

## MODUL 10

### CLUSTERING : K-MEANS

#### 1. Tabel Data Nilai Ujian 30 Siswa

Formula = $5 + \text{RAND}() * 5$

	A	B	C	D	E	F	G
1	NO_SISWA	NAMA	B.IND	B.ING	MTK	IPA	
2	S-101	JOKO	9,614591	6,16921	5,032877	6,427933	
3	S-102	AGUS	6,878795	5,566158	8,728699	6,278169	
4	S-103	SUSI	5,965179	8,214616	8,839693	7,21129	
5	S-104	DYAH	8,227455	6,150243	9,993913	5,475834	
6	S-105	WATI	7,737012	8,156474	7,041902	8,200734	
7	S-106	IKA	7,32149	5,16566	5,852753	7,401254	
8	S-107	EKO	8,039714	9,311685	9,274001	7,024796	
9	S-108	YANTO	9,127672	9,299555	6,427703	7,387804	
10	S-109	WAWAN	8,19904	7,677059	6,977216	6,797989	
11	S-110	MAHMUD	5,372238	6,846026	5,700649	9,965502	
12	S-111	BUDI	6,758975	6,974261	8,610256	6,902662	
13	S-112	SANTI	7,620446	6,357188	9,548382	9,287948	
14	S-113	DIAN	9,403547	5,824465	5,633037	5,090908	
15	S-114	DANI	6,364049	9,069068	5,059245	6,660267	
16	S-115	AHMAD	7,732089	8,365577	8,092492	8,728945	
17	S-116	BAYU	9,139486	7,092177	8,642348	7,236848	
18	S-117	RISA	7,38874	6,734609	9,339675	8,322403	
19	S-118	RANI	8,738915	5,73577	8,20312	5,257188	
20	S-119	YANI	7,288794	7,797071	8,905553	8,620658	
21	S-120	RATIH	7,473897	9,882226	6,787557	7,86793	
22	S-121	INDAH	6,611861	7,929852	5,77459	6,242802	
23	S-122	JONO	6,530295	7,682273	7,150075	7,929659	
24	S-123	SARAH	5,378342	6,25127	6,384469	8,792469	
25	S-124	RAMA	5,14332	5,983147	5,29512	6,21335	
26	S-125	BAMBANG	8,861086	5,314014	7,170561	5,176568	
27	S-126	HADI	5,790763	9,368589	5,42408	7,529709	
28	S-127	NANA	8,019324	6,164227	8,595004	5,827853	
29	S-128	FEBRI	9,63861	5,549301	7,578907	8,579821	
30	S-129	DENI	8,714299	9,748743	6,520612	9,476324	
31	S-130	TONI	8,351183	9,92891	8,535906	7,880284	
32							
33							

#### 2. Melakukan kembali langkah pada kegiatan 10.4.1 dan 10.4.2 pada Tabel Data Ujian 30 Siswa, dengan ketentuan jumlah Cluster = 4.

