

PRAKTIKUM DWDM



disusun oleh :

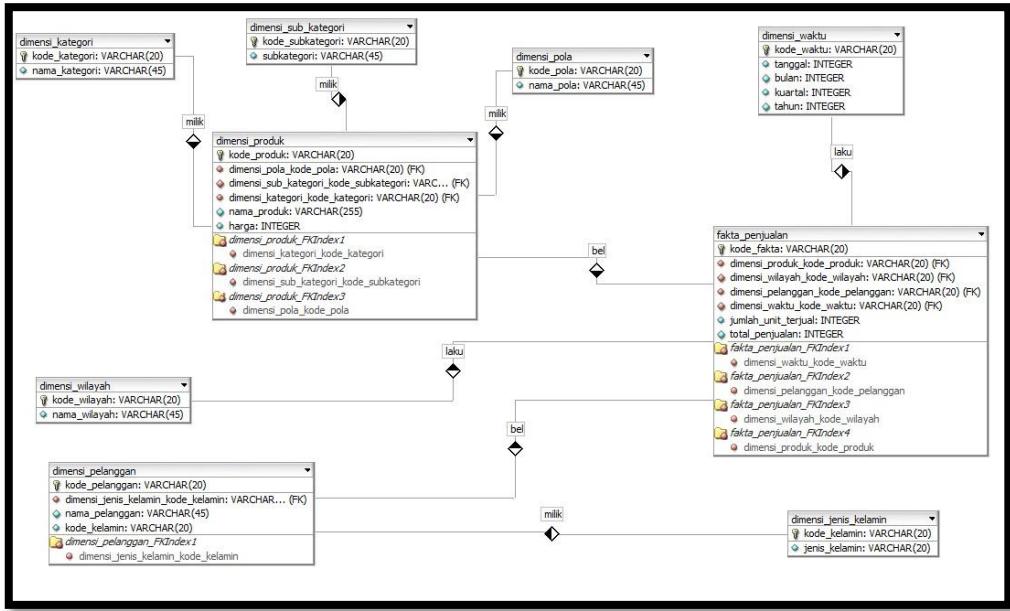
Muhammad Khoiruddin

L200170104

**JURUSAN TEKNIK INFORMATIKA
FAKULTAS KOMUNIKASI DAN INFORMATIKA
UNIVERSITAS MUHAMMADIYAH SURAKARTA**

2019

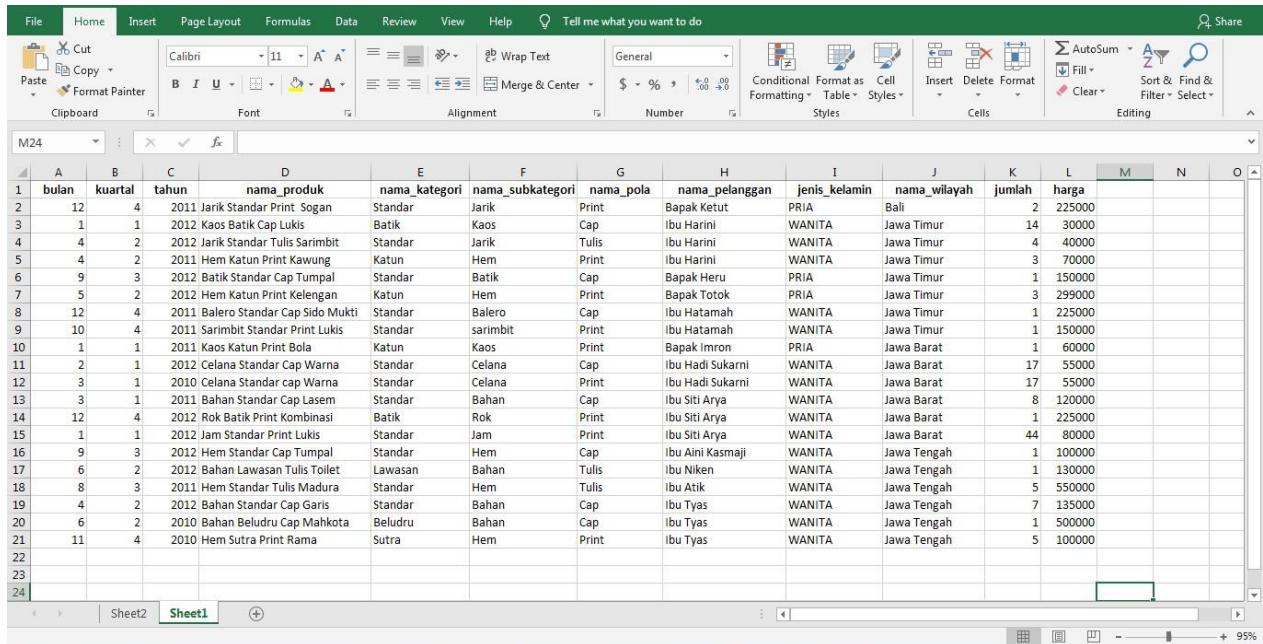
MODUL 1



MODUL 5

➤ Kegiatan

- Membuat tabel pada excel disimpan dengan nama “**Fakta_Penjualan.xls**”



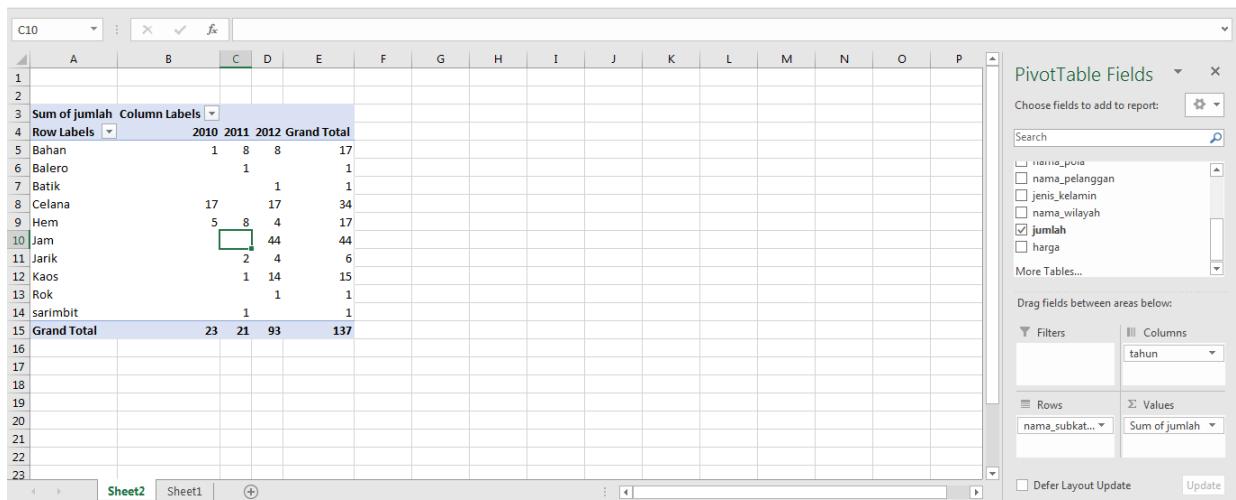
The screenshot shows a Microsoft Excel spreadsheet titled "Sheet1". The data is organized into several columns:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	bulan	kuartal	tahun	nama_produk	nama_kategori	nama_subkategori	nama_pola	nama_pelanggan	jenis_kelamin	nama_wilayah	jumlah	harga			
2	12	4	2011	Jarik Standar Print Sogan	Standar	Jarik	Print	Bapak Ketut	PRIA	Bali	2	225000			
3	1	1	2012	Kaos Batik Cap Lukis	Batik	Kaos	Cap	Ibu Harini	WANITA	Jawa Timur	14	30000			
4	4	2	2012	Jarik Standar Tulis Sarimbit	Standar	Jarik	Tulis	Ibu Harini	WANITA	Jawa Timur	4	40000			
5	4	2	2011	Hem Katun Print Kawung	Katun	Hem	Print	Ibu Harini	WANITA	Jawa Timur	3	70000			
6	9	3	2012	Batik Standar Cap Tumpal	Standar	Batik	Cap	Bapak Heru	PRIA	Jawa Timur	1	150000			
7	5	2	2012	Hem Katun Print Kelengen	Katun	Hem	Print	Bapak Totok	PRIA	Jawa Timur	3	299000			
8	12	4	2011	Balero Standar Cap Sido Mukti	Standar	Balero	Cap	Ibu Hatamah	WANITA	Jawa Timur	1	225000			
9	10	4	2011	Sarimbit Standar Print Lukis	Standar	sarimbit	Print	Ibu Hatamah	WANITA	Jawa Timur	1	150000			
10	1	1	2011	Kaos Katun Print Bola	Katun	Kaos	Print	Bapak Imron	PRIA	Jawa Barat	1	60000			
11	2	1	2012	Celana Standar Cap Warna	Standar	Celana	Cap	Ibu Hadi Sukarni	WANITA	Jawa Barat	17	55000			
12	3	1	2010	Celana Standar cap Warna	Standar	Celana	Print	Ibu Hadi Sukarni	WANITA	Jawa Barat	17	55000			
13	3	1	2011	Bahan Standar Cap Lasem	Standar	Bahan	Cap	Ibu Siti Arya	WANITA	Jawa Barat	8	120000			
14	12	4	2012	Rok Batik Print Kombinasi	Batik	Rok	Print	Ibu Siti Arya	WANITA	Jawa Barat	1	225000			
15	1	1	2012	Jam Standar Print Lukis	Standar	Jam	Print	Ibu Siti Arya	WANITA	Jawa Barat	44	80000			
16	9	3	2012	Hem Standar Cap Tumpal	Standar	Hem	Cap	Ibu Aini Kasmaji	WANITA	Jawa Tengah	1	100000			
17	6	2	2012	Bahan Lawasan Tulis Tolley	Lawasan	Bahan	Tulis	Ibu Niken	WANITA	Jawa Tengah	1	130000			
18	8	3	2011	Hem Standar Tulis Madura	Standar	Hem	Tulis	Ibu Atik	WANITA	Jawa Tengah	5	550000			
19	4	2	2012	Bahan Standar Cap Garis	Standar	Bahan	Cap	Ibu Tyas	WANITA	Jawa Tengah	7	135000			
20	6	2	2010	Bahan Beludru Cap Mahkota	Beludru	Bahan	Cap	Ibu Tyas	WANITA	Jawa Tengah	1	500000			
21	11	4	2010	Hem Sutra Print Rama	Sutra	Hem	Print	Ibu Tyas	WANITA	Jawa Tengah	5	100000			

- Pada Pivot Table Field List, menyusun layout field dengan urutan :

- Field **nama_subkategori** di kotak Row Labels
- Field **tahun** di kotak Column Labels
- Field **jumlah** di kotak Values

Dan akan menghasilkan suatu tabel dengan grouping field **nama_subkategori** pada bagian baris, field **tahun** pada kolom. Sedangkan nilai total **jumlah** ditempatkan pada cell-cell hasil perpotongan item grouping baris dan kolom tersebut.



