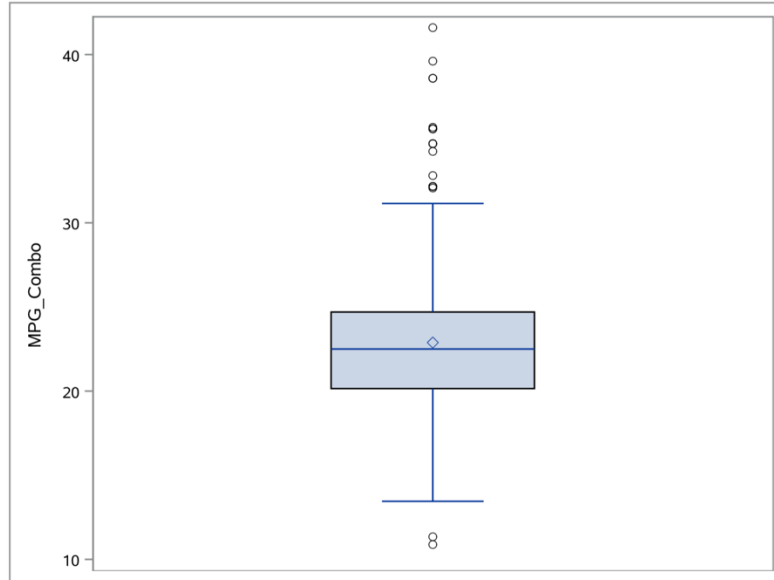1. Descriptive Statistics (4 parts)

(a) Create a combined mpg variable called MPG Combo which combines 55% of the MPG City and 45% of the MPG Highway. Obtain a box plot for MPG Combo and comment on what the plot tells us about fuel efficiencies.

From the box plot, we can tell that the majority of the MPG Combo is between 20 and 25, but there are still several cars have very high MPG Combo which means their fuel efficiency is quite higher than average.

(b) Obtain box plots for MPG Combo by Type and comment on any differences you notice between the different vehicle types combined fuel efficiency.
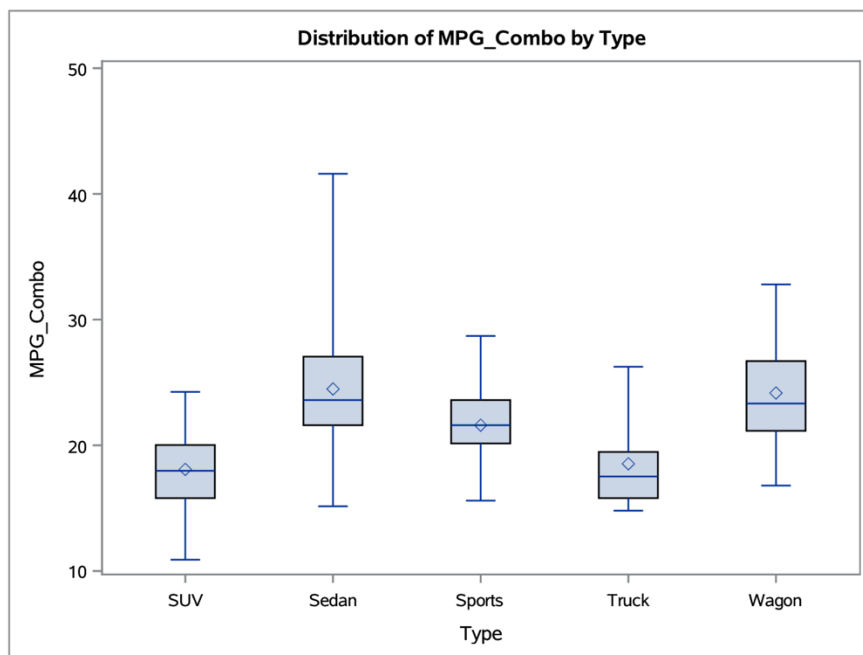
From the box plot, we can tell that SUV and Truck have the lowest MPG Combo overall which is between 15 and 20 approximately, but SUV has the lowest MPG Combo which means some SUV cars' fuel efficiency is lower than any other type cars; Sports cars' MPG Combo is the second lowest which lies between 18 and 24 in general; Majority of Sedan and Wagon has the highest MPG Combo lies in 22 to 27, but Sedan has the highest maximum which means some of Sedan cars have very high fuel efficiency than any other kinds of cars.

Besides, Truck and Sport cars' have a relative short box plot, while the box plot of Sedan and Wagon is relative tall which means their MPG Combo number tends to be scattered compared to Truck and Sport cars.

(c) Obtain basic descriptive statistics for the MPG Combo and Invoice for all vehicles. Comment on any general features and statistics of the data. Use visual and quantitative methods to comment on whether an assumption of normality would be reasonable for the MPG Combo and Invoice variables.

<center>visual methods:</center>

Probability Plot for MPG_Combo
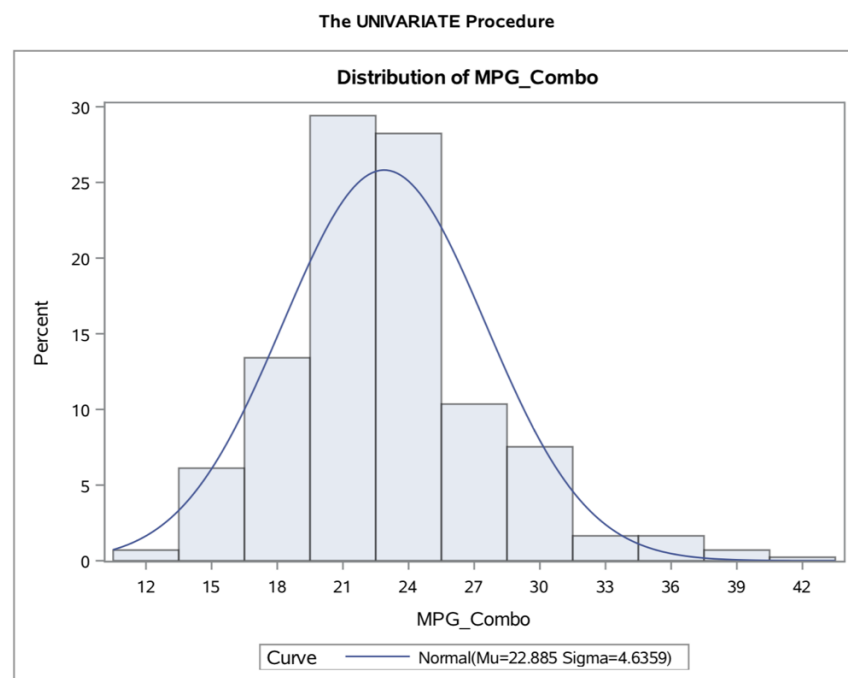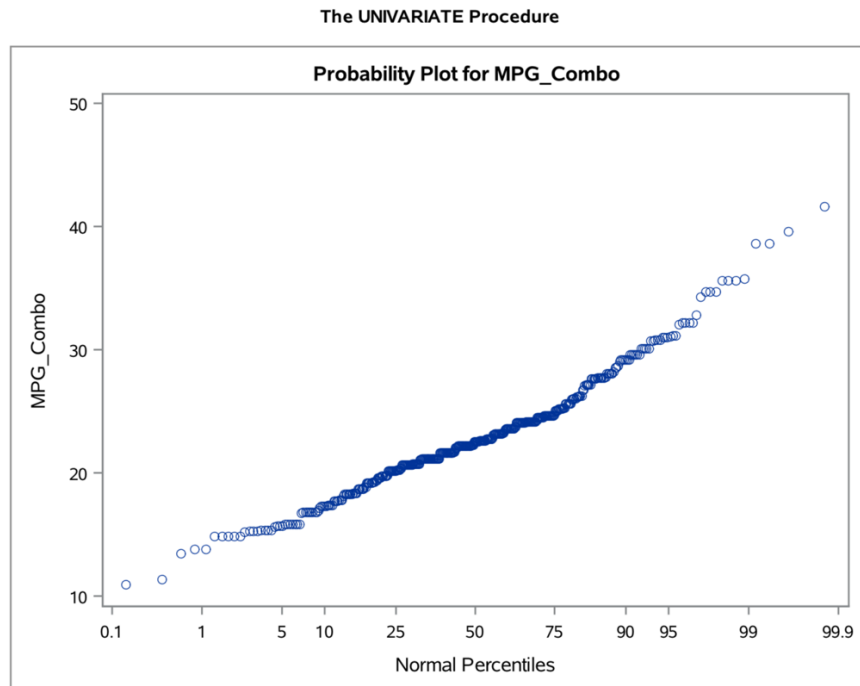
quantitative methods:

