

LAPORAN PRAKTIKUM
DATA WAREHOUSING DAN DATA MINING

PERTEMUAN 10
“ALGORITMA CLUSTERING : FUZZY C-MEANS(FCM)”

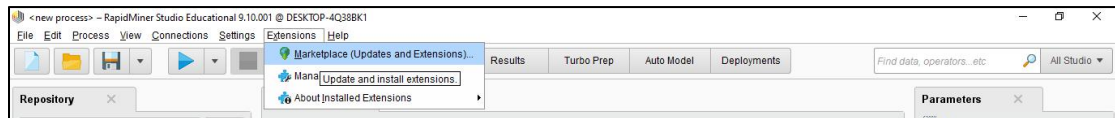


Oleh:

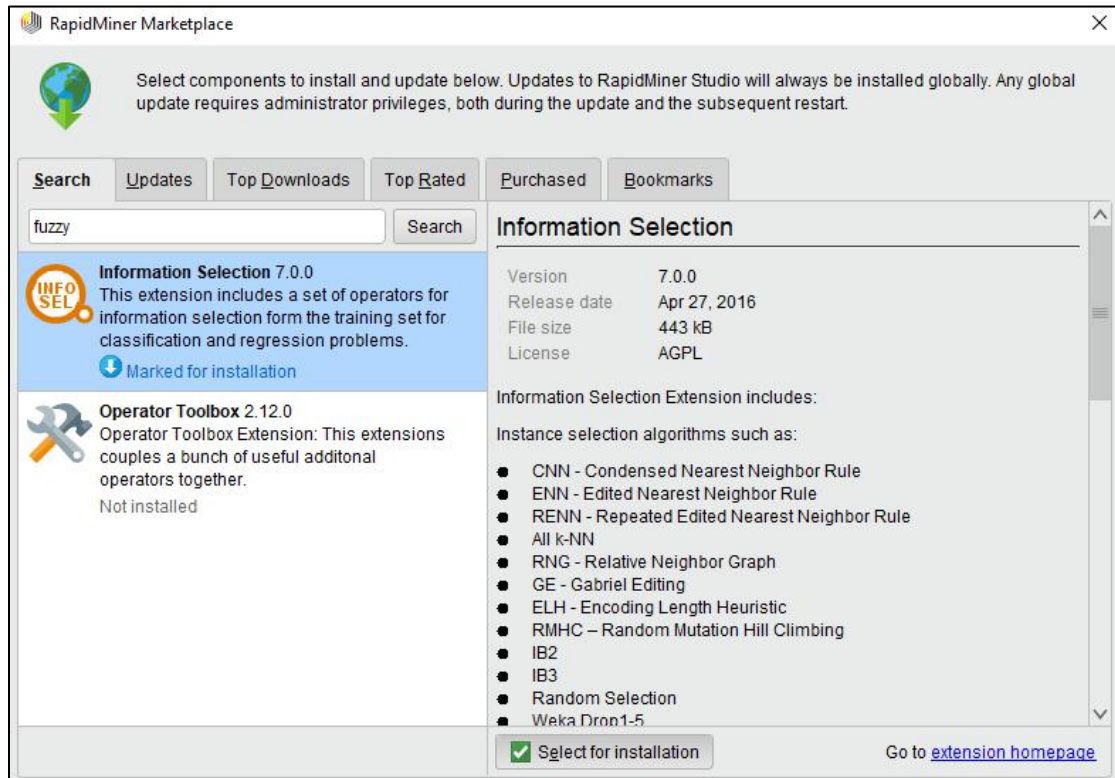
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KELAS : B
PRODI : INFORMATIKA

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Universitas Muhammadiyah Surakarta

