Name: Ayush Jain **SAP ID: 60004200132**

Div: B3 **Sub: Business Analytics**

Experiment 2

AIM: Import appropriate dataset. Create summary statistical data/reports with PROC MEANS, PROC UNIVARIARIATE, and PROC FREQ. Draw inferences from the statistical data.

CODE/OUTPUT:

```
PROC IMPORT DATAFILE='/home/u63311610/CARS.csv' DBMS=CSV
OUT=CARS REPLACE; GETNAMES=YES;
RUN;
PROC PRINT DATA=CARS;
TITLE 'CARS';
RUN;
```

CARS

Obs	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horsepower	MPG_City	MPG_Highway	Weight	Wheelbase	Length
1	Acura	MDX	SUV	Asia	All	$36,945	$33,337	3.5	6	265	17	23	4451	106	189
2	Acura	RSX Type S 2dr	Sedan	Asia	Front	$23,820	$21,761	2	4	200	24	31	2778	101	172
3	Acura	TSX 4dr	Sedan	Asia	Front	$26,990	$24,647	2.4	4	200	22	29	3230	105	183
4	Acura	TL 4dr	Sedan	Asia	Front	$33,195	$30,299	3.2	6	270	20	28	3575	108	186
5	Acura	3.5 RL 4dr	Sedan	Asia	Front	$43,755	$39,014	3.5	6	225	18	24	3880	115	197
6	Acura	3.5 RL w/Navigation 4dr	Sedan	Asia	Front	$46,100	$41,100	3.5	6	225	18	24	3893	115	197
7	Acura	NSX coupe 2dr manual S	Sports	Asia	Rear	$89,765	$79,978	3.2	6	290	17	24	3153	100	174
8	Audi	A4 1.8T 4dr	Sedan	Europe	Front	$25,940	$23,508	1.8	4	170	22	31	3252	104	179
9	Audi	A41.8T convertible 2dr	Sedan	Europe	Front	$35,940	$32,506	1.8	4	170	23	30	3638	105	180
10	Audi	A4 3.0 4dr	Sedan	Europe	Front	$31,840	$28,846	3	6	220	20	28	3462	104	179
11	Audi	A4 3.0 Quattro 4dr manual	Sedan	Europe	All	$33,430	$30,366	3	6	220	17	26	3583	104	179
12	Audi	A4 3.0 Quattro 4dr auto	Sedan	Europe	All	$34,480	$31,388	3	6	220	18	25	3627	104	179
13	Audi	A6 3.0 4dr	Sedan	Europe	Front	$36,640	$33,129	3	6	220	20	27	3561	109	192
14	Audi	A6 3.0 Quattro 4dr	Sedan	Europe	All	$39,640	$35,992	3	6	220	18	25	3880	109	192
15	Audi	A4 3.0 convertible 2dr	Sedan	Europe	Front	$42,490	$38,325	3	6	220	20	27	3814	105	180
16	Audi	A4 3.0 Quattro convertible 2dr	Sedan	Europe	All	$44,240	$40,075	3	6	220	18	25	4013	105	180
17	Audi	A6 2.7 Turbo Quattro 4dr	Sedan	Europe	All	$42,840	$38,840	2.7	6	250	18	25	3836	109	192
18	Audi	A6 4.2 Quattro 4dr	Sedan	Europe	All	$49,690	$44,936	4.2	8	300	17	24	4024	109	193
19	Audi	A8 L Quattro 4dr	Sedan	Europe	All	$69,190	$64,740	4.2	8	330	17	24	4399	121	204

```
PROC MEANS DATA=CARS N MEAN MEDIAN MODE MIN MAX RANGE QRANGE CV
SKEWNESS MAXDEC=2;
TITLE 'STATISTICAL SUMMARY OF CARS (MEANS)';

RUN;
```

STATISTICAL SUMMARY OF CARS (MEANS)