The UNIVARIATE Procedure
Variable: MPG_Combo

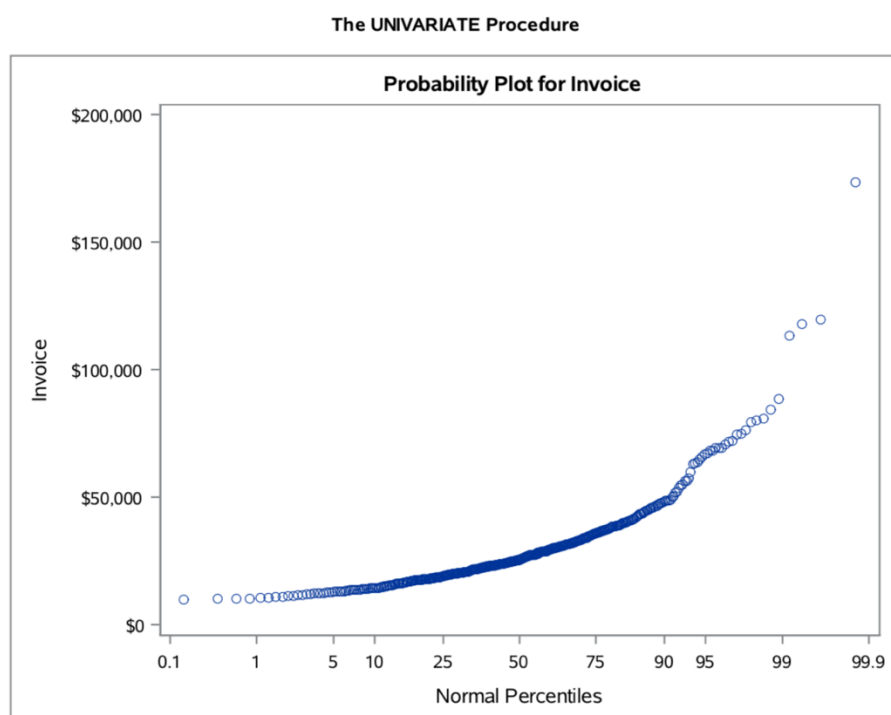| Tests for Normality				
Test	Statistic		p Value	
Shapiro-Wilk	W	0.967372	Pr < W	<0.0001
Kolmogorov-Smirnov	D	0.103925	Pr > D	<0.0100
Cramer-von Mises	W-Sq	0.696027	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	3.776247	Pr > A-Sq	<0.0050

The UNIVARIATE Procedure
Fitted Normal Distribution for MPG_Combo

Goodness-of-Fit Tests for Normal Distribution				
Test	Statistic		p Value	
Kolmogorov-Smirnov	D	0.10392485	Pr > D	<0.010
Cramer-von Mises	W-Sq	0.69602685	Pr > W-Sq	<0.005
Anderson-Darling	A-Sq	3.77624692	Pr > A-Sq	<0.005

There might be normal distribution when we using the visual method to evaluate the normality of the MPG Combo by looking at the histograms and the possibility plot. However, by doing the quantitative analysis we find that the p value is less than 0.0001 which means it is not a normal distribution.

visual methods:

The UNIVARIATE Procedure

Distribution of Invoice

The UNIVARIATE Procedure

Probability Plot for Invoice

quantitative methods:

The UNIVARIATE Procedure
Variable: Invoice

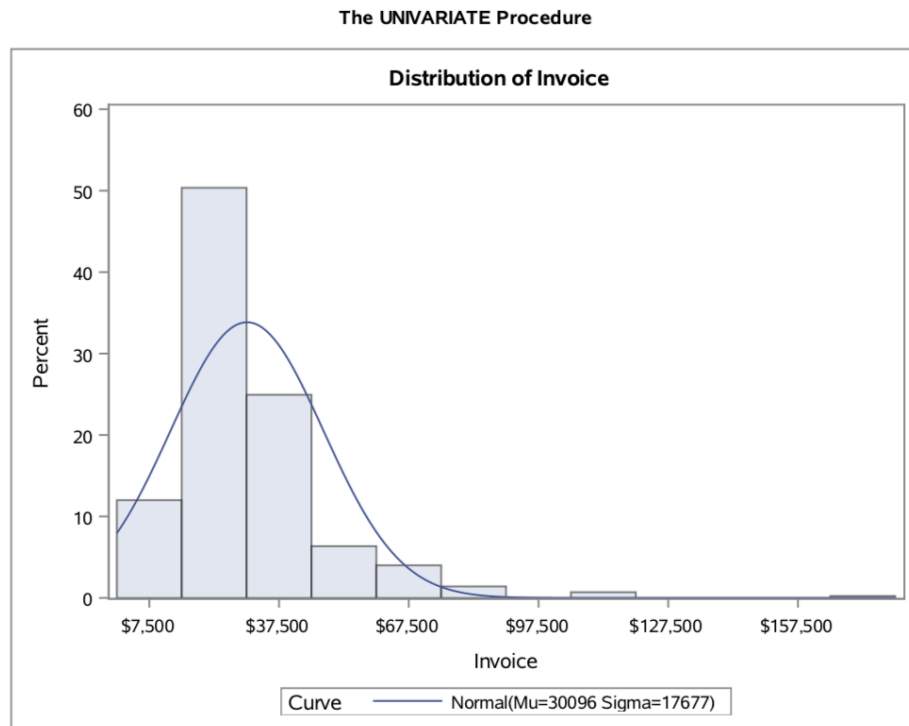| Tests for Normality				
Test	Statistic		p Value	
Shapiro-Wilk	W	0.77353	Pr < W	<0.0001
Kolmogorov-Smirnov	D	0.140604	Pr > D	<0.0100
Cramer-von Mises	W-Sq	3.393462	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	20.06351	Pr > A-Sq	<0.0050

The UNIVARIATE Procedure
Fitted Normal Distribution for Invoice

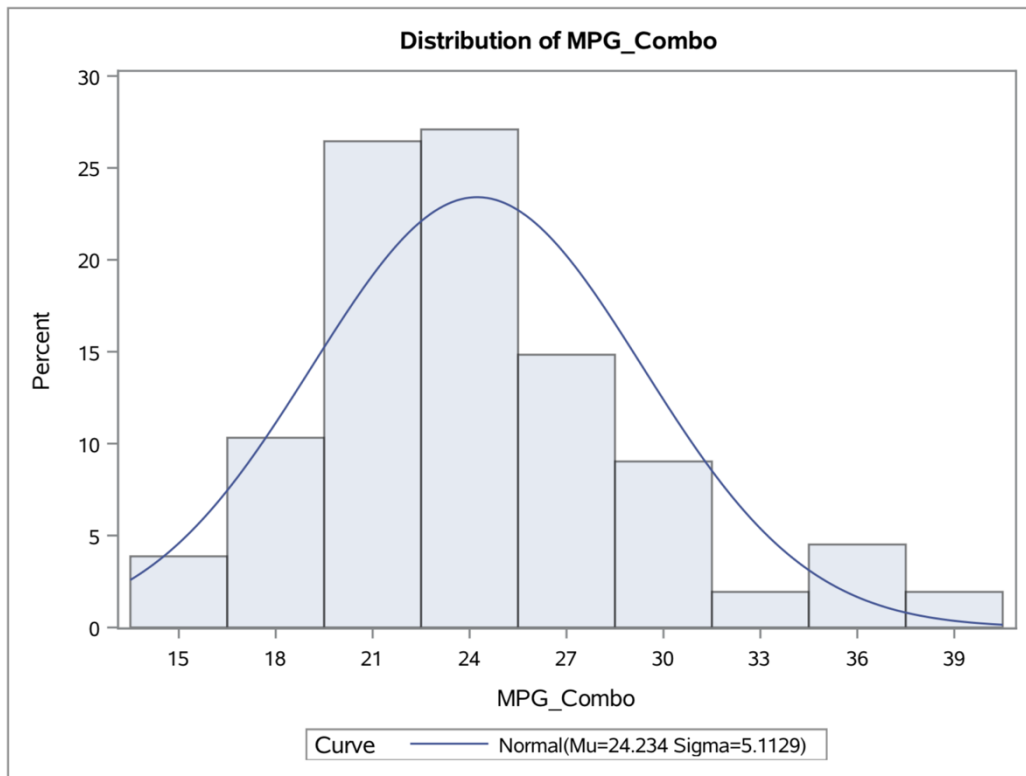| Goodness-of-Fit Tests for Normal Distribution				
Test	Statistic		p Value	
Kolmogorov-Smirnov	D	0.1406037	Pr > D	<0.010
Cramer-von Mises	W-Sq	3.3934617	Pr > W-Sq	<0.005
Anderson-Darling	A-Sq	20.0635117	Pr > A-Sq	<0.005

There might be normal distribution when we are looking at possibility plot. However, by analyzing the histogram and doing the quantitative analysis we find that it is not likely to be a normal distribution, according to the histogram, and the p value is less than 0.01 which means it is not a normal distribution (reject our assumption of normality).