The screenshot shows a Microsoft Excel spreadsheet with a PivotTable report. The report displays the following data:

	2010	2011	2012	Grand Total
Bahan	1	8	8	17
Balero		1		1
Batik		1		1
Celana	17	17		34
Hem	5	8	4	17
Jam		2	4	6
Jarik		1	14	15
Kaos		1	1	2
Rok		1		1
sarimbit		1		1
Grand Total	23	21	93	137

The PivotTable Fields dialog box on the right side of the screen shows the following settings:

- Choose fields to add to report: jumlah
- More Tables...
- Drag fields between areas below:
- Filters: tahun
- Columns: tahun
- Rows: nama_subkat...
- Σ Values: Sum of jumlah
- Defer Layout Update
- Update

- Kemudian menambahkan field jumlah pada kotak values dan mensetting jumlah2 di values field setting dengan mengubah nilai sum menjadi count dan akan menghasilkan tabel seperti yang di bawah ini :

SEBELUM DIUBAH

	B	C	D	E	F	G	H	I	J	K	L	M	N	
	Column Labels			2010			2011			2012			Total Sum of jumlah	
	Row Labels	Sum of jumlah	Sum of jumlah2	Total Sum of jumlah	Total Sum of jumlah2									
6	Bahan	1	1	8	8	8	8	17	17	17	17	17	17	
7	Balero			1	1			1	1	1	1	1	1	
8	Batik					1	1	1	1	1	1	1	1	
9	Celana	17	17			17	17	34	34	34	34	34	34	
10	Hem	5	5	8	8	4	4	17	17	17	17	17	17	
11	Jam					44	44	44	44	44	44	44	44	
12	Jarik			2	2	4	4	6	6	6	6	6	6	
13	Kaos			1	1	14	14	15	15	15	15	15	15	
14	Rok					1	1	1	1	1	1	1	1	
15	sarimbit					1	1	1	1	1	1	1	1	
16	Grand Total	23	23	21	21	93	93	137	137	137	137	137	137	
17														
18														
19														
20														
21														

SESUDAH DIUBAH

	B	C	D	E	F	G	H	I	J	K	L	M	N
	Row Labels	Sum of jumlah	Count of jumlah2	Total Sum of jumlah	Total Count of jumlah2								
6	Bahan	1	1	8	1	8	1	2	2	23	4		
7	Balero			1	1						1		
8	Batik					1	1				1		
9	Celana	17	1			17	1			34	2		
10	Hem	5	1	8	2	4	2	2	2	23	5		
11	Jam					44	1			44	1		
12	Jarik			2	1	4	1			6	2		
13	Kaos			1	1	14	1			15	2		
14	Rok					1	1			1	1		
15	sarimbit					1	1			1	1		
16	Grand Total	23	3	21	7	93	10	137	20				
17													
18													
19													
20													
21													

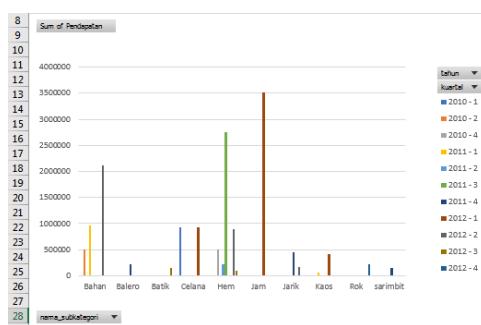
- Calculated Field, jika kita ingin mencari jumlah pendapatan yang diperoleh berdasarkan jumlah produk yang terjual dikalikan dengan harga produk menggunakan Pivot Table dengan menggunakan **Calculated Field**

	B	C	D	E	F	G	H	I	J	K	L	M	N
	Row Labels	Sum of jumlah	Count of jumlah2	Sum of Pendapatan	Sum of jumlah	Count of jumlah2	Sum of Pendapatan	Sum of jumlah	Count of jumlah2	Total Sum of jumlah	Total Count of jumlah2	Total Sum of Pendapatan	
6	Bahan	1	1	500000	8	1	960000	8	2	2120000	17	15045000	
7	Balero			0	1	1	225000			0	1	225000	
8	Batik			0			0	1		150000	1	150000	
9	Celana	17	1	935000			0	17		935000	34	3740000	
10	Hem	5	1	500000	8	2	4960000	4		1596000	17	18023000	
11	Jam			0			0	44		3520000	44	3520000	
12	Jarik			0	2	1	450000	4		160000	6	1590000	
13	Kaos			0	1	1	60000	14		420000	15	1350000	
14	Rok			0			0	1		225000	1	225000	
15	sarimbit			0	1	1	150000			0	1	150000	
16	Grand Total	23	3	15065000	21	7	29400000	93	115692000	137	20	451963000	
17													
18													
19													
20													
21													
22													
23													

- Operasi Roll Up dan Drill Down, digunakan untuk melihat data secara lebih rinci dan secara lebih umum berdasarkan kategori tertentu pada sebuah data, seperti gambar dibawah ini

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3	Sum of Pendapatan	Column Labels																								
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										
13																										
14																										
15																										
16																										
17																										
18																										
19																										
20																										
21																										
22																										
23																										
24																										

- Gambar dibawah menggunakan PivotChart yang merupakan sebuah cara untuk menampilkan cube dalam bentuk grafik.



➤ Tugas

NO 1

- Membuat PivotTable dan PivotChart baru

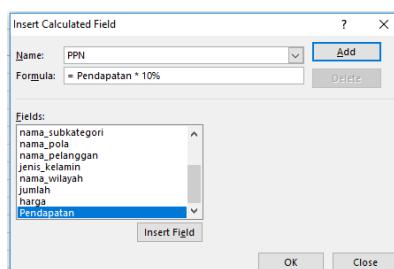
- Menambahkan field **nama_subkategori** ke kotak Row Labels dan field **tahun** ke kotak Column Labels dan tahun yang di gunakan hanya tahun 2012

The screenshot shows a Microsoft Excel spreadsheet with a PivotTable. The PivotTable Fields pane on the right has several fields selected: tahun, nama_subkategori, and nama_pola. The PivotTable itself displays data for various items (Bahan, Batik, Celana, Hem, Jam, Jarik, Kaos, Rok) across years (2012, Grand Total). The entire PivotTable area is highlighted with a yellow box.

- Menambahkan field Pendapatan pada kotak values

The screenshot shows the same Microsoft Excel spreadsheet with the PivotTable Fields pane on the right. The 'Pendapatan' field has been added to the Values section. The PivotTable itself displays data for various items (Bahan, Batik, Celana, Hem, Jam, Jarik, Kaos, Rok) across years (2012, Grand Total), with the total sum of Pendapatan shown in the Values column.

- Kemudian tambahkan field baru dengan cara “Insert Calculated Field” dengan nama PPN dan formulanya = Pendapatan * 10%. Dan klik OK



The screenshot shows the final Microsoft Excel spreadsheet with the PivotTable. The 'PPN' field has been added to the Values section of the PivotTable Fields pane. The PivotTable displays data for various items (Bahan, Batik, Celana, Hem, Jam, Jarik, Kaos, Rok) across years (2012, Grand Total), with the total sum of Pendapatan and the calculated sum of PPN shown in the Values column.

- Kemudian tambahkan field baru dengan cara “Insert Calculated Field” dengan nama **Total Penghasilan** dan formulanya = Pendapatan – PPN. Dan klik OK

Insert Calculated Field

Name: Total Penghasilan
Formula: = Pendapatan - PPN

Fields:
nama_pola
nama_pelanggan
jenis_kelamin
nama_wilayah
jumlah
harga
Pendapatan
PPN

OK Close

	A	B	C	D	E	F	G	H	I
1									
2									
3		Column Labels							
4			2012		Total Sum of Pendapatan	Total Sum of PPN	Total Sum of Total Penghasilan		
5	Row Labels	Sum of Pendapatan	Sum of PPN	Sum of Total Penghasilan					
6	Bahan	212000	212000	1908000	2120000	212000	1908000		
7	Batik	150000	15000	135000	150000	15000	135000		
8	Celana	935000	93500	841500	935000	93500	841500		
9	Hem	1596000	159600	1436400	1596000	159600	1436400		
10	Jam	3520000	352000	3168000	3520000	352000	3168000		
11	Jarik	160000	16000	144000	160000	16000	144000		
12	Kaos	420000	42000	378000	420000	42000	378000		
13	Rok	225000	22500	202500	225000	22500	202500		
14	Grand Total	115692000	11569200	104122800	115692000	11569200	104122800		
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

PivotTable Fields

Choose fields to add to report:

- nama_pola
- nama_pelanggan
- jenis_kelamin
- nama_wilayah
- jumlah
- harga
- Pendapatan
- PPN
- Total Penghasilan

Drag fields between areas below:

FILTERS

- COLUMNS: tahun
- VALUES: Sum of Pendapatan, Sum of PPN, Sum of Total Penghasilan

ROWS

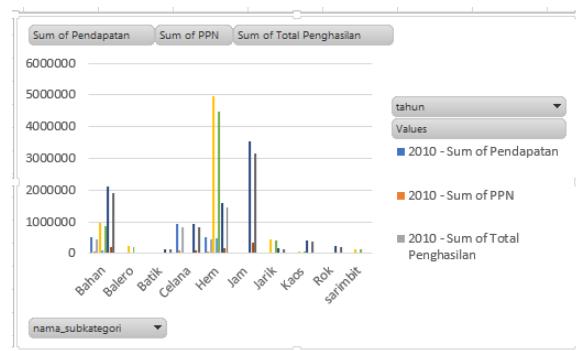
- nama_subkategor...: Sum of Pendapatan, Sum of PPN, Sum of Total Penghasilan

Activate Windows

Defer Layout Update/Window UPDATE

NO 2

- PivotChart dari tahun 2010-2012



- PivotTable dari tahun 2010-2012

	A	B	C	D	E	F	G	H	I	J
1										
2										
3		Column Labels			2010		2011		2012	
4					Sum of Pendapatan	Sum of PPN	Sum of Total Penghasilan	Sum of Pendapatan	Sum of PPN	Sum of Total Penghasilan
5	Row Labels	Sum of Pendapatan	Sum of PPN	Sum of Total Penghasilan	Sum of Pendapatan	Sum of PPN	Sum of Total Penghasilan	Sum of Pendapatan	Sum of PPN	Sum of Total Penghasilan
6	Bahan	500000	50000	450000	960000	96000	864000	2120000	212000	1908000
7	Balero	0	0	0	22500	22500	202500	0	0	0
8	Batik	0	0	0	0	0	0	150000	15000	135000
9	Celana	935000	93500	841500	0	0	0	935000	93500	841500
10	Hem	500000	50000	450000	4960000	496000	4464000	1596000	159600	1436400
11	Jam	0	0	0	0	0	0	3520000	352000	3168000
12	Jarik	0	0	0	450000	45000	405000	160000	16000	144000
13	Kaos	0	0	0	60000	6000	54000	420000	42000	378000
14	Rok	0	0	0	0	0	0	225000	22500	202500
15	sarimbit	0	0	0	150000	15000	135000	0	0	0
16	Grand Total	15065000	1506500	13558500	29400000	2940000	26460000	115692000	11569200	104122800
17										
18										
19										
20										
21										
22										
23										
24										

PivotChart Fields

Choose fields to add to report:

- nama_pola
- nama_pelanggan
- jenis_kelamin
- nama_wilayah
- jumlah
- harga
- Pendapatan
- PPN
- Total Penghasilan

Drag fields between areas below:

FILTERS

- LEGEND (SERIES): tahun
- VALUES: Sum of Pendapatan, Sum of PPN, Sum of Total Penghasilan

AXIS (CATEG...)