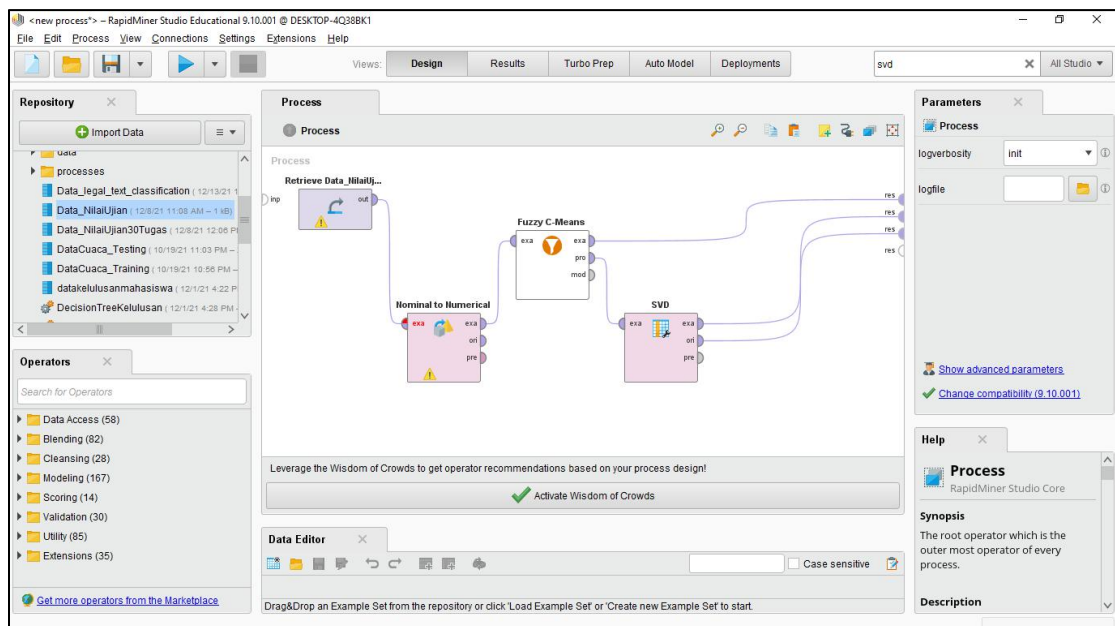
1. Pastikan terhubung internet, buka Extensions lalu pilih Marketplace.



2. Setelah itu ketikkan “fuzzy” lalu pilih “Information Selection”, dan install jika belum.



3. Masukkan Data_NilaiUjian, Nominal to Numerical, Fuzzy C-Means, dan SVD lalu sambungkan port sesuai di modul.



> Fuzzy C-Means

Result History

SVD (SVD)

ExampleSet (Fuzzy C-Means)

ExampleSet (SVD)

Data

Statistics

Visualizations

Annotations

Open in

Turbo Prep

Auto Model

Row No. ↑	NAMA	cluster	B.IND	B.ING	MTK	IPA
1	JOKO	cluster_2	8.666	6.496	8.780	8.808
2	AGUS	cluster_2	9.403	8.587	9.252	7.371
3	SUSI	cluster_3	6.886	9.559	5.787	8.250
4	DYAH	cluster_0	5.965	6.789	9.541	9.148
5	WATI	cluster_3	9.583	8.762	6.347	6.321
6	IKA	cluster_0	7.063	5.948	6.176	7.389
7	EKO	cluster_0	6.568	6.420	6.360	8.951
8	YANTO	cluster_2	9.370	6.679	7.840	6.105
9	WAWAN	cluster_3	6.049	6.795	5.196	5.228
10	MAHMUD	cluster_3	7.395	9.332	7.033	5.228
11	BUDI	cluster_0	8.274	6.518	6.748	9.447
12	SANTI	cluster_3	5.176	9.868	5.456	6.566
13	DIAN	cluster_3	9.219	6.494	6.675	5.022
14	DANI	cluster_2	9.264	7.794	7.745	5.059
15	AHMAD	cluster_3	8.140	9.366	7.961	6.051
16	BAYU	cluster_0	9.760	8.271	6.532	7.833

ExampleSet (30 examples, 2 special attributes, 4 regular attributes)

> K-Means

Result History

Cluster Model (K-Means)

SVD (SVD)

ExampleSet (K-Means)

ExampleSet (SVD)

Open in

Turbo Prep

Auto Model

Filter (30 / 30 examples):

