ASSIGNMENT 2

Factor Analysis on Performance Indicators

Standardization

It is not required to standardize as all the scales belong to the same range.

KMO and Bartlette's test

KMO is above 0.5 though it is not as high, and the significance is less than 0.05 hence it is passes the test.

According to KMO and Bartlette's test it is acceptable but it is recommended to go through other analyses as well.

Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.595
Bartlett's Test of Sphericity	Approx. Chi-Square	955.163
	df	36
	Sig.	.000

Communalities

Communalities explain the variance of the variables. It is recommended to have a value above 0.5 or 0.6. According to this dataset when considering each value of the extraction it could be seen that it has significantly higher values than the recommended values.

Hence, it displays a green light to go ahead with the Eigenvalues Analysis as well.

Communalities

	Initial	Extraction
Performance: Employees Polite	1.000	.850
Performance: Check out clerks polite	1.000	.762
Performance: Deliver in timely manner	1.000	.729
Performance: Service promptly	1.000	.669
Performance: Managers polite	1.000	.754
Performance: Fun to shop	1.000	.685
Performance: Attractive looking	1.000	.721
Performance: Well laid out/clear signs	1.000	.690
Performance: Flexible opening hours	1.000	.989

Extraction Method: Principal Component Analysis.

Eigenvalue Analysis

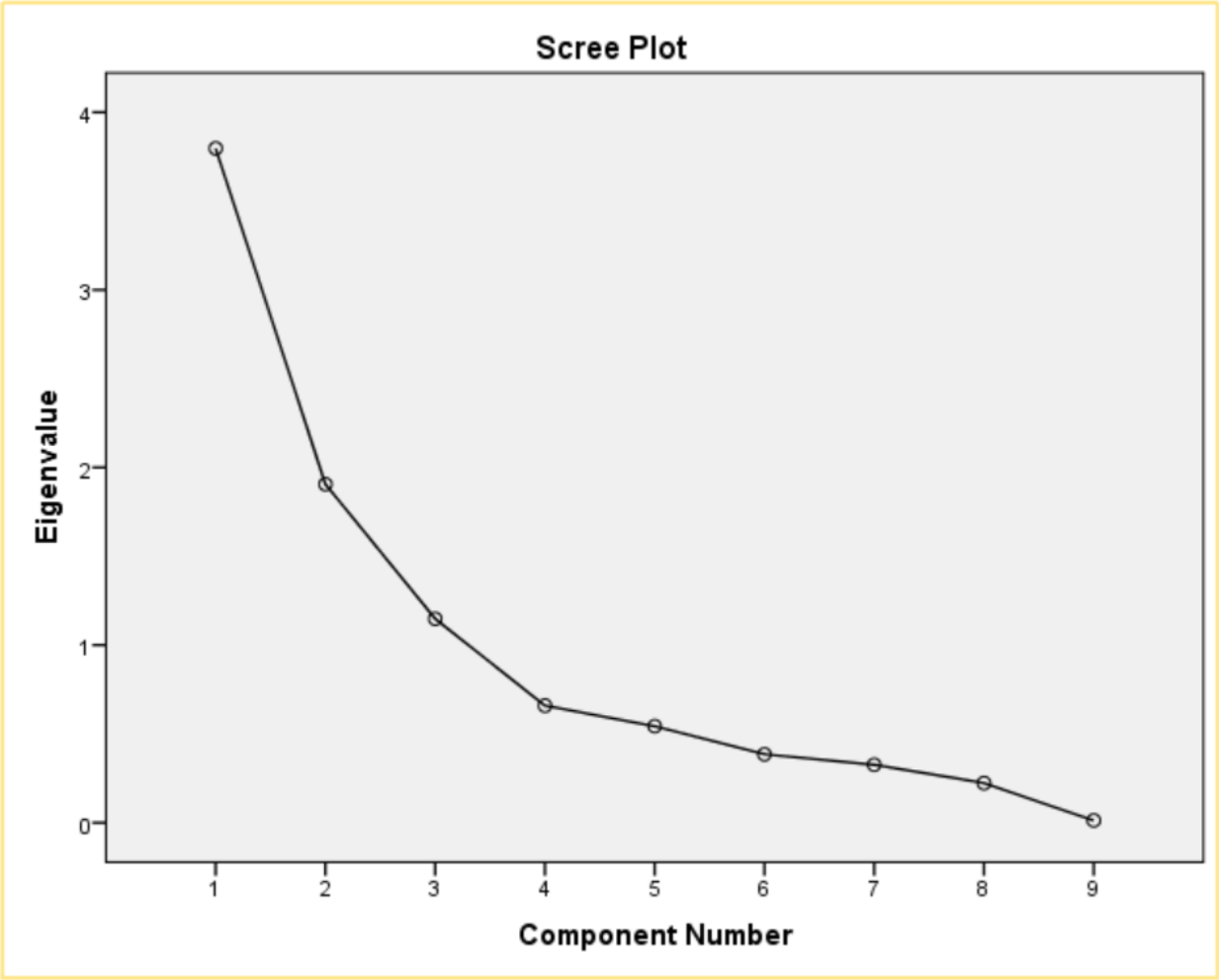
When we proceed to Eigen value analysis we have both table output as well as the Scree plot. In the Scree plot the elbow value is considered while we can also use the table to derive the optimum number of components.

