset.head(10)
```

In [345]:
```
Top_10_sunset
```

Out[345]:
```
0    6:41
1    6:40
2    6:34
3    6:38
4    6:39
5    6:42
6    6:31
7    6:34
8    6:31
9    6:48
Name: sunset, dtype: object
```

In [330]:
```
Top_10_sunrise
```

Out[330]:
```
0    5:59
1    6:00
2    5:56
3    6:00
4    6:01
5    6:03
6    5:51
7    5:55
8    5:49
9    6:08
Name: sunrise, dtype: object
```

In [346]:
```
Top_10_moonrise
```

Out[346]:
```
0    5:42
1    5:39
2    5:32
3    5:36
4    5:38
5    5:42
6    5:30
7    5:33
8    5:32
9    5:47
Name: moonrise, dtype: object
```

In [347]:
```
Top_10_moonset
```

Out[347]:
```
0    3:38
1    3:41
2    3:39
3    3:43
4    3:42
5    3:44
6    3:32
7    3:36
8    3:27
9    3:49
Name: moonset, dtype: object
```

In [ ]:
```

```