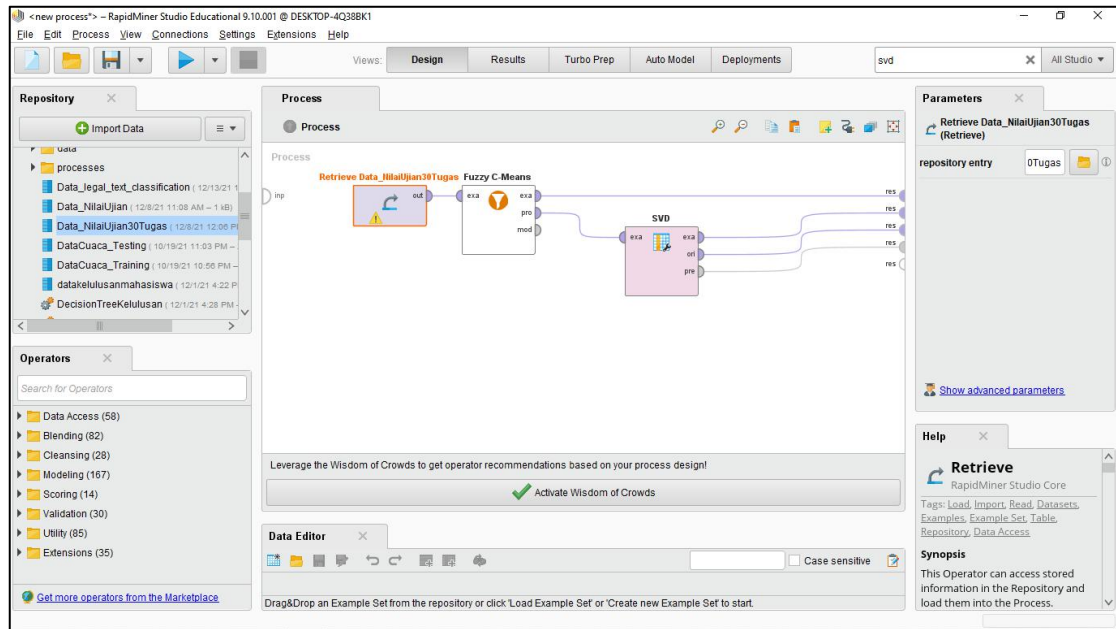
all

Row No.	NAMA	cluster	B.LIND	B.JNG	MTK	IPA
1	JOKO	cluster_0	8.666	6.496	8.780	8.808
2	AGUS	cluster_3	9.403	8.587	9.252	7.371
3	SUSI	cluster_1	6.886	9.559	5.787	8.250
4	DYAH	cluster_0	5.965	6.789	9.541	9.148
5	WATI	cluster_2	9.583	8.762	6.347	6.321
6	IKA	cluster_0	7.063	5.948	6.176	7.389
7	EKO	cluster_0	6.568	6.420	6.360	8.951
8	YANTO	cluster_2	9.370	6.679	7.840	6.105
9	WAWAN	cluster_1	6.049	6.795	5.196	5.228
10	MAHMUUD	cluster_1	7.395	9.332	7.033	5.228
11	BUDI	cluster_0	8.274	6.518	6.748	9.447
12	SANTI	cluster_1	5.176	9.868	5.456	6.566
13	DIAN	cluster_2	9.219	6.494	6.675	5.022
14	DANI	cluster_2	9.264	7.794	7.745	5.059
15	AHMAD	cluster_3	8.140	9.366	7.961	6.051
16	BAYU	cluster_2	9.760	8.271	6.532	7.833

ExampleSet (30 examples, 2 special attributes, 4 regular attributes)

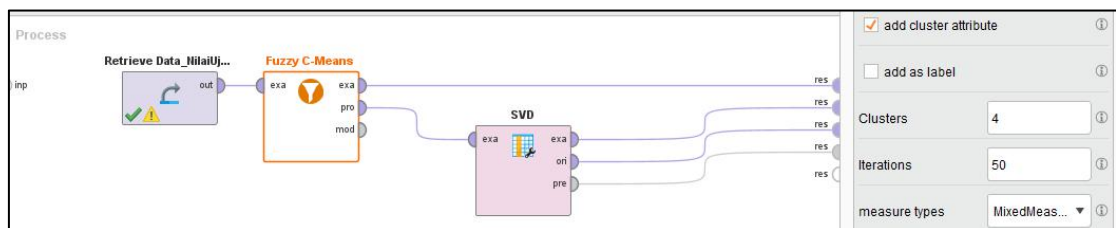
TUGAS

1. Buka kembali tugas pada pertemuan 9 / modul 10, kerjakan langkah 1 - 3 dengan mengganti operator menjadi Fuzzy C-Means.
2. Dimulai dengan memasukan Data_NilaiUjian30Tugas, Fuzzy C-Means, dan SVD, hubungkan sesuai port pada modul 10.



