SAS Analysis of Meteorological Data

Overview:

This SAS script is designed for the analysis and visualization of meteorological data from the valentia.csv dataset, focusing on key weather variables across different time periods. The tasks include importing data, examining dataset structure, data preprocessing such as renaming variables and adding new calculated fields, and conducting exploratory data analysis through statistical summaries and visualizations like scatterplot matrices and histograms. Each section of the script is clearly labeled and structured to facilitate an understanding of the data's characteristics and underlying patterns. The analysis is conducted within the framework of SAS software, utilizing its powerful data management and analytical capabilities to draw meaningful insights from the weather dataset.

Importing the Dataset:

INFERENCE :-

Using SAS commands, the file was imported and changing new name weather in the local directory.

Dataset Contents

The CONTENTS Procedure

Data Set Name	S40840.WEATHER	**Observations**	3652
Member Type	DATA	**Variables**	27
Engine	V9	**Indexes**	0
Created	08/01/2024 10:26:51	**Observation Length**	208
Last Modified	08/01/2024 10:26:51	**Deleted Observations**	0
Protection		**Compressed**	NO
Data Set Type		**Sorted**	NO
Label			
Data Representation	SOLARIS_X86_64, LINUX_X86_64, ALPHA_TRU64, LINUX_IA64		
Encoding	utf-8 Unicode (UTF-8)		

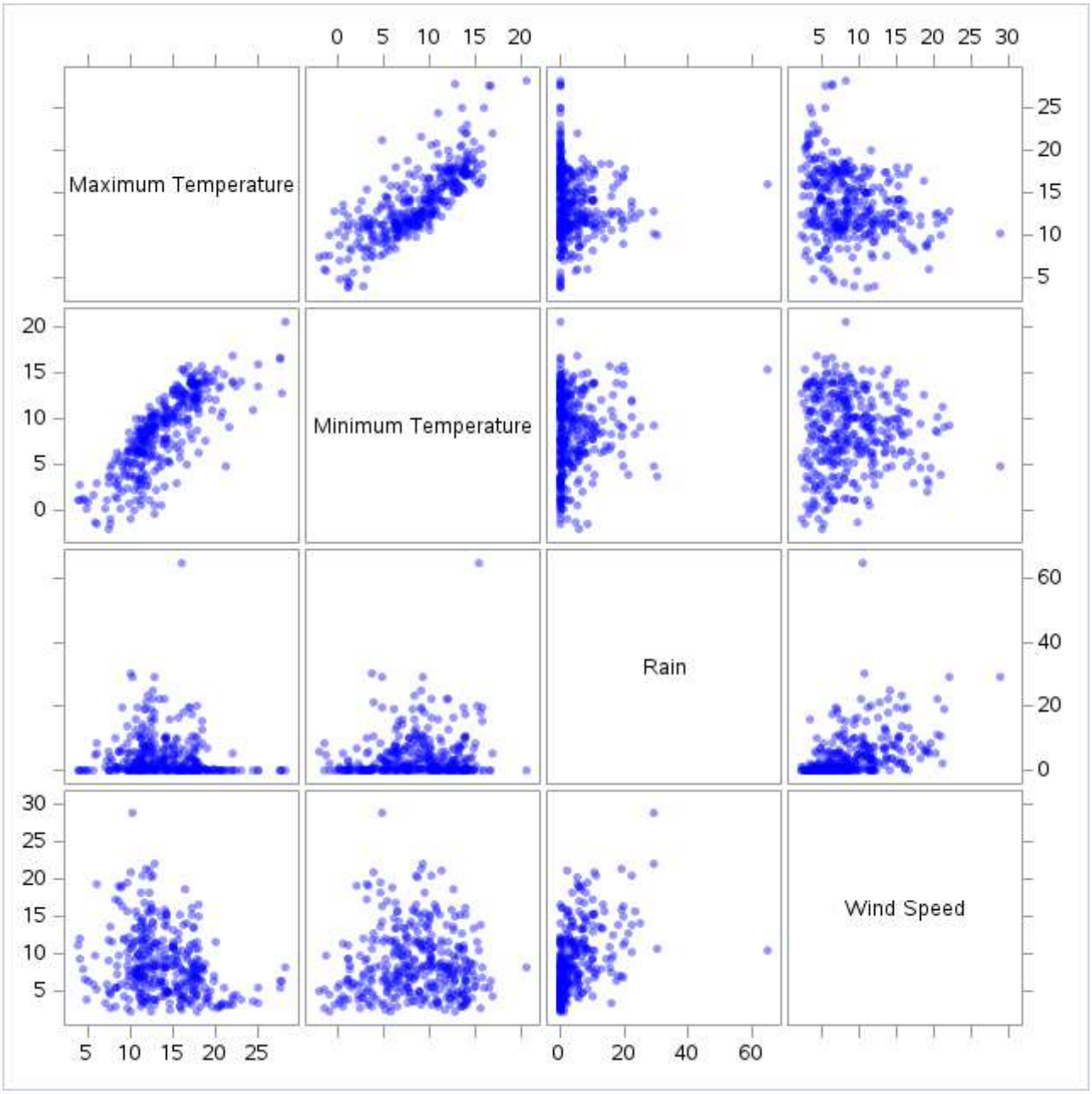
Engine/Host Dependent Information	
Data Set Page Size	131072
Number of Data Set Pages	6
First Data Page	1
Max Obs per Page	629
Obs in First Data Page	604
Number of Data Set Repairs	0
Filename	/home/u63920244/s40840/weather.sas7bdat
Release Created	9.0401M7
Host Created	Linux
Inode Number	16036177
Access Permission	rw-r--r--
Owner Name	u63920244
File Size	896KB
File Size (bytes)	917504