- VALUES: Sum of Pendapatan, Sum of PPN, Sum of Total Penghasilan

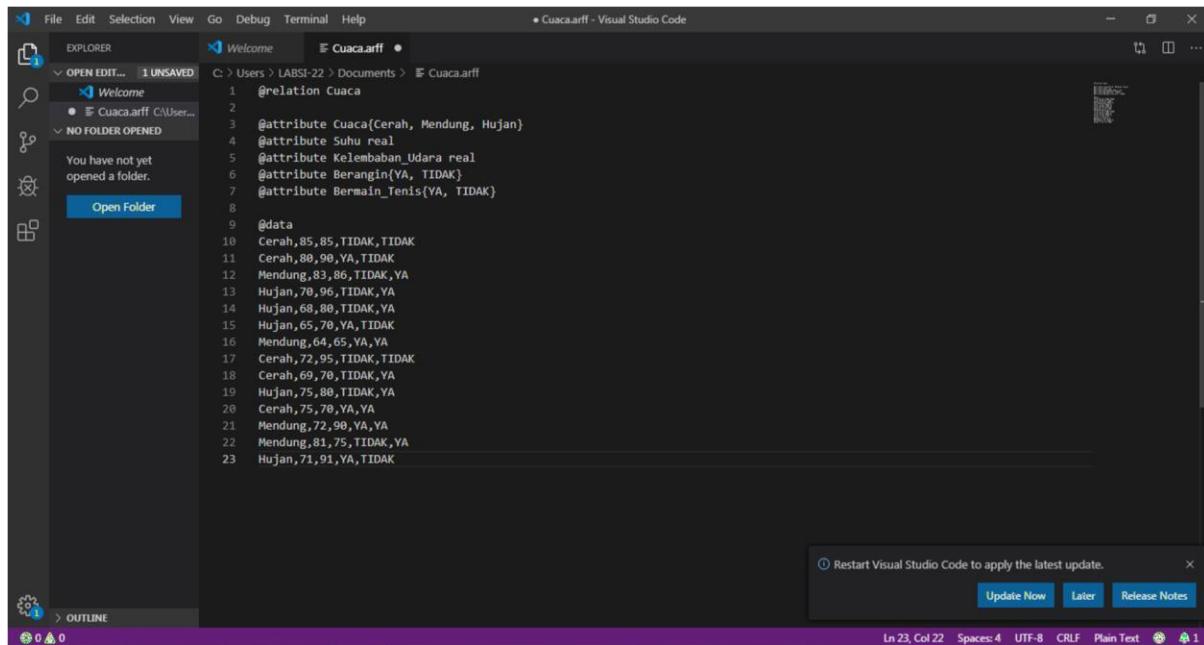
Activate Windows

MODUL 6

MODUL 7

➤ Kegiatan

1. Cuaca.arff



The screenshot shows the Visual Studio Code interface with the file 'Cuaca.arff' open. The code editor displays the following ARFF file content:

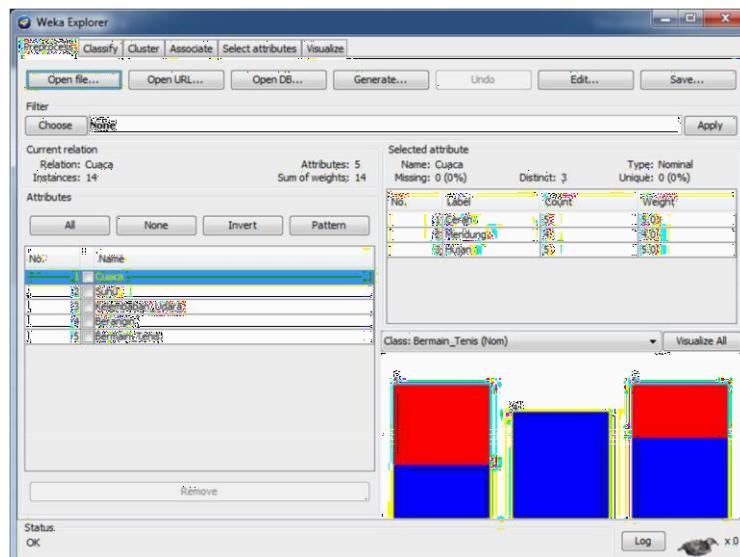
```
C: > Users > LABSI-22 > Documents > Cuaca.arff
@relation Cuaca
@attribute Cuaca{Cerah, Mendung, Hujan}
@attribute Suhu real
@attribute Kelembaban_Udara real
@attribute Berangin{YA, TIDAK}
@attribute Bermain_Tenis{YA, TIDAK}

@data
10 Cerah,85,,85,TIDAK,TIDAK
11 Cerah,,98,YA,TIDAK
12 Mendung,,83,,86,TIDAK,YA
13 Hujan,,70,,96,TIDAK,YA
14 Hujan,68,,88,TIDAK,YA
15 Hujan,65,,70,YA,TIDAK
16 Mendung,,64,,65,YA,YA
17 Cerah,,72,,95,TIDAK,TIDAK
18 Cerah,,69,,78,TIDAK,YA
19 Hujan,,75,,88,TIDAK,YA
20 Cerah,,75,,70,YA,YA
21 Mendung,,72,,90,YA,YA
22 Mendung,,81,,75,TIDAK,YA
23 Hujan,,71,,91,YA,TIDAK
```

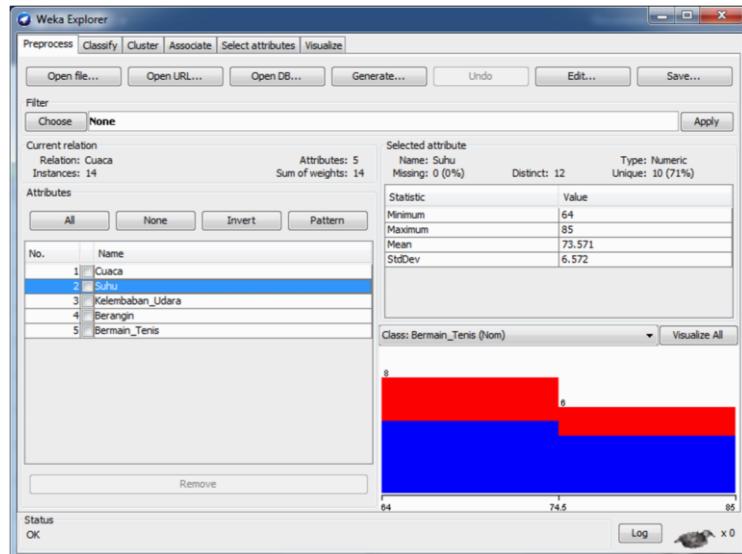
A status bar at the bottom right indicates: In 23, Col 22, Spaces: 4, UTF-8, CRLF, Plain Text, 1.