 (d) Repeat the analysis in part (c) by Origin. Comment on these basic statistics and comment on the assumption of normality of the population for each of the vehicle types. Be sure to use quantitative and visual methods.
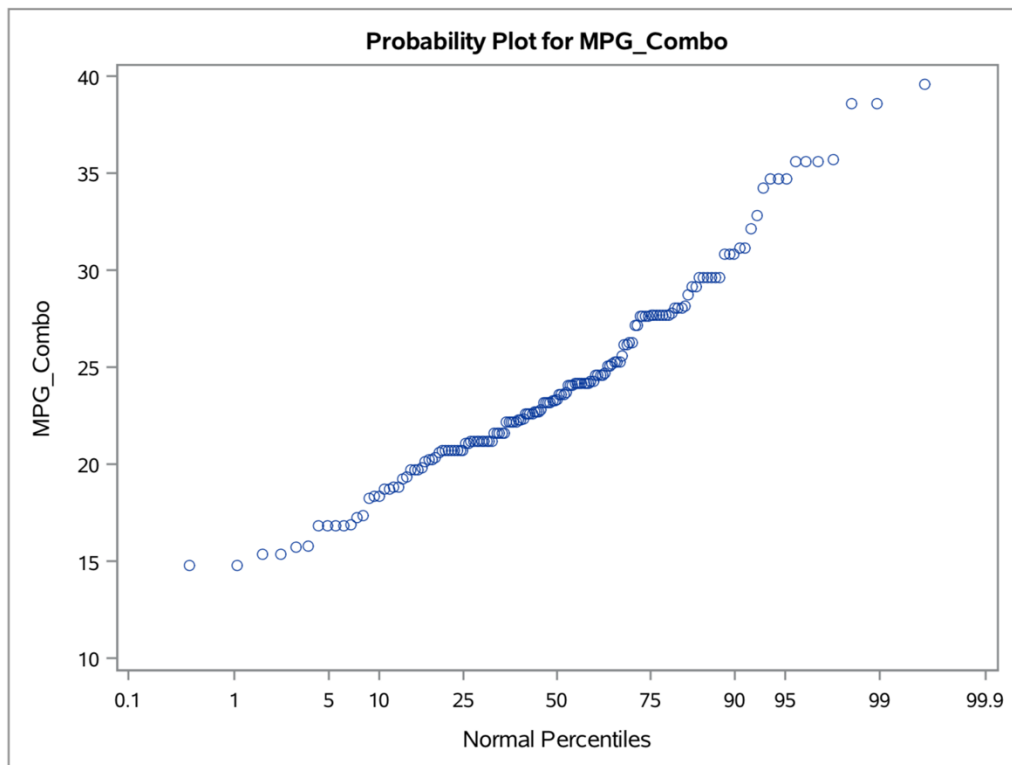
Asia:

The UNIVARIATE Procedure

Origin=Asia

Distribution of MPG_Combo

The UNIVARIATE Procedure

Origin=Asia

Probability Plot for MPG_Combo

The UNIVARIATE Procedure
Variable: MPG_Combo

Origin=Asia

Tests for Normality				
Test	**Statistic**		**p Value**	
Shapiro-Wilk	W	0.959591	Pr < W	0.0002
Kolmogorov-Smirnov	D	0.105193	Pr > D	<0.0100
Cramer-von Mises	W-Sq	0.315702	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	1.837931	Pr > A-Sq	<0.0050

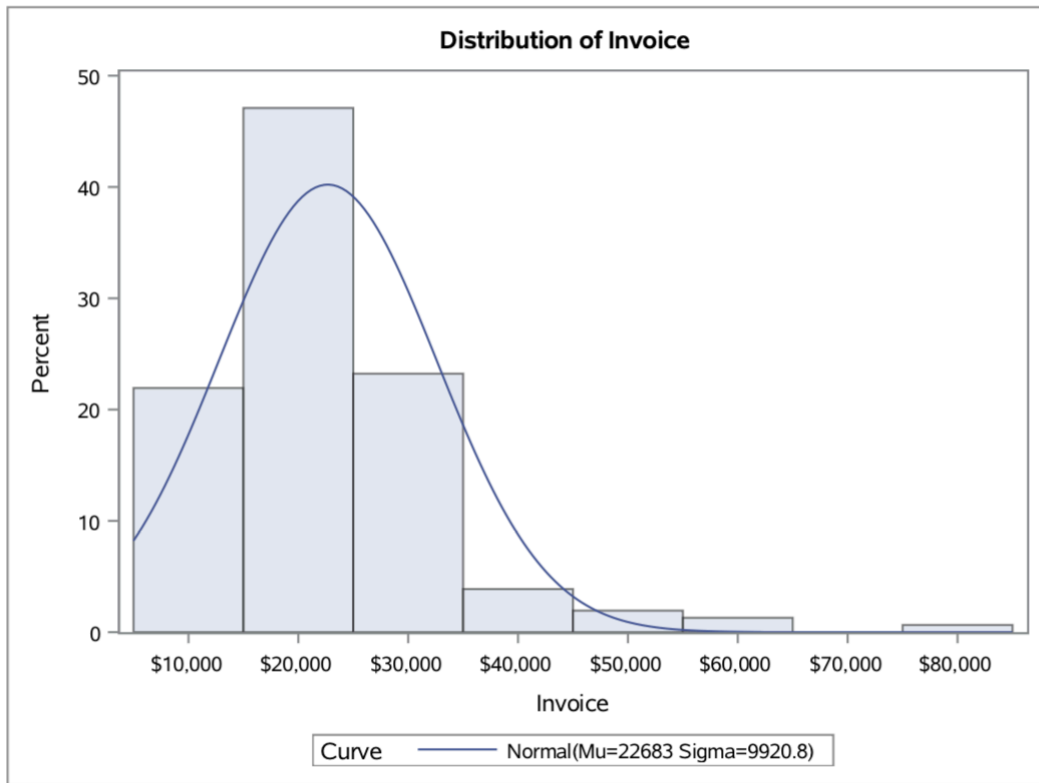## The UNIVARIATE Procedure
Fitted Normal Distribution for MPG_Combo

Origin=Asia

Goodness-of-Fit Tests for Normal Distribution				
Test	**Statistic**		**p Value**	
Kolmogorov-Smirnov	D	0.10519312	Pr > D	<0.010
Cramer-von Mises	W-Sq	0.31570185	Pr > W-Sq	<0.005
Anderson-Darling	A-Sq	1.83793128	Pr > A-Sq	<0.005

There might be normal distribution when we are looking at possibility plot. However, by analyzing the histogram and doing the quantitative analysis we find that it is not likely to be a normal distribution, according to the histogram, and the p value is less than 0.01 which means it is not a normal distribution (reject our assumption of normality).

The UNIVARIATE Procedure

Origin=Asia

Distribution of Invoice

Curve —— Normal(Mu=22683 Sigma=9920.8)

The UNIVARIATE Procedure

Origin=Asia

Probability Plot for Invoice
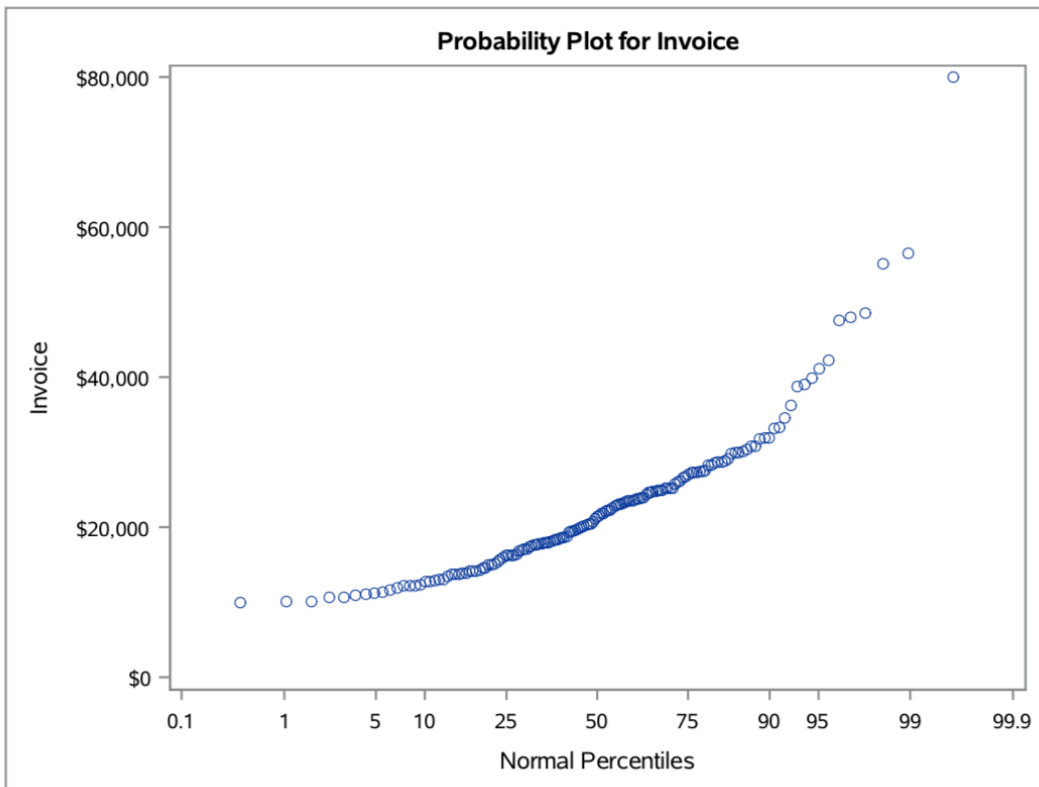
The UNIVARIATE Procedure
Variable: Invoice

