Experiment No:2

Aim:

To create summary statistical data in SAS Studio.

Implementation: Mean:

```
PROC MEANS DATA=sashelp.cars N MEAN MEDIAN MODE MIN MAX RANGE QRANGE CV SKEWNESS MAXDEC=2;
TITLE 'STATISTICAL SUMMARY OF CARS (MEANS)';
VAR EngineSize Horsepower MPG_CIty MPG_Highway;
RUN;
```

STATISTICAL SUMMARY OF CARS (MEANS)

The MEANS Procedure

Variable	Label	N	Mean	Median	Mode	Minimum	Maximum	Range	Quartile Range	Coeff of Variation	Skewness
EngineSize	Engine Size (L)	428	3.20	3.00	3.00	1.30	8.30	7.00	1.55	34.68	0.71
Horsepower		428	215.89	210.00	200.00	73.00	500.00	427.00	90.00	33.28	0.93
MPG_City	MPG (City)	428	20.06	19.00	18.00	10.00	60.00	50.00	4.50	26.11	2.78
MPG_Highway	MPG (Highway)	428	26.84	26.00	26.00	12.00	66.00	54.00	5.00	21.39	1.25

Univariate:

```
PROC UNIVARIATE DATA=sashelp.cars;
TITLE 'STATISTICAL SUMMARY OF CARS (UNIVARIATE)';
VAR EngineSize Horsepower MPG_CIty MPG_Highway;
RUN;
```

STATISTICAL SUMMARY OF CARS (UNIVARIATE)

The UNIVARIATE Procedure
Variable: EngineSize (Engine Size (L))

Moments			
N	428	Sum Weights	428
Mean	3.19672897	Sum Observations	1368.2
Std Deviation	1.10859472	Variance	1.22898225
Skewness	0.70815198	Kurtosis	0.54194354
Uncorrected SS	4898.54	Corrected SS	524.775421
Coeff Variation	34.6790337	Std Error Mean	0.05358595

Basic Statistical Measures			
Location		Variability	
Mean	3.196729	Std Deviation	1.10859
Median	3.000000	Variance	1.22898
Mode	3.000000	Range	7.00000
		Interquartile Range	1.55000

Tests for Location: Mu0=0				
Test	Statistic		p Value	
Student's t	t	59.65611	Pr > |t|	<.0001
Sign	M	214	Pr >= |M|	<.0001
Signed Rank	S	45903	Pr >= |S|	<.0001

Quantiles (Definition 5)	
Level	Quantile
100% Max	8.30
99%	6.00
95%	5.30
90%	4.60
75% Q3	3.90
50% Median	3.00
25% Q1	2.35
10%	1.80
5%	1.70
1%	1.50
0% Min	1.30

Extreme Observations			
Lowest		Highest	
Value	Obs	Value	Obs
1.3	249	6.0	148
1.3	248	6.0	167
1.4	150	6.0	413
1.5	385	6.8	119
1.5	384	8.3	115

STATISTICAL SUMMARY OF CARS (UNIVARIATE)

The UNIVARIATE Procedure
Variable: Horsepower

Moments			
N	428	Sum Weights	428
Mean	215.885514	Sum Observations	92399
Std Deviation	71.8360316	Variance	5160.41543
Skewness	0.93033074	Kurtosis	1.55215883
Uncorrected SS	22151103	Corrected SS	2203497.39
Coeff Variation	33.2750587	Std Error Mean	3.47232565

Basic Statistical Measures			
Location		Variability	
Mean	215.8855	Std Deviation	71.83603
Median	210.0000	Variance	5160
Mode	200.0000	Range	427.00000
		Interquartile Range	90.00000

Tests for Location: Mu0=0				
Test	Statistic		p Value	
Student's t	t	62.17318	Pr > |t|	<.0001
Sign	M	214	Pr >= |M|	<.0001
Signed Rank	S	45903	Pr >= |S|	<.0001

Quantiles (Definition 5)	
Level	Quantile
100% Max	500
99%	477
95%	340
90%	302
75% Q3	255
50% Median	210
25% Q1	165
10%	130
5%	115
1%	103
0% Min	73

