IBM Software

Clustering Course
Lab 4: Getting familiar with K-means clustering method

Contents

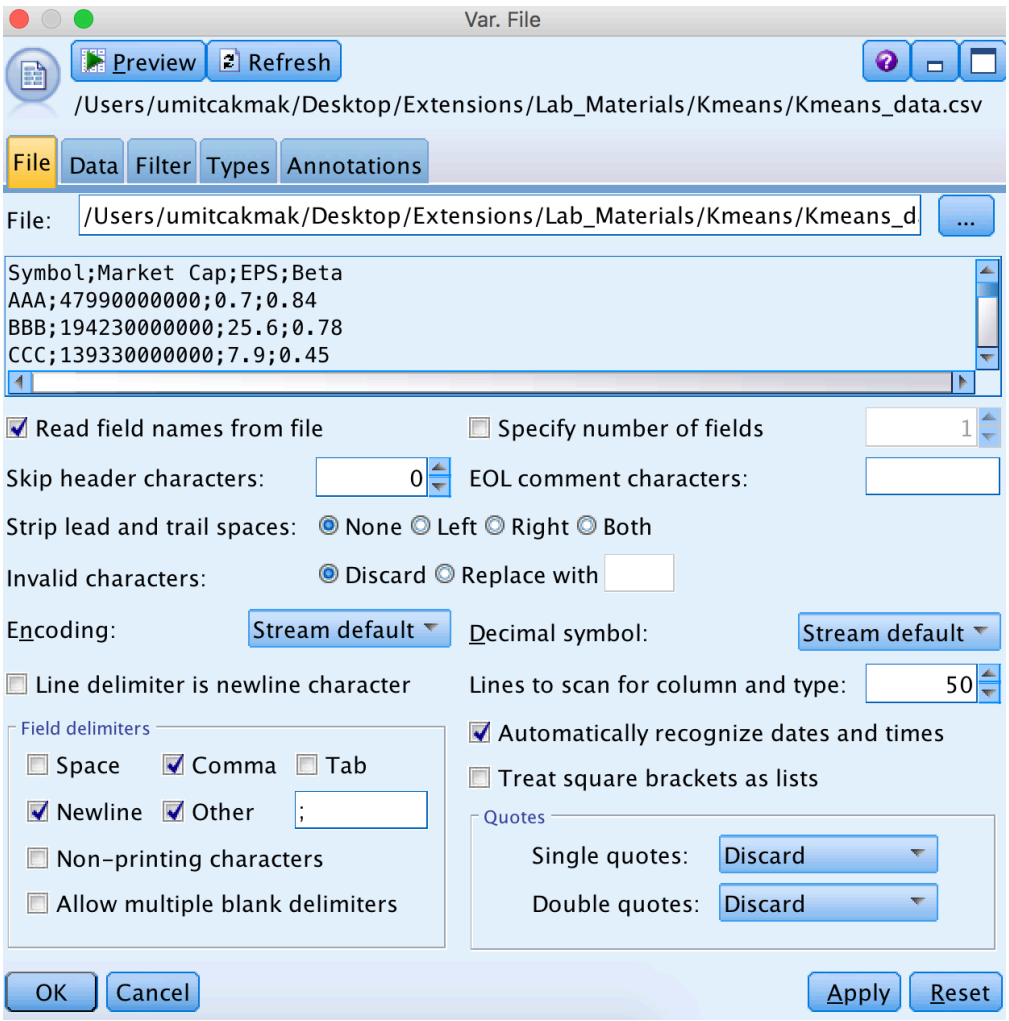
Hello everybody! In this lab, we are going to get familiar with K-means clustering algorithm which is one of the most popular algorithms in machine learning.

Let's get started.