Origin=Asia

Tests for Normality				
Test	Statistic		p Value	
Shapiro-Wilk	W	0.846964	Pr < W	<0.0001
Kolmogorov-Smirnov	D	0.115286	Pr > D	<0.0100
Cramer-von Mises	W-Sq	0.601988	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	4.140188	Pr > A-Sq	<0.0050

The UNIVARIATE Procedure
Fitted Normal Distribution for Invoice

Origin=Asia

Goodness-of-Fit Tests for Normal Distribution				
Test	Statistic		p Value	
Kolmogorov-Smirnov	D	0.11528623	Pr > D	<0.010
Cramer-von Mises	W-Sq	0.60198767	Pr > W-Sq	<0.005
Anderson-Darling	A-Sq	4.14018762	Pr > A-Sq	<0.005

There might be normal distribution when we are looking at possibility plot. However, by analyzing the histogram and doing the quantitative analysis we find that it is not likely to be a normal distribution, according to the histogram, and the p value is less than 0.01 which means it is not a normal distribution (reject our assumption of normality).
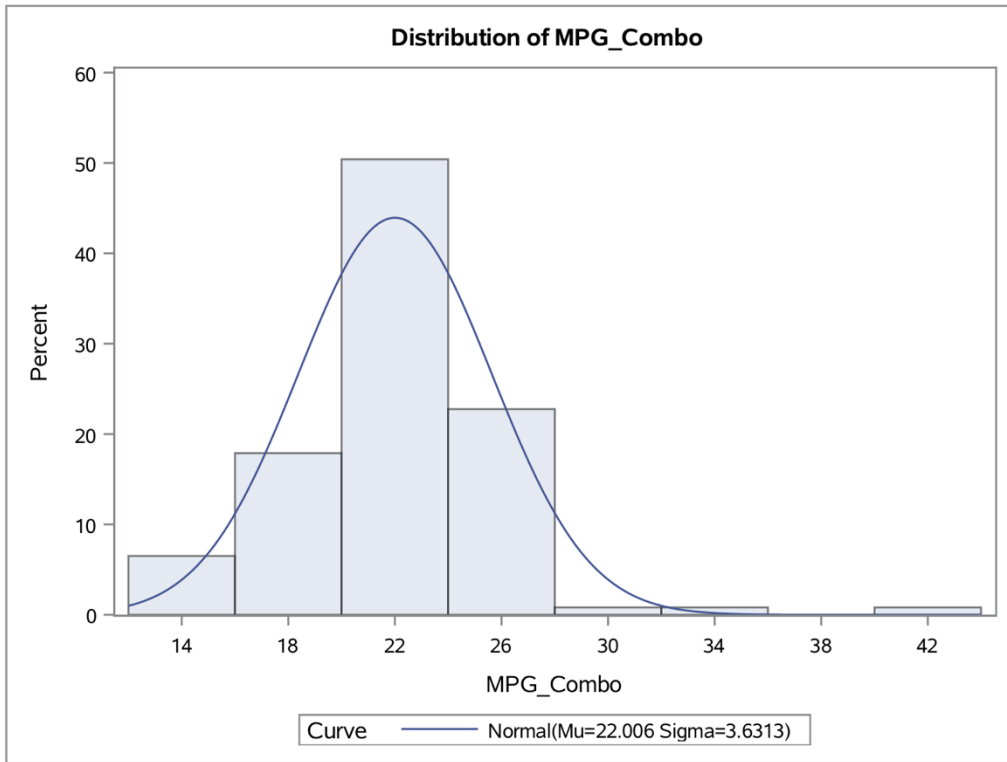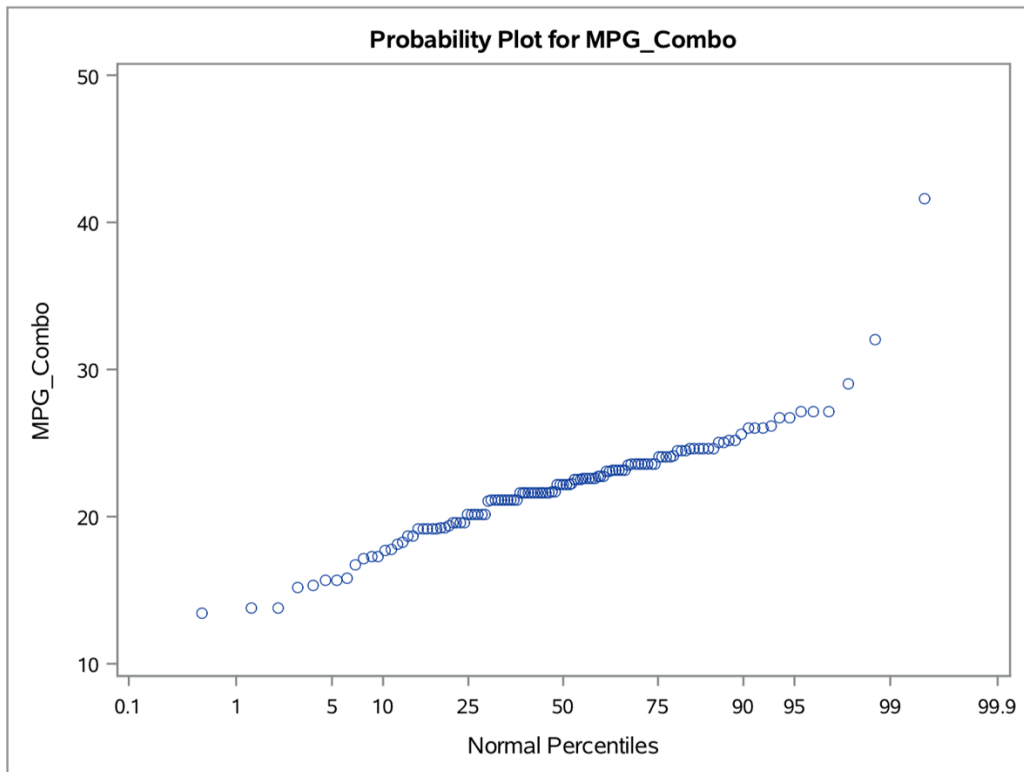
Europe:

Distribution of MPG_Combo

Curve —— Normal(Mu=22.006 Sigma=3.6313)

Probability Plot for MPG_Combo

The UNIVARIATE Procedure
Fitted Normal Distribution for MPG_Combo

Origin=Europe

Goodness-of-Fit Tests for Normal Distribution				
Test	Statistic		p Value	
Kolmogorov-Smirnov	D	0.10599719	Pr > D	<0.010
Cramer-von Mises	W-Sq	0.24727698	Pr > W-Sq	<0.005
Anderson-Darling	A-Sq	1.56948971	Pr > A-Sq	<0.005

The UNIVARIATE Procedure
Variable: MPG_Combo

Origin=Europe

Tests for Normality				
Test	Statistic		p Value	
Shapiro-Wilk	W	0.915292	Pr < W	<0.0001
Kolmogorov-Smirnov	D	0.105997	Pr > D	<0.0100
Cramer-von Mises	W-Sq	0.247277	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	1.56949	Pr > A-Sq	<0.0050

There might be normal distribution when we using the visual method to comment the normality of the MPG Combo by looking at the histograms and the possibility plot. However, by doing the quantitative analysis we find that the p value is less than 0.01 which means it is not a normal distribution.

Distribution of Invoice

Curve —— Normal(Mu=44395 Sigma=23080)

Probability Plot for Invoice
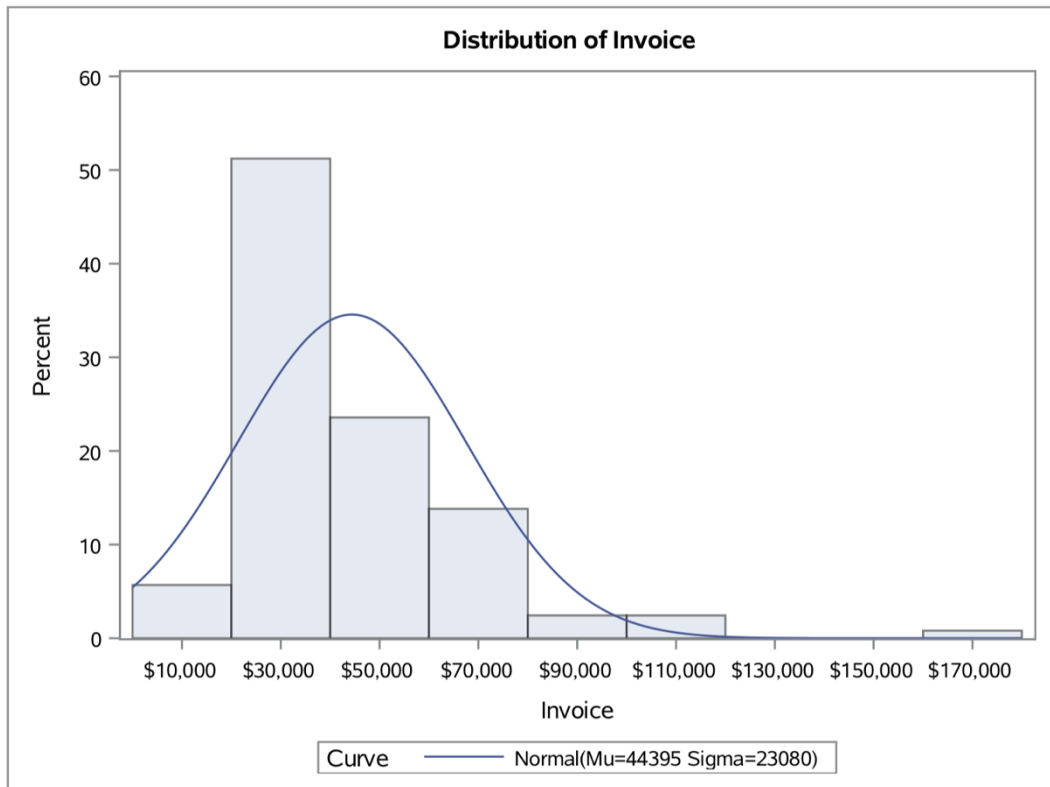
The UNIVARIATE Procedure
Fitted Normal Distribution for Invoice