Alphabetic List of Variables and Attributes					
#	Variable	Type	Len	Format	Informat
12	cbl	Num	8	BEST12.	BEST32.
1	date	Num	8	BEST12.	BEST32.
17	ddhm	Num	8	BEST12.	BEST32.
24	evap	Num	8	BEST12.	BEST32.
21	glorad	Char	2	$2.	$2.
9	gmin	Num	8	BEST12.	BEST32.
19	hg	Num	8	BEST12.	BEST32.
15	hm	Num	8	BEST12.	BEST32.
8	igmin	Num	8	BEST12.	BEST32.
4	ind	Num	8	BEST12.	BEST32.
6	ind.1	Num	8	BEST12.	BEST32.
10	ind.2	Num	8	BEST12.	BEST32.
14	ind.3	Num	8	BEST12.	BEST32.
16	ind.4	Num	8	BEST12.	BEST32.
18	ind.5	Num	8	BEST12.	BEST32.
5	maxtp	Num	8	BEST12.	BEST32.
7	mintp	Num	8	BEST12.	BEST32.
2	month	Char	5	$5.	$5.
23	pe	Num	8	BEST12.	BEST32.
11	rain	Num	8	BEST12.	BEST32.
26	smd_md	Num	8	BEST12.	BEST32.
27	smd_pd	Num	8	BEST12.	BEST32.
25	smd_wd	Num	8	BEST12.	BEST32.
22	soil	Num	8	BEST12.	BEST32.
20	sun	Char	2	$2.	$2.
13	wdsp	Num	8	BEST12.	BEST32.
3	year	Num	8	BEST12.	BEST32.

Viewing the First 15 Rows of Data

Obs	date	month	year	maxtp	mintp	rain
1	1	jan	2012	10.9	4.1	5.7
2	2	jan	2012	12.1	3.3	19.1
3	3	jan	2012	12.8	4.8	5
4	4	jan	2012	10.9	7.6	3.6
5	5	jan	2012	11.2	6.9	2.5
6	6	jan	2012	11.5	8.2	3.4
7	7	jan	2012	10.9	9	0.2
8	8	jan	2012	12.2	10.2	0.2
9	9	jan	2012	11.3	8.4	3.8
10	10	jan	2012	11.4	9.8	6.1
11	11	jan	2012	11.2	10	3.9
12	12	jan	2012	10.9	9.6	2.6
13	13	jan	2012	10.2	7.2	0.6
14	14	jan	2012	10.5	8.2	0.3
15	15	jan	2012	9.7	6.8	14.3

Scatterplot Matrix for Selected Meteorological Variables



Renaming Variables

Obs	date	month	year	max_temp	min_temp	wind_speed
1	1	jan	2012	10.9	4.1	17.2
2	2	jan	2012	12.1	3.3	18.6
3	3	jan	2012	12.8	4.8	25.7
4	4	jan	2012	10.9	7.6	22.1
5	5	jan	2012	11.2	6.9	15.8
6	6	jan	2012	11.5	8.2	10.6
7	7	jan	2012	10.9	9	8.9
8	8	jan	2012	12.2	10.2	9.1
9	9	jan	2012	11.3	8.4	6.9

Obs	date	month	year	max_temp	min_temp	wind_speed
10	10	jan	2012	11.4	9.8	12.8

Adding a New Derived Variable

Obs	wind_speed	wind_speed1
1	17.2	8.6
2	18.6	9.3
3	25.7	12.9
4	22.1	11.1
5	15.8	7.9

Filter

Days with Maximum Temperature Greater Than 25°C

Obs	date	month	year	max_temp	min_temp	rain
145	25	may	2012	25.9	7.3	0.1
222	10	aug	2012	25.5	13.1	0
555	9	jul	2013	27.6	14.4	0
565	19	jul	2013	26	13.4	0
566	20	jul	2013	27.5	16.2	0
1661	19	jul	2016	25.2	13.6	0
1997	20	jun	2017	26	15.2	0.7
2368	26	jun	2018	26.6	12.8	0
2369	27	jun	2018	28.2	13.2	0
2370	28	jun	2018	28.4	10.9	0
2371	29	jun	2018	25.4	13.5	0
2734	27	jun	2019	28	17.7	0
3485	17	jul	2021	25.1	13.4	0
3489	21	jul	2021	27.6	16.5	0
3490	22	jul	2021	28.3	20.5	0
3491	23	jul	2021	27.7	16.6	0
3537	7	sep	2021	27.9	12.7	0.2

Statistical Summary

Summary Statistics for Maximum and Minimum Temperature and Rain

The MEANS Procedure

Variable	N	Mean	Median	Std Dev	Maximum
max_temp	3652	13.6709474	13.3000000	3.6898882	28.4000000

Variable	N	Mean	Median	Std Dev	Maximum
min_temp	3652	8.3817087	8.5000000	3.9369566	20.5000000
rain	3650	4.5807945	1.9000000	6.9143831	105.5000000

Printed Summary Statistics

Obs	_TYPE_	_FREQ_	mean	median	std	max
1	0	3652	13.67	13.30	3.69	28.40

Histogram and Density Plot of Wind Speed