2. Gambar grafik dari WEKA

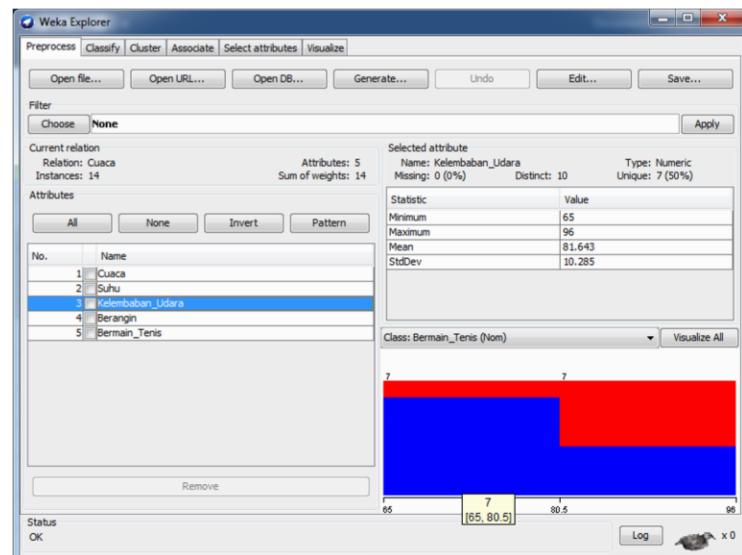
- Cuaca



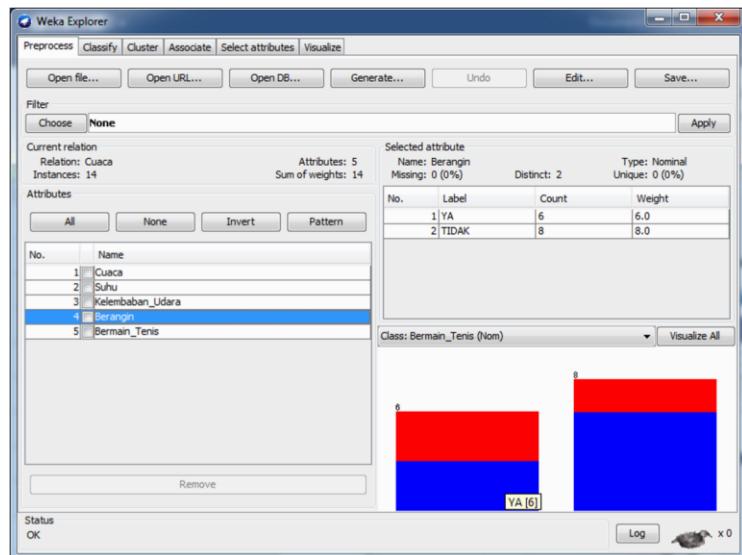
- Suhu



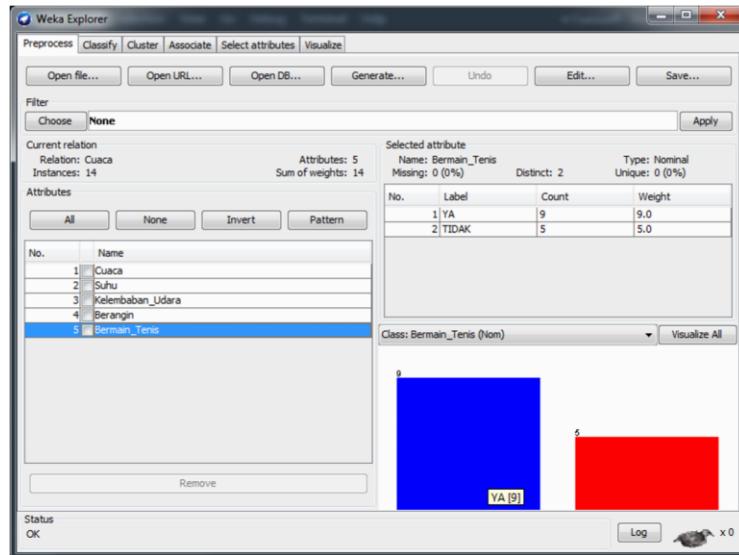
- Kelembaban_Udara



- Berangin



- Bermain_Tenis



➤ Tugas

1. Tugas.arff

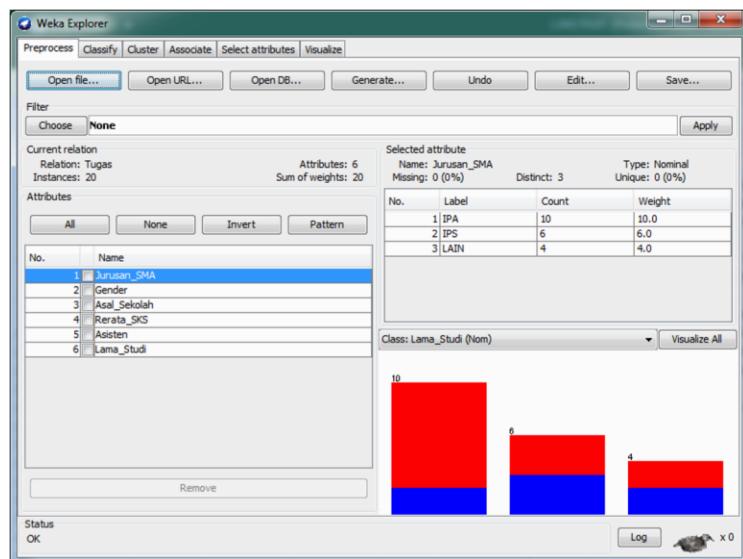
```

@relation Tugas
@attribute Jurusan_SMA{IPA, IPS, LAIN}
@attribute Gender{MANITA, PRIA}
@attribute Asal_Sekolah{SURAKARTA, LUAR}
@attribute Rerata_SKS real
@attribute Asisten{YA, TIDAK}
@attribute Lama_Studi{TERLAMBAT, TEPAT}
@data
IPS,WANITA,SURAKARTA,18,TIDAK,TERLAMBAT
IPA,PRIA,SURAKARTA,19,YA,TEPAT
LAIN,PRIA,SURAKARTA,19,TIDAK,TERLAMBAT
IPA,PRIA,LUAR,17,TIDAK,TERLAMBAT
IPA,WANITA,SURAKARTA,17,TIDAK,TEPAT
IPA,WANITA,LUAR,18,YA,TEPAT
IPA,PRIA,SURAKARTA,18,TIDAK,TERLAMBAT
IPA,PRIA,SURAKARTA,19,TIDAK,TEPAT
IPS,PRIA,LUAR,18,TIDAK,TERLAMBAT
LAIN,WANITA,SURAKARTA,18,TIDAK,TEPAT
IPA,WANITA,SURAKARTA,19,TIDAK,TEPAT
IPS,PRIA,SURAKARTA,20,TIDAK,TEPAT
IPS,PRIA,SURAKARTA,19,TIDAK,TEPAT
IPA,PRIA,SURAKARTA,19,TIDAK,TEPAT
IPA,PRIA,LUAR,22,YA,TEPAT
LAIN,PRIA,SURAKARTA,16,TIDAK,TERLAMBAT
IPS,PRIA,LUAR,20,TIDAK,TEPAT
LAIN,PRIA,LUAR,23,YA,TEPAT
IPA,PRIA,SURAKARTA,21,YA,TEPAT
IPS,PRIA,SURAKARTA,19,TIDAK,TERLAMBAT
31 |

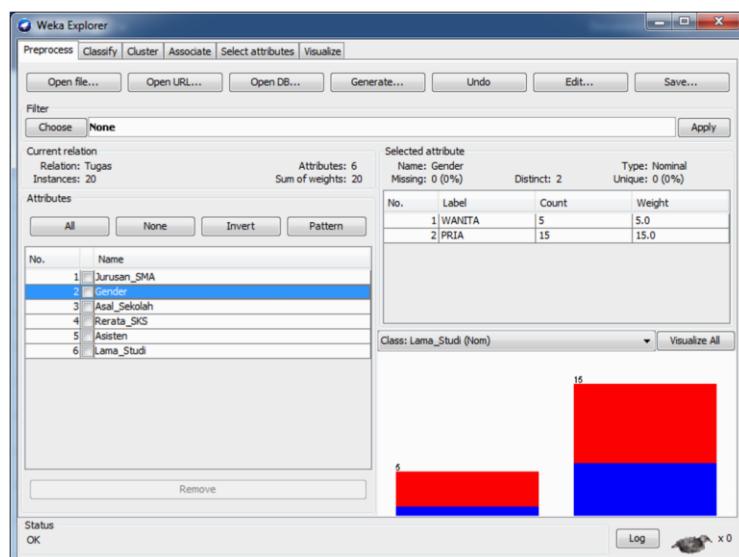
```

2. Hasil dari WEKA

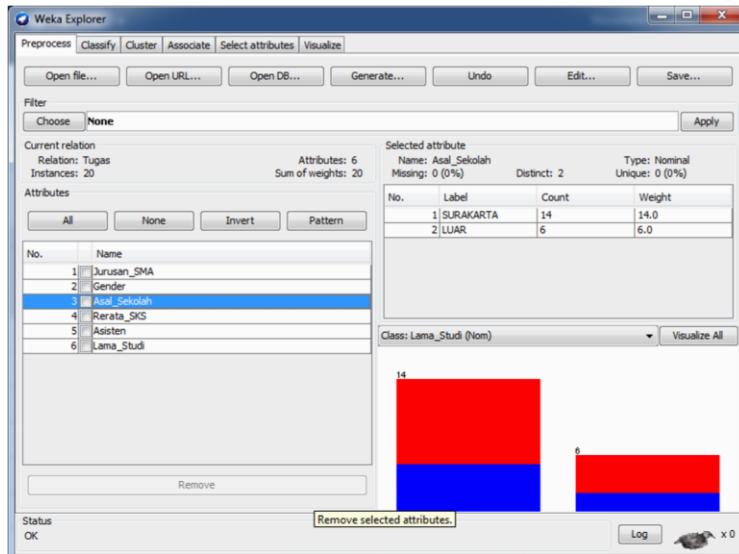
- Jurusan_SMA



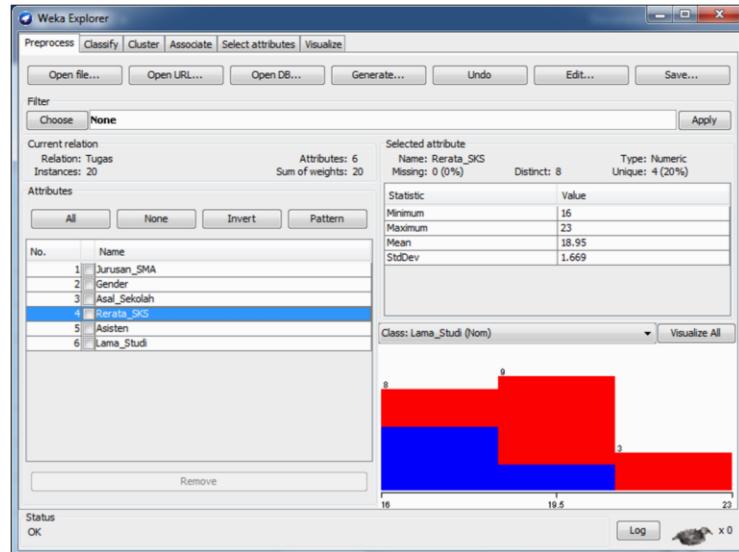
- Gender



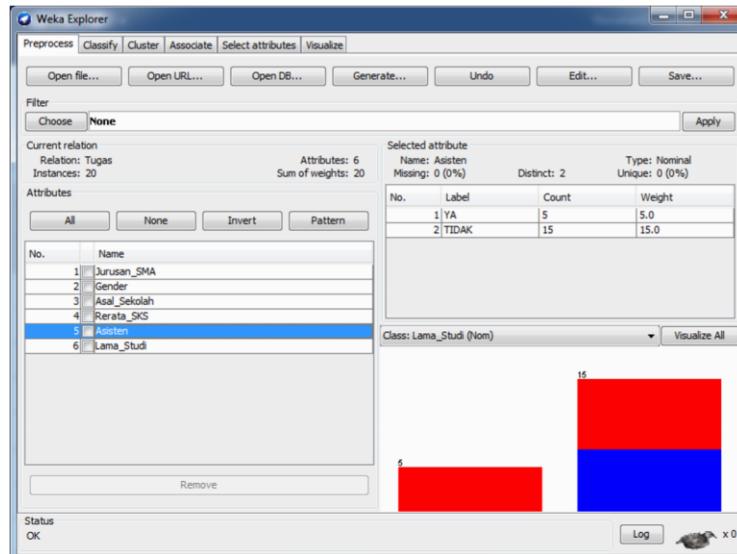
- Asal_Sekolah



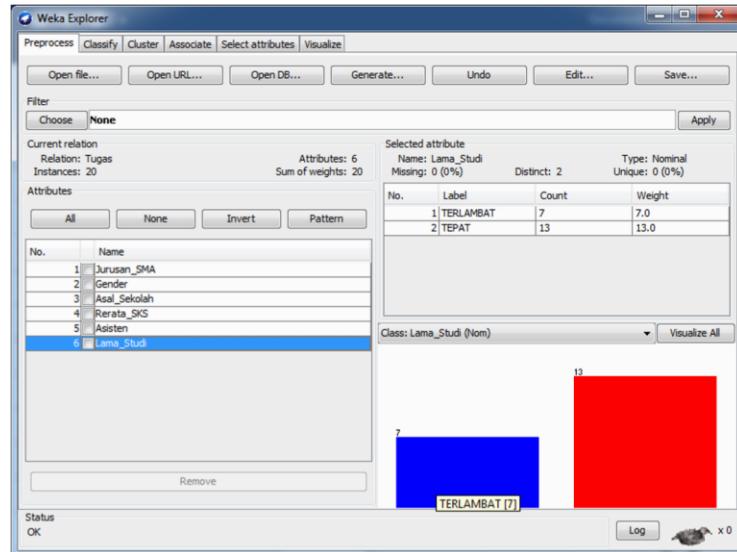
- Rerata_SKS



- Asisten



- Lama_Studi



3. Jumlah atribut
 - a. Bertipe binomial 4
 - b. Bertipe polynomial 1
 - c. Bertipe real 1
4. Pada atribut Rerata_SKS, nilai
 - Maximum 23
 - Minimum 16
 - Mean : 18.95
 - StdDev : 1.669

MODUL 8

➤ Kegiatan

Implementasi Naive Bayes dengan WEKA

The image shows two screenshots of software interfaces related to data analysis.

The top screenshot is of Visual Studio Code. The title bar says "CuacaTesting.arff - Visual Studio Code". The left sidebar shows an "EXPLORER" view with "OPEN EDITORS" containing "CuacaTesting.arff" and "Cuaca.arff". The main editor area displays an ARFF file with the following content:

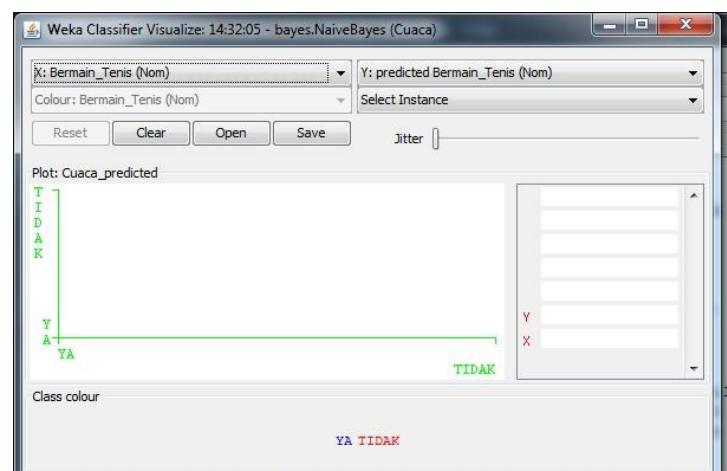
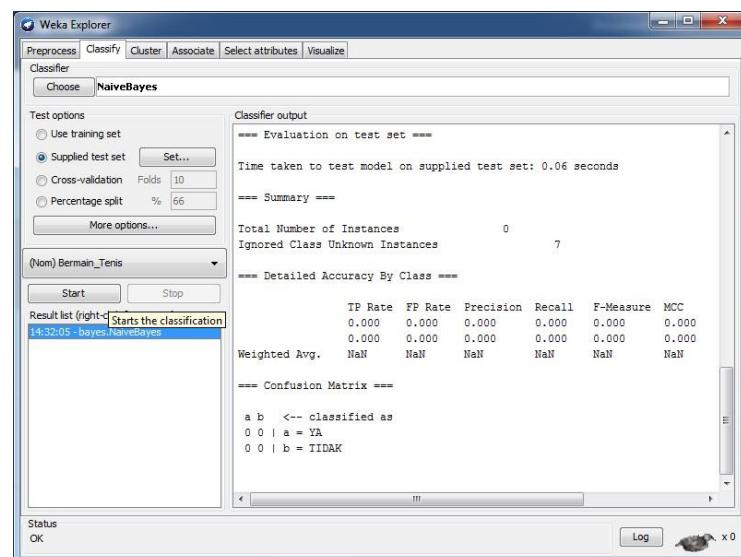
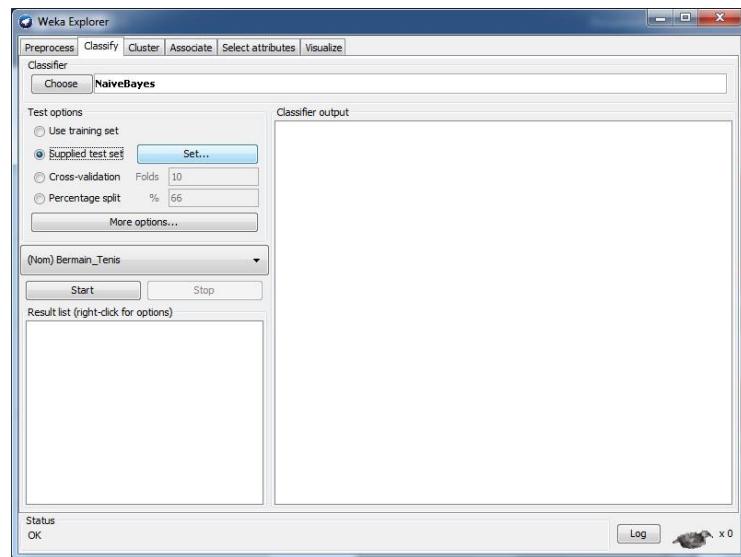
```
@relation CuacaTesting
1 @attribute Cuaca {Cerah, Mendung, Hujan}
2 @attribute Suhu real
3 @attribute Kelembaban_Udara real
4 @attribute Berangin {YA, TIDAK}
5 @attribute Bermain_Tenis {YA, TIDAK}

@data
10 Cerah,75,65,TIDAK,?
11 Cerah,80,68,YA,?
12 Cerah,83,87,YA,?
13 Mendung,70,96,TIDAK,?
14 Mendung,68,81,TIDAK,?
15 Hujan,65,75,YA,?
16 Hujan,64,85,YA,?
```