Origin=Europe

Goodness-of-Fit Tests for Normal Distribution				
Test		Statistic	p Value	
Kolmogorov-Smirnov	D	0.17550470	Pr > D	<0.010
Cramer-von Mises	W-Sq	1.11621934	Pr > W-Sq	<0.005
Anderson-Darling	A-Sq	6.06899680	Pr > A-Sq	<0.005

The UNIVARIATE Procedure
Variable: Invoice

Origin=Europe

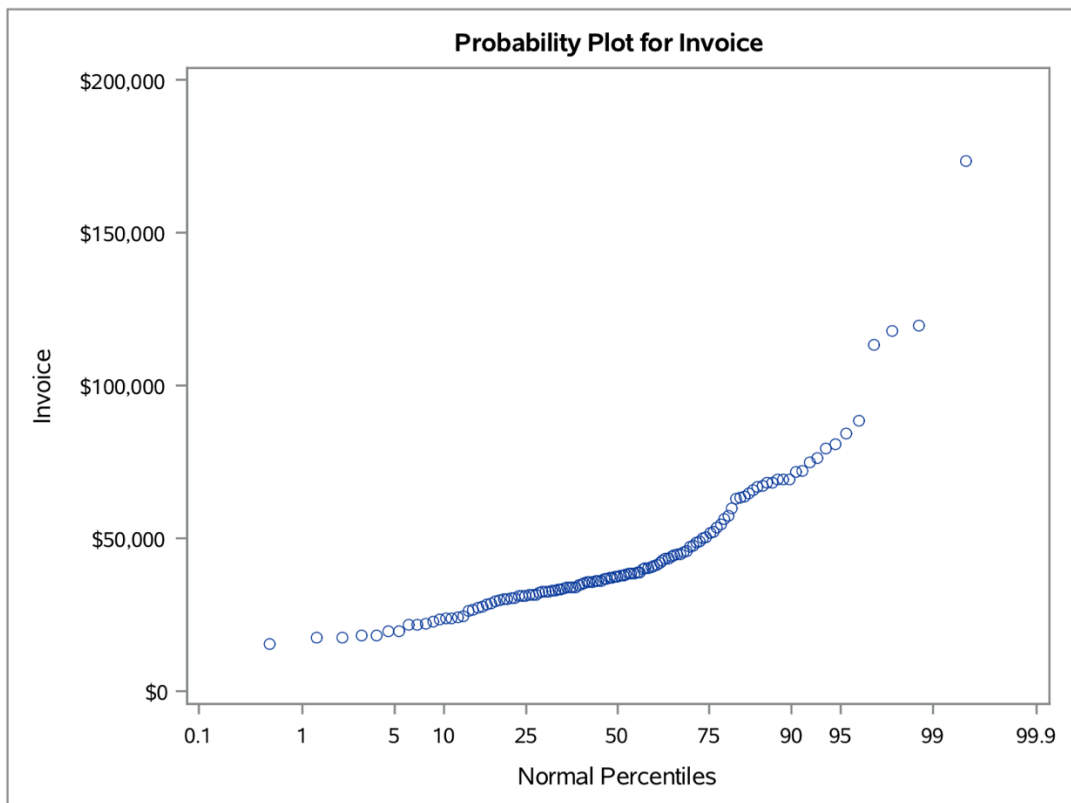| Tests for Normality				
Test		Statistic	p Value	
Shapiro-Wilk	W	0.798086	Pr < W	<0.0001
Kolmogorov-Smirnov	D	0.175505	Pr > D	<0.0100
Cramer-von Mises	W-Sq	1.116219	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	6.068997	Pr > A-Sq	<0.0050

There might be normal distribution when we are looking at possibility plot. However, by analyzing the histogram and doing the quantitative analysis we find that it looks unlikely a normal distribution and the p value is less than 0.01 which means it is not a normal distribution (reject our assumption of normality).

USA:

Distribution of MPG_Combo

Curve —— Normal(Mu=22.197 Sigma=4.5565)

Probability Plot for MPG_Combo
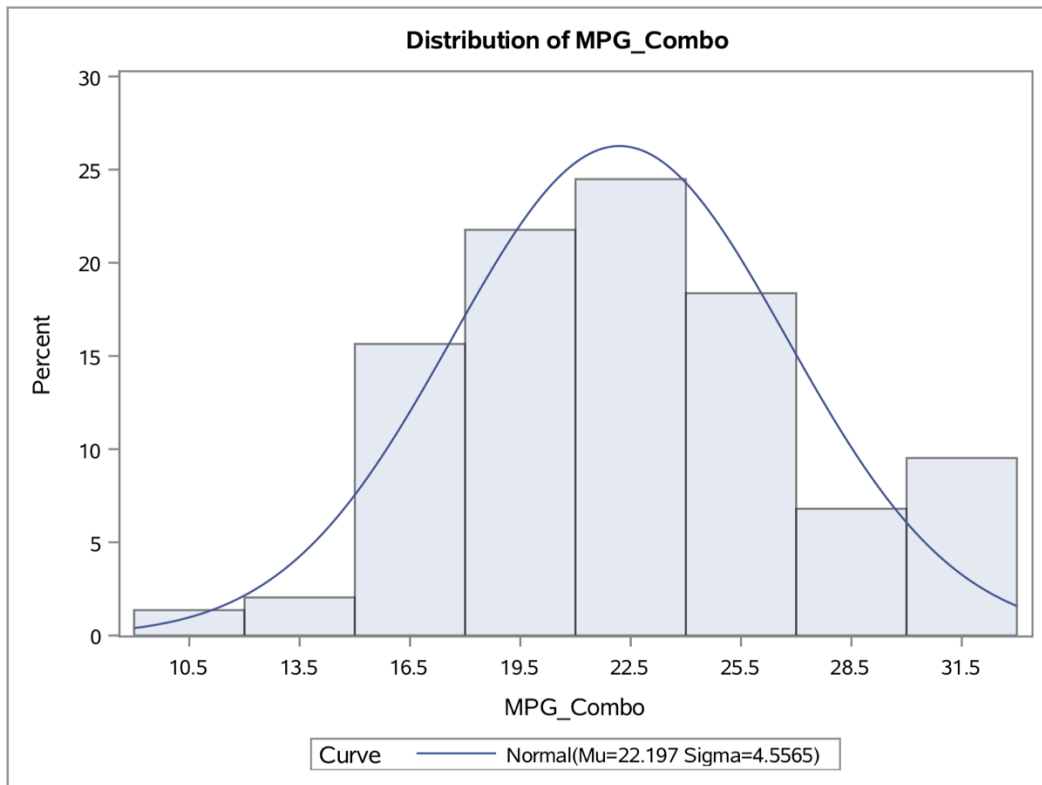
The UNIVARIATE Procedure
Variable: MPG_Combo