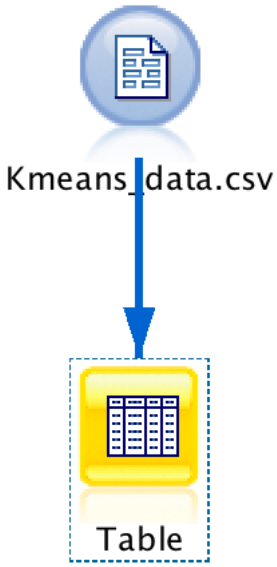
1. Getting familiar with dataset

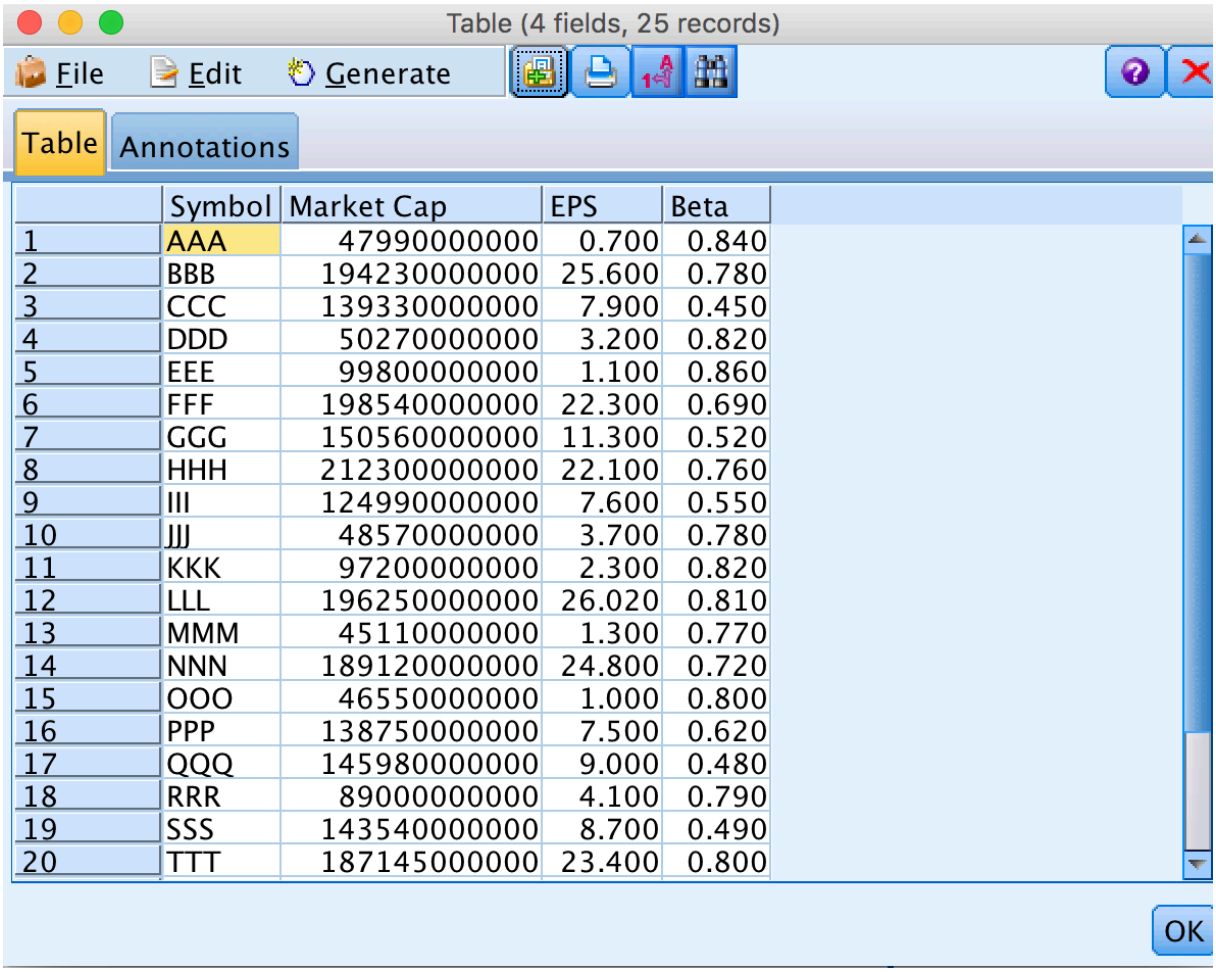
We need to import "Kmeans_data.csv". Add a "Var. File" node from "Sources" palette.

Browse to "Kmeans_data.csv" file, check the box "Others" and type semicolon as shown below and click OK.



You can add “Table” node from “Output” palette to see all records.

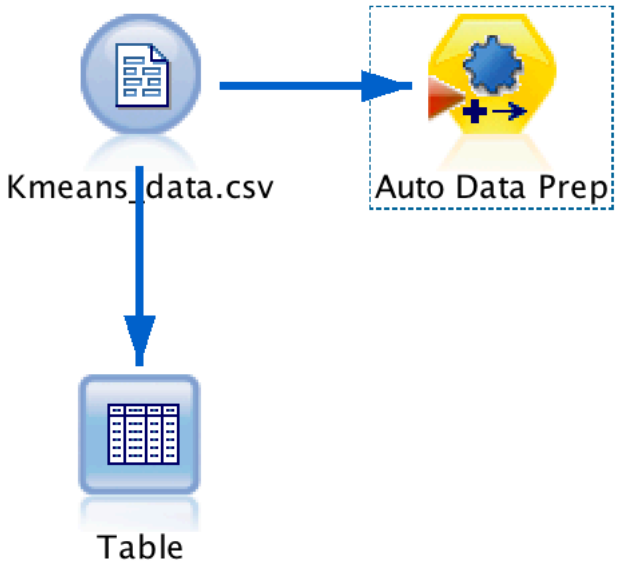




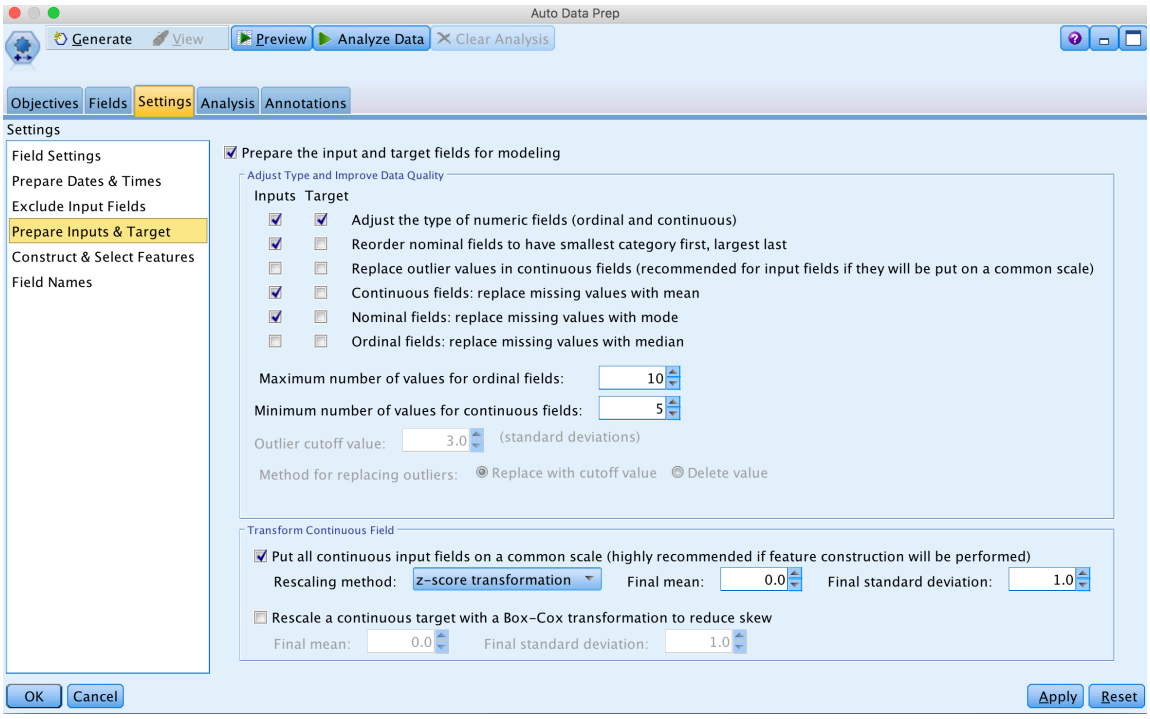
	Symbol	Market Cap	EPS	Beta
1	AAA	47990000000	0.700	0.840
2	BBB	194230000000	25.600	0.780
3	CCC	139330000000	7.900	0.450
4	DDD	50270000000	3.200	0.820
5	EEE	99800000000	1.100	0.860
6	FFF	198540000000	22.300	0.690
7	GGG	150560000000	11.300	0.520
8	HHH	212300000000	22.100	0.760
9	III	124990000000	7.600	0.550
10	JJJ	48570000000	3.700	0.780
11	KKK	97200000000	2.300	0.820
12	LLL	196250000000	26.020	0.810
13	MMM	45110000000	1.300	0.770
14	NNN	189120000000	24.800	0.720
15	OOO	46550000000	1.000	0.800
16	PPP	138750000000	7.500	0.620
17	QQQ	145980000000	9.000	0.480
18	RRR	89000000000	4.100	0.790
19	SSS	143540000000	8.700	0.490
20	TTT	187145000000	23.400	0.800

