```
 PRESERVE.
SET DECIMAL DOT.

GET DATA /TYPE=TXT
 /FILE="C:\users\jaswinder\Documents\finalyrproject\st3yrrate.csv"
 /ENCODING=UTF8'
 /DELIMITERS=","
 /QUALIFIER='"'
 /ARRANGEMENT=DELIMITED
 /FIRSTCASE=2
 /DATATYPEMINPERCENTAGE=95.0
 /VARIABLES=
 State AUTO
 rate2017 AUTO
 rate2018 AUTO
 rate2019 AUTO
 rate2020 AUTO
 rate2021 AUTO
 /MAP.
RESTORE.
CACHE.
EXECUTE.

Data written to the working file.
6 variables and 28 cases written.
Variable:State       Type:String  Format:A17
Variable:rate2017      Type:Number  Format:F11.9
Variable:rate2018      Type:Number  Format:F11.9
Variable:rate2019      Type:Number  Format:F11.9
Variable:rate2020      Type:Number  Format:F11.9
Variable:rate2021      Type:Number  Format:F11.9

Substitute the following to build syntax for these data.
 /VARIABLES=
  State A17
  rate2017 F11.9
  rate2018 F11.9
  rate2019 F11.9
  rate2020 F11.9
  rate2021 F11.9

DATASET NAME DataSet1 WINDOW=FRONT.
CLUSTER  rate2017 rate2018 rate2019 rate2020 rate2021
 /METHOD BAVERAGE
 /MEASURE=SEUCLID
 /ID=State
 /PRINT SCHEDULE
 /PLOT DENDROGRAM VICICLE.
```

Cluster

Notes

Output Created		02-APR-2023 20:35:14
Comments		
Input	Data	C:\users\jaswinder\Documents\finalyrproject\st3yrrate.csv
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	28
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		CLUSTER rate2017 rate2018 rate2019 rate2020 rate2021 /METHOD BAVERAGE /MEASURE=SEUCLID /ID=State /PRINT SCHEDULE /PLOT DENDROGRAM VICICLE.
Resources	Processor Time	00:00:03.76
	Elapsed Time	00:00:01.54

[DataSet1]

Case Processing Summary[a,b]

Cases					
Valid		Missing		Total	
N	Percent	N	Percent	N	Percent
28	100.0	0	.0	28	100.0