Origin=USA

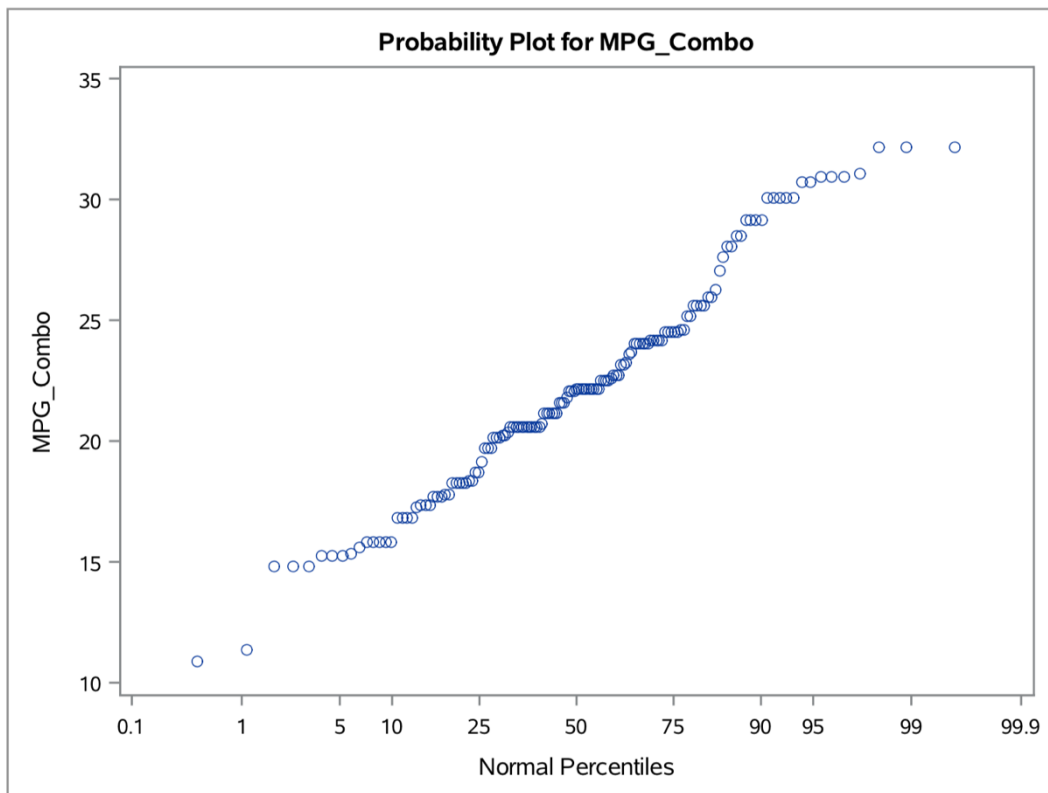| Tests for Normality				
Test	Statistic		p Value	
Shapiro-Wilk	W	0.97656	Pr < W	0.0128
Kolmogorov-Smirnov	D	0.075122	Pr > D	0.0415
Cramer-von Mises	W-Sq	0.152181	Pr > W-Sq	0.0227
Anderson-Darling	A-Sq	1.07095	Pr > A-Sq	0.0083

The UNIVARIATE Procedure
Fitted Normal Distribution for MPG_Combo

Origin=USA

Goodness-of-Fit Tests for Normal Distribution				
Test	Statistic		p Value	
Kolmogorov-Smirnov	D	0.07512154	Pr > D	0.042
Cramer-von Mises	W-Sq	0.15218117	Pr > W-Sq	0.023
Anderson-Darling	A-Sq	1.07095008	Pr > A-Sq	0.008

There might be normal distribution when we using the visual method to comment the normality of the MPG Combo by looking at the histograms and the possibility plot. However, by doing the quantitative analysis we find that the p value is less than 0.05 which means it is not a normal distribution.

Distribution of Invoice

Curve — Normal(Mu=25949 Sigma=10519)

Probability Plot for Invoice
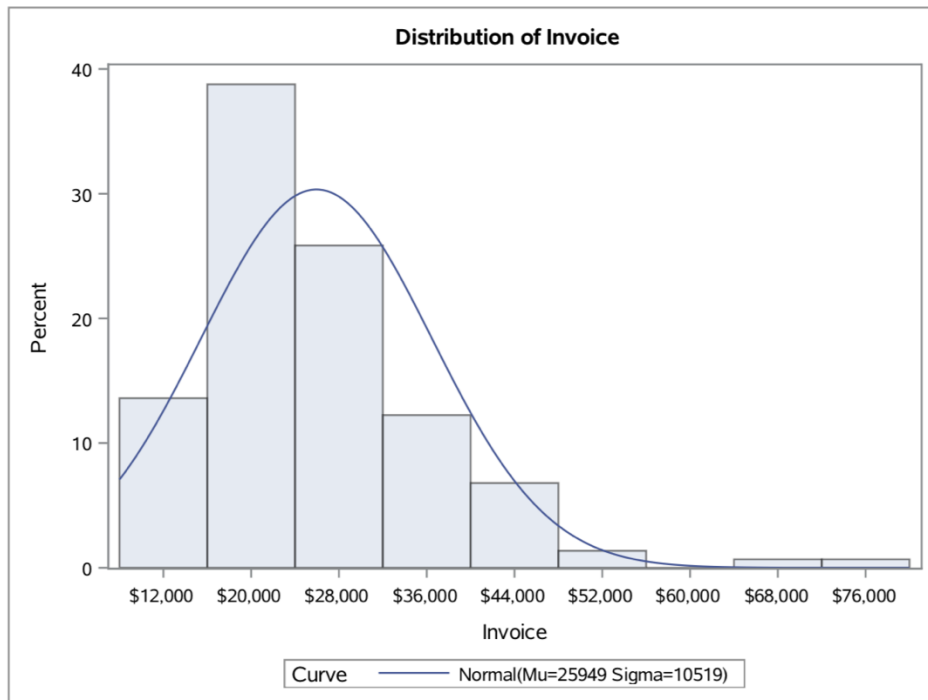
The UNIVARIATE Procedure
Variable: Invoice

Origin=USA

Tests for Normality				
Test	Statistic		p Value	
Shapiro-Wilk	W	0.892216	Pr < W	<0.0001
Kolmogorov-Smirnov	D	0.111942	Pr > D	<0.0100
Cramer-von Mises	W-Sq	0.552353	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	3.252361	Pr > A-Sq	<0.0050

The UNIVARIATE Procedure
Fitted Normal Distribution for Invoice

Origin=USA
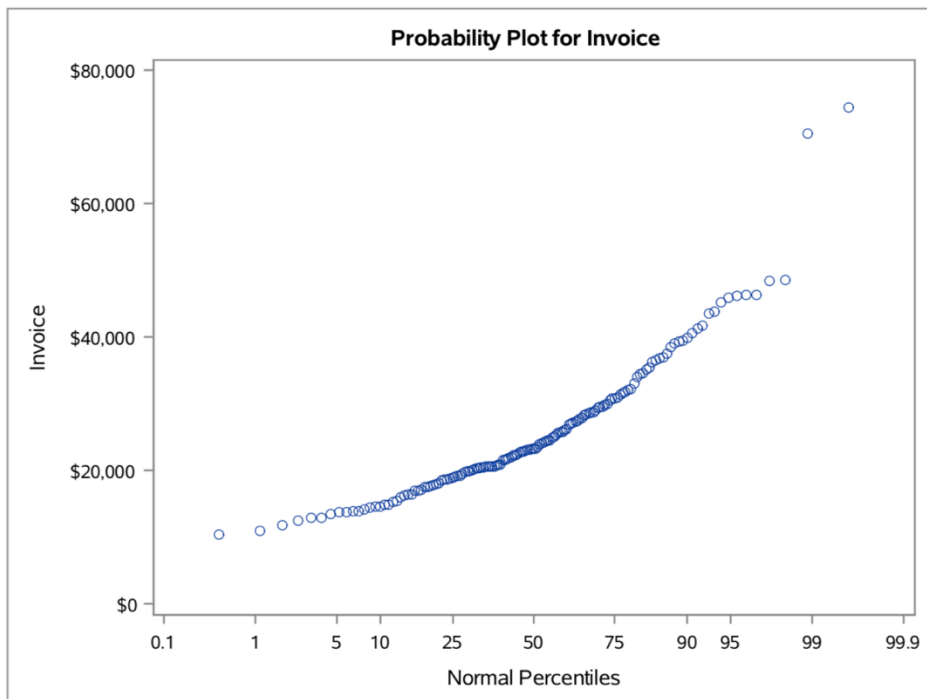
Goodness-of-Fit Tests for Normal Distribution				
Test	Statistic		p Value	
Kolmogorov-Smirnov	D	0.11194232	Pr > D	<0.010
Cramer-von Mises	W-Sq	0.55235302	Pr > W-Sq	<0.005
Anderson-Darling	A-Sq	3.25236085	Pr > A-Sq	<0.005

There might be normal distribution when we are looking at possibility plot. However, by analyzing the histogram and doing the quantitative analysis we find that it looks unlikely a normal distribution and the p value is less than 0.01 which means it is not a normal distribution (reject our assumption of normality).

