Assignment 3

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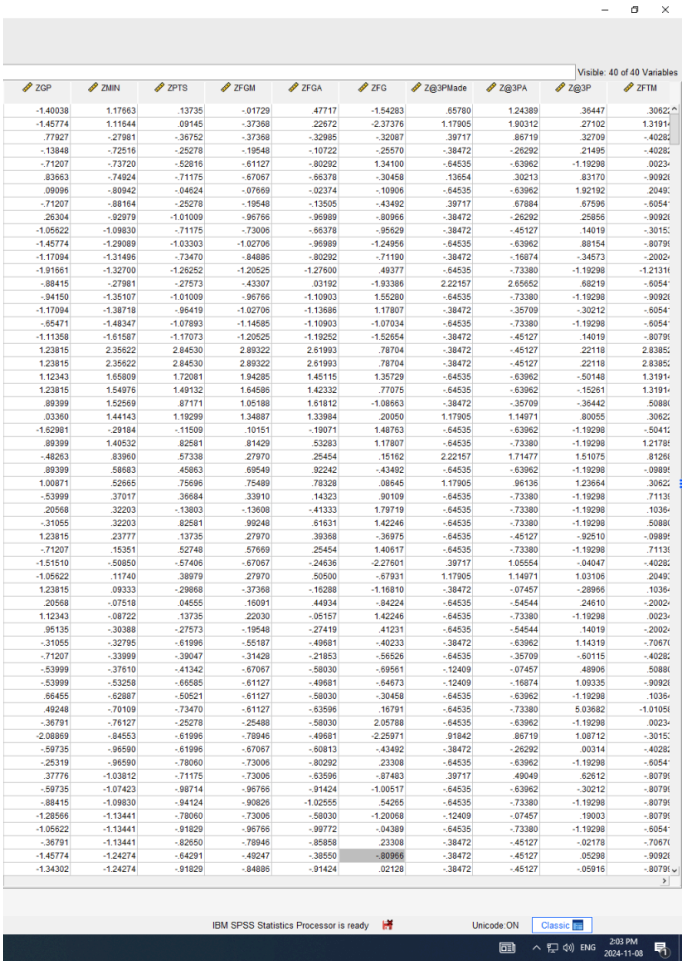
Please implement the following tasks on your approved dataset via IBM SPSS Statistics;

•Normalization via Z-score and showing the calculated columns

We generated the Z-score for all our numerical features:



Visible: 40 of 40 Variables

ZGP	ZMIN	ZPTS	ZFGM	ZFGA	ZFG	Z@3PMade	Z@3PA	Z@3P	ZFTM
-1.40038	1.17663	.13735	-.01729	.47717	-1.54283	.65780	1.24389	.36447	.3062
-1.45774	1.11644	.09145	-.37368	.22672	-2.37376	1.17905	1.90312	.27102	1.3191
.77927	-.27981	-.36752	-.37368	-.32985	-.32087	.39717	.86719	.32709	-.4028
-.13848	-.72516	-.25278	-.19548	-.10722	-.25570	-.38472	-.26292	.21495	-.4028
-.71207	-.73720	-.52816	-.61127	-.80292	1.34100	-.64535	-.63962	-1.19298	.0023
.83663	-.74924	-.71175	-.67067	-.56378	-.30458	.13654	.30213	.83170	-.9092
.09096	-.80942	-.04624	-.07669	-.02374	-.10906	-.64535	-.63962	1.92192	.2049
-.71207	-.88164	-.25278	-.19548	-.13505	-.43492	.39717	.67884	.67596	-.5054
.26304	-.92979	-1.01009	-.96766	-.96989	-.80966	-.38472	-.26292	.25856	-.9092
-1.05622	-1.09830	-.71175	-.73006	-.66378	-.95629	-.38472	-.45127	.14019	-.3015
-1.45774	-1.29089	-1.03303	-1.02706	-.96989	-1.24956	-.64535	-.63962	.88154	-.8079
-1.17094	-1.31496	-.73470	-.84886	-.80292	-.71190	-.38472	-.16874	-.34573	-.2002
-1.91661	-1.32700	-1.26252	-1.20525	-1.27600	.49377	-.64535	-.73380	-1.19298	-1.2131
-.88415	-.27981	-.27573	-.43307	.03192	-1.93386	2.22157	2.65652	.68219	-.6054
-.94150	-1.35107	-1.01009	-.96766	-1.10903	1.55280	-.64535	-.73380	-1.19298	-.9092
-1.17094	-1.38718	-.96419	-1.02706	-1.13686	1.17807	-.38472	-.35709	-.30212	-.5054
-.65471	-1.48347	-1.07893	-1.14585	-1.10903	-1.07034	-.64535	-.73380	-1.19298	-.5054
-1.11358	-1.61587	-1.17073	-1.20525	-1.19252	-1.52654	-.38472	-.45127	.14019	-.8079
1.23815	2.35622	2.84530	2.89322	2.61993	.78704	-.38472	-.45127	.22118	2.8385
1.23815	2.35622	2.84530	2.89322	2.61993	.78704	-.38472	-.45127	.22118	2.8385
1.12343	1.65809	1.72081	1.94285	1.45115	1.35729	-.64535	-.63962	-.50148	1.3191
1.23815	1.54976	1.49132	1.64586	1.42332	.77075	-.64535	-.63962	-.15261	1.3191
.89399	1.52569	.87171	1.05188	1.51812	-1.08663	-.38472	-.35709	-.36442	.5088
.03360	1.44143	1.19299	1.34887	1.33984	.20050	1.17905	1.14971	.80055	.3062
-1.62981	-.29184	-.11509	.10151	-.19071	1.48763	-.64535	-.63962	-1.19298	-.5041
.89399	1.40532	.82581	.81429	.53283	1.17807	-.64535	-.73380	-1.19298	1.2178
-.48263	.83960	.57338	.27970	.25454	.15162	2.22157	1.71477	1.51075	.8126
.89399	.58683	.45863	.69549	.92242	-.43492	-.64535	-.63962	-1.19298	-.0989
1.00871	.52665	.75696	.75489	.78328	.08645	1.17905	.96136	1.23664	.3062
-.53999	.37017	.36684	.33910	.14323	.90109	-.64535	-.73380	-1.19298	.7113
.20568	.32203	-.13803	-.13608	-.41333	1.79719	-.64535	-.73380	-1.19298	.1036
-.31055	.32203	.82581	.99248	.51631	1.42246	-.64535	-.73380	-1.19298	.5088
1.23815	.23777	.13735	.27970	.39368	-.36975	-.64535	-.45127	-.92510	-.0989
-.71207	.15351	.52748	.57669	.25454	1.40617	-.64535	-.73380	-1.19298	.7113
-1.51510	-.50850	-.57406	-.67067	-.24636	-2.27601	.39717	1.05554	-.04047	-.4028
-1.05622	.11740	.38979	.27970	.50500	-.67931	1.17905	1.14971	1.03106	.2049
1.23815	.09333	-.29868	-.37368	-.16288	-1.16810	-.38472	-.07457	-.28966	.1036
.20568	-.07518	.04555	.16091	.44934	-.84224	-.64535	-.54544	.24610	-.2002
1.12343	-.08722	.13735	.22030	-.05157	1.42246	-.64535	-.73380	-1.19298	.0023
.95135	-.30388	-.27573	-.19548	-.27419	.41231	-.64535	-.54544	.14019	-.2002
-.31055	-.32795	-.61996	-.55187	-.49681	-.40233	-.38472	-.63962	1.14319	-.7057
-.71207	-.33999	-.39047	-.31429	-.21853	-.56526	-.64535	-.35709	-.60115	-.4028
-.53999	-.37610	-.41342	-.67067	-.58030	-.69561	-.12409	-.07457	.48906	.5088
-.53999	-.53258	-.66585	-.61127	-.49681	-.64673	-.12409	-.16874	1.09335	-.9092
.66455	-.62887	-.50521	-.61127	-.58030	-.30458	-.64535	-.63962	-1.19298	.1036
.49248	-.70109	-.73470	-.61127	-.53596	.16791	-.64535	-.73380	5.03682	-1.0105
-.36791	-.76127	-.25278	-.25488	-.58030	2.05788	-.64535	-.63962	-1.19298	.0023
-2.08869	-.84553	-.61996	-.78946	-.49681	-2.25971	.91842	.86719	1.08712	-.3015
-.59735	-.96590	-.61996	-.67067	-.50813	-.43492	-.38472	-.26292	.00314	-.4028
-.25319	-.96590	-.78060	-.73006	-.80292	.23308	-.64535	-.63962	-1.19298	-.6054
.37776	-1.03812	-.71175	-.73006	-.53596	-.87483	.39717	.49049	.52612	-.8079
-.59735	-1.07423	-.98714	-.96766	-.91424	-1.00517	-.64535	-.63962	.30212	-.8079
-.88415	-1.09830	-.94124	-.90826	-1.02555	.54265	-.64535	-.73380	-1.19298	-.8079
-1.28566	-1.13441	-.78060	-.73006	-.58030	-1.20068	-.12409	-.07457	.19003	-.8079
-1.05622	-1.13441	-.91829	-.96766	-.99772	-.04389	-.64535	-.73380	-1.19298	-.6054
-.36791	-1.13441	-.82650	-.78946	-.85858	.23308	-.38472	-.45127	-.02178	-.7057
-1.45774	-1.24274	-.64291	-.49247	-.38550	-.80966	-.38472	-.45127	.05298	-.9092
-1.34302	-1.24274	-.91829	-.84886	-.91424	.02128	-.38472	-.45127	-.05916	-.8079

IBM SPSS Statistics Processor is ready

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- Principal Component Analysis (PCA)

Showing the values of correlation between the features

Factor Analysis

Correlation Matrix[a]