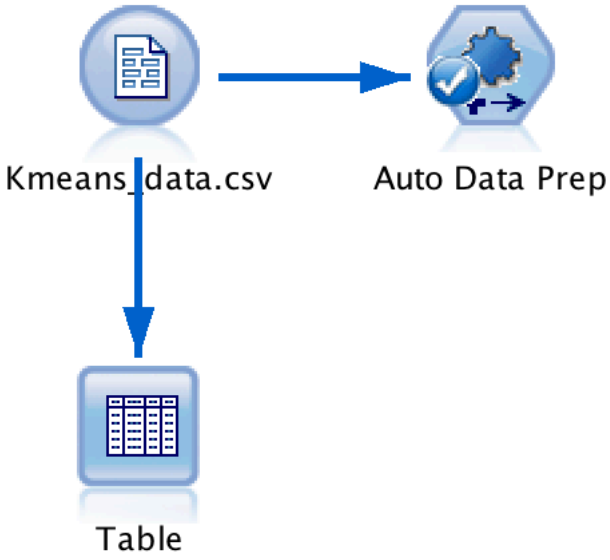
2. Data preparation

We will add “Auto Data Prep” node to normalize our data set so that large values in scale compared to other will not distort the results.

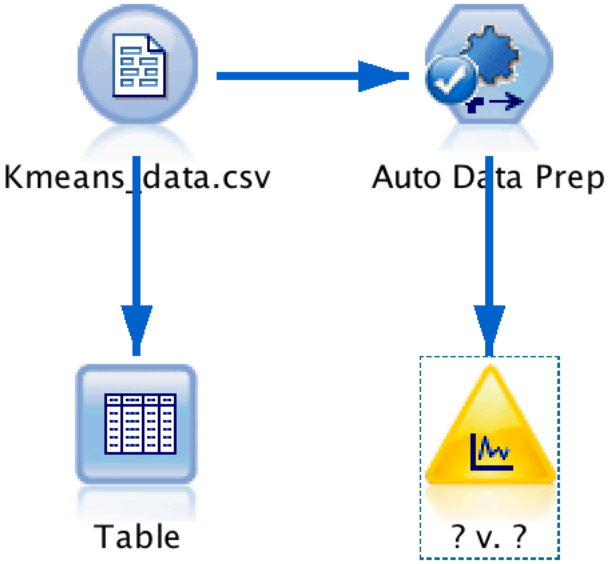


Open “Auto Data Prep” node and in “Settings” tab, “Prepare Inputs & Target” section will allow you to transform all records. Default settings are already set properly for normalization, we can click “Analyze Data” on top to perform normalization.