According to the table the extraction sums of squared loadings cumulative is 76.115 for 3 components and is above 60% . The total value is 1.148 and is above the recommended 1.0 hence we proceed to the next step.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.797	42.185	42.185	3.797	42.185	42.185	2.392	26.573	26.573
2	1.906	21.175	63.360	1.906	21.175	63.360	2.384	26.486	53.059
3	1.148	12.755	76.115	1.148	12.755	76.115	2.075	23.056	76.115
4	.659	7.325	83.440						
5	.543	6.036	89.476						
6	.385	4.281	93.757						
7	.326	3.625	97.383						
8	.223	2.478	99.861						
9	.013	.139	100.000						

Extraction Method: Principal Component Analysis.



Rotated Component Matrix

We then check for the rotated component matrix analysis to divide all the items into the related components. We check each component and because we have organized according to scale in SPSS, it is possible to view the categorizations easily.

Rotated Component Matrix[a]

	Component		
	1	2	3
Performance: Flexible opening hours	.980	.146	.082
Performance: Deliver in timely manner	.829	.163	.122
Performance: Service promptly	.814	.083	.002
Performance: Employees Polite	.161	.894	.155
Performance: Check out clerks polite	.094	.832	.248
Performance: Managers polite	.161	.827	.210
Performance: Well laid out/clear signs	.010	.089	.826
Performance: Fun to shop	.098	.207	.795
Performance: Attractive looking	.096	.319	.781

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Component Score Covariance Matrix

Component	1	2	3
1	1.000	.000	.000
2	.000	1.000	.000
3	.000	.000	1.000

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

We can categorize into three factors as General services, Employee qualities and the aesthetics of the shop.

Cronbach Alpha Calculation

Then we need to proceed to calculate Cronbach alpha for each component.

We calculated Cronbach's Alpha for first component with variables of flexible hours, deliver in timely manner and service promptly. Based on the output of Cronbach Alpha it has a very good value of 0.828. We would not be deleting any items here as it would not make a considerable impact.

Case Processing Summary

		N	%
Cases	Valid	237	93.7
	Excluded[a]	16	6.3
	Total	253	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.828	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Performance: Flexible opening hours	18.47	7.055	.982	.495
Performance: Service promptly	17.28	8.763	.544	.894
Performance: Deliver in timely manner	17.61	7.222	.606	.864

Next we calculate Cronbach's Alpha for second component with variables of employees polite, checkout clerks polite and managers polite. Based on the output of Cronbach Alpha it also has a very good value of 0.851. We would not be deleting any items here as it would not make a considerable impact.

Case Processing Summary

		N	%
Cases	Valid	150	59.3
	Excluded[a]	103	40.7
	Total	253	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.851	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Performance: Employees Polite	17.19	13.066	.792	.732
Performance: Managers polite	17.03	14.805	.699	.821
Performance: Check out clerks polite	17.83	10.789	.715	.826

Lastly, we calculate Cronbach's Alpha for last component with variables of well laid out signs, fun to shop and attractive looking. Based on the output of Cronbach Alpha it also has a good value of 0.765 though as not high as the previous items. We would not be deleting any items here as it would not make a considerable impact.