		Zscore(GP)	Zscore(MIN)	Zscore(PTS)	Zscore(FGM)	Zscore(FGA)	Zscore(FG)	Zscore (@3PMade)	Zscore(@3PA)	Zscore(@3P)	Zscore(FTM)	Zscore(FTA)	Zscore(FT)	Zscore(OREB)	Zscore(DREB)	Zscore(REB)	Zscore(AST)	Zscore(STL)	Zscore(BLK)	Zscore(TOV)
Correlation	Zscore(GP)	1.000	.590	.538	.543	.517	.296	.107	.099	.037	.482	.479	.196	.401	.467	.460	.373	.451	.276	.518
	Zscore(MIN)	.590	1.000	.912	.903	.910	.204	.390	.403	.168	.791	.780	.240	.573	.746	.710	.629	.757	.399	.826
	Zscore(PTS)	.538	.912	1.000	.991	.980	.255	.347	.357	.155	.896	.881	.259	.575	.694	.677	.552	.675	.387	.850
	Zscore(FGM)	.543	.903	.991	1.000	.980	.292	.289	.299	.123	.848	.840	.224	.597	.703	.691	.533	.663	.398	.834
	Zscore(FGA)	.517	.910	.980	.980	1.000	.130	.390	.414	.201	.827	.806	.270	.504	.640	.614	.590	.690	.322	.846
	Zscore(FG)	.296	.204	.255	.292	.130	1.000	-.294	-.351	-.337	.246	.300	-.161	.511	.411	.465	-.109	.057	.392	.122
	Zscore(@3PMade)	.107	.390	.347	.289	.390	-.294	1.000	.983	.592	.158	.095	.314	-.219	.017	-.073	.377	.307	-.159	.258
	Zscore(@3PA)	.099	.403	.357	.299	.414	-.351	.983	1.000	.585	.174	.108	.324	-.232	.011	-.081	.411	.339	-.172	.284
	Zscore(@3P)	.037	.168	.155	.123	.201	-.337	.592	.585	1.000	.036	-.027	.332	-.289	-.126	-.193	.267	.198	-.246	.111
	Zscore(FTM)	.482	.791	.896	.848	.827	.246	.158	.174	.036	1.000	.981	.258	.584	.654	.654	.476	.600	.407	.805
	Zscore(FTA)	.479	.780	.881	.840	.806	.300	.095	.108	-.027	.981	1.000	.115	.653	.701	.711	.429	.580	.469	.799
	Zscore(FT)	.196	.240	.259	.224	.270	-.161	.314	.324	.332	.258	.115	1.000	-.147	-.023	-.071	.296	.207	-.161	.200
	Zscore(OREB)	.401	.573	.575	.597	.504	.511	-.219	-.232	-.289	.584	.653	-.147	1.000	.839	.933	-.012	.287	.648	.422
	Zscore(DREB)	.467	.746	.694	.703	.640	.411	.017	.011	-.126	.654	.701	-.023	.839	1.000	.978	.187	.412	.688	.570
	Zscore(REB)	.460	.710	.677	.691	.614	.465	-.073	-.081	-.193	.654	.711	-.071	.933	.978	1.000	.119	.381	.700	.537
	Zscore(AST)	.373	.629	.552	.533	.590	-.109	.377	.411	.267	.476	.429	.296	-.012	.187	.119	1.000	.751	-.086	.747
	Zscore(STL)	.451	.757	.675	.663	.690	.057	.307	.339	.198	.600	.580	.207	.287	.412	.381	.751	1.000	.134	.742
	Zscore(BLK)	.276	.399	.387	.398	.322	.392	-.159	-.172	-.246	.407	.469	-.161	.648	.688	.700	-.086	.134	1.000	.282
	Zscore(TOV)	.518	.826	.850	.834	.846	.122	.258	.284	.111	.805	.799	.200	.422	.570	.537	.747	.742	.282	1.000
Sig. (1-tailed)	Zscore(GP)		<.001	<.001	<.001	<.001	<.001	<.001	<.001	.087	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
	Zscore(MIN)	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Zscore(PTS)	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Zscore(FGM)	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Zscore(FGA)	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Zscore(FG)	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.019	.000	.000
	Zscore(@3PMade)	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.272	.004	.000	.000	.000	.000
	Zscore(@3PA)	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.341	.002	.000	.000	.000	.000
	Zscore(@3P)	.087	.000	.000	.000	.000	.000	.000	.000		.092	.159	.000	.000	.000	.000	.000	.000	.000	.000
	Zscore(FTM)	.000	.000	.000	.000	.000	.000	.000	.000	.092		.000	.000	.000	.000	.000	.000	.000	.000	.000
	Zscore(FTA)	.000	.000	.000	.000	.000	.000	.000	.000	.159	.000		.000	.000	.000	.000	.000	.000	.000	.000
	Zscore(FT)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.201	.005	.000	.000	.000	.000
	Zscore(OREB)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.329	.000	.000	.000
	Zscore(DREB)	.000	.000	.000	.000	.000	.000	.272	.341	.000	.000	.000	.201	.000		.000	.000	.000	.000	.000
	Zscore(REB)	.000	.000	.000	.000	.000	.000	.004	.002	.000	.000	.000	.005	.000	.000		.000	.000	.000	.000
	Zscore(AST)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.329	.000	.000		.000	.001	.000
	Zscore(STL)	.000	.000	.000	.000	.000	.019	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000
	Zscore(BLK)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.000		.000
	Zscore(TOV)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	

a. Determinant = 1.847e-18

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.830
Bartlett's Test of Sphericity	Approx. Chi-Square	54382.372
	df	171
	Sig.	<.001

