Report:

1) Find all the unique 'Wind Speed' values in the data.

datac["Wind Speed_km/h"].unique()

```
([ 9, 24, 26, 15,  4,  0, 19, 17, 11, 22, 35, 13, 20, 6, 7, 30, 32,
       41, 39, 28, 44, 33, 37, 52, 46, 2, 50, 48, 57, 63, 43, 83, 70, 54]
```

These are the unique wind speeds present in the data.

2) ***Find the number of times when the 'Weather is exactly Clear'.***

```
datac.loc[data['Weather']=="Clear"].count()
```

```
Weather  - 1326
```

1326 times the weather is clear.

3) Find the number of times when the 'Wind Speed was exactly 4 km/h'.

```
datac.loc[data["Wind Speed_km/h"]==4].count()
```

```
Wind Speed_km/h  474
```

474 times wind speed is exactly 4 km/h

#6) What is the mean 'Visibility' ?

```
datac["Visibility_km"].mean(
```

```
27.664446721311162
```

27.664446721311162 is the mean of visisbility

#7) What is the Standard Deviation of 'Pressure' in this data?

```
datac["Press_kPa"].std()
```

```
0.8440047459486459
```

0.844047459486459 is the std of pressure

#8) What is the Variance of 'Relative Humidity' in this data ?

```
datac["Rel Hum_%"].var()
```

```
286.2485501985015
```

286.2485501985015 is the rel humidity

#10) Find all instances when 'Wind Speed is above 24' and 'Visibility is 25'.

```
datac.loc[(data["Wind
Speed_km/h"]==24)&(data["Visibility_km"]==25)].value_counts()
```

```
107
```

There are 107 instnaces when 'Wind Speed is above 24' and 'Visibility is 25'

#11) What is the Mean value of each column against each 'Weather Condition ?

```
g=datac.groupby("Weather condition")
```

```
g[["Press_kPa","Temp_C","Rel Hum_%","Wind
Speed_km/h","Visibility_km","Temp_C",]].mean()
```

Clear	101.084495	6.825716	67.127451	10.557315	30.153243	6.825716
Cloudy	101.056852	7.970544	67.349537	16.127315	26.625752	7.970544
Drizzle	101.099268	7.353659	69.048780	16.097561	17.931707	7.353659
Drizzle,Fog	100.820750	8.067500	70.062500	11.862500	5.257500	8.067500
Drizzle,Ice Pellets,Fog	99.440000	0.400000	52.000000	20.000000	4.000000	0.400000
Drizzle,Snow	100.490000	1.050000	44.000000	14.000000	10.500000	1.050000
Drizzle,Snow,Fog	100.971333	0.693333	69.800000	15.533333	5.513333	0.693333
Fog	101.149400	4.303333	66.466667	7.946667	6.248000	4.303333
Freezing Drizzle	101.070000	-5.657143	68.857143	16.571429	9.200000	-5.657143
Freezing Drizzle,Fog	100.851667	-2.533333	64.000000	17.000000	5.266667	-2.533333
Freezing Drizzle,Haze	101.136667	-5.433333	63.333333	10.333333	2.666667	-5.433333
Freezing Drizzle,Snow	100.380909	-5.109091	62.454545	16.272727	5.872727	-5.109091
Freezing Fog	101.222500	-7.575000	68.000000	4.750000	0.650000	-7.575000
Freezing Rain	101.500714	-3.885714	60.785714	19.214286	8.242857	-3.885714
Freezing Rain,Fog	100.267500	-2.225000	52.750000	15.500000	7.550000	-2.225000
Freezing Rain,Haze	100.265000	-4.900000	63.000000	7.500000	2.400000	-4.900000
Freezing Rain,Ice Pellets,Fog	98.330000	-2.600000	65.000000	28.000000	8.000000	-2.600000