(Masih menggunakan nilai 30 ujian siswa,

Pada modul 10, K-Means diganti dengan Fuzzy C-Means)



(jangan lupa mengubah jumlah Cluster menjadi 4, sesuai modul 10)

3. Berikut adalah hasil proses Clustering dengan algoritma Fuzzy C-Means:

a) SVD (Singular Value Decomposition)

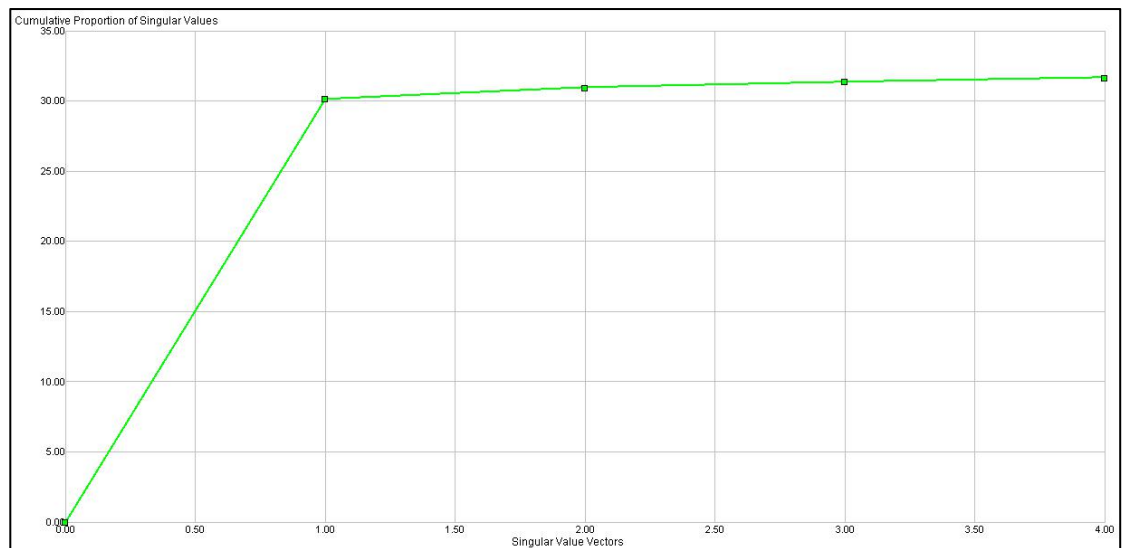
i. Nilai Eigenvalue

Component	Singular Value	Proportion of Singular Values	Cumulative Singular Values	Cumulative Proportion of Singular Val...
SVD 1	30.158	0.952	30.158	0.952
SVD 2	0.824	0.026	30.982	0.978
SVD 3	0.417	0.013	31.399	0.991
SVD 4	0.285	0.009	31.684	1.000

ii. Nilai vsd Vectors

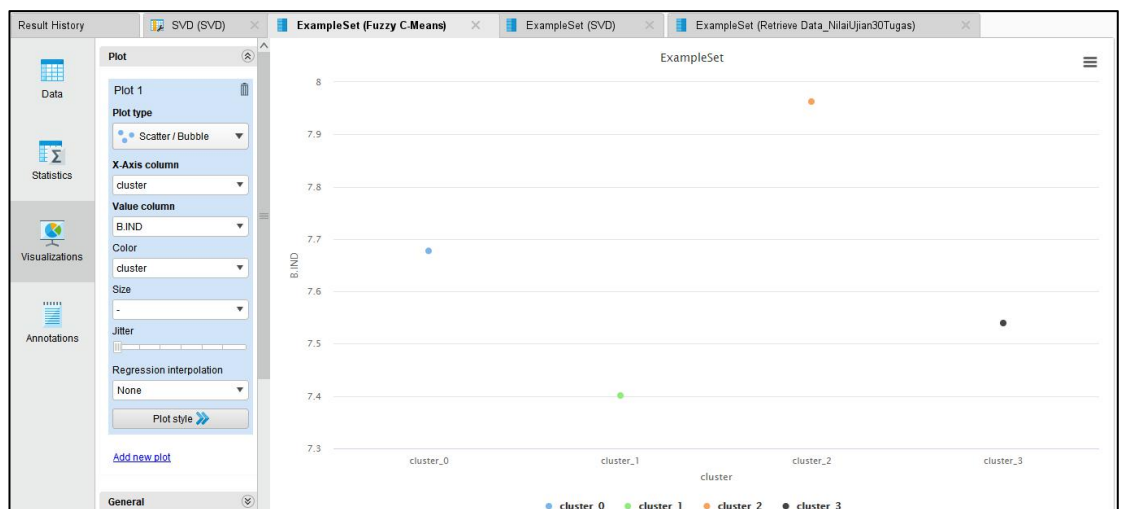
Attribute	SVD Vector 1	SVD Vector 2	SVD Vector 3
B.IND	0.507	-0.045	0.016
B.ING	0.511	-0.776	0.139
MTK	0.499	0.559	0.601
IPA	0.482	0.289	-0.787