Communalities

	Initial	Extraction
Zscore(GP)	1.000	.409
Zscore(MIN)	1.000	.924
Zscore(PTS)	1.000	.944
Zscore(FGM)	1.000	.913
Zscore(FGA)	1.000	.911
Zscore(FG)	1.000	.446
Zscore(@3PMade)	1.000	.907
Zscore(@3PA)	1.000	.917
Zscore(@3P)	1.000	.597
Zscore(FTM)	1.000	.823
Zscore(FTA)	1.000	.834
Zscore(FT)	1.000	.292
Zscore(OREB)	1.000	.869
Zscore(DREB)	1.000	.884
Zscore(REB)	1.000	.932
Zscore(AST)	1.000	.806
Zscore(STL)	1.000	.716
Zscore(BLK)	1.000	.672
Zscore(TOV)	1.000	.871

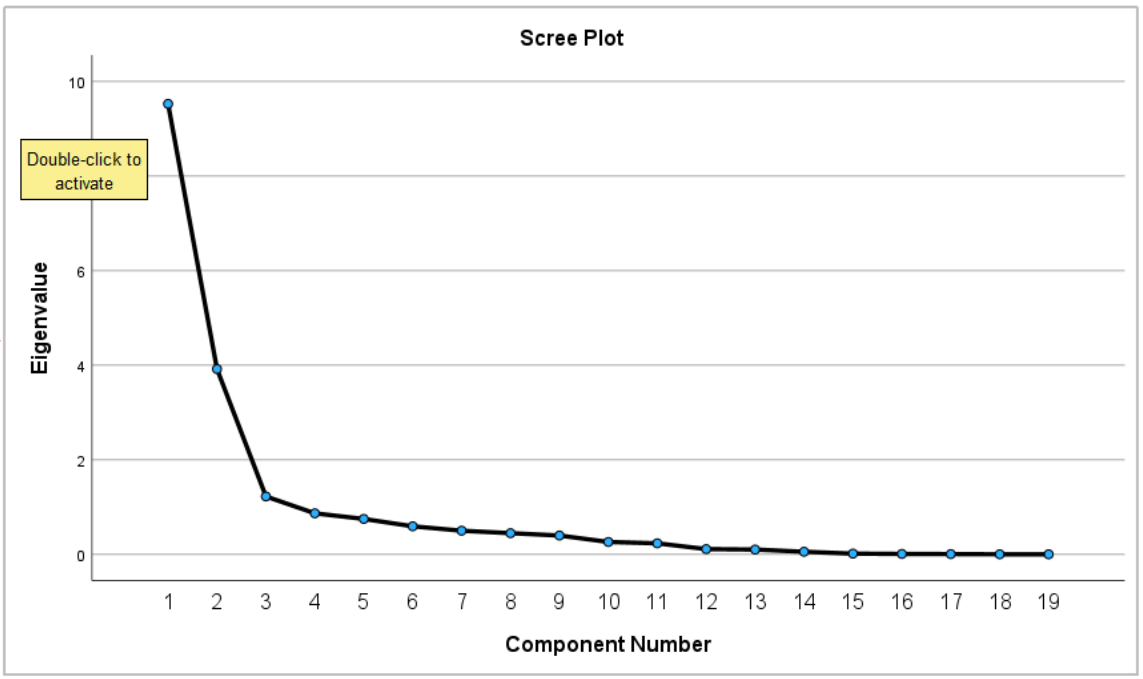
Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.524	50.126	50.126	9.524	50.126	50.126
2	3.917	20.618	70.744	3.917	20.618	70.744
3	1.224	6.440	77.184	1.224	6.440	77.184
4	.867	4.561	81.745			
5	.748	3.937	85.682			
6	.592	3.117	88.799			
7	.499	2.625	91.424			
8	.447	2.351	93.775			
9	.397	2.090	95.865			
10	.261	1.374	97.239			
11	.232	1.222	98.461			
12	.110	.581	99.042			
13	.100	.529	99.570			
14	.054	.285	99.855			
15	.015	.077	99.932			
16	.008	.040	99.973			
17	.005	.024	99.997			
18	.000	.002	99.999			
19	.000	.001	100.000			

Extraction Method: Principal Component Analysis.