The bottom screenshot is of the Weka Explorer window. The title bar says "Weka Explorer". The window has tabs for Preprocess, Classify, Cluster, Associate, Select attributes, and Visualize. The "Preprocess" tab is active. It shows the "Current relation" is "Cuaca" with "Instances: 14" and "Attributes: 5 Sum of weights: 14". The "Selected attribute" is "Cuaca" (Nominal type, 3 distinct values). A table shows the distribution of "Cuaca" values:

No.	Label	Count	Weight
1	Cerah	5	5.0
2	Mendung	4	4.0
3	Hujan	5	5.0

Below the table is a histogram titled "Class: Bermain_Tenis (Nom)". The histogram shows three bars: one red bar reaching height 6, one blue bar reaching height 4, and another red bar reaching height 5. The blue bar is labeled "Mendung [4]".



ARFF-Viewer - C:\Users\LABSI-21\Documents\aini\HasilPrediksi.arff

File Edit View
HasilPrediksi.arff

Relation: Cuaca_predicted

No.	1: Cuaca Nominal	2: Suhu Numeric	3: Kelembaban_Udara Numeric	4: Berangin Nominal	5: prediction margin Numeric	6: predicted Bermain_Tenis Nominal	7: Bermain_Tenis Nominal
1	Cerah	75.0	65.0	TIDAK	0.762765	YA	
2	Cerah	80.0	68.0	YA	0.087878	YA	
3	Cerah	83.0	87.0	YA	-0.676866	TIDAK	
4	Mendung	70.0	96.0	TIDAK	0.628523	YA	
5	Mendung	68.0	81.0	TIDAK	0.833996	YA	
6	Hujan	65.0	75.0	YA	0.253733	YA	
7	Hujan	64.0	85.0	YA	-0.160143	TIDAK	

Implementasi Naive Bayes dengan RapidMiner

File Home Insert Page Layout Formulas Data Review View Help Tell me what you want to do

Clipboard Font Alignment Number Styles Cells Editing

F20

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1 Cuaca	Suhu	Kelembaban_udara	Berangin	Bermain_Tenis											
2 Cerah	85.00	85.00	TIDAK												
3 Cerah	80.00	90.00	YA	TIDAK											
4 Mendung	83.00	86.00	TIDAK	YA											
5 Hujan	70.00	96.00	TIDAK	YA											
6 Hujan	68.00	80.00	TIDAK	YA											
7 Hujan	65.00	70.00	YA	TIDAK											
8 Mendung	64.00	65.00	YA	YA											
9 Cerah	72.00	95.00	TIDAK	TIDAK											
10 Cerah	69.00	70.00	TIDAK	YA											
11 Hujan	75.00	80.00	TIDAK	YA											
12 Cerah	75.00	70.00	YA	YA											
13 Mendung	72.00	90.00	YA	YA											
14 Mendung	81.00	75.00	TIDAK	YA											
15 Hujan	71.00	91.00	YA	TIDAK											
16															
17															
18															
19															
20															
21															
22															
23															

Training Testing +

2:50 PM 10/10/2019

Screenshot of Microsoft Excel showing a table titled "Tabel_Cuaca - Excel". The table has columns: Cuaca, Suhu, Kelembaban_udara, Berangin, and Bermain_Tenis. The data rows are as follows:

	Cuaca	Suhu	Kelembaban_udara	Berangin	Bermain_Tenis
1	Cerah	75	65	TIDAK	
2	Cerah	80	68	YA	
3	Cerah	83	87	YA	
4	Mendung	70	96	TIDAK	
5	Mendung	68	81	TIDAK	
6	Hujan	65	75	YA	
7	Hujan	64	85	YA	

The status bar at the bottom shows "Training Testing". The taskbar includes icons for Windows, File Explorer, Word, Google Chrome, Task View, and Excel. The system tray shows the date and time as "10/10/2019 2:56 PM".

Screenshot of the "Import Data - Select the cells to import" dialog box. The sheet is set to "Training". The cell range selected is "A:E". The header row is defined as row 1. The data table is as follows:

A	B	C	D	E
1 Cuaca	Suhu	Kelembaban_udara	Berangin	Bermain_Tenis
2 Cerah	85.000	85.000	TIDAK	TIDAK
3 Cerah	80.000	90.000	YA	TIDAK
4 Mendung	83.000	88.000	TIDAK	YA
5 Hujan	70.000	96.000	TIDAK	YA
6 Hujan	68.000	80.000	TIDAK	YA
7 Hujan	65.000	70.000	YA	TIDAK
8 Mendung	64.000	65.000	YA	YA
9 Cerah	72.000	95.000	TIDAK	TIDAK
10 Cerah	69.000	70.000	TIDAK	YA
11 Hujan	75.000	80.000	TIDAK	YA
12 Cerah	75.000	70.000	YA	YA
13 Mendung	72.000	90.000	YA	YA
14 Mendung	81.000	75.000	TIDAK	YA
15 Hujan	74.000	84.000	75.000	TIDAK

Import Data - Format your columns.

Format your columns.

Replace errors with missing values (i)

	Cuaca polynominal	Suhu integer	Kelembaban_u... integer	Berangin polynominal	Bermain_Tenis binominal
1	Cerah	85	85	TIDAK	TIDAK
2	Cerah	80	90	YA	TIDAK
3	Mendung	83	86	TIDAK	YA
4	Hujan	70	96	TIDAK	YA
5	Hujan	68	80	TIDAK	YA
6	Hujan	65	70	YA	TIDAK
7	Mendung	64	65	YA	YA
8	Cerah	72	95	TIDAK	TIDAK
9	Cerah	69	70	TIDAK	YA
10	Hujan	75	80	TIDAK	YA
11	Cerah	75	70	YA	YA
12	Mendung	72	90	YA	YA
13	Mendung	81	75	TIDAK	YA

 no problems.

[Previous](#) [Next](#) [Cancel](#)

Import Data - Format your columns.

Format your columns.

Replace errors with missing values (i)

	Cuaca polynominal	Suhu integer	Kelembaban_u... integer	Berangin polynominal	Bermain_Tenis binominal label
1	Cerah	85	85	TIDAK	TIDAK
2	Cerah	80	90	YA	TIDAK
3	Mendung	83	86	TIDAK	YA
4	Hujan	70	96	TIDAK	YA
5	Hujan	68	80	TIDAK	YA
6	Hujan	65	70	YA	TIDAK
7	Mendung	64	65	YA	YA
8	Cerah	72	95	TIDAK	TIDAK
9	Cerah	69	70	TIDAK	YA
10	Hujan	75	80	TIDAK	YA
11	Cerah	75	70	YA	YA
12	Mendung	72	90	YA	YA
13	Mendung	81	75	TIDAK	YA

 no problems.

[Previous](#) [Next](#) [Cancel](#)

Where to store the data?

Local Repository (LABSI-21)

- Connections (LABSI-21)
- data (LABSI-21)
- processes (LABSI-21)
 - DataCuaca_Testing (LABSI-21 - v1, 10/10/19 1:42 PM - 357 bytes)
 - DataCuaca_Training (LABSI-21 - v1, 10/10/19 1:42 PM - 629 bytes)

File Edit Process view connections settings Extensions Help

m HQ Views Design Results Turbo Prep Auto Model Find data, operators, etc. All Studio

Result History ExampleSet (/Local Repository/processes/DataCuaca_Training)

Data Statistics Visualizations Annotations

Open in Turbo Prep Auto Model Filter (14 / 14 examples): all

Row No.	Bermain_Tenis	Cuaca	Suhu	Kelembaban_udara	Berangin
1	TIDAK	Cerah	85	85	TIDAK
2	TIDAK	Cerah	80	90	YA
3	YA	Mendung	83	86	TIDAK
4	YA	Hujan	70	96	TIDAK
5	YA	Hujan	68	80	TIDAK
6	TIDAK	Hujan	85	70	YA
7	YA	Mendung	84	65	YA
8	TIDAK	Cerah	72	95	TIDAK
9	YA	Cerah	69	70	TIDAK
10	YA	Hujan	75	80	TIDAK
11	YA	Cerah	75	70	YA
12	YA	Mendung	72	90	YA
13	YA	Mendung	81	75	TIDAK
14	TIDAK	Hujan	71	91	YA

ExampleSet (14 examples, 1 special attribute, 4 regular attributes)

Repository

- + Import Data
- Training Resources (connected)
- Samples
- Community Samples (connected)
- DB (Legacy)
- Local Repository (LABSI-21)
 - Connections (LABSI-21)
 - data (LABSI-21)
 - processes (LABSI-21)
 - DataCuaca_Training (LABSI-21 - v1, 10/10/18 2:42 PM)
 - DataCuaca_Testing (LABSI-21 - v1, 10/10/19 1:42 PM)
 - DataCuaca_Training (LABSI-21 - v1, 10/10/19 1:42 PM)

2:55 PM 10/10/2019

Import Data - Select the cells to import.

Select the cells to import.

Sheet Testing Cell range: A:E Select All Define header row: 1

A	B	C	D	E
1 Cuaca	Suhu	Kelembaban_udara	Berangin	Bermain_Tenis
2 Cerah	75.000	65.000	TIDAK	
3 Cerah	80.000	68.000	YA	
4 Cerah	83.000	87.000	YA	
5 Mendung	70.000	96.000	TIDAK	
6 Mendung	68.000	81.000	TIDAK	
7 Hujan	65.000	75.000	YA	
8 Hujan	64.000	85.000	YA	

← Previous → Next ✖ Cancel

Import Data - Format your columns.

Format your columns.

Replace errors with missing values (?)

	Cuaca polynominal	Suhu integer	Kelembaban_ud... integer	Berangin polynominal	Bermain_Tenis binominal label
1	Cerah	75	65	TIDAK	?
2	Cerah	80	68	YA	?
3	Cerah	83	87	YA	?
4	Mendung	70	98	TIDAK	?
5	Mendung	68	81	TIDAK	?
6	Hujan	65	75	YA	?
7	Hujan	64	85	YA	?