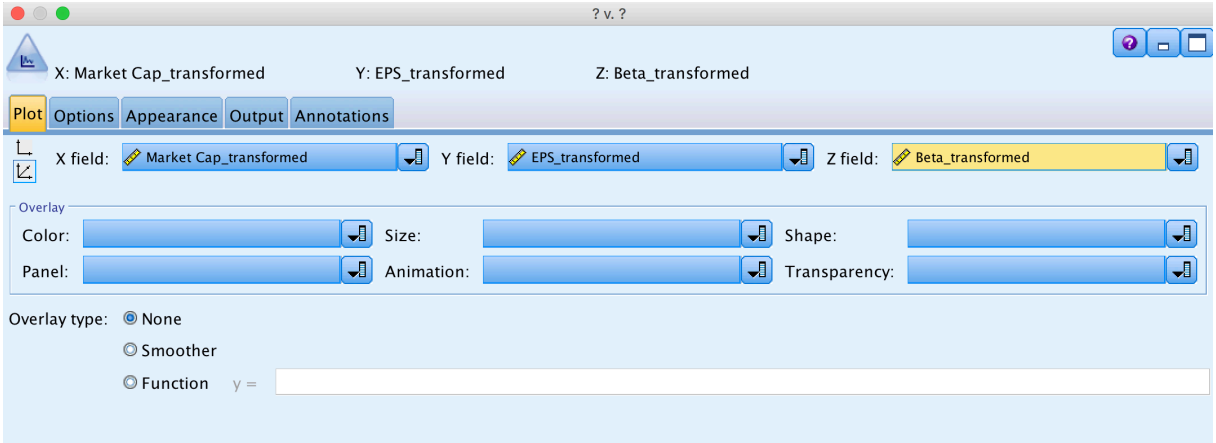


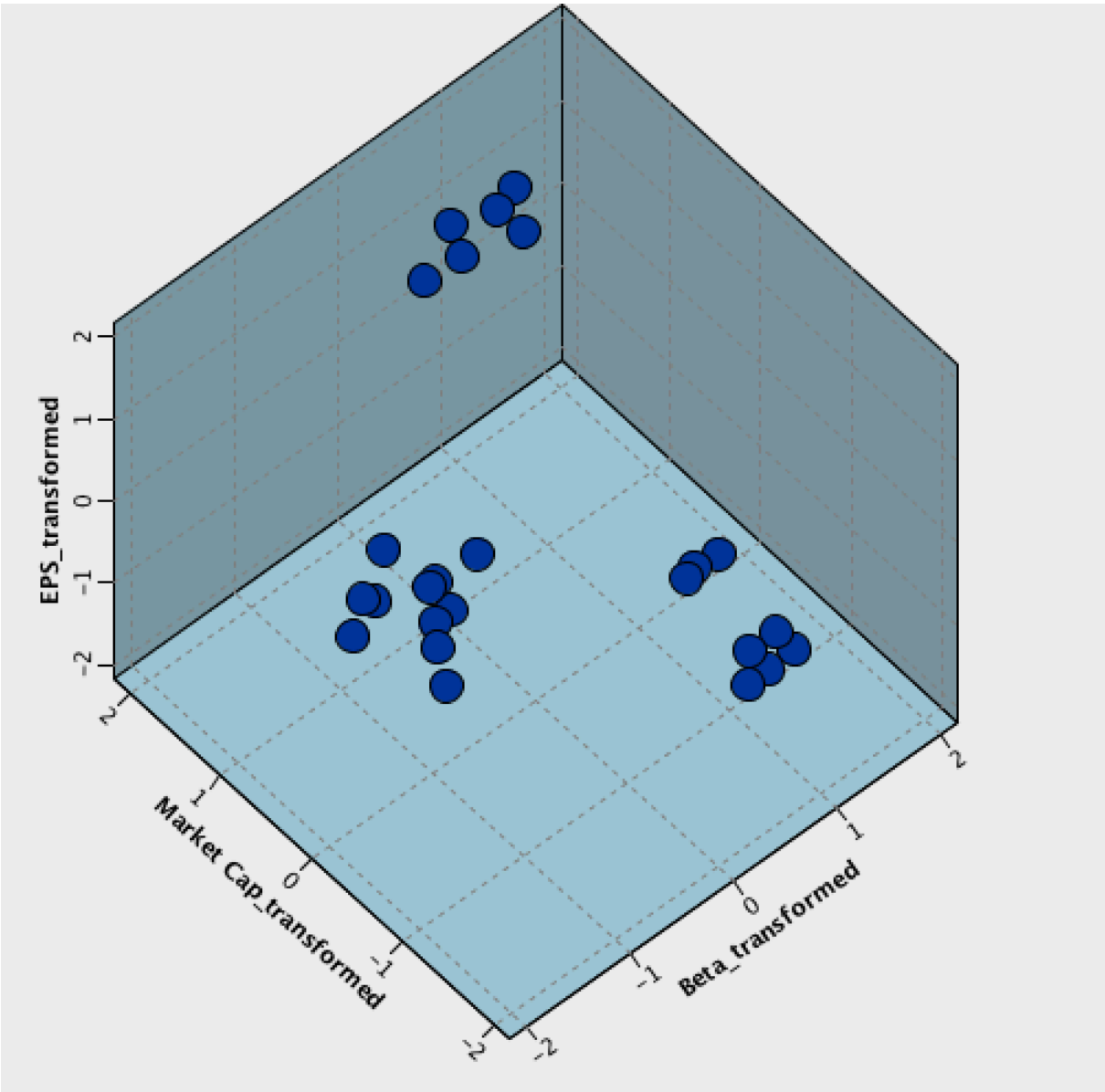


Let's add a "Plot" node from "Graphs" palette to see what our data looks like



Adjust settings as shown below and click “Run” to see 3D-plot

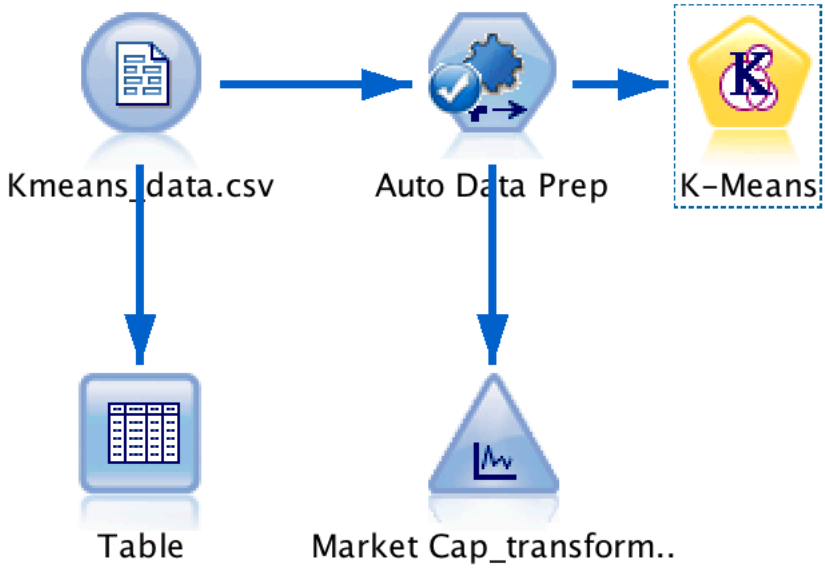