Generating the Scree plot to visualize the principal components



Component Matrix[a]

	Component		
	1	2	3
Zscore(GP)	.620	-.033	-.154
Zscore(MIN)	.951	.136	.042
Zscore(PTS)	.966	.106	.011
Zscore(FGM)	.954	.056	-.004
Zscore(FGA)	.934	.198	.006
Zscore(FG)	.304	-.594	-.027
Zscore(@3PMade)	.275	.782	.468
Zscore(@3PA)	.286	.806	.431
Zscore(@3P)	.090	.706	.301
Zscore(FTM)	.899	-.025	-.120
Zscore(FTA)	.899	-.131	-.096
Zscore(FT)	.212	.483	-.119
Zscore(OREB)	.677	-.613	.185
Zscore(DREB)	.804	-.402	.274
Zscore(REB)	.788	-.498	.250
Zscore(AST)	.576	.516	-.456
Zscore(STL)	.730	.299	-.305
Zscore(BLK)	.493	-.557	.345
Zscore(TOV)	.877	.172	-.268

Extraction Method: Principal Component Analysis.
a. 3 components extracted.

We can see that there is a knee plot at component number 3 .

•Linear Regression based on multiple numerical predictors and the target

Because our dataset has a categorical target, the logistic regression model was used.

First, we use all our features to predict the model

1s Logistic Regression model

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	1340	100.0
	Missing Cases	0	.0
	Total	1340	100.0
Unselected Cases		0	.0
Total		1340	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Block 0: Beginning Block

Classification Table[a,b]

			Predicted		
			TARGET_5Yrs		Percentage Correct
	Observed		0	1	
Step 0	TARGET_5Yrs	0	0	509	.0
		1	0	831	100.0
	Overall Percentage				62.0

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.490	.056	75.845	1	<.001	1.633

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Zscore(GP)	211.018	1	<.001
		Zscore(MIN)	135.340	1	<.001
		Zscore(PTS)	133.791	1	<.001
		Zscore(FGM)	135.161	1	<.001
		Zscore(FGA)	114.771	1	<.001
		Zscore(FG)	69.131	1	<.001
		Zscore(@3PMade)	1.797	1	.180
		Zscore(@3PA)	.439	1	.507
		Zscore(@3P)	.000	1	1.000
		Zscore(FTM)	118.073	1	<.001
		Zscore(FTA)	117.476	1	<.001
		Zscore(FT)	15.257	1	<.001
		Zscore(OREB)	115.279	1	<.001
		Zscore(DREB)	108.595	1	<.001
		Zscore(REB)	120.123	1	<.001
		Zscore(AST)	41.203	1	<.001
		Zscore(STL)	70.769	1	<.001
		Zscore(BLK)	59.158	1	<.001
		Zscore(TOV)	99.392	1	<.001
	Overall Statistics		272.662	19	<.001

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	303.448	19	<.001
	Block	303.448	19	<.001
	Model	303.448	19	<.001

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1476.048[a]	.203	.276

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Classification Table[a]

			Predicted		
			TARGET_5Yrs		Percentage Correct
	Observed		0	1	
Step 1	TARGET_5Yrs	0	272	237	53.4
		1	141	690	83.0
	Overall Percentage				71.8

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Step 1[a]	Zscore(GP)	.620	.082	57.097	1	<.001	1.859	1.583	2.183
	Zscore(MIN)	-.494	.275	3.213	1	.073	.610	.356	1.047
	Zscore(PTS)	-.892	3.837	.054	1	.816	.410	.000	755.776
	Zscore(FGM)	-.188	2.931	.004	1	.949	.829	.003	258.928
	Zscore(FGA)	1.188	.829	2.053	1	.152	3.281	.646	16.666
	Zscore(FG)	.221	.132	2.817	1	.093	1.247	.964	1.615
	Zscore(@3PMade)	1.347	.510	6.986	1	.008	3.845	1.416	10.439
	Zscore(@3PA)	-1.269	.435	8.520	1	.004	.281	.120	.659
	Zscore(@3P)	.063	.084	.556	1	.456	1.065	.903	1.256
	Zscore(FTM)	.690	1.004	.472	1	.492	1.994	.279	14.267
	Zscore(FTA)	-.302	.619	.238	1	.626	.739	.220	2.488
	Zscore(FT)	.126	.104	1.455	1	.228	1.134	.924	1.392
	Zscore(OREB)	.179	.994	.033	1	.857	1.197	.171	8.393
	Zscore(DREB)	-1.056	1.735	.370	1	.543	.348	.012	10.433
	Zscore(REB)	1.349	2.612	.267	1	.606	3.853	.023	644.280
	Zscore(AST)	.446	.164	7.399	1	.007	1.563	1.133	2.156
	Zscore(STL)	.000	.130	.000	1	.998	1.000	.775	1.290
	Zscore(BLK)	.249	.115	4.683	1	.030	1.283	1.024	1.609
	Zscore(TOV)	-.209	.195	1.148	1	.284	.811	.553	1.190
	Constant	.639	.068	89.132	1	<.001	1.895		

a. Variable(s) entered on step 1: Zscore(GP), Zscore(MIN), Zscore(PTS), Zscore(FGM), Zscore(FGA), Zscore(FG), Zscore (@3PMade), Zscore(@3PA), Zscore(@3P), Zscore(FTM), Zscore(FTA), Zscore(FT), Zscore(OREB), Zscore(DREB), Zscore (REB), Zscore(AST), Zscore(STL), Zscore(BLK), Zscore(TOV).