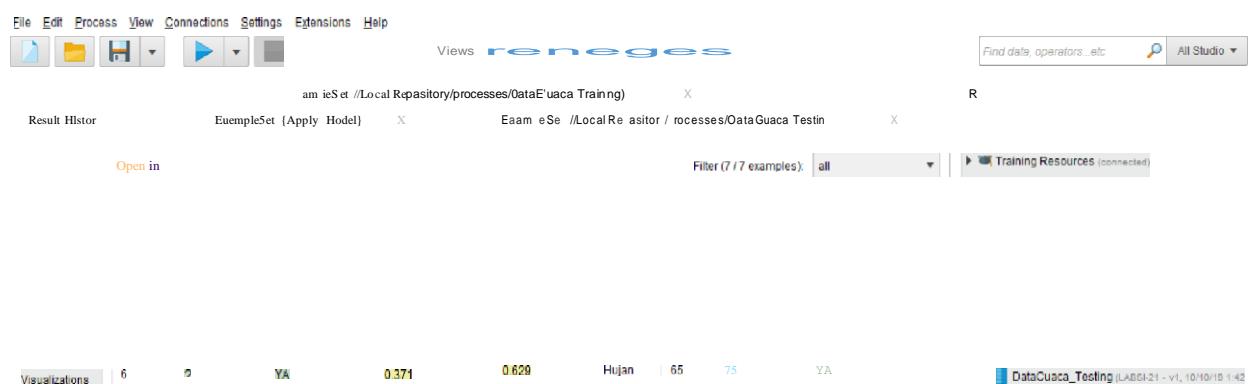
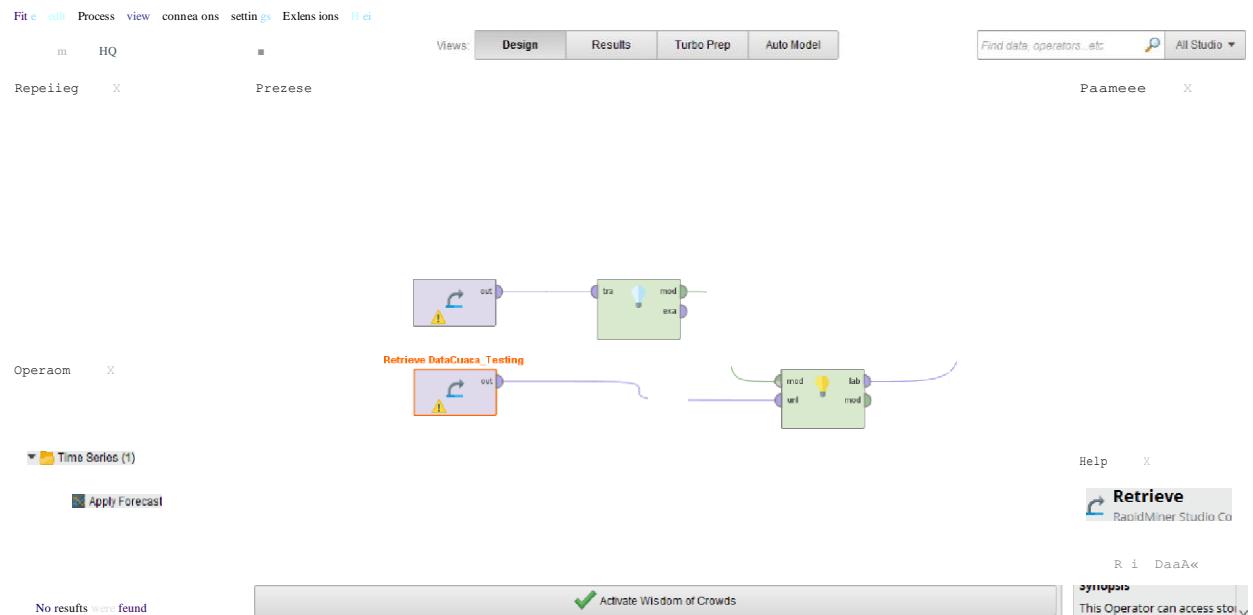
✓ no problems.

← Previous → Next ✖ Cancel

Where to store the data

Local Repository (LABSI-21)

- ▶ Connections (LABSI-21)
- ▶ data (LABSI-21)
- ▶ processes (LABSI-21)
 - DataCuaca_Training (LABSI-21 - v1, 10/10/19 2:55 PM - 529 bytes)
 - DataCuaca_Testing (LABSI-21 - v1, 10/10/19 1:42 PM - 357 bytes)
 - DataCuaca_Training (LABSI-21 - v1, 10/10/19 1:42 PM - 529 bytes)



RapidMiner Studio Trial 9.3.001 @ LABSI-21-PC

File Edit Process View Connections Settings Extensions Help

Views: Design Results Turbo Prep Auto Model

Find data, operators... etc. All Studio

Repository

- + Import Data
- Training Resources (connected)
- Samples
- Community Samples (connected)
- DB (Legacy)
- Local Repository (LABSI-21)
 - Connections (LABSI-21)
 - data (LABSI-21)
 - processes (LABSI-21)
 - DataCuaca_Testing (LABSI-21 - v1, 10/10/19 2:20 PM)
 - DataCuaca_Training (LABSI-21 - v1, 10/10/19 1:42 PM)
 - DataCuaca_Testing (LABSI-21 - v1, 10/10/19 1:42 PM)
 - DataCuaca_Training (LABSI-21 - v1, 10/10/19 1:42 PM)

Result History ExampleSet (/Local Repository/processes/DataCuaca_Training) ExampleSet (Apply Model) ExampleSet (/Local Repository/processes/DataCuaca_Testing)

Name	Type	Missing	Statistics	Filter (8 / 8 attributes):	Search for Attributes	Filter
Bermain_Tenis	Binomial	7	Least	Most	Values	
prediction(Bermain_Tenis)	Binomial	0	Least TIDAK (2)	Most YA (5)	YA (5)	
Confidence_TIDAK	Real	0	Min 0.007	Max 0.856	Average 0.353	
confidence(TIDAK)	Real	0	Min 0.144	Max 0.993	Average 0.647	
Cuaca	Polynomial	0	Least Mendung (2)	Most Cerah (3)	Values Cerah (3)	
Suhu	Integer	0	Min 64	Max 83	Average 72.143	
Kelembaban_udara	Integer	0	Min 65	Max 96	Average 79.571	

Showing attributes 1 - 8 Examples: 7 Special Attributes: 4 Regular Attributes: 4

➤ Tugas

tugas - Excel

File Home Insert Page Layout Formulas Data Review View Help Tell me what you want to do

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Jurusan_SMA	Gender	Asal_Sekolah	Rerata_SKS	Asisten	Lama_Studi												
2	IPS	WANITA	SURAKARTA	18	TIDAK	TERLAMBAT												
3	IPA	PRIA	SURAKARTA	19	YA	TEPAT												
4	LAIN	PRIA	SURAKARTA	19	TIDAK	TERLAMBAT												
5	IPA	PRIA	LUAR	17	TIDAK	TERLAMBAT												
6	IPA	WANITA	SURAKARTA	17	TIDAK	TEPAT												
7	IPA	WANITA	LUAR	18	YA	TEPAT												
8	IPA	PRIA	SURAKARTA	18	TIDAK	TERLAMBAT												
9	IPA	PRIA	SURAKARTA	19	TIDAK	TEPAT												
10	IPS	PRIA	LUAR	18	TIDAK	TERLAMBAT												
11	LAIN	WANITA	SURAKARTA	18	TIDAK	TEPAT												
12	IPA	WANITA	SURAKARTA	19	TIDAK	TEPAT												
13	IPS	PRIA	SURAKARTA	20	TIDAK	TEPAT												
14	IPS	PRIA	SURAKARTA	19	TIDAK	TEPAT												
15	IPA	PRIA	SURAKARTA	19	TIDAK	TEPAT												
16	IPA	PRIA	LUAR	22	YA	TEPAT												
17	LAIN	PRIA	SURAKARTA	16	TIDAK	TERLAMBAT												
18	IPS	PRIA	LUAR	20	TIDAK	TEPAT												
19	LAIN	PRIA	LUAR	23	YA	TEPAT												
20	IPA	PRIA	SURAKARTA	21	YA	TEPAT												
21	IPS	PRIA	SURAKARTA	19	TIDAK	TERLAMBAT												
22																		
23																		

Training Testing + 100%

The screenshot shows the Visual Studio Code interface with the following details:

- File Menu:** File, Edit, Selection, View, Go, Debug, Terminal, Help.
- Editor Area:** Displays the content of the file "tugasTraining.arff".
- Explorer Bar:** Shows the file path: C:\Users\LABSI-21\Documents\aini>Tugas>tugasTraining.arff. It also lists "OPEN EDITORS" (tugasTraining.arff) and "NO FOLDER OPENED".
- Bottom Status Bar:** Shows Ln 31, Col 1, Spaces: 4, UTF-8, CRLF, Plain Text, and a few icons.

```
C: > Users > LABSI-21 > Documents > aini > Tugas > tugasTraining.arff
1 @relation tugasTraining
2
3 @attribute Jurusan_SMA {LAIN, IPA, IPS}
4 @attribute Gender {WANITA, PRIA}
5 @attribute Asal_Sekolah {SURAKARTA, LUAR}
6 @attribute Rerata_SKS real
7 @attribute Asisten {YA, TIDAK}
8 @attribute Lama_Studi {TEPAT, TERLAMBAT}
9
10 @data
11 IPS,WANITA,SURAKARTA,18,TIDAK,TERLAMBAT
12 IPA,PRIA,SURAKARTA,19,YA,TEPAT
13 LAIN,PRIA,SURAKARTA,19,TIDAK,TERLAMBAT
14 IPA,PRIA,LUAR,17,TIDAK,TERLAMBAT
15 IPA,WANITA,SURAKARTA,17,TIDAK,TEPAT
16 IPA,WANITA,LUAR,18,YA,TEPAT
17 IPA,PRIA,SURAKARTA,18,TIDAK,TERLAMBAT
18 IPA,PRIA,SURAKARTA,19,TIDAK,TEPAT
19 IPS,PRIA,LUAR,18,TIDAK,TERLAMBAT
20 LAIN,WANITA,SURAKARTA,18,TIDAK,TEPAT
21 IPA,WANITA,SURAKARTA,19,TIDAK,TEPAT
22 IPS,PRIA,SURAKARTA,28,TIDAK,TEPAT
23 IPA,PRIA,SURAKARTA,19,TIDAK,TEPAT
24 IPA,PRIA,SURAKARTA,19,TIDAK,TEPAT
25 IPA,PRIA,LUAR,22,YA,TEPAT
26 LAIN,PRIA,SURAKARTA,16,TIDAK,TERLAMBAT
27 TPS,PRIA,LUAR,28,TIDAK,TEPAT
28 LAIN,PRIA,LUAR,23,YA,TEPAT
29 IPA,PRIA,SURAKARTA,21,YA,TEPAT
30 IPS,PRIA,SURAKARTA,19,TIDAK,TERLAMBAT
31
```