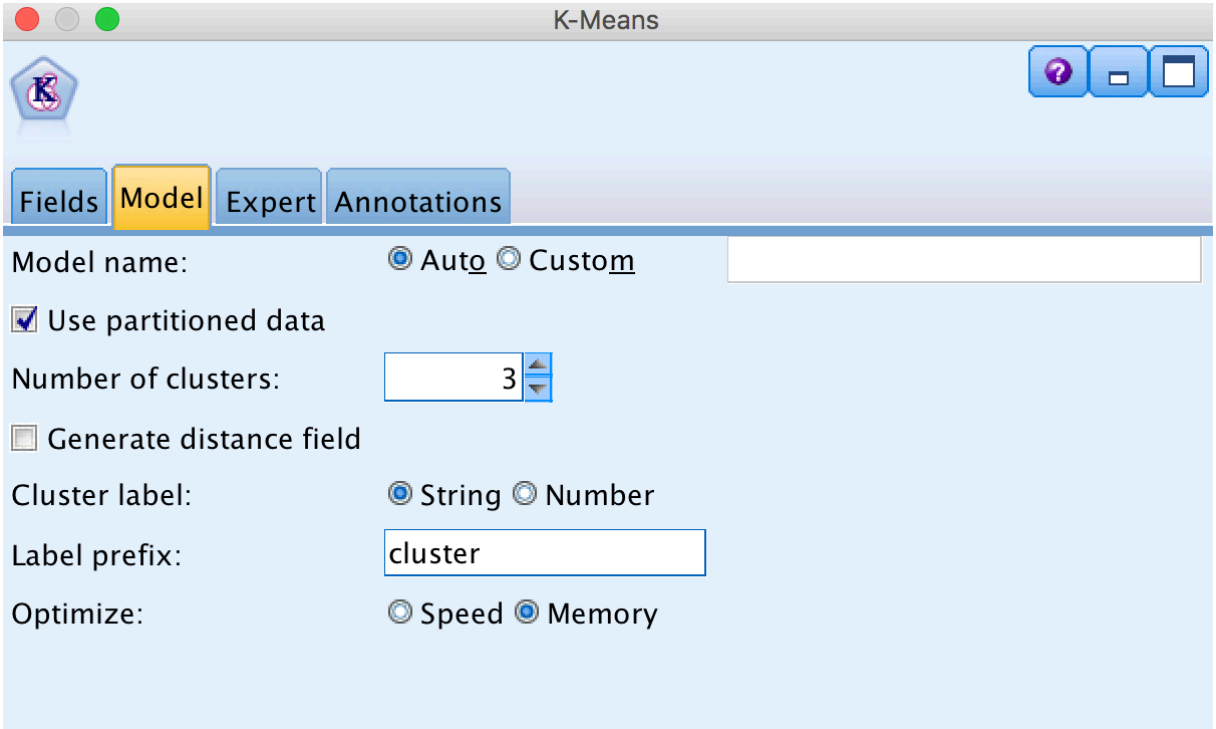
We can see 3 different groupings on this chart, and next step is to apply K-means to group these records.

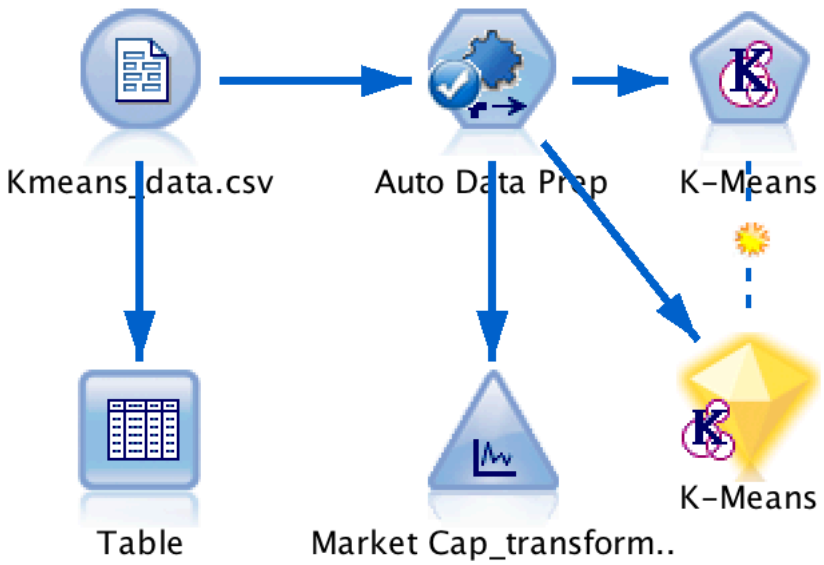
3. Applying K-means clustering

We will add “Kmeans” node from “Modeling” palette.