iii. Nilai Cumulative Variance

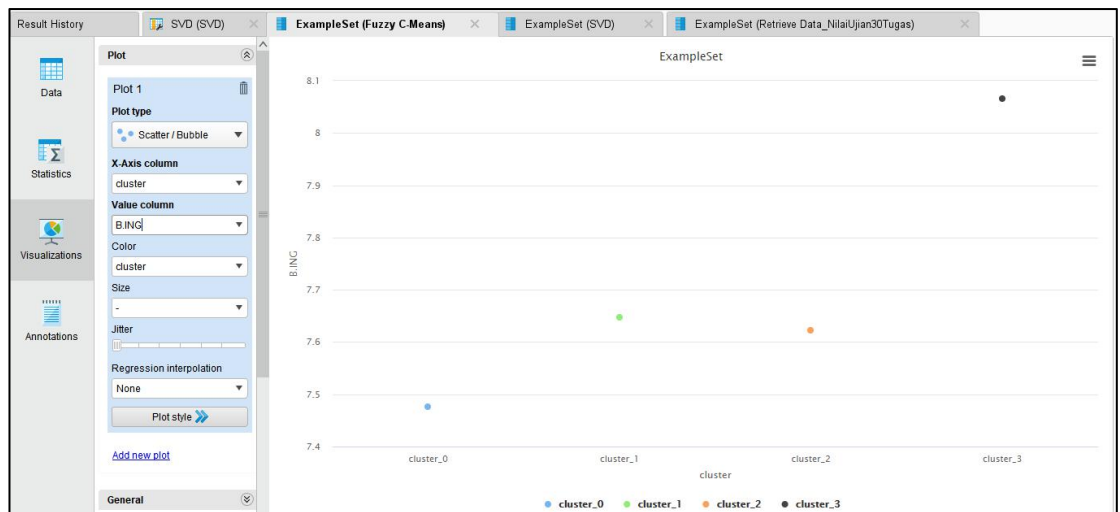


b) ExampleSet (k-Means)

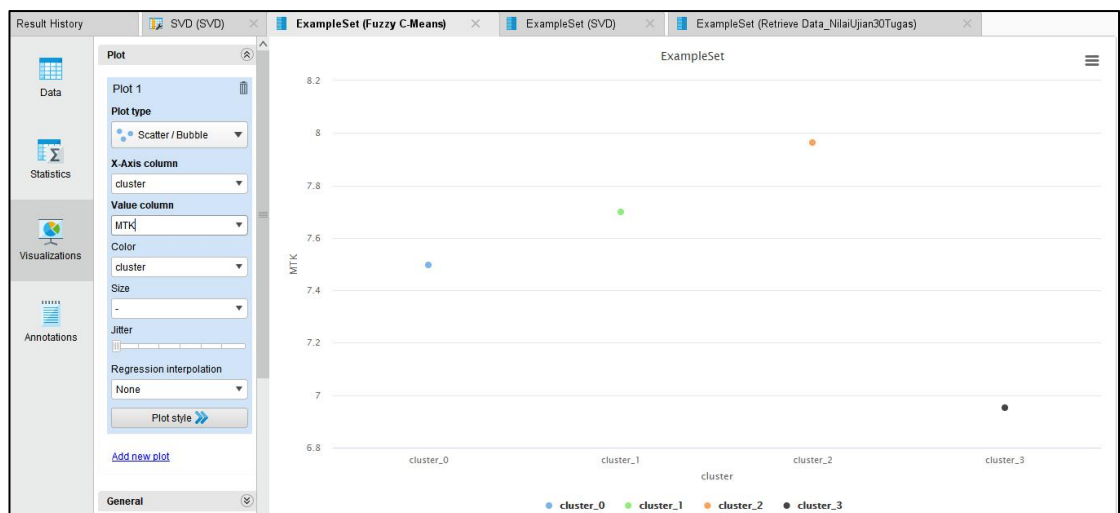
i. Kelompok siswa bidang B. Indonesia.