2 LAIN WANITA SURAKARTA 18 TIDAK

LAIN PRIA SURAKARTA 19 TIDAK

9 IPA PRIA SURAKARTA 19 TIDAK

```

File Edit Selection View Go Debug Terminal Help
tugasTesting.arff - Visual Studio Code

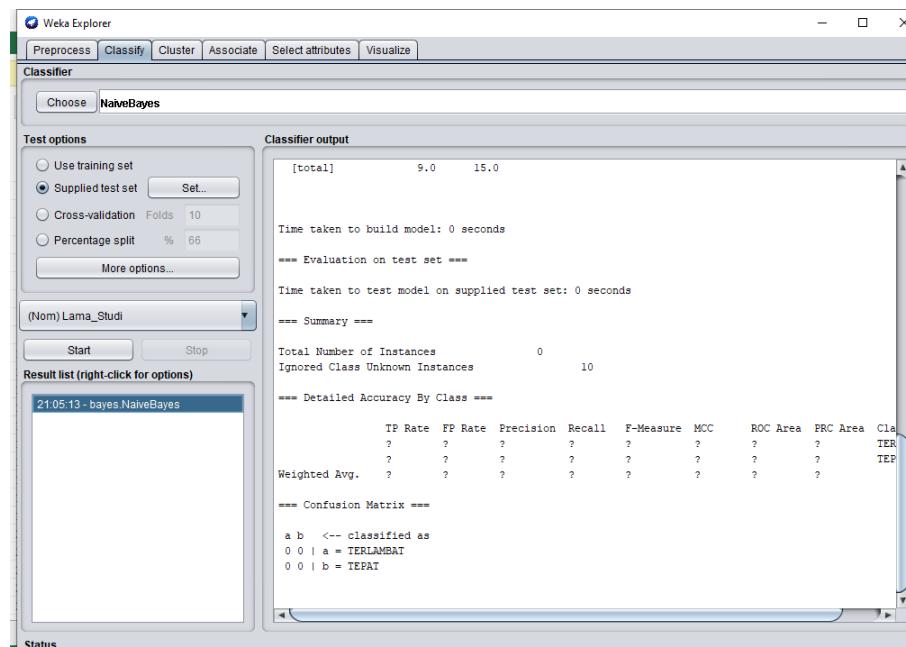
EXPLORER
OPEN EDITORS
  tugasTraining.arff
  tugasTesting.arff ...
NO FOLDER OPENED
OUTLINE

tugasTesting.arff
C: > Users > LABSI-21 > Documents > aini > Tugas' > tugasTesting.arff
1 @relation tugasTraining
2
3 @attribute Jurusan_SMA {LAIN, IPA, IPS}
4 @attribute Gender {WANITA, PRIA}
5 @attribute Asal_Sekolah {SURAKARTA, LUAR}
6 @attribute Rerata_SKS real
7 @attribute Asisten {YA, TIDAK}
8 @attribute Lama_Studi {TEPAT, TERLAMBAT}
9
10 @data
11 LAIN,WANITA,SURAKARTA,18,TIDAK,?
12 IPA,PRIA,SURAKARTA,19,YA,?
13 LAIN,PRIA,SURAKARTA,19,TIDAK,?
14 IPS,PRIA,LUAR,17,TIDAK,?
15 LAIN,WANITA,SURAKARTA,17,TIDAK,?
16 IPA,WANITA,LUAR,18,YA,?
17 IPA,PRIA,SURAKARTA,18,TIDAK,?
18 IPA,PRIA,SURAKARTA,19,TIDAK,?
19 IPS,PRIA,LUAR,18,TIDAK,?
20 LAIN,WANITA,SURAKARTA,18,TIDAK,?
21

```

Ln 21, Col 1 Spaces: 4 UTF-8 CR/LF Plain Text

Implementasi Naive Bayes dengan WEKA



ARFF-Viewer - D:\Praktikum Semester 5\Praktikum DWDM\Modul 8\tugas\HasilPrediksi.arff

File Edit View
HasilPrediksi.arff

Relation: tugasTesting_predicted

No: 1:Jurusan_SMA 2:Gender 3:Asal_Sekolah 4:Rerata_SKS 5:Asisten 6: prediction margin 7:predicted Lama_Studi 8:Lama_Studi

	Nominal	Nominal	Nominal	Numeric	Nominal	Numeric	Nominal	Nominal
1	LAIN	WANITA	SURAKARTA	18.0	TIDAK	0.375862	TERLAMBAT	
2	IPA	PRIA	SURAKARTA	19.0	YA	-0.836469	TEPAT	
3	LAIN	PRIA	SURAKARTA	19.0	TIDAK	0.175169	TERLAMBAT	
4	IPS	PRIA	LUAR	17.0	TIDAK	0.713206	TERLAMBAT	
5	LAIN	WANITA	SURAKARTA	17.0	TIDAK	0.546846	TERLAMBAT	
6	IPA	WANITA	LUAR	18.0	YA	-0.757815	TEPAT	
7	IPA	PRIA	SURAKARTA	18.0	TIDAK	0.125076	TERLAMBAT	
8	IPA	PRIA	SURAKARTA	19.0	TIDAK	-0.356012	TEPAT	
9	IPS	PRIA	LUAR	18.0	TIDAK	0.588286	TERLAMBAT	
10	LAIN	WANITA	SURAKARTA	18.0	TIDAK	0.375862	TERLAMBAT	

Implementasi Naive Bayes dengan RapidMiner

File Edit Process Tools View Help

ExampleSet ((Local Repository\data\CuacaTesting)) ExampleSet ((Local Repository\data\CuacaTraining)) ExampleSet (Retrieve CuacaTesting) ExampleSet ((Local Repository\processes\tugasTraining)) ExampleSet ((Local Repository\processes\SMATraining)) ExampleSet ((Local Repository\processes\SMATesting))

Result Overview Data View Meta Data View Plot View Advanced Charts Annotations

ExampleSet (20 examples, 1 special attribute, 5 regular attributes)

View Filter (20 / 20): all

Row No.	Lama_Studi	Jurusan_S...	Gender	Asal_Sekol...	Rerata_SKS	Asisten
1	TERLAMBAT	IPS	WANITA	SURAKARTA	18	TIDAK
2	TEPAT	IPA	PRIA	SURAKARTA	19	YA
3	TERLAMBAT	LAIN	PRIA	SURAKARTA	19	TIDAK
4	TERLAMBAT	IPA	PRIA	LUAR	17	TIDAK
5	TEPAT	IPA	WANITA	SURAKARTA	17	TIDAK
6	TEPAT	IPA	WANITA	LUAR	18	YA
7	TERLAMBAT	IPA	PRIA	SURAKARTA	18	TIDAK
8	TEPAT	IPA	PRIA	SURAKARTA	19	TIDAK
9	TERLAMBAT	IPS	PRIA	LUAR	18	TIDAK
10	TEPAT	LAIN	WANITA	SURAKARTA	18	TIDAK
11	TEPAT	IPA	WANITA	SURAKARTA	19	TIDAK
12	TEPAT	IPS	PRIA	SURAKARTA	20	TIDAK
13	TEPAT	IPS	PRIA	SURAKARTA	19	TIDAK
14	TEPAT	IPA	PRIA	SURAKARTA	19	TIDAK
15	TEPAT	IPA	PRIA	LUAR	22	YA
16	TERLAMBAT	LAIN	PRIA	SURAKARTA	16	TIDAK
17	TEPAT	IPS	PRIA	LUAR	20	TIDAK
18	TEPAT	LAIN	PRIA	LUAR	23	YA
19	TEPAT	IPA	PRIA	SURAKARTA	21	YA
20	TERLAMBAT	IPS	PRIA	SURAKARTA	19	TIDAK

Repositories

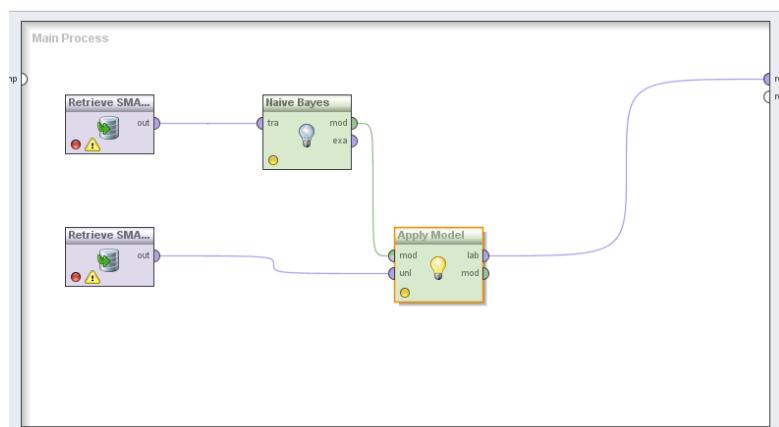
al Repository (user)
data (user)
CuacaTraining (user - v1, 10/16/19 8:20 PM - 627 b)
CuacaTesting (user - v1, 10/16/19 8:22 PM - 427 b)
processes (user)
tugasTraining (user - v1, 10/16/19 9:08 PM - 669 b)
SMATraining (user - v1, 10/16/19 9:17 PM - 549 byt)
SMATesting (user - v1, 10/16/19 9:18 PM - 500 byt)

Log System Monitor Go to Settings to activate Windows.

Screenshot of the Weka interface showing the Data View tab. The table displays 10 examples with attributes: Row No., Lama_Studi, Jurusan_S..., Gender, Asal_Sekolah, Rerata_SKS, and Asisten. The 'Asisten' column shows values like SURAKARTA, YA, TIDAK, etc.

Log window output:

```
Oct 16, 2019 9:08:55 PM INFO: Reading example set...
Oct 16, 2019 9:16:18 PM INFO: Reading example set...
Oct 16, 2019 9:17:01 PM INFO: Reading example set...
```



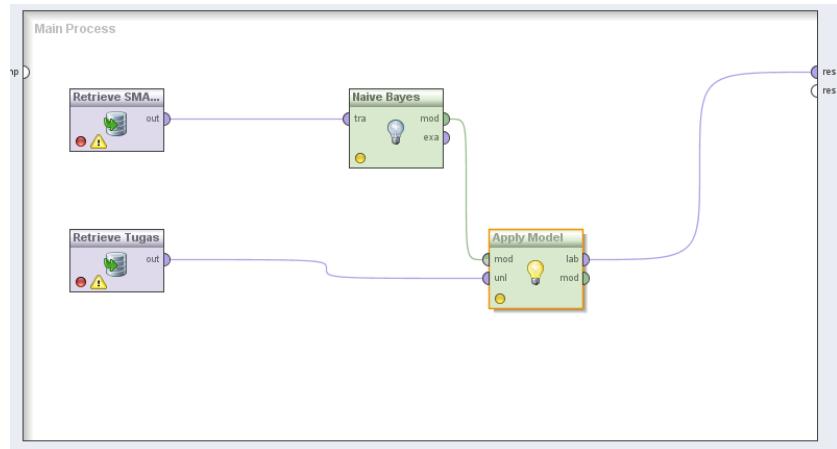
Data View tab showing the same 10 examples as the top screenshot, but with additional columns: confidence(...confidence(...confidence(...prediction(Lam...), Jurusan_S..., Gender, Asal_Sekolah, Rerata_SKS, Asisten.

confidence_TERLAMBAT	confidence(TERLAMBAT)	real	avg = 0.524 +/- 0.312	[0.005 ; 0.868]	0
confidence_TEPAT	confidence(TEPAT)	real	avg = 0.476 +/- 0.312	[0.132 ; 0.995]	0
prediction	prediction(Lama_Studi)	binominal	mode = TERLAMBAT (7), least = TEPAT (3)	TERLAMBAT (7), TEPAT	0

- Nilai rerata confidence TEPAT = 0.476
- Nilai rerata confidence TERLAMBAT = 0.524
- Orang yang lulus TEPAT = 3

- Orang yang lulus TERLAMBAT = 7
- Prediksi dari Dewi dan Jono

ExampleSet (2 examples, 1 special attribute, 5 regular attributes)						
Row No.	Lama_Studi	Jurusan_S...	Gender	Asal_Sekol...	Rerata_SKS	Asisten
1	?	IPA	WANITA	LUAR	18	TIDAK
2	?	LAIN	PRIA	SURAKARTA	17	YA