The value of R is far from 1, showing that the model does not fit the data correctly.

Taking into account the p-values, we will run the model again and use only those attributes that are less than or close to the value 0.005.

2nd Logistic Regression Model

Logistic Regression

[DataSet1]

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	1340	100.0
	Missing Cases	0	.0
	Total	1340	100.0
Unselected Cases		0	.0
Total		1340	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Block 0: Beginning Block

Classification Table[a,b]

			Predicted		
			TARGET_5Yrs		Percentage Correct
	Observed		0	1	
Step 0	TARGET_5Yrs	0	0	509	.0
		1	0	831	100.0
	Overall Percentage				62.0

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.490	.056	75.845	1	<.001	1.633

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Zscore(GP)	211.018	1	<.001
		Zscore(@3PMade)	1.797	1	.180
		Zscore(@3PA)	.439	1	.507
		Zscore(AST)	41.203	1	<.001
	Overall Statistics		224.548	4	<.001

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	235.921	4	<.001
	Block	235.921	4	<.001
	Model	235.921	4	<.001

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1543.575[a]	.161	.220

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	15.173	8	.056

Contingency Table for Hosmer and Lemeshow Test

		TARGET_5Yrs = 0		TARGET_5Yrs = 1		
		Observed	Expected	Observed	Expected	Total
Step 1	1	97	101.790	37	32.210	134
	2	81	82.789	53	51.211	134
	3	69	71.043	65	62.957	134
	4	68	60.533	66	73.467	134
	5	51	50.658	83	83.342	134
	6	50	42.109	84	91.891	134
	7	40	33.416	94	100.584	134
	8	29	27.068	105	106.932	134
	9	11	22.661	123	111.339	134
	10	13	16.933	121	117.067	134

Classification Table[a]

			Predicted		
			TARGET_5Yrs		Percentage Correct
	Observed		0	1	
Step 1	TARGET_5Yrs	0	236	273	46.4
		1	144	687	82.7
	Overall Percentage				68.9

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Zscore(GP)	.829	.070	139.069	1	<.001	2.292
	Zscore(@3PMade)	1.285	.363	12.532	1	<.001	3.614
	Zscore(@3PA)	-1.384	.364	14.455	1	<.001	.251
	Zscore(AST)	.215	.085	6.413	1	.011	1.240
	Constant	.571	.063	82.834	1	<.001	1.769

a. Variable(s) entered on step 1: Zscore(GP), Zscore(@3PMade), Zscore(@3PA), Zscore(AST).

•K-Means based on two different values of K and comparison between these two, based on your normalized numerical subsets, by adding the cluster membership.

Quick Cluster

Initial Cluster Centers

	Cluster		
	1	2	3
Zscore(GP)	1.23815	1.23815	-2.66228
Zscore(MIN)	2.28400	2.52473	-1.74828
Zscore(PTS)	4.01568	2.79940	-1.30842
Zscore(FGM)	3.42780	2.41804	-1.32405
Zscore(FGA)	2.78690	2.73125	-1.19252
Zscore(FG)	1.45504	-.20682	-2.94401
Zscore(@3PMade)	-.64535	5.34911	-.12409
Zscore(@3PA)	-.73380	5.01091	.11378
Zscore(@3P)	-1.19298	1.09958	.24610
Zscore(FTM)	6.28244	2.02818	-1.31445
Zscore(FTA)	6.33270	1.57074	-1.37714
Zscore(FT)	.27411	1.33287	-6.64560
Zscore(OREB)	3.46227	-.65550	-1.29890
Zscore(DREB)	4.61340	.42224	-1.19540
Zscore(REB)	4.35690	.03184	-1.28026
Zscore(AST)	.30552	3.36432	-.98597
Zscore(STL)	2.63934	.68697	-1.50944
Zscore(BLK)	8.23080	-.39292	-.39292
Zscore(TOV)	2.63849	2.50009	-1.23672

Iteration History[a]

	Change in Cluster Centers		
Iteration	1	2	3
1	8.511	7.809	8.100
2	1.468	.345	.174
3	.443	.271	.062
4	.259	.227	.065
5	.177	.139	.041
6	.253	.201	.057
7	.094	.070	.041
8	.100	.061	.035
9	.101	.037	.015
10	.172	.062	.016
11	.148	.060	.010
12	.082	.058	.008
13	.059	.037	.006
14	.030	.030	.009
15	.023	.013	.000
16	.022	.012	.000
17	.000	.000	.000

a. Convergence achieved due to no or small change in cluster centers. The maximum absolute coordinate change for any center is .000. The current iteration is 17. The minimum distance between initial centers is 16.192.