Freezing Rain,Snow Grains	102.520000	-5.000000	92.000000	32.000000	4.800000	-5.000000
Haze	100.805625	-0.200000	69.625000	10.437500	7.831250	-0.200000
Mainly Clear	101.040940	12.558927	68.020893	14.144824	34.264862	12.558927
Moderate Rain,Fog	100.450000	1.700000	89.000000	17.000000	6.400000	1.700000
Moderate Snow	100.760000	-5.525000	67.500000	33.750000	0.750000	-5.525000
Moderate Snow,Blowing Snow	102.215000	-5.450000	81.500000	40.000000	0.600000	-5.450000
Mostly Cloudy	101.051054	10.574287	67.214113	15.813920	31.253842	10.574287
Rain	101.051797	9.786275	67.614379	19.254902	18.856536	9.786275
Rain Showers	101.020106	13.722340	68.335106	17.132979	22.816489	13.722340
Rain Showers,Fog	99.800000	12.800000	31.000000	13.000000	6.400000	12.800000
Rain Showers,Snow Showers	101.080000	2.150000	68.500000	22.500000	21.700000	2.150000
Rain,Fog	100.991983	8.273276	66.818966	14.793103	6.873276	8.273276
Rain,Haze	100.716667	4.633333	57.666667	11.666667	6.700000	4.633333
Rain,Ice Pellets	101.880000	0.600000	54.000000	24.000000	9.700000	0.600000
Rain,Snow	100.895000	1.055556	66.944444	28.388889	11.672222	1.055556
Rain,Snow Grains	100.870000	1.900000	87.000000	26.000000	25.000000	1.900000
Rain,Snow,Fog	102.480000	0.800000	61.000000	9.000000	6.400000	0.800000
Rain,Snow,Ice Pellets	101.170000	1.100000	72.500000	23.250000	6.000000	1.100000
Snow	101.077205	-4.524103	66.402564	20.038462	11.171795	-4.524103
Snow Pellets	99.560000	0.700000	66.000000	35.000000	2.400000	0.700000
Snow Showers	100.999333	-3.506667	65.600000	19.233333	20.158333	-3.506667
Snow Showers,Fog	100.770000	-10.675000	63.750000	13.750000	7.025000	-10.675000
Snow,Blowing Snow	101.032105	-5.410526	72.631579	34.842105	4.105263	-5.410526
Snow,Fog	101.194865	-5.075676	70.459459	17.324324	4.537838	-5.075676
Snow,Haze	100.360000	-4.020000	66.000000	5.000000	4.640000	-4.020000
Snow,Ice Pellets	100.746667	-1.883333	74.000000	23.833333	7.416667	-1.883333
Thunderstorms	101.375000	24.150000	56.500000	7.500000	24.550000	24.150000
Thunderstorms,Heavy Rain Showers	101.400000	10.900000	82.000000	9.000000	2.400000	10.900000
Thunderstorms,Moderate Rain Showers,Fog	99.940000	19.600000	58.000000	15.000000	3.200000	19.600000
Thunderstorms,Rain	101.536667	20.433333	71.666667	15.666667	19.833333	20.433333
Thunderstorms,Rain Showers	100.976875	20.037500	68.437500	18.312500	15.893750	20.037500

Thunderstorms,Rain Showers,Fog	100.806667	21.600000	58.666667	19.666667	9.700000	21.600000
Thunderstorms,Rain,Fog	100.450000	20.600000	42.000000	19.000000	4.800000	20.600000

These are the mean values against weather column.

#12) What is the Minimum & Maximum value of each column against each 'Weather Condition ?

```
g[["Press_kPa","Temp_C","Rel Hum_%","Wind
Speed_km/h","Visibility_km","Temp_C",]].min()
```

Clear	97.75	-23.3	18	0	11.3	-23.3
Cloudy	97.52	-21.4	20	0	11.3	-21.4
Drizzle	98.29	1.1	37	0	6.4	1.1
Drizzle,Fog	98.32	0.0	38	0	1.0	0.0
Drizzle,Ice Pellets,Fog	99.44	0.4	52	20	4.0	0.4
Drizzle,Snow	100.27	0.9	39	9	9.7	0.9
Drizzle,Snow ,Fog	99.26	0.3	46	7	2.4	0.3
Fog	97.97	-16.0	21	0	0.2	-16.0
Freezing Drizzle	99.75	-9.0	43	6		

These are the min values against weather.

```
g[["Press_kPa","Temp_C","Rel Hum_%","Wind
Speed_km/h","Visibility_km","Temp_C",]].max()
```

13) Show all the Records where Weather Condition is Fog.

```
datac.loc[data["Weather condition"]=="Fog"]
```

Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility _km	Press_ kPa	Weather condition	