##### a) SVD (Singular Value Decomposition)

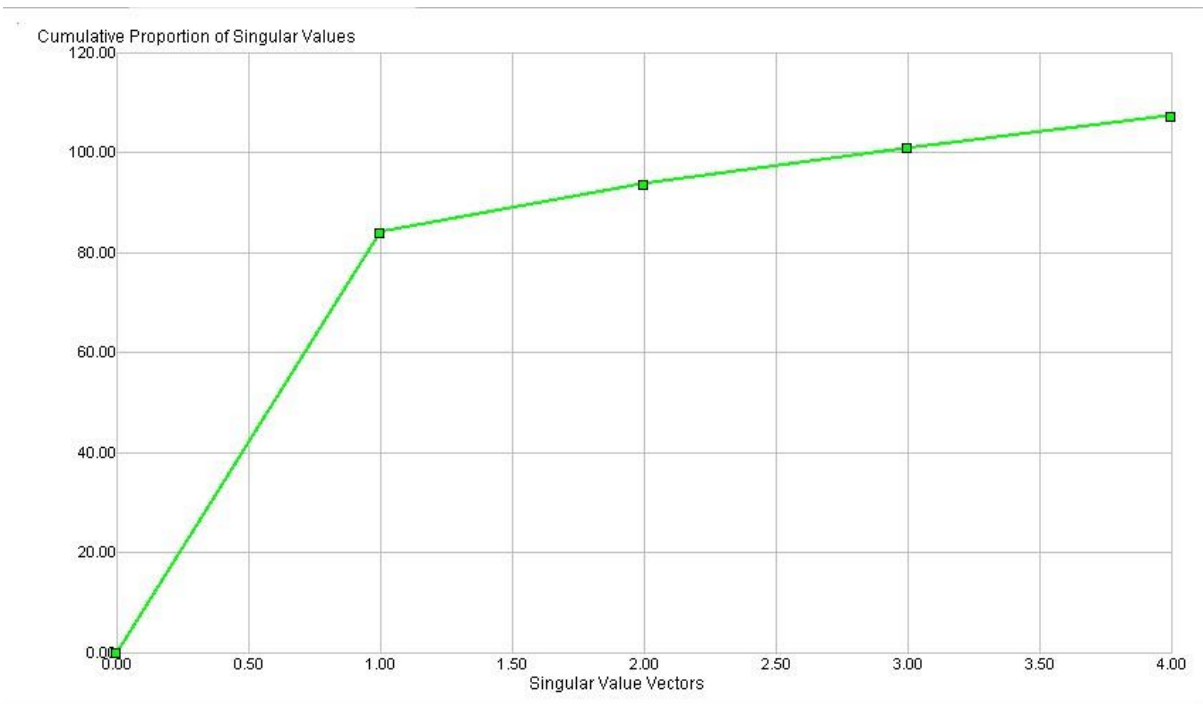
##### i. Nilai Eigenvalue

Component	Singular Value	Proportion of Singular V...	Cumulative Singular Val...	Cumulative Proportion o...
SVD 1	84.170	0.783	84.170	0.783
SVD 2	9.621	0.090	93.791	0.873
SVD 3	7.244	0.067	101.035	0.940
SVD 4	6.404	0.060	107.438	1.000

##### i. Nilai Svd Vectors

Attribute	SVD Vector 1	SVD Vector 2	SVD Vector 3
B.IND	0.507	-0.737	0.268
B.ING	0.507	0.637	0.013
MTK	0.489	0.205	0.528
IPA	0.497	-0.100	-0.806

## ii. Nilai Cumulative Variance



## b) ExampleSet (k-Means)

Plotter = Scatter x-Axis

= cluster y-Axis = B.IND,

B.ING, MTK, IPA

color Column = cluster

Jitter = bisa diubah-ubah untuk melihat distribusi data secara lebih detail

### c) ExampleSet (SVD)

Row No.	NAMA	cluster	svd_1
1	JOKO	cluster_1	0.156
2	AGUS	cluster_1	0.175
3	SUSI	cluster_2	0.172
4	DYAH	cluster_2	0.184
5	WATI	cluster_2	0.159
6	IKA	cluster_3	0.200
7	EKO	cluster_0	0.183
8	YANTO	cluster_0	0.195
9	WAWAN	cluster_0	0.201
10	MAHMUD	cluster_2	0.163
11	BUDI	cluster_1	0.155
12	SANTI	cluster_2	0.161
13	DIAN	cluster_2	0.190
14	DANI	cluster_3	0.181
15	AHMAD	cluster_2	0.169
16	BAYU	cluster_0	0.196
17	RISA	cluster_3	0.201
18	RANI	cluster_0	0.193
19	YANI	cluster_0	0.210
20	RATIH	cluster_2	0.186
21	INDAH	cluster_0	0.189
22	JONO	cluster_3	0.195
23	SARAH	cluster_1	0.162
24	RAMA	cluster_1	0.131
25	BAMBANG	cluster_0	0.203
26	HADI	cluster_0	0.204
27	NANA	cluster_3	0.195
28	FEBRI	cluster_0	0.206
29	DENI	cluster_2	0.159
30	TONI	cluster_2	0.172

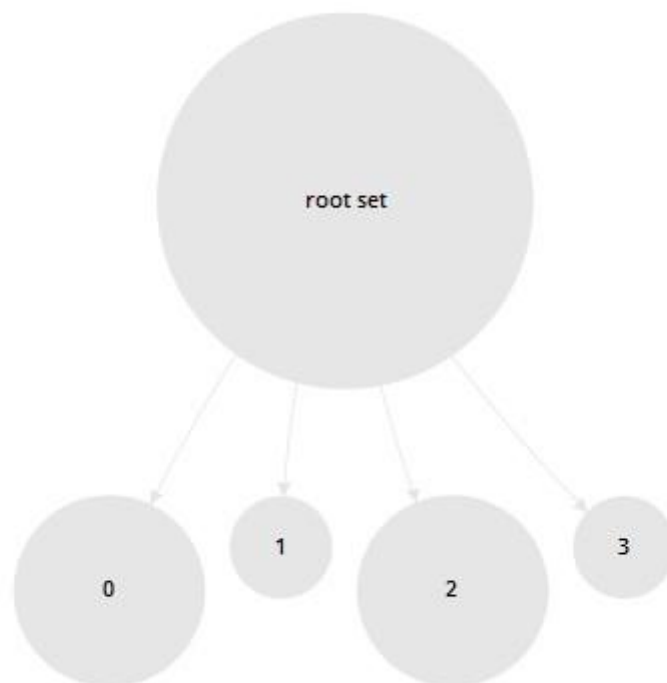
#### d) Cluster Model (Clustering)

##### i. Description

### Cluster Model

Cluster 0: 10 items  
Cluster 1: 5 items  
Cluster 2: 10 items  
Cluster 3: 5 items  
Total number of items: 30

##### ii. Graph



3. Tulis masing-masing nama siswa yang terdapat pada kelompok Cluster 0, Cluster 1, Cluster 2, dan Cluster 3.

Cluster 0	Cluster 1	Cluster 2	Cluster 3
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1. EKO 2. YANTO 3. WAWAN 4. BAYU 5. RANI 6. YANI 7. INDAH 8. BAMBANG 9. HADI 10. FEBRI	1. JOKO 2. AGUS 3. BUDI 4. SARAH 5. RAMA	1. SUSI 2. DYAH 3. WATI 4. MAHMUD 5. SANTI 6. DIAN 7. AHMAD 8. RATIH 9. DENI 10. TONI	1. IKA 2. DANI 3. RISA 4. JONO 5. NANA
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