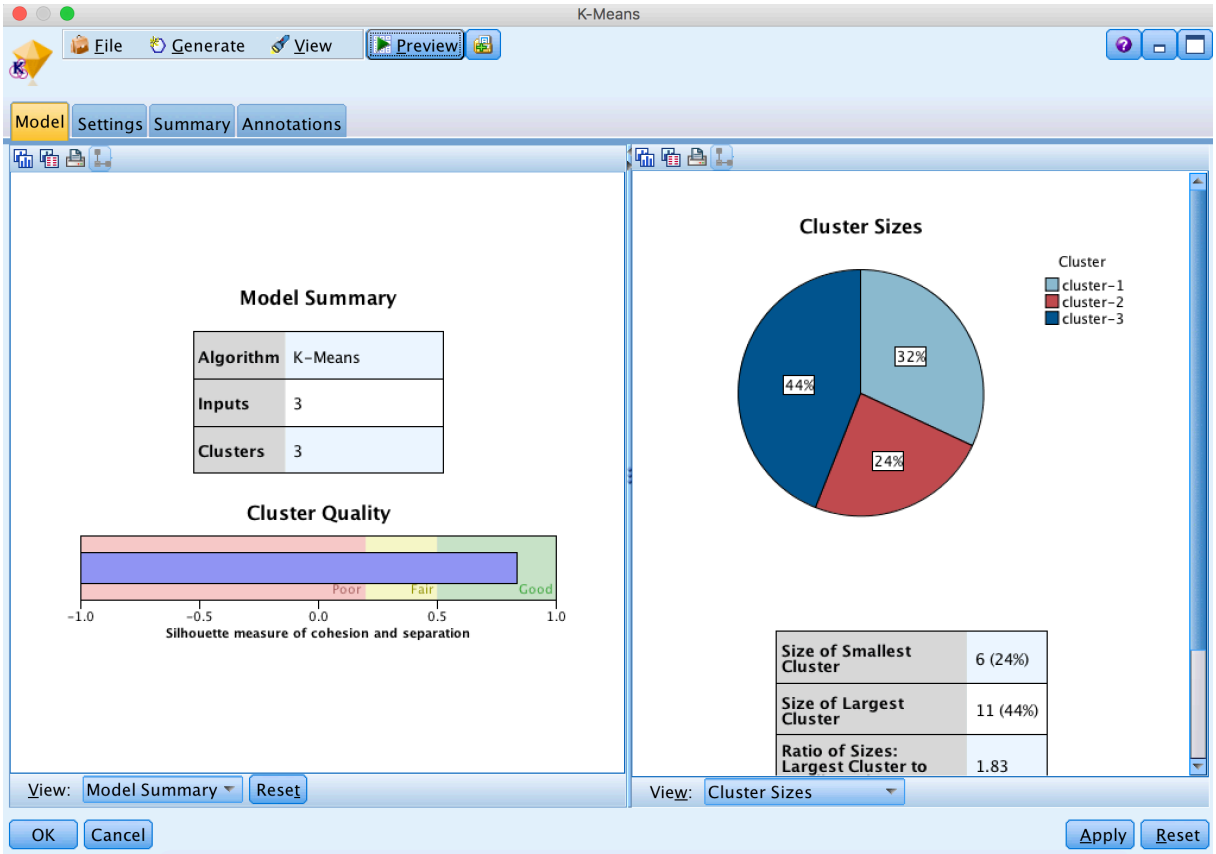


We will set “Number of clusters” to 3 and “Run” the model.

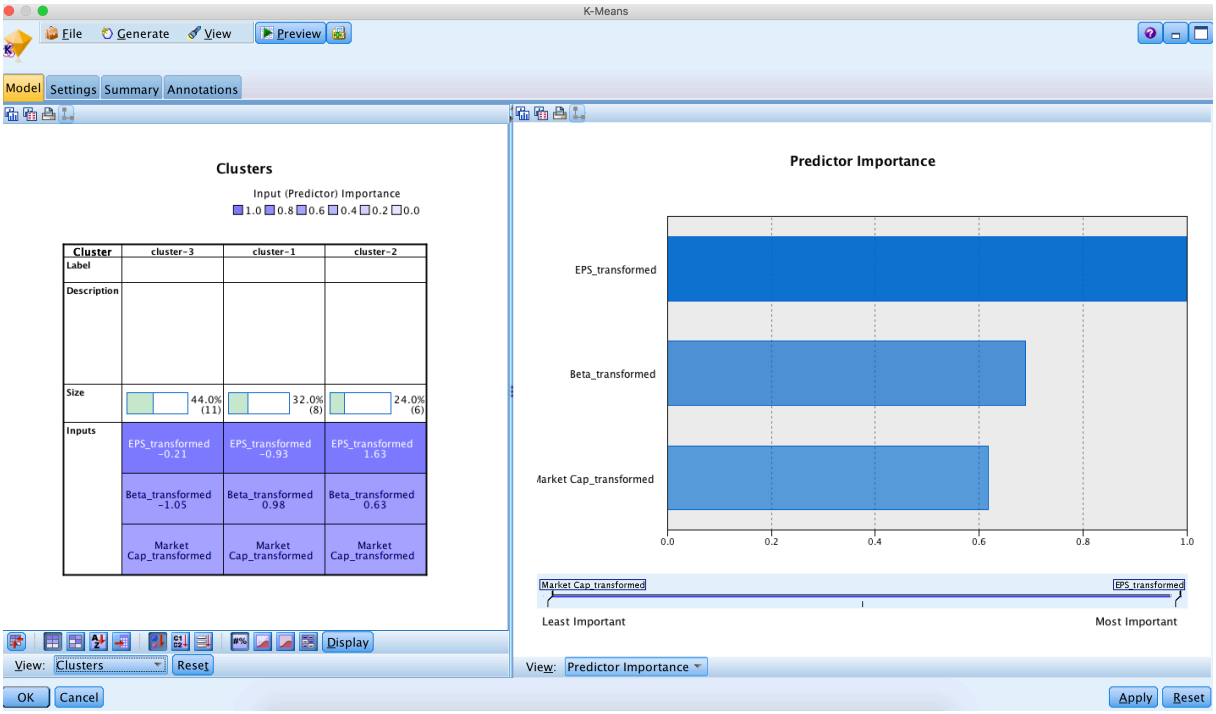




Once we have model nugget, we can double-click on it to open model summary



We can see model summary and various measures to assess the performance of clustering method.



We can also add “Table” from “Output” node to see group memberships of individual records.