2. Hypothesis Testing (2 parts)

1. (a) Test the null hypothesis that the true mean or median Invoice price is $22000 against the alternative that it is not. Based on the normality tests from the above Problem, which location test should we use and what do we conclude from that test?
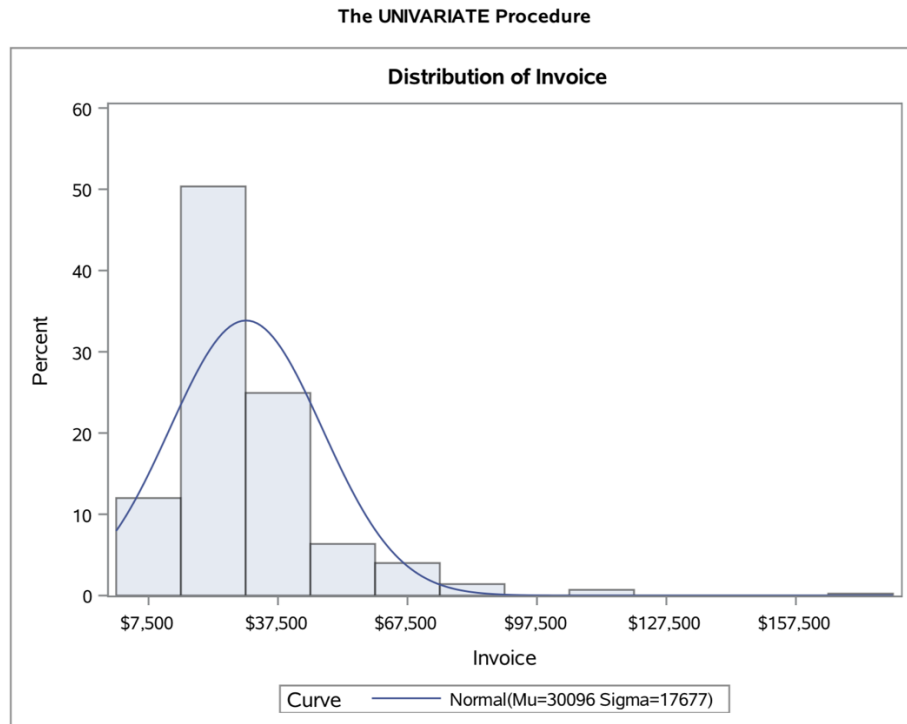
Distribution of Invoice

Variable: Invoice

Tests for Normality				
Test	Statistic		p Value	
Shapiro-Wilk	W	0.77353	Pr < W	<0.0001
Kolmogorov-Smirnov	D	0.140604	Pr > D	<0.0100
Cramer-von Mises	W-Sq	3.393462	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	20.06351	Pr > A-Sq	<0.0050

According to the normality test, the Invoice is not normal distributed (p value less than 0.0001). And it can tell from the histogram that data of Invoice is not symmetrical, so we do nonparametric analysis.

The UNIVARIATE Procedure
Variable: Invoice

Tests for Location: Mu0=22000				
Test	Statistic		p Value	
Student's t	t	9.442204	Pr > |t|	<.0001
Sign	M	58.5	Pr >= |M|	<.0001
Signed Rank	S	21930	Pr >= |S|	<.0001

Based on the feature of the data of Invoice, we look at the sign test which p value is less than 0.0001. As a result, 22000 is neither true mean nor median of Invoice.

2. *(b) Perform a hypothesis test of whether cars originated in Europe have significantly greater invoice price than Asian cars, and state your conclusions. Recall the test of normality from the above Problem when choosing your test.*

The NPAR1WAY Procedure

Wilcoxon Scores (Rank Sums) for Variable Invoice Classified by Variable Origin					
Origin	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Asia	155	23477.0	33015.0	1218.88254	151.464516
Europe	123	39068.0	26199.0	1148.33910	317.626016
USA	147	27980.0	31311.0	1204.46779	190.340136
Average scores were used for ties.					

Distribution of Wilcoxon Scores for Invoice
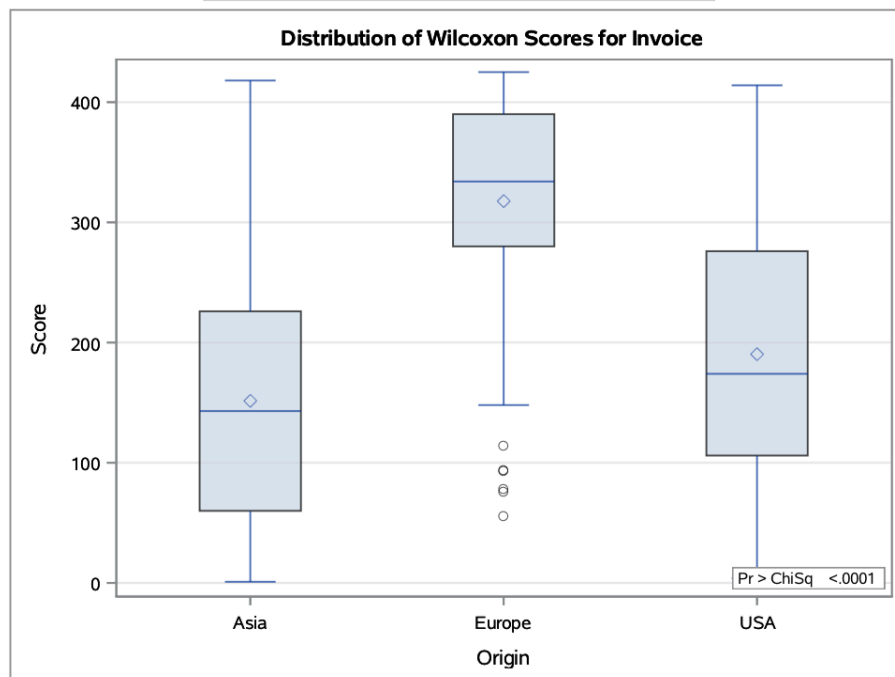
According to the result obtained from 1(b), the Invoice price originated in Europe and

Asia both aren't normal distribution, so we do the Wilcoxon rank sum test. As we can see from the result, the mean score of cars originated in Europe is 318 approximately which is significantly larger than that of cars originated in Asia which is 152 roughly. What is more, it can be tell from the box plot that the majority of Europe cars' Invoice price is from 280 to 295. However, the majority of Asia cars' Invoice price is from 50 to 220. And the lowest Invoice of Asia cars is much lower than that of Europe cars. In conclusion, cars originated in Europe have significantly greater invoice price than Asian cars in general.

3. Correlation (2 parts)

1. *(a) Obtain the Pearson correlation matrix for the numeric variables in the data set except MPG City and MPG Highway. State what this tells us about the relationships between the vehicle attributes, and what we might infer about the population of the data.*

The CORR Procedure

Pearson Correlation Coefficients, N = 425 Prob > |r| under H0: Rho=0					
	Invoice	**Horsepower**	**Wheelbase**	**Length**	**MPG_Combo**
Invoice	1.00000	0.82581 <.0001	0.14515 0.0027	0.16206 0.0008	-0.50457 <.0001
Horsepower	0.82581 <.0001	1.00000	0.38199 <.0001	0.37198 <.0001	-0.70511 <.0001
Wheelbase Wheelbase (IN)	0.14515 0.0027	0.38199 <.0001	1.00000	0.88882 <.0001	-0.56758 <.0001
Length Length (IN)	0.16206 0.0008	0.37198 <.0001	0.88882 <.0001	1.00000	-0.50977 <.0001
MPG_Combo	-0.50457 <.0001	-0.70511 <.0001	-0.56758 <.0001	-0.50977 <.0001	1.00000

According to the matrix, Invoice have strong (0.83) positive linear relationship with Horsepower with p value less than 0.0001 which is strong evidence that the correlation is not 0 and is in fact positive.

Invoice also has a moderate (-0.50) negative linear relationship with MPG Combo with p value less than 0.0001 which is strong evidence that the correlation is not 0 and is in fact negative.

Invoice has no relationship with Wheelbase and Length in general, because the correlation number is too small.

Horsepower has a weak positive (0.38, 0.37 respectively) linear relationship with Wheelbase and Length with p value less than 0.0001 for both which is strong evidence that the correlation is not 0 and is in fact positive.

Horsepower also has a strong (-0.71) negative linear relationship with MPG Combo with p value less than 0.0001 for both which is strong evidence that the correlation is not 0 and is in fact negative.

Wheelbase has strong positive (0.88) linear relationship with Length with p value less than 0.0001 for both which is strong evidence that the correlation is not 0 and is in fact positive.

Wheelbase also has a moderate negative linear relationship with MPG Combo with p value less than 0.0001 for both which is strong evidence that the correlation is not 0 and is in fact negative.

Length has a moderate (-0.51) negative linear relationship with MPG Combo with p value less than 0.0001 for both which is strong evidence that the correlation is not 0 and is in fact negative.

(b) Perform the same correlation analysis by Type. Comment on how the relationships between vehicle attributes differ between the various vehicle types and note any differences with what you found in part (a).

The CORR Procedure

Type=Sedan

Pearson Correlation Coefficients, N = 262 Prob > |r| under H0: Rho=0					
	Invoice	Horsepower	Wheelbase	Length	MPG_Combo
Invoice	1.00000	0.85442 <.0001	0.59361 <.0001	0.42909 <.0001	-0.63038 <.0001
Horsepower	0.85442 <.0001	1.00000	0.66364 <.0001	0.55883 <.0001	-0.75485 <.0001
Wheelbase Wheelbase (IN)	0.59361 <.0001	0.66364 <.0001	1.00000	0.85600 <.0001	-0.69395 <.0001
Length Length (IN)	0.42909 <.0001	0.55883 <.0001	0.85600 <.0001	1.00000	-0.60801 <.0001
MPG_Combo	-0.63038 <.0001	-0.75485 <.0001	-0.69395 <.0001	-0.60801 <.0001	1.00000

Compared to the matrix of the various types, the relationship between vehicle attributes type in Sedan change in many ways:

The correlation relationship between Invoice and Wheelbase, Length increases from 0.15, 0.16 to 0.59, 0.43 respectively, which means the positive linear relationship between Invoice and Wheelbase, Length are stronger.