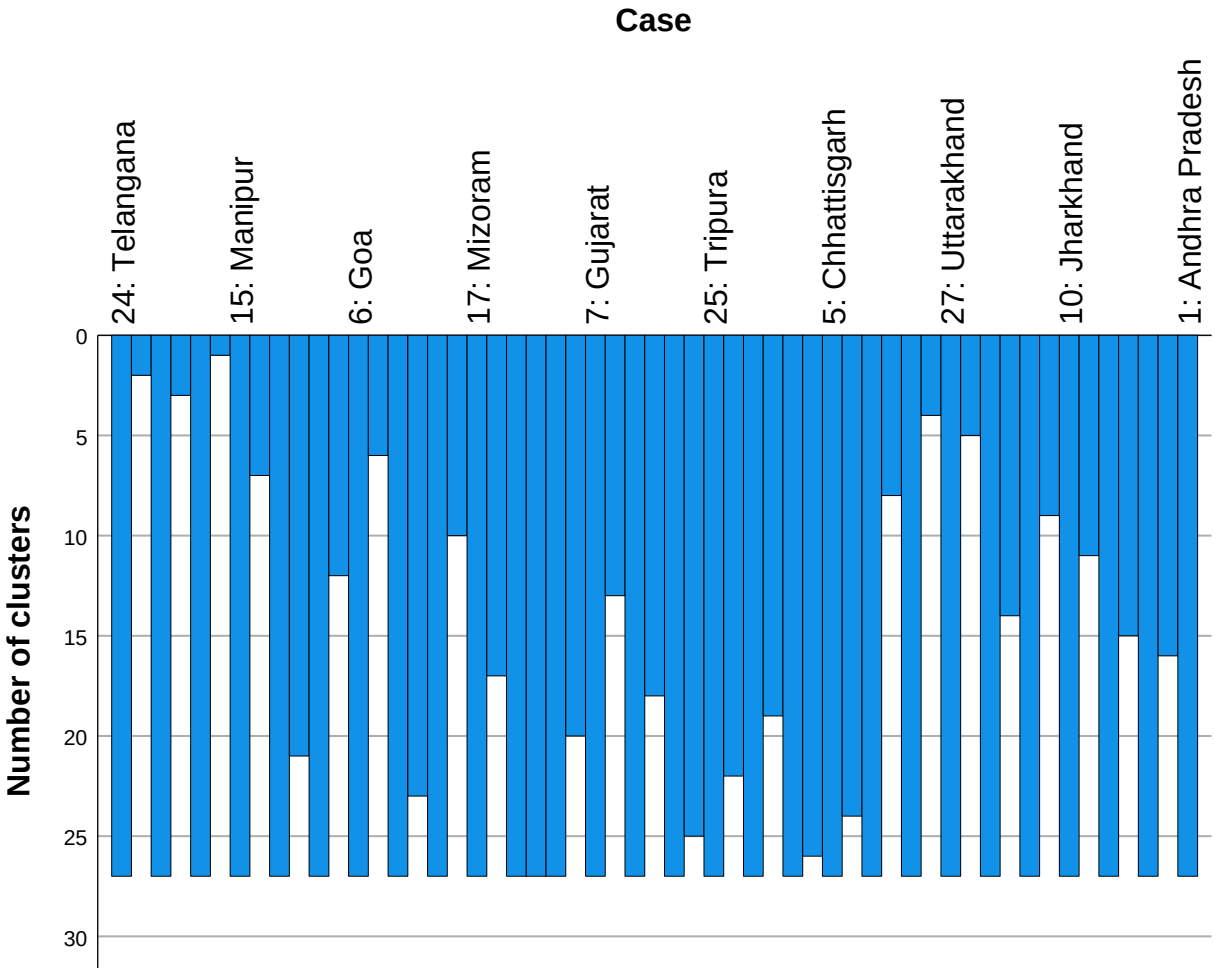
a. Squared Euclidean Distance used

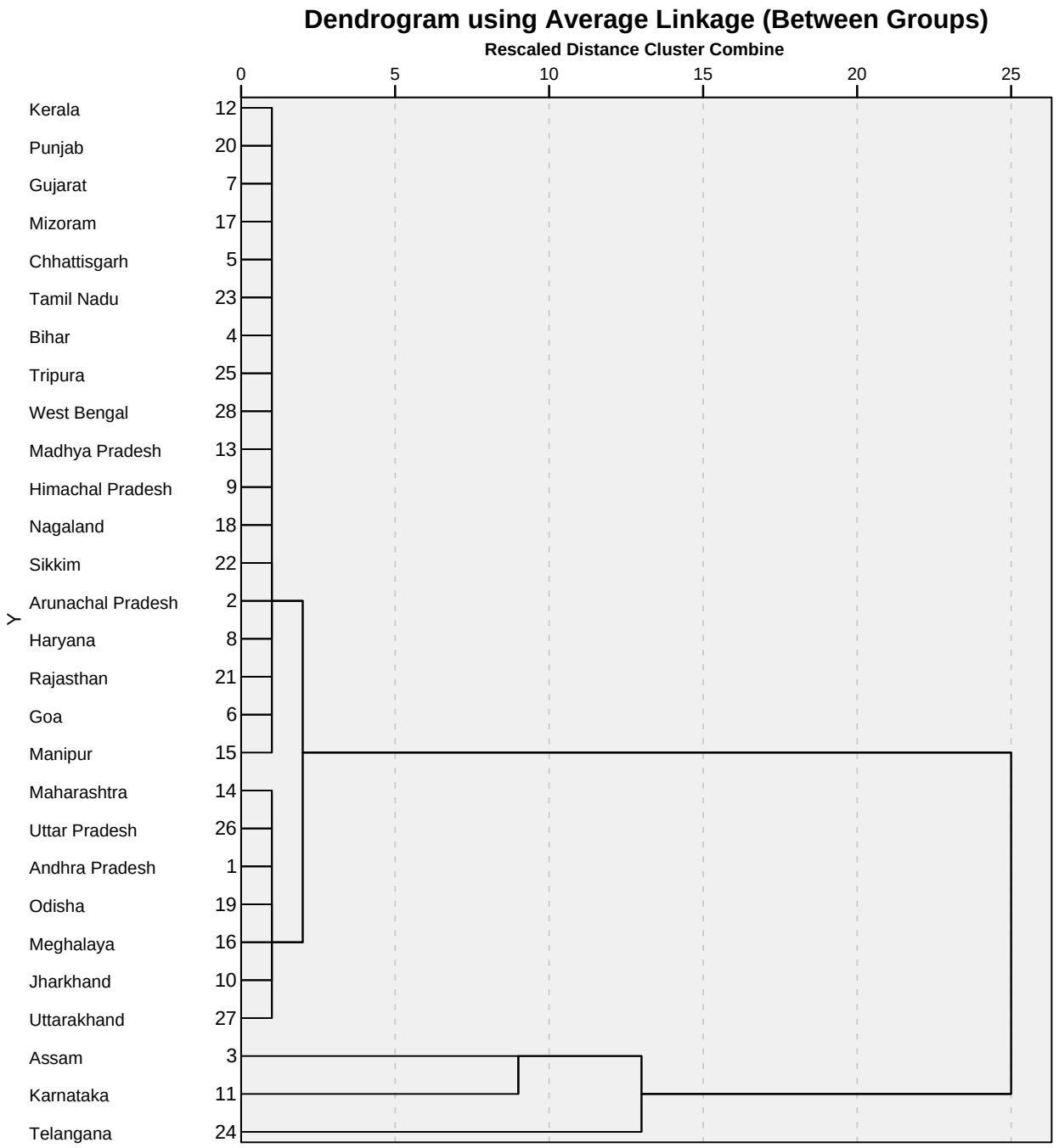
b. Average Linkage (Between Groups)