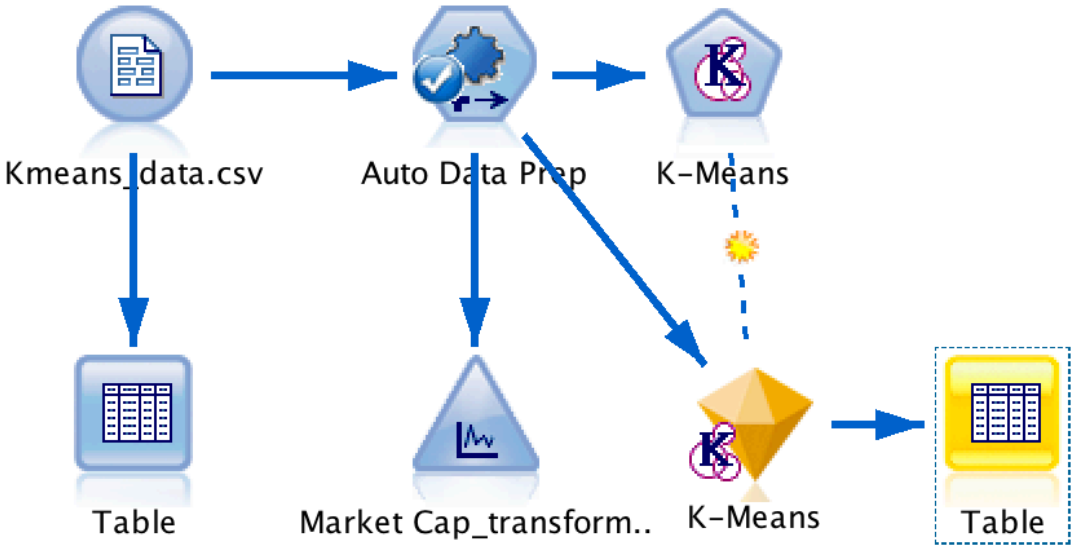
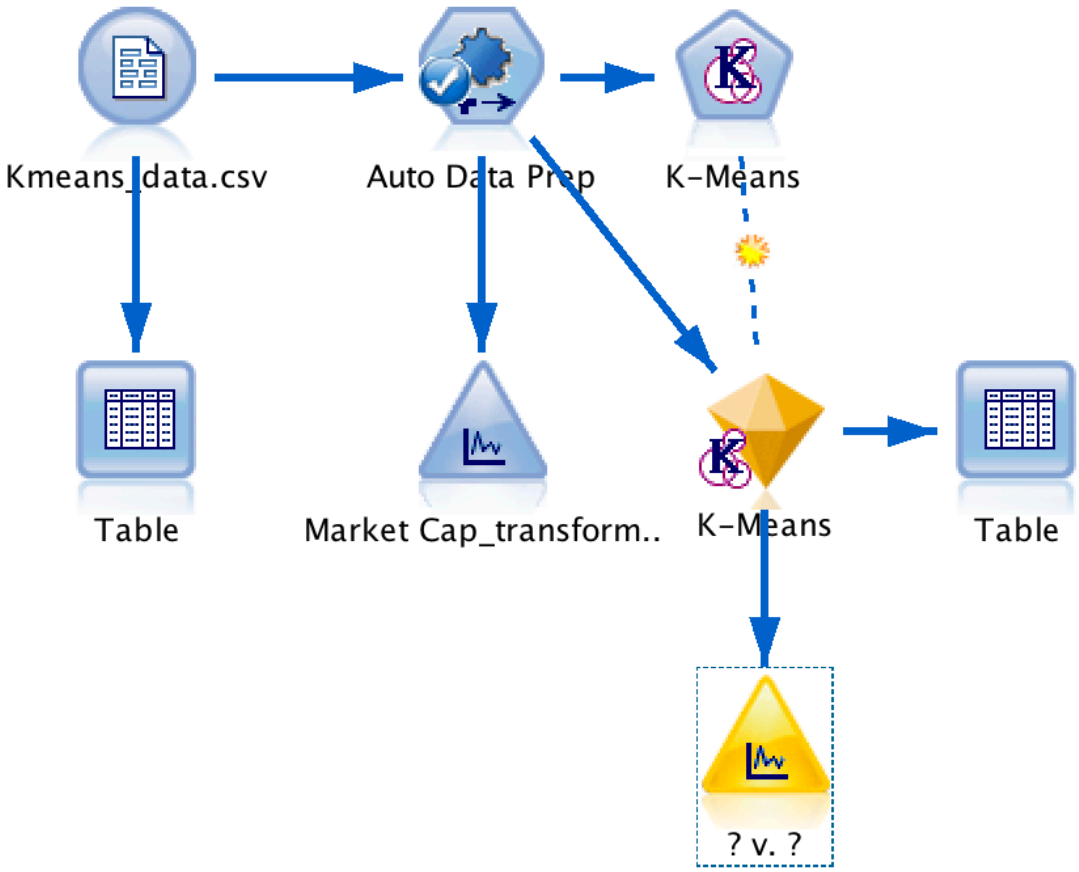