The correlation relationship between Invoice and MPG Combo increases from -0.50 to -0.63, which means the negative linear relationship between Invoice and MPG Combo is stronger.

The correlation relationship between Horsepower and Wheelbase, Length increase from 0.38, 0.37 to 0.66, 0.56 respectively, which means the positive linear relationship between Invoice and MPG Combo is stronger.

The correlation relationship between Wheelbase and MPG Combo increases from -0.57 to -0.69, which means the negative linear relationship between Wheelbase and MPG Combo is stronger.

The correlation relationship between Length and MPG Combo increases from -0.51 to -0.61, which means the negative linear relationship between Length and MPG Combo is slightly stronger.

All other correlation coefficients don't have significant difference, so their correlations are same in general.

The CORR Procedure

Type=Sports

Pearson Correlation Coefficients, N = 49 Prob > |r| under H0: Rho=0					
	Invoice	Horsepower	Wheelbase	Length	MPG_Combo
Invoice	1.00000	0.80000 <.0001	-0.05278 0.7187	0.34370 0.0156	-0.59893 <.0001
Horsepower	0.80000 <.0001	1.00000	0.31025 0.0300	0.56576 <.0001	-0.84301 <.0001
Wheelbase Wheelbase (IN)	-0.05278 0.7187	0.31025 0.0300	1.00000	0.67539 <.0001	-0.39329 0.0052
Length Length (IN)	0.34370 0.0156	0.56576 <.0001	0.67539 <.0001	1.00000	-0.59452 <.0001
MPG_Combo	-0.59893 <.0001	-0.84301 <.0001	-0.39329 0.0052	-0.59452 <.0001	1.00000

Compared to the matrix of the various types, the relationship between vehicle attributes type in Sports change in many ways:

There seems to have some correlation relationship of cars type in Sports between Invoice and Length, the correlation coefficients increase from 0.16 to 0.34, which means there is a weak positive linear relationship between Invoice and Wheelbase.

The correlation relationship between Invoice and MPG Combo increases from -0.50 to -0.63, which means the negative linear relationship between Invoice and MPG Combo is stronger.

The correlation relationship between Horsepower and Length increase from 0.38 to 0.57, which means the positive linear relationship between Horsepower and Length is stronger in cars type in Sports.

The correlation relationship between Horsepower and MPG Combo increase from -0.71 to -0.86, which means the negative linear relationship between Horsepower and MPG Combo is stronger in cars type in Sports.

The correlation relationship between Wheelbase and Length decrease from 0.88 to 0.68, which means the positive linear relationship between Wheelbase and MPG Combo is slightly weaker.

The correlation relationship between Wheelbase and MPG Combo increases from -0.57 to -0.39, which means the negative linear relationship between Wheelbase and MPG Combo is weaker.

All other correlation coefficients don't have significant difference, so their correlations are same in general.

The CORR Procedure

Type=Truck

Pearson Correlation Coefficients, N = 24 Prob > |r| under H0: Rho=0					
	Invoice	Horsepower	Wheelbase	Length	MPG_Combo
Invoice	1.00000	0.84423 <.0001	0.48689 0.0158	0.49544 0.0138	-0.60713 0.0017
Horsepower	0.84423 <.0001	1.00000	0.74923 <.0001	0.71352 <.0001	-0.74895 <.0001
Wheelbase Wheelbase (IN)	0.48689 0.0158	0.74923 <.0001	1.00000	0.94404 <.0001	-0.75378 <.0001
Length Length (IN)	0.49544 0.0138	0.71352 <.0001	0.94404 <.0001	1.00000	-0.74183 <.0001
MPG_Combo	-0.60713 0.0017	-0.74895 <.0001	-0.75378 <.0001	-0.74183 <.0001	1.00000

Compared to the matrix of the various types, the relationship between vehicle attributes type in Truck change in many ways:

There seems to have some correlation relationship of cars type in Truck between Invoice and Wheelbase, Length, the correlation coefficients increase from 0.15, 0.16 to 0.49, 0.50 respectively, which means there is a moderate positive linear relationship

between Invoice and Wheelbase, Length when car's type is Truck.

The correlation relationship between Invoice and MPG Combo increases from -0.50 to -0.60, which means the negative linear relationship between Invoice and MPG Combo is stronger.

The correlation relationship between Horsepower and Wheelbase, Length increase from 0.38, 0.37to 0.74, 0.71 respectively, which means the positive linear relationship between Horsepower and Wheelbase, Length is stronger when cars' type is Truck.

The correlation relationship between Wheelbase and Length increase from 0.88 to 0.94, which means the positive linear relationship between Wheelbase and MPG Combo is slightly stronger when cars' type is Truck.

The correlation relationship between Wheelbase and MPG Combo increases from -0.57 to -0.75, which means the negative linear relationship between Wheelbase and MPG Combo is stronger.

The correlation relationship between Length and MPG Combo increases from -0.51 to -0.75, which means the negative linear relationship between Length and MPG Combo is slightly stronger.

All other correlation coefficients don't have significant difference, so their correlations are same in general.

The CORR Procedure

Type=Wagon

Pearson Correlation Coefficients, N = 30 Prob > |r| under H0: Rho=0					
	Invoice	Horsepower	Wheelbase	Length	MPG_Combo
Invoice	1.00000	0.83032 <.0001	0.60500 0.0004	0.47532 0.0079	-0.73759 <.0001
Horsepower	0.83032 <.0001	1.00000	0.64068 0.0001	0.49217 0.0057	-0.84074 <.0001
Wheelbase Wheelbase (IN)	0.60500 0.0004	0.64068 0.0001	1.00000	0.83381 <.0001	-0.66254 <.0001
Length Length (IN)	0.47532 0.0079	0.49217 0.0057	0.83381 <.0001	1.00000	-0.62878 0.0002
MPG_Combo	-0.73759 <.0001	-0.84074 <.0001	-0.66254 <.0001	-0.62878 0.0002	1.00000

Compared to the matrix of the various types, the relationship between vehicle attributes type in Wagon change in many ways:

There seems to have some correlation relationship of cars type in Wagon between Invoice and Wheelbase, Length, the correlation coefficients increase from 0.15, 0.16

to 0.61, 0.48 respectively, which means there is a moderate positive linear relationship between Invoice and Wheelbase, Length.

The correlation relationship between Invoice and MPG Combo increases from -0.50 to -0.73, which means the negative linear relationship between Invoice and MPG Combo is stronger.

The correlation relationship between Horsepower and Wheelbase increase from 0.38 to 0.64, which means the positive linear relationship between Horsepower and Wheelbase is stronger in cars type in Wagon.

The correlation relationship between Horsepower and Length increase from 0.38 to 0.49, which means the positive linear relationship between Horsepower and Length is stronger in cars type in Wagon.

The correlation relationship between Horsepower and MPG Combo increase from -0.71 to -0.84, which means the negative linear relationship between Horsepower and MPG Combo is stronger in cars type in Wagon.

The correlation relationship between Wheelbase and Length, MPG Combo are both stronger when car's type is Wagon. So are the correlation relationship between Length and MPG Combo.

All other correlation coefficients don't have significant difference, so their correlations are same in general.

The CORR Procedure

Type=SUV

Pearson Correlation Coefficients, N = 60 Prob > |r| under H0: Rho=0					
	Invoice	Horsepower	Wheelbase	Length	MPG_Combo
Invoice	1.00000	0.76589 <.0001	0.44030 0.0004	0.45230 0.0003	-0.73206 <.0001
Horsepower	0.76589 <.0001	1.00000	0.70261 <.0001	0.69163 <.0001	-0.75954 <.0001
Wheelbase Wheelbase (IN)	0.44030 0.0004	0.70261 <.0001	1.00000	0.93951 <.0001	-0.62128 <.0001
Length Length (IN)	0.45230 0.0003	0.69163 <.0001	0.93951 <.0001	1.00000	-0.59980 <.0001
MPG_Combo	-0.73206 <.0001	-0.75954 <.0001	-0.62128 <.0001	-0.59980 <.0001	1.00000

Compared to the matrix of the various types, the relationship between vehicle attributes type in SUV change in many ways:

There seems to have some correlation relationship of cars type in SUV between Invoice and Wheelbase, Length, the correlation coefficients increase from 0.15, 0.16 to 0.44, 0.45 respectively, which means there is a moderate positive linear relationship between Invoice and Wheelbase, Length respectively.

The correlation relationship between Invoice and MPG Combo increases from -0.50 to -0.73, which means the negative linear relationship between Invoice and MPG Combo is stronger.

The correlation relationship between Horsepower and Wheelbase, Length increase from 0.38, 0.37to 0.70, 0.69 respectively, which means the positive linear relationship between Horsepower and Wheelbase, Length is stronger when cars' type is SUV.

The correlation relationship between Wheelbase and Length, MPG Combo are both stronger when car's type is SUV. So is the correlation relationship between Length and MPG Combo.