13	1/1/2012 13:00	9.5	7.8	40	13	6.4	100.90	Fog
53	3/1/2012 5:00	-3.6	-4.3	57	7	9.7	101.32	Fog
136	6/1/2012 16:00	14.8	13.5	80	19	9.7	100.86	Fog
197	9/1/2012 5:00	2.1	0.7	43	11	8.0	101.44	Fog
278	12/1/2012 14:00	1.2	0.6	70	13	6.4	103.22	Fog
...	...	...	...	...	...	...	...	...
8475	9/18/2012 11:00	6.2	5.4	56	7	4.8	102.03	Fog
8511	9/19/2012 22:00	15.7	15.4	66	7	8.0	101.93	Fog
8518	9/19/2012 8:00	-2.9	-4.5	68	6	6.4	100.41	Fog
8537	9/20/2012 3:00	-0.5	-2.1	74	7	4.0	100.81	Fog
8771	9/30/2012 19:00	12.8	12.2	91	19	4.8	100.60	Fog

```
#These are records where weather condition is fog.
```

```
#14) Find all instances when 'Weather is Clear' or 'Visibility is above 40'.
datac.loc[(data["Weather condition"]=="clear")|(data["Visibility_km"]>40)]
```

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather condition
9	1/1/2012 9:00	20.0	3.8	35	17	48.3	100.11	Clear
17	1/1/2012 17:00	-6.8	-9.8	42	20	48.3	100.76	Mainly Clear
18	1/1/2012 18:00	2.3	-2.4	42	6	48.3	101.05	Cloudy
19	1/1/2012 19:00	-12.7	-17.2	43	17	48.3	101.16	Clear
23	1/1/2012 23:00	29.5	16.8	45	4	48.3	101.07	Mainly Clear
...	...	...	...	...	...	...	...	...
8759	9/29/2012 9:00	-2.1	-10.9	86	24	48.3	101.41	Mostly Cloudy
8774	9/30/2012 21:00	23.0	14.7	92	13	48.3	101.93	Mostly Cloudy
8777	9/30/2012 3:00	9.3	5.8	95	9	48.3	101.25	Mainly Clear

8779	9/30/2012 5:00	1.4	-3.7	97	22	48.3	100.16	Cloudy
8780	9/30/2012 6:00	-4.6	-9.5	98	11	48.3	101.46	Mostly Cloudy

2014 rows × 8 columns

In [50]:

```
# 15) Find all instances when :A. 'Weather is Clear' and 'Relative Humidity is greater than 50' datac.loc[(data["Weather condition"]=="Clear")&(data["Rel Hum_%"]>50)]
```

Out[50]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather condition
35	2/1/2012 11:00	9.1	6.2	53	6	16.1	102.34	Clear
37	2/1/2012 13:00	-12.0	-18.2	54	22	25.0	100.94	Clear
40	2/1/2012 16:00	21.5	10.9	54	0	48.3	101.68	Clear
50	3/1/2012 2:00	18.9	16.2	56	9	25.0	101.86	Clear
51	3/1/2012 3:00	22.2	5.5	57	19	48.3	100.88	Clear
...	...	...	...	...	...	...	...	...
8735	9/28/2012 9:00	14.2	12.9	80	4	25.0	102.47	Clear
8743	9/29/2012 15:00	17.7	7.8	81	9	25.0	100.95	Clear
8768	9/30/2012 16:00	18.2	8.8	90	4	25.0	101.26	Clear
8770	9/30/2012 18:00	24.6	12.6	90	15	24.1	101.78	Clear
8781	9/30/2012 7:00	1.5	-6.3	99	30	24.1	101.48	Clear

1098 rows × 8 columns

These are the instnaces when Weather is Clear' and 'Relative Humidity is greater than 50'

```
# B. 'Visibility is above 40'

datac.loc[data["Visibility_km"]>40]\
```

Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather condition	
9	1/1/2012 9:00	20.0	3.8	35	17	48.3	100.11	Clear
17	1/1/2012 17:00	-6.8	-9.8	42	20	48.3	100.76	Mainly Clear
18	1/1/2012 18:00	2.3	-2.4	42	6	48.3	101.05	Cloudy
19	1/1/2012 19:00	-12.7	-17.2	43	17	48.3	101.16	Clear

23	1/1/2012 23:00	29.5	16.8	45	4	48.3	101.07	Mainly Clear
...	...	...	...	...	...	...	...	...
8759	9/29/2012 9:00	-2.1	-10.9	86	24	48.3	101.41	Mostly Cloudy
8774	9/30/2012 21:00	23.0	14.7	92	13	48.3	101.93	Mostly Cloudy
8777	9/30/2012 3:00	9.3	5.8	95	9	48.3	101.25	Mainly Clear
8779	9/30/2012 5:00	1.4	-3.7	97	22	48.3	100.16	Cloudy
8780	9/30/2012 6:00	-4.6	-9.5	98	11	48.3	101.46	Mostly Cloudy

2014 rows × 8 columns

These are the instnaces when visibility is greater than 40.