Final Cluster Centers

	Cluster		
	1	2	3
Zscore(GP)	.78863	.64346	-.46604
Zscore(MIN)	1.36649	.77758	-.66114
Zscore(PTS)	1.49978	.60443	-.61758
Zscore(FGM)	1.51737	.57942	-.61090
Zscore(FGA)	1.35317	.69012	-.62003
Zscore(FG)	.76912	-.16468	-.11075
Zscore(@3PMade)	-.24617	.83829	-.30543
Zscore(@3PA)	-.24210	.85014	-.31153
Zscore(@3P)	-.34776	.60360	-.17952
Zscore(FTM)	1.53771	.36356	-.52205
Zscore(FTA)	1.63837	.27230	-.50630
Zscore(FT)	-.05645	.54130	-.22151
Zscore(OREB)	1.77182	-.17591	-.34343
Zscore(DREB)	1.76782	.09686	-.46084
Zscore(REB)	1.83885	-.00167	-.43491
Zscore(AST)	.30696	.86943	-.44998
Zscore(STL)	.76147	.81390	-.53356
Zscore(BLK)	1.41033	-.23017	-.23424
Zscore(TOV)	1.25376	.62214	-.56698

ANOVA

	Cluster		Error			
	Mean Square	df	Mean Square	df	F	Sig.
Zscore(GP)	218.220	2	.675	1337	323.259	<.001
Zscore(MIN)	457.878	2	.317	1337	1446.406	<.001
Zscore(PTS)	430.201	2	.358	1337	1201.798	<.001
Zscore(FGM)	426.799	2	.363	1337	1175.584	<.001
Zscore(FGA)	410.980	2	.387	1337	1062.741	<.001
Zscore(FG)	65.834	2	.903	1337	72.905	<.001
Zscore(@3PMade)	165.439	2	.754	1337	219.410	<.001
Zscore(@3PA)	170.242	2	.747	1337	227.952	<.001
Zscore(@3P)	87.806	2	.870	1337	100.910	<.001
Zscore(FTM)	356.920	2	.468	1337	763.326	<.001
Zscore(FTA)	370.695	2	.447	1337	829.335	<.001
Zscore(FT)	70.961	2	.895	1337	79.255	<.001
Zscore(OREB)	350.916	2	.477	1337	736.343	<.001
Zscore(DREB)	383.688	2	.428	1337	897.425	<.001
Zscore(REB)	397.080	2	.408	1337	974.408	<.001
Zscore(AST)	221.673	2	.670	1337	330.905	<.001
Zscore(STL)	284.509	2	.576	1337	494.024	<.001
Zscore(BLK)	220.180	2	.672	1337	327.585	<.001
Zscore(TOV)	345.588	2	.485	1337	713.237	<.001

The F tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in different clusters. The observed significance levels are not corrected for this and thus cannot be interpreted as tests of the hypothesis that the cluster means are equal.

Number of Cases in each Cluster

Cluster	1	190.000
	2	348.000
	3	802.000
Valid		1340.000
Missing		.000

2nd Cluster

Quick Cluster

Initial Cluster Centers

	Cluster					
	1	2	3	4	5	6
Zscore(GP)	-2.66228	1.23815	1.18079	1.23815	.03360	1.23815
Zscore(MIN)	-1.74828	2.64510	2.44047	1.65809	.32203	2.48862
Zscore(PTS)	-1.30842	1.56017	3.80914	.64222	.66517	4.91068
Zscore(FGM)	-1.32405	1.58646	3.78419	.63609	.39850	4.49697
Zscore(FGA)	-1.19252	1.81292	2.84256	.36586	.61631	3.87220
Zscore(FG)	-2.94401	-.15794	1.96012	1.14548	-.43492	1.19436
Zscore(@3PMade)	-.12409	.39717	-.64535	-.64535	2.74283	-.38472
Zscore(@3PA)	.11378	.67884	-.73380	-.73380	2.56235	-.16874
Zscore(@3P)	.24610	.38939	-1.19298	-1.19298	1.17434	-.11523
Zscore(FTM)	-1.31445	1.21785	4.05402	.91397	.30622	6.48502
Zscore(FTA)	-1.37714	1.04163	5.35007	1.41956	-.01658	5.50124
Zscore(FT)	-6.64560	.67115	-1.04933	-1.08714	1.86224	1.34232
Zscore(OREB)	-1.29890	.63130	4.10567	5.52116	-1.04154	1.27470
Zscore(DREB)	-1.19540	1.01048	5.56927	3.51046	-.23952	1.81929
Zscore(REB)	-1.28026	.85798	5.28023	4.40550	-.55131	1.68411
Zscore(AST)	-.98597	6.15121	.23755	-.30623	-.23826	2.95648
Zscore(STL)	-1.50944	4.59171	.19888	.44293	-.53326	4.34766
Zscore(BLK)	-.39292	-.62599	7.29851	1.00552	-.62599	1.00552
Zscore(TOV)	-1.23672	2.63849	3.60730	.83929	.14728	3.19209

Iteration History[a]