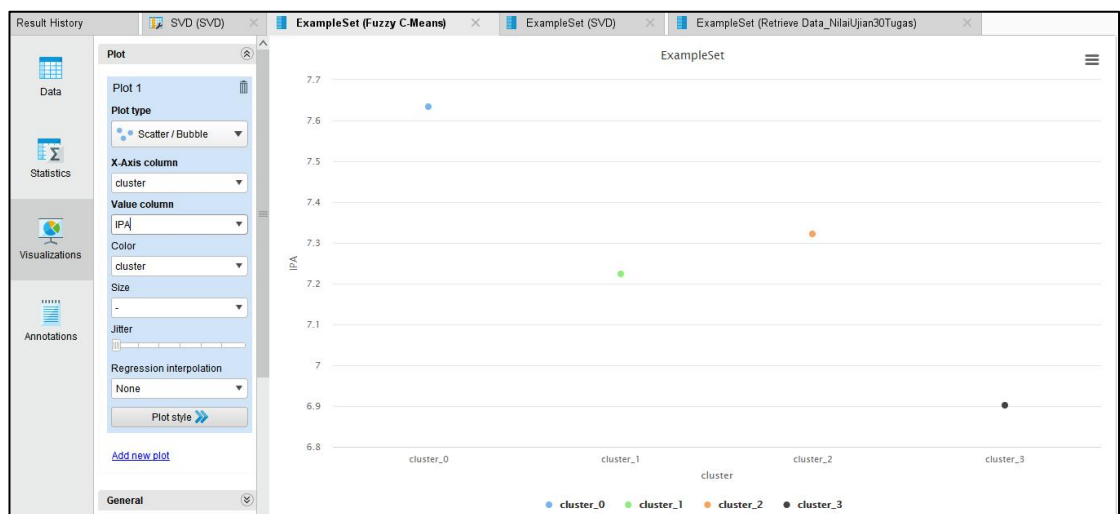
ii. Kelompok siswa bidang B. Inggris



iii. Kelompok siswa bidang MTK



iv. Kelompok siswa bidang IPA



c) ExampleSet(SVD)

The screenshot shows the Orange3 software interface. At the top, there are three tabs: "Result History", "SVD (SVD)", and "ExampleSet (Fuzzy C-Means)". The "SVD (SVD)" tab is active. Below the tabs, there are two buttons: "Open in Turbo Prep" and "Auto Model". On the left side, there is a sidebar with "Data" and "Statistics" sections. The "Data" section is selected, and it displays a table with the following data:

Row No.	cluster	svd_1
1	cluster_0	0.502
2	cluster_1	0.497
3	cluster_2	0.512
4	cluster_3	0.489

d) Hasil Algoritma Fuzzy C-Means

Result History

SVD (SVD)

ExampleSet (Fuzzy C-Means)

ExampleSet (S)

Data

Statistics

Open in

Turbo Prep

Auto Model

Row No.	cluster	B.IND	B.ING	MTK	IPA
1	cluster_0	7.677	7.477	7.498	7.633
2	cluster_1	7.401	7.648	7.698	7.225
3	cluster_2	7.963	7.623	7.962	7.322
4	cluster_3	7.540	8.066	6.952	6.901

4. Setelah itu menuliskan nama siswa pada masing-masing kelompok cluster dengan menggunakan Fuzzy C-Means. Berikut hasilnya:

File Edit Process View Connections Settings Extensions Help

Views: Design Results Turbo Prep Auto Model Deployments Find data, operators...etc All Studio