Case Processing Summary

		N	%
Cases	Valid	249	98.4
	Excluded[a]	4	1.6
	Total	253	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.765	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Performance: Attractive looking	16.32	12.064	.624	.669
Performance: Well laid out/clear signs	16.13	12.640	.605	.694
Performance: Fun to shop	17.19	7.952	.634	.692

We can successfully proceed to create new factors.

Creation of factors and calculating summary statistics.

Frequencies

Statistics

		EmployeeQualities	GeneralServices	Aesthetics
N	Valid	228	253	253
	Missing	25	0	0
Mean		8.7259	8.8814	8.2708
Median		9.3333	9.6667	8.6667
Mode		10.00	9.67	10.00
Std. Deviation		1.61613	1.40765	1.54900

EmployeeQualities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	2	.8	.9	.9
	2.33	1	.4	.4	1.3
	3.50	1	.4	.4	1.8
	4.33	1	.4	.4	2.2
	5.00	2	.8	.9	3.1
	5.33	4	1.6	1.8	4.8
	5.67	1	.4	.4	5.3
	6.00	5	2.0	2.2	7.5
	6.33	3	1.2	1.3	8.8
	6.50	3	1.2	1.3	10.1
	6.67	1	.4	.4	10.5
	7.00	13	5.1	5.7	16.2
	7.33	4	1.6	1.8	18.0
	7.50	4	1.6	1.8	19.7
	7.67	7	2.8	3.1	22.8
	8.00	15	5.9	6.6	29.4
	8.33	8	3.2	3.5	32.9
	8.50	3	1.2	1.3	34.2
	8.67	7	2.8	3.1	37.3
	9.00	23	9.1	10.1	47.4
	9.33	20	7.9	8.8	56.1
	9.50	2	.8	.9	57.0
	9.67	13	5.1	5.7	62.7
	10.00	85	33.6	37.3	100.0
	Total	228	90.1	100.0	
Missing	System	25	9.9		
Total		253	100.0		

GeneralServices

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	1	.4	.4	.4
	2.67	3	1.2	1.2	1.6
	3.00	1	.4	.4	2.0
	4.33	1	.4	.4	2.4
	4.67	1	.4	.4	2.8
	5.00	3	1.2	1.2	4.0
	5.33	3	1.2	1.2	5.1
	6.00	1	.4	.4	5.5
	6.33	1	.4	.4	5.9
	6.67	4	1.6	1.6	7.5
	7.00	2	.8	.8	8.3
	7.33	2	.8	.8	9.1
	7.67	11	4.3	4.3	13.4
	8.00	11	4.3	4.3	17.8
	8.33	6	2.4	2.4	20.2
	8.67	29	11.5	11.5	31.6
	9.00	26	10.3	10.3	41.9
	9.33	12	4.7	4.7	46.6
	9.67	127	50.2	50.2	96.8
	10.00	8	3.2	3.2	100.0
	Total	253	100.0	100.0	

Aesthetics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.33	1	.4	.4	.4
	3.33	1	.4	.4	.8
	3.67	1	.4	.4	1.2
	4.33	1	.4	.4	1.6
	4.67	2	.8	.8	2.4
	5.00	5	2.0	2.0	4.3
	5.33	6	2.4	2.4	6.7
	5.67	2	.8	.8	7.5
	6.00	8	3.2	3.2	10.7
	6.33	6	2.4	2.4	13.0
	6.67	13	5.1	5.1	18.2
	7.00	11	4.3	4.3	22.5
	7.33	14	5.5	5.5	28.1
	7.50	1	.4	.4	28.5
	7.67	18	7.1	7.1	35.6
	8.00	17	6.7	6.7	42.3
	8.33	16	6.3	6.3	48.6
	8.50	2	.8	.8	49.4
	8.67	19	7.5	7.5	56.9
	9.00	17	6.7	6.7	63.6
	9.33	23	9.1	9.1	72.7
	9.67	16	6.3	6.3	79.1
	10.00	53	20.9	20.9	100.0
	Total	253	100.0	100.0	