Extreme Observations			
Lowest		Highest	
Value	Obs	Value	Obs
73	151	477	335
93	150	493	263
100	405	493	271
103	171	493	272
103	170	500	115

STATISTICAL SUMMARY OF CARS (UNIVARIATE)

The UNIVARIATE Procedure
Variable: MPG_City (MPG (City))

Moments			
N	428	Sum Weights	428
Mean	20.0607477	Sum Observations	8586
Std Deviation	5.23821764	Variance	27.438924
Skewness	2.7820718	Kurtosis	15.7911473
Uncorrected SS	183958	Corrected SS	11716.4206
Coeff Variation	26.1117767	Std Error Mean	0.25319681

Basic Statistical Measures			
Location		Variability	
Mean	20.06075	Std Deviation	5.23822
Median	19.00000	Variance	27.43892
Mode	18.00000	Range	50.00000
		Interquartile Range	4.50000

Tests for Location: Mu0=0				
Test	Statistic		p Value	
Student's t	t	79.22923	Pr > |t|	<.0001
Sign	M	214	Pr >= |M|	<.0001
Signed Rank	S	45903	Pr >= |S|	<.0001

Quantiles (Definition 5)	
Level	Quantile
100% Max	60.0
99%	36.0
95%	29.0
90%	26.0
75% Q3	21.5
50% Median	19.0
25% Q1	17.0
10%	15.0
5%	14.0
1%	12.0
0% Min	10.0

Extreme Observations			
Lowest		Highest	
Value	Obs	Value	Obs
10	167	36	156
10	119	38	405
12	413	46	150
12	217	59	374
12	216	60	151

STATISTICAL SUMMARY OF CARS (UNIVARIATE)

The UNIVARIATE Procedure
Variable: MPG_Highway (MPG (Highway))

Moments			
N	428	Sum Weights	428
Mean	26.8434579	Sum Observations	11489
Std Deviation	5.74120072	Variance	32.9613857
Skewness	1.25239527	Kurtosis	6.04561068
Uncorrected SS	322479	Corrected SS	14074.5117
Coeff Variation	21.3877092	Std Error Mean	0.27751141

Basic Statistical Measures			
Location		Variability	
Mean	26.84346	Std Deviation	5.74120
Median	26.00000	Variance	32.96139
Mode	26.00000	Range	54.00000
		Interquartile Range	5.00000

Tests for Location: Mu0=0				
Test	Statistic		p Value	
Student's t	t	96.7292	Pr > |t|	<.0001
Sign	M	214	Pr >= |M|	<.0001
Signed Rank	S	45903	Pr >= |S|	<.0001

Quantiles (Definition 5)	
Level	Quantile
100% Max	66
99%	44
95%	36
90%	34
75% Q3	29
50% Median	26
25% Q1	24
10%	20
5%	18
1%	16
0% Min	12

Extreme Observations			
Lowest		Highest	
Value	Obs	Value	Obs
12	167	44	156
13	119	46	405
14	252	51	150
16	217	51	374
16	216	66	151

Frequency:

```
PROC FREQ DATA=sashelp.cars;
TITLE 'STATISTICAL SUMMARY OF CARS (FREQUENCY)';
TABLE Origin Type DriveTrain;
RUN;
```

STATISTICAL SUMMARY OF CARS (FREQUENCY)

The FREQ Procedure

Origin	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Asia	158	36.92	158	36.92
Europe	123	28.74	281	65.65
USA	147	34.35	428	100.00

Type	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Hybrid	3	0.70	3	0.70
SUV	60	14.02	63	14.72
Sedan	262	61.21	325	75.93
Sports	49	11.45	374	87.38
Truck	24	5.61	398	92.99
Wagon	30	7.01	428	100.00

DriveTrain	Frequency	Percent	Cumulative Frequency	Cumulative Percent
All	92	21.50	92	21.50
Front	226	52.80	318	74.30
Rear	110	25.70	428	100.00

Conclusion:

In this experiment, we learnt how to create summary statistical data in sas Studio using functions like mean, univariate and frequency.