Result History SVD (SVD) ExampleSet (Fuzzy C-Means) ExampleSet (SVD) **ExampleSet (Retrieve Data_NilaiUjian30Tugas)**

Open in Turbo Prep Auto Model Filter (30 / 30 examples): all

Row No.	NAMA	cluster ↑	B.IJND	B.IJNG	MTK	IPA
4	DYAH	cluster_0	5.965	6.789	9.541	9.148
6	IKA	cluster_0	7.053	5.948	6.176	7.389
7	EKO	cluster_0	6.568	6.420	6.360	8.951
11	BUDI	cluster_0	8.274	6.518	6.748	9.447
16	BAYU	cluster_0	9.760	8.271	6.532	7.833
19	YANI	cluster_0	7.436	8.335	7.903	8.117
27	NANA	cluster_0	8.374	7.357	6.401	8.169
28	FEBRI	cluster_0	7.386	7.902	6.960	9.245
29	DENI	cluster_0	5.003	8.635	6.818	9.726
17	RISA	cluster_1	6.807	5.628	8.546	7.341
18	RANI	cluster_1	5.789	6.198	8.961	8.244
20	RATH	cluster_1	6.705	8.915	9.280	5.087
22	JONO	cluster_1	6.961	6.041	8.929	6.832
30	TONI	cluster_1	6.633	8.328	9.775	7.143
1	JOKO	cluster_2	8.666	6.496	8.780	8.808
2	AGUS	cluster_2	9.403	8.587	9.252	7.371

ExampleSet (30 examples, 2 special attributes, 4 regular attributes)

<new process*> - RapidMiner Studio Educational 9.10.001 @ DESKTOP-4Q38BK1

File Edit Process View Connections Settings Extensions Help

Views: Design Results Turbo Prep Auto Model Deployments

Find data, operators, etc. All Studio

Result History SVD (SVD) ExampleSet (Fuzzy C-Means) ExampleSet (SVD) ExampleSet (Retrieve Data_NilaiUjian30Tugas)

Open in Turbo Prep Auto Model

Filter (30 / 30 examples): all

Row No.	NAMA	cluster ↑	BJND	BJNG	MTK	IPA
1	JOKO	cluster_2	8.666	6.496	8.780	8.808
2	AGUS	cluster_2	9.403	8.587	9.252	7.371
8	YANTO	cluster_2	9.370	6.679	7.840	6.105
14	DANI	cluster_2	9.264	7.794	7.745	5.059
21	INDAH	cluster_2	8.187	8.027	9.386	9.149
25	BAMBANG	cluster_2	9.751	9.747	9.022	7.581
26	HADI	cluster_2	9.402	5.714	8.493	7.511
3	SUSI	cluster_3	6.886	9.559	5.787	8.250
5	WATI	cluster_3	9.583	8.762	6.347	6.321
9	WAWAN	cluster_3	6.049	6.795	5.196	5.228
10	MAHMUD	cluster_3	7.395	9.332	7.033	5.228
12	SANTI	cluster_3	5.176	9.868	5.456	6.566
13	DIAN	cluster_3	9.219	6.494	6.675	5.022
15	AHMAD	cluster_3	8.140	9.366	7.961	6.051
23	SARAH	cluster_3	7.411	7.545	5.527	5.842
24	RAMA	cluster_3	6.836	8.929	6.347	5.485

ExampleSet (30 examples, 2 special attributes, 4 regular attributes)

Nama dengan masing-masing kelompok cluster:

DYAH	cluster_0
IKA	cluster_0
EKO	cluster_0
BUDI	cluster_0
BAYU	cluster_0
YANI	cluster_0
NANA	cluster_0
FEBRI	cluster_0
DENI	cluster_0
RISA	cluster_1
RANI	cluster_1
RATIH	cluster_1
JONO	cluster_1
TONI	cluster_1
JOKO	cluster_2
AGUS	cluster_2
YANTO	cluster_2
DANI	cluster_2
INDAH	cluster_2
BAMBANG	cluster_2
HADI	cluster_2
SUSI	cluster_3

WATI	cluster_3
WAWAN	cluster_3
MAHMUD	cluster_3
SANTI	cluster_3
DIAN	cluster_3
AHMAD	cluster_3
SARAH	cluster_3
RAMA	cluster_3