The MEANS Procedure

Variable	N	Mean	Median	Mode	Minimum	Maximum	Range	Quartile Range	Coeff of Variation	Skewness
EngineSize	428	3.20	3.00	3.00	1.30	8.30	7.00	1.55	34.68	0.71
Cylinders	428	5.81	6.00	6.00	3.00	12.00	9.00	2.00	26.83	0.59
Horsepower	428	215.89	210.00	200.00	73.00	500.00	427.00	90.00	33.28	0.93
MPG_City	428	20.06	19.00	18.00	10.00	60.00	50.00	4.50	26.11	2.78
MPG_Highway	428	26.84	26.00	26.00	12.00	66.00	54.00	5.00	21.39	1.26
Weight	428	3577.95	3474.50	3175.00	1850.00	7190.00	5340.00	875.50	21.21	0.89
Wheelbase	428	108.15	107.00	107.00	89.00	144.00	55.00	9.00	7.69	0.96
Length	428	186.36	187.00	178.00	143.00	238.00	95.00	16.00	7.70	0.18

```
PROC UNIVARIATE DATA=CARS;
TITLE 'STATISTICAL SUMMARY OF CARS TABLE (UNIVARIATE)';

RUN;
```

STATISTICAL SUMMARY OF CARS TABLE (UNIVARIATE)

The UNIVARIATE Procedure
Variable: EngineSize

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 TABLE (UNIVARIATE)

The UNIVARIATE Procedure
Variable: Cylinders

Moments			
N	426	Sum Weights	426
Mean	5.80751174	Sum Observations	2474
Std Deviation	1.55844263	Variance	2.42874344
Skewness	0.5927852	Kurtosis	0.44037632
Uncorrected SS	15400	Corrected SS	1032.21596
Coeff Variation	26.8349459	Std Error Mean	0.07550679

Basic Statistical Measures			
Location		Variability	
Mean	5.807512	Std Deviation	1.55844
Median	6.000000	Variance	2.42874
Mode	6.000000	Range	9.00000
		Interquartile Range	2.00000

Tests for Location: Mu0=0				
Test	Statistic		p Value	
Student's t	t	76.91377	Pr > |t|	<.0001
Sign	M	213	Pr >= |M|	<.0001
Signed Rank	S	45475.5	Pr >= |S|	<.0001

Moments			
N	426	Sum Weights	426
Mean	20.0607477	Sum Observations	8546
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	0.25379881

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

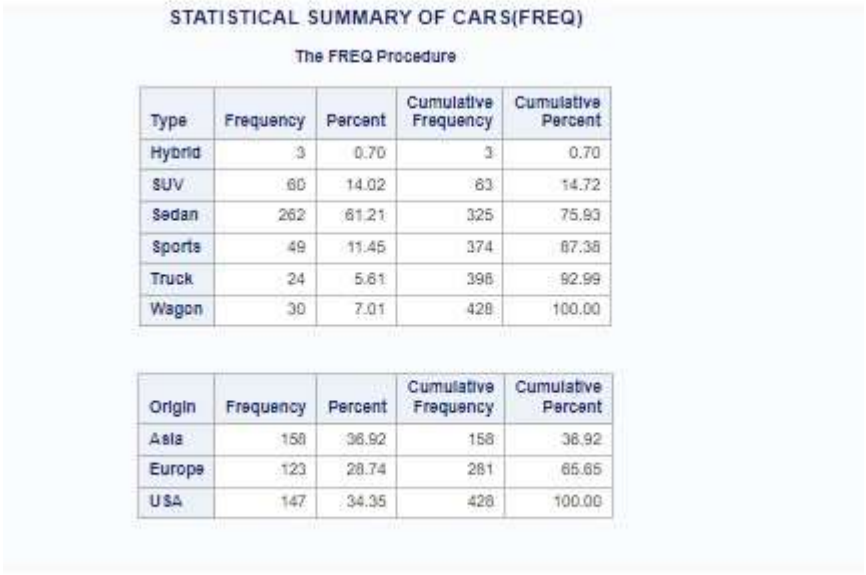
Tests for Location: Mu0=0				
Test	Statistic		p Value	
Student's t	t	79.22923	Pr > |t|	<.0001
Sign	M	214	Pr >= |M|	<.0001
Signed Rank	S	45903	Pr >= |S|	<.0001

Quantiles (Definition 5)	
Level	Quantile
100% Max	60.0
99%	36.0
95%	29.0
90%	26.0

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	38	156
10	119	38	405
12	413	46	150
12	217	59	374
12	216	60	151

```
PROC FREQ DATA=CARS;
TITLE 'STATISTICAL SUMMARY OF CARS(FREQ)';
TABLES TYPE ORIGIN;
RUN;
```



STATISTICAL SUMMARY OF CARS(FREQ)

The FREQ Procedure

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

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

Conclusion: From this experiment, we learn how to create summary statistical data in SAS Studio.