Average Linkage (Between Groups)

Agglomeration Schedule

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	12	20	.122	0	0	8
2	5	23	.172	0	0	4
3	25	28	.220	0	0	6
4	4	5	.237	0	2	9
5	18	22	.336	0	0	18
6	13	25	.405	0	3	9
7	8	21	.419	0	0	16
8	7	12	.705	0	1	11
9	4	13	.728	4	6	10
10	4	9	.855	9	0	15
11	7	17	.890	8	0	15
12	1	19	1.426	0	0	13
13	1	16	1.915	12	0	17
14	14	26	2.105	0	0	19
15	4	7	2.115	10	11	18
16	6	8	3.352	0	7	21
17	1	10	3.438	13	0	19
18	4	18	3.828	15	5	20
19	1	14	5.537	17	14	23
20	2	4	5.752	0	18	22
21	6	15	5.922	16	0	22
22	2	6	7.677	20	21	24
23	1	27	21.565	19	0	24
24	1	2	28.608	23	22	27
25	3	11	188.086	0	0	26
26	3	24	296.687	25	0	27
27	1	3	576.083	24	26	0


Case
24: Telangana
15: Manipur
6: Goa
17: Mizoram
7: Gujarat
25: Tripura
5: Chhattisgarh
27: Uttarakhand
10: Jharkhand
1: Andhra Pradesh
Number of clusters
0
5
10
15
20
25
30




```
QUICK CLUSTER rate2017 rate2018 rate2019 rate2020 rate2021
/MISSING=LISTWISE
/CRITERIA=CLUSTER(5)MXITER(10)CONVERGE(0)
/METHOD=KMEANS(NOUPDATE)
/PRINT ID(State) INITIAL.
```

Notes

Output Created		02-APR-2023 20:36:07
Comments		
Input	Data	C:\users\jaswinder\Documents\finalyrproject\st3yrrate.csv
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	28
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any clustering variable used.
Syntax		QUICK CLUSTER rate2017 rate2018 rate2019 rate2020 rate2021 /MISSING=LISTWISE /CRITERIA=CLUSTER(5) MXITER(10) CONVERGE(0) /METHOD=KMEANS(NOUPDATE) /PRINT ID(State) INITIAL.
Resources	Processor Time	00:00:00.01
	Elapsed Time	00:00:00.01
	Workspace Required	1464 bytes

```
QUICK CLUSTER rate2017 rate2018 rate2019 rate2020 rate2021
/MISSING=LISTWISE
/CRITERIA=CLUSTER(5) MXITER(10) CONVERGE(0)
/METHOD=KMEANS(NOUPDATE)
/PRINT ID(State) INITIAL ANOVA CLUSTER DISTAN.
```