	Change in Cluster Centers					
Iteration	1	2	3	4	5	6
1	5.930	4.071	2.980	4.954	4.507	5.267
2	1.026	1.872	.726	.732	.233	.995
3	.435	.752	1.545	.513	.276	.683
4	.171	.478	1.187	.535	.259	.592
5	.086	.181	.905	.324	.197	.366
6	.024	.080	.965	.237	.090	.250
7	.040	.217	.733	.216	.053	.717
8	.029	.137	.533	.135	.059	.719
9	.036	.209	.240	.141	.061	.502
10	.041	.195	.261	.139	.058	.447
11	.025	.233	.165	.099	.060	.304
12	.034	.200	.040	.056	.093	.194
13	.043	.091	.048	.032	.100	.000
14	.055	.094	.000	.032	.085	.076
15	.061	.137	.000	.025	.107	.119
16	.084	.105	.000	.025	.121	.103
17	.070	.097	.000	.013	.109	.082
18	.046	.113	.000	.042	.081	.000
19	.043	.094	.000	.028	.072	.049
20	.027	.090	.000	.042	.068	.000

a. Iterations stopped because the maximum number of iterations was performed. Iterations failed to converge. The maximum absolute coordinate change for any center is .041. The current iteration is 20. The minimum distance between initial centers is 9.510.

Double-click to activate

Final Cluster Centers

	Cluster					
	1	2	3	4	5	6
Zscore(GP)	-.80083	.66561	.90099	.48615	-.34216	.82465
Zscore(MIN)	-.97412	.84750	1.64752	.17823	-.45920	2.05943
Zscore(PTS)	-.82663	.66643	1.90888	.03596	-.48821	2.28048
Zscore(FGM)	-.80316	.64018	1.96168	.07938	-.51522	2.15562
Zscore(FGA)	-.83091	.77345	1.71247	-.06765	-.43280	2.30136
Zscore(FG)	-.07512	-.20682	.85678	.86163	-.61926	-.01374
Zscore(@3PMade)	-.55146	.98777	-.54364	-.59877	.22700	1.42801
Zscore(@3PA)	-.56607	1.00845	-.56727	-.63783	.24532	1.51939
Zscore(@3P)	-.65246	.65661	-.46205	-.73809	.74970	.64369
Zscore(FTM)	-.69094	.37220	1.93059	.11904	-.48709	2.17634
Zscore(FTA)	-.65439	.28368	2.09616	.22541	-.54986	1.99492
Zscore(FT)	-.66368	.52003	-.05732	-.32956	.45445	.64688
Zscore(OREB)	-.43448	-.19391	2.34338	.85588	-.69131	.39891
Zscore(DREB)	-.65738	.12712	2.45595	.63025	-.60493	.78879
Zscore(REB)	-.59655	.01289	2.51499	.73676	-.66337	.67157
Zscore(AST)	-.63748	.85742	.21517	-.43236	-.08827	2.42385
Zscore(STL)	-.78082	.81123	.76733	-.09806	-.24484	2.17675
Zscore(BLK)	-.31836	-.21223	1.97477	.64483	-.49180	.05583
Zscore(TOV)	-.78523	.63168	1.53466	-.04953	-.39984	2.49390

ANOVA

	Cluster		Error			
	Mean Square	df	Mean Square	df	F	Sig.
Zscore(GP)	107.181	5	.602	1334	178.037	<.001
Zscore(MIN)	215.497	5	.196	1334	1099.260	<.001
Zscore(PTS)	213.605	5	.203	1334	1051.567	<.001
Zscore(FGM)	207.615	5	.226	1334	920.358	<.001
Zscore(FGA)	206.901	5	.228	1334	906.441	<.001
Zscore(FG)	81.189	5	.699	1334	116.077	<.001
Zscore(@3PMade)	118.417	5	.560	1334	211.495	<.001
Zscore(@3PA)	128.558	5	.522	1334	246.330	<.001
Zscore(@3P)	126.856	5	.528	1334	240.130	<.001
Zscore(FTM)	181.736	5	.323	1334	563.386	<.001
Zscore(FTA)	183.238	5	.317	1334	578.128	<.001
Zscore(FT)	68.727	5	.746	1334	92.109	<.001
Zscore(OREB)	180.159	5	.328	1334	548.446	<.001
Zscore(DREB)	185.414	5	.309	1334	600.447	<.001
Zscore(REB)	194.981	5	.273	1334	714.388	<.001
Zscore(AST)	150.139	5	.441	1334	340.447	<.001
Zscore(STL)	149.011	5	.445	1334	334.680	<.001
Zscore(BLK)	112.426	5	.582	1334	193.052	<.001
Zscore(TOV)	193.890	5	.277	1334	699.908	<.001

The F tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in different clusters. The observed significance levels are not corrected for this and thus cannot be interpreted as tests of the hypothesis that the cluster means are equal.

Number of Cases in each Cluster

Cluster	1	347.000
	2	218.000
	3	82.000
	4	263.000
	5	363.000
	6	67.000
Valid		1340.000
Missing		.000