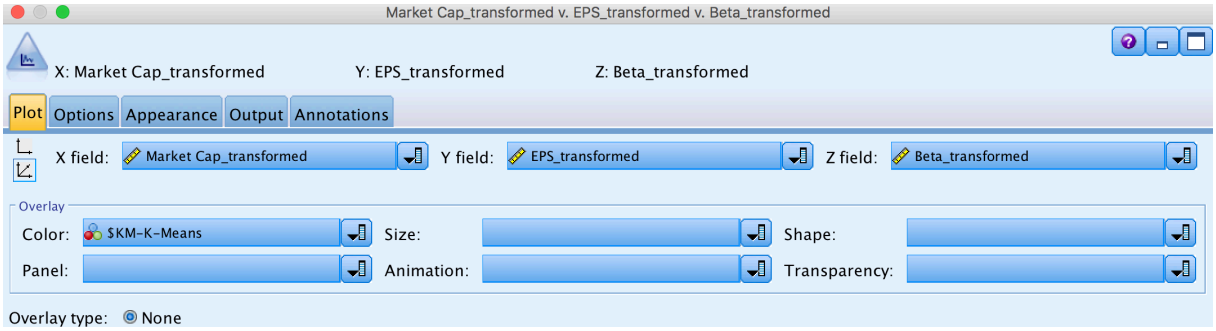
Table | Annotations

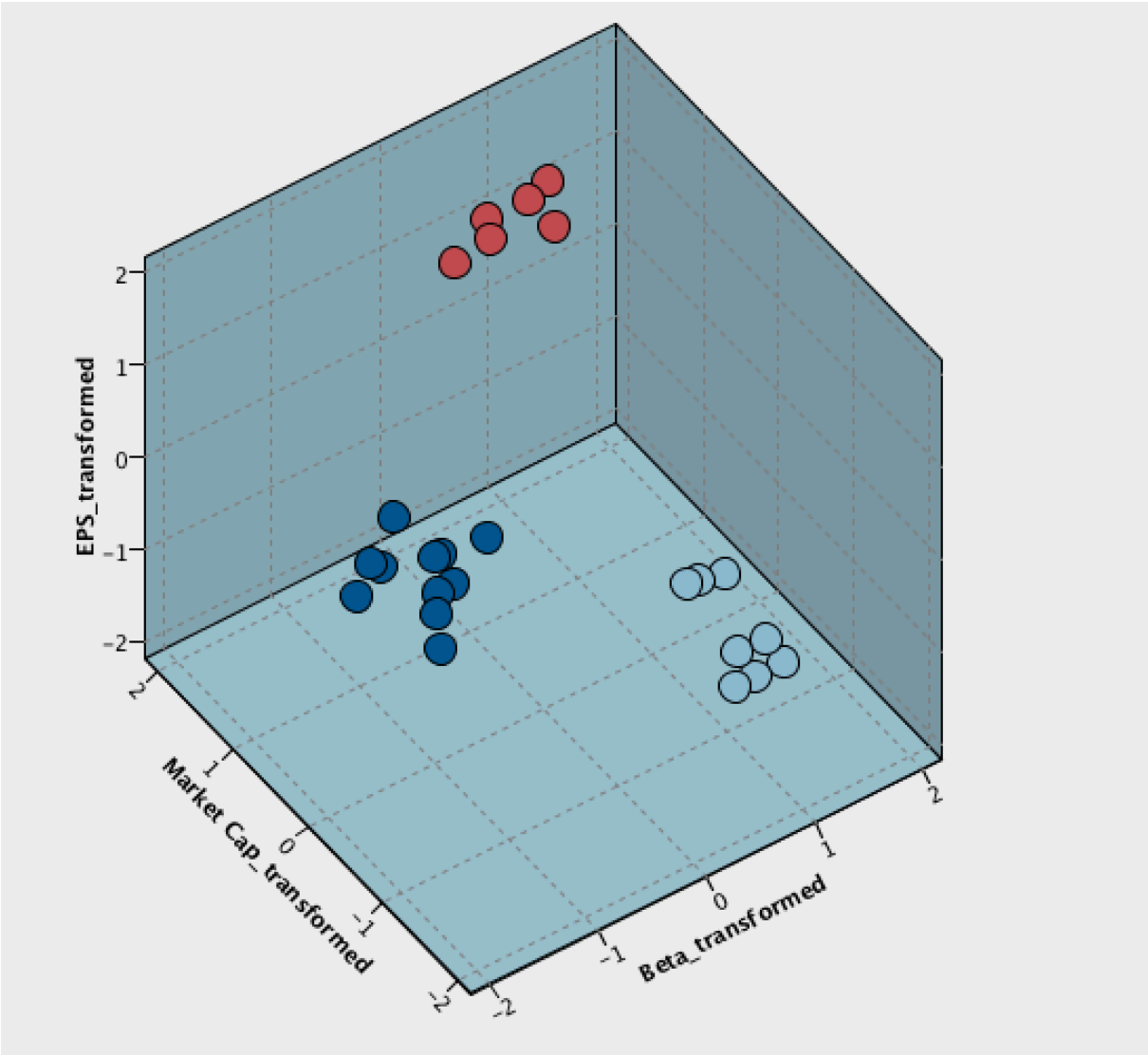
	Market Cap_transformed	EPS_transformed	Beta_transformed	Symbol_transformed	$KM-K-Means
1	-1.492	-1.107	1.186	00	cluster-1
2	1.297	1.813	0.766	01	cluster-2
3	0.250	-0.262	-1.548	02	cluster-3
4	-1.448	-0.813	1.046	03	cluster-1
5	-0.504	-1.060	1.327	04	cluster-1
6	1.379	1.426	0.135	05	cluster-2
7	0.464	0.136	-1.057	06	cluster-3
8	1.642	1.403	0.625	07	cluster-2
9	-0.023	-0.297	-0.847	08	cluster-3
10	-1.480	-0.755	0.766	09	cluster-1
11	-0.553	-0.919	1.046	10	cluster-1
12	1.336	1.863	0.976	11	cluster-2
13	-1.546	-1.036	0.696	12	cluster-1
14	1.200	1.719	0.345	13	cluster-2
15	-1.519	-1.071	0.906	14	cluster-1
16	0.239	-0.309	-0.356	15	cluster-3
17	0.377	-0.133	-1.338	16	cluster-3
18	-0.710	-0.708	0.836	17	cluster-1
19	0.330	-0.168	-1.268	18	cluster-3
20	1.162	1.555	0.906	19	cluster-2
21	0.144	-0.122	-0.847	20	cluster-3
22	0.127	-0.098	-0.917	21	cluster-3
23	-0.015	-0.333	-0.987	22	cluster-3
24	-0.456	-0.403	-1.268	23	cluster-3
25	-0.201	-0.321	-1.127	24	cluster-3

You can also visualize memberships by add another “Plot” node to model nugget.



Adjust settings as shown below and click “Run” to see chart





Summary

In this lab, you have learned how you can apply Kmeans clustering methods and how to check model summary to see model performance.

Thank you and see you in next lab.