Quick Cluster

Notes

Output Created		02-APR-2023 20:36:53
Comments		
Input	Data	C:\users\jaswinder\Documents\finalyrproject\st3yrrate.csv
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	28
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any clustering variable used.
Syntax		QUICK CLUSTER rate2017 rate2018 rate2019 rate2020 rate2021 /MISSING=LISTWISE /CRITERIA=CLUSTER(5) MXITER(10) CONVERGE(0) /METHOD=KMEANS(NOUPDATE) /PRINT ID(State) INITIAL ANOVA CLUSTER DISTAN.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02
	Workspace Required	1584 bytes

Initial Cluster Centers

	Cluster				
	1	2	3	4	5
rate2017	2.233053322	5.030908226	3.401153963	3.256127121	.151515152
rate2018	5.051998053	18.22040321	6.481696688	7.218347639	.298507463
rate2019	4.847333246	16.15187970	10.14659385	13.38305807	.000000000
rate2020	3.810530859	12.14509628	13.78270762	27.27826317	.000000000
rate2021	2.816143498	8.921313980	5.940070505	3.254118282	.151515152

Iteration History[a]

Iteration	Change in Cluster Centers				
	1	2	3	4	5
1	2.167	.000	.000	.000	2.223
2	.000	.000	.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 2. The minimum distance between initial centers is 8.488.

Cluster Membership

Case Number	State	Cluster	Distance
1	Andhra Pradesh	1	.665
2	Arunachal Pradesh	5	1.888
3	Assam	3	.000
4	Bihar	5	.672
5	Chhattisgarh	5	.553
6	Goa	5	1.900
7	Gujarat	5	.998
8	Haryana	5	2.031
9	Himachal Pradesh	5	.608
10	Jharkhand	1	1.755
11	Karnataka	2	.000
12	Kerala	5	.398
13	Madhya Pradesh	5	.949
14	Maharashtra	1	1.604
15	Manipur	5	2.547
16	Meghalaya	1	1.199
17	Mizoram	5	1.067
18	Nagaland	5	1.924
19	Odisha	1	.726
20	Punjab	5	.390
21	Rajasthan	5	1.975
22	Sikkim	5	2.223
23	Tamil Nadu	5	.721
24	Telangana	4	.000
25	Tripura	5	1.237
26	Uttar Pradesh	1	2.167

Cluster Membership

Case Number	State	Cluster	Distance
27	Uttarakhand	1	3.818
28	West Bengal	5	1.238

Final Cluster Centers

	Cluster				
	1	2	3	4	5
rate2017	1.933408687	5.030908226	3.401153963	3.256127121	.774047755
rate2018	3.238561945	18.22040321	6.481696688	7.218347639	.808135314
rate2019	3.830128228	16.15187970	10.14659385	13.38305807	1.322809677
rate2020	4.035720134	12.14509628	13.78270762	27.27826317	1.474440565
rate2021	2.333247022	8.921313980	5.940070505	3.254118282	.760984138

Distances between Final Cluster Centers

Cluster	1	2	3	4	5
1		22.249	12.672	25.493	4.751
2	22.249		13.714	19.824	26.864
3	12.672	13.714		14.156	17.183
4	25.493	19.824	14.156		29.407
5	4.751	26.864	17.183	29.407	

ANOVA

	Cluster		Error			
	Mean Square	df	Mean Square	df	F	Sig.
rate2017	7.419	4	.461	23	16.107	.000
rate2018	85.141	4	.663	23	128.443	.000
rate2019	96.473	4	.594	23	162.336	.000
rate2020	204.542	4	.903	23	226.458	.000
rate2021	22.802	4	.236	23	96.461	.000

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	7.000
	2	1.000
	3	1.000
	4	1.000
	5	18.000
Valid		28.000
Missing		.000