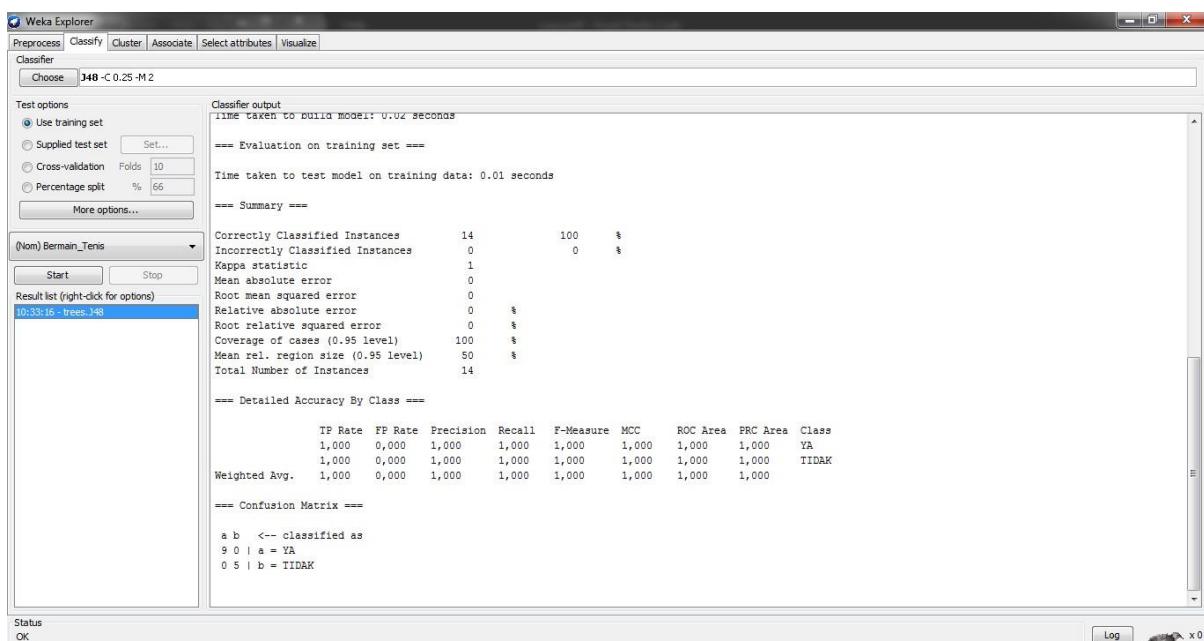
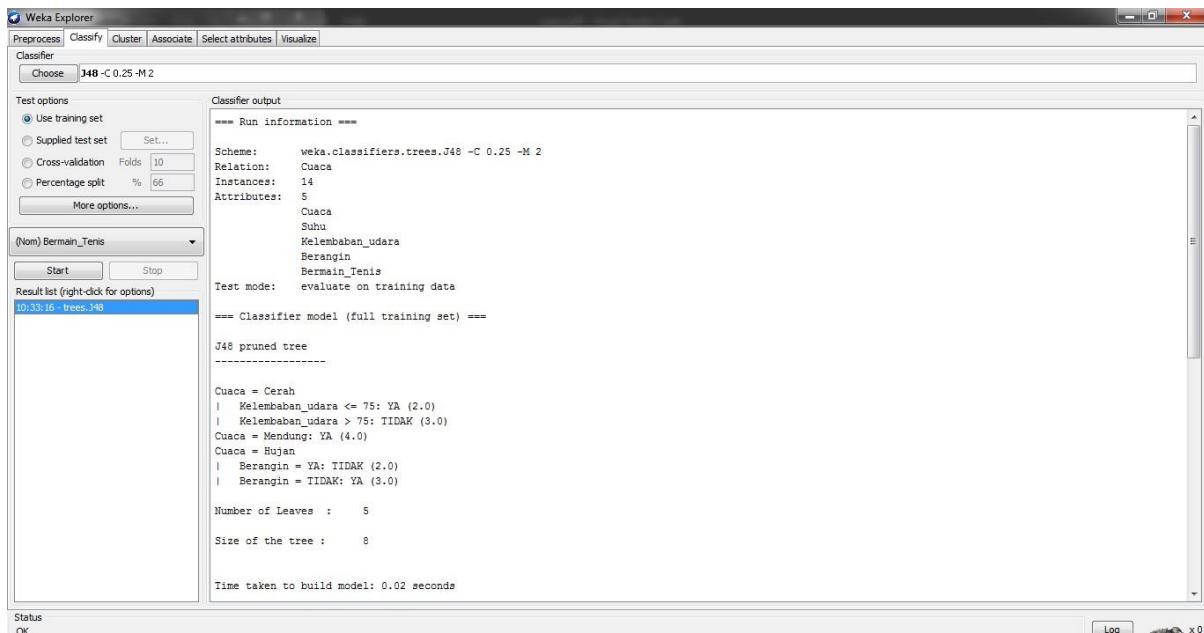
ExampleSet (2 examples, 4 special attributes, 5 regular attributes)									
Row No.	Lama_Studi	confidence(...)	confidence(...)	prediction(L...	Jurusan_S...	Gender	Asal_Sekol...	Rerata_SKS	Asisten
1	?	0.298	0.702	EPAT	IPA	WANITA	LUAR	18	TIDAK
2	?	0.076	0.924	EPAT	LAIN	PRIA	SURAKARTA	17	YA

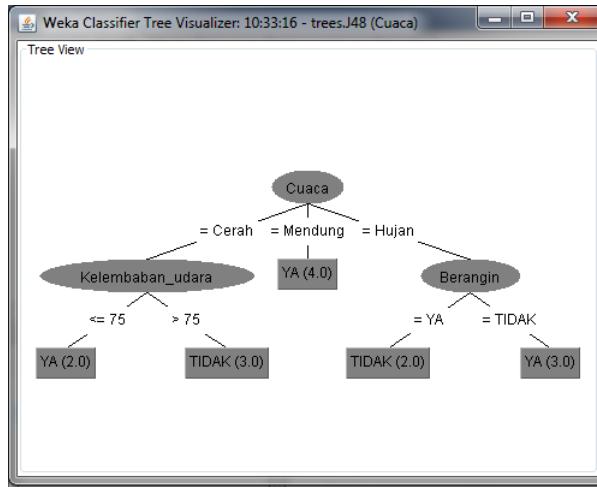
Hasil prediksi menyatakan bahwa Dewi dan Jono akan lulus dengan TEPAT

MODUL 9

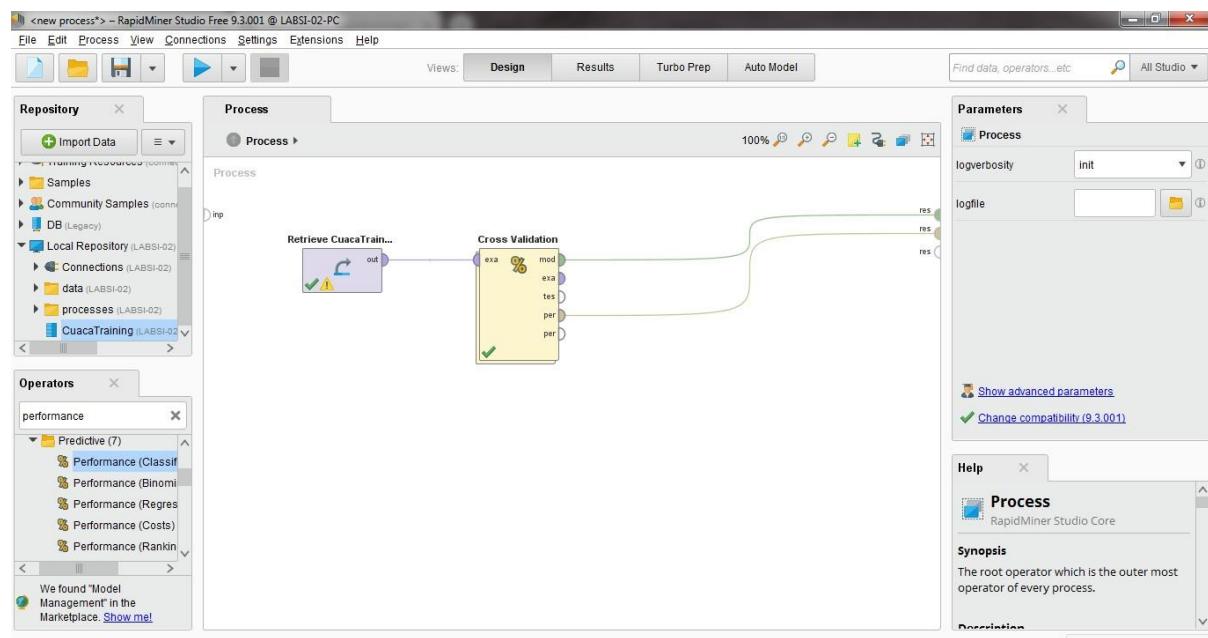
➤ Kegiatan

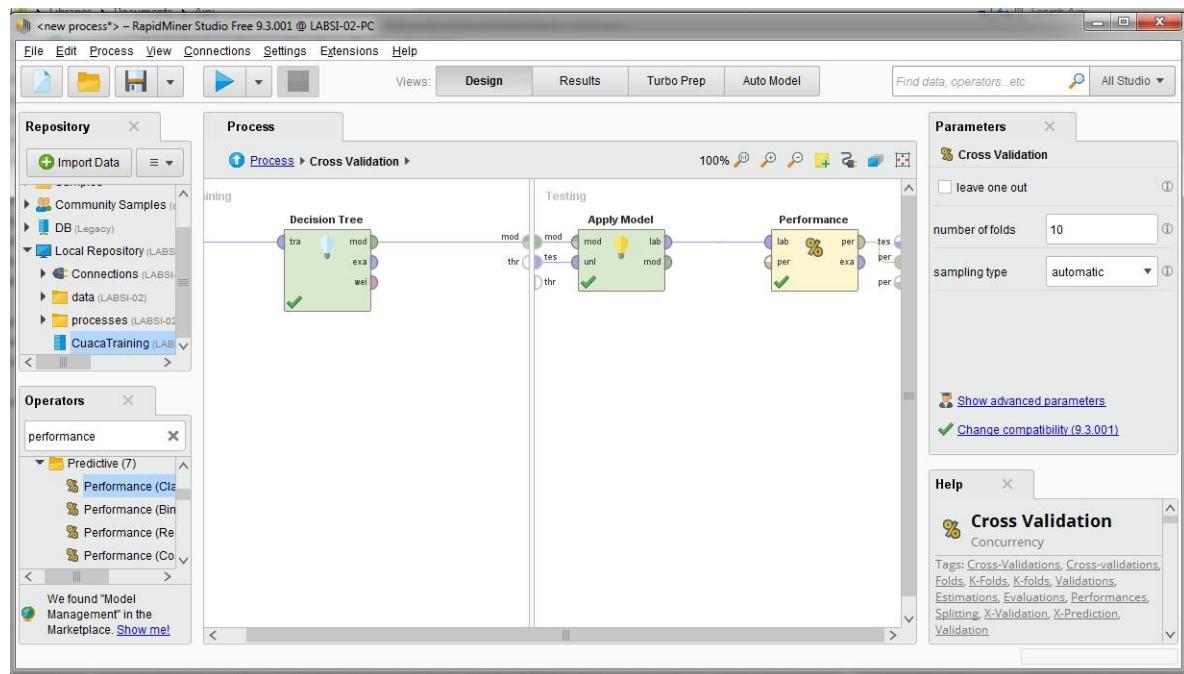
Menggunakan WEKA





Menggunakan RapidMiner





RapidMiner Studio Free 9.3.001 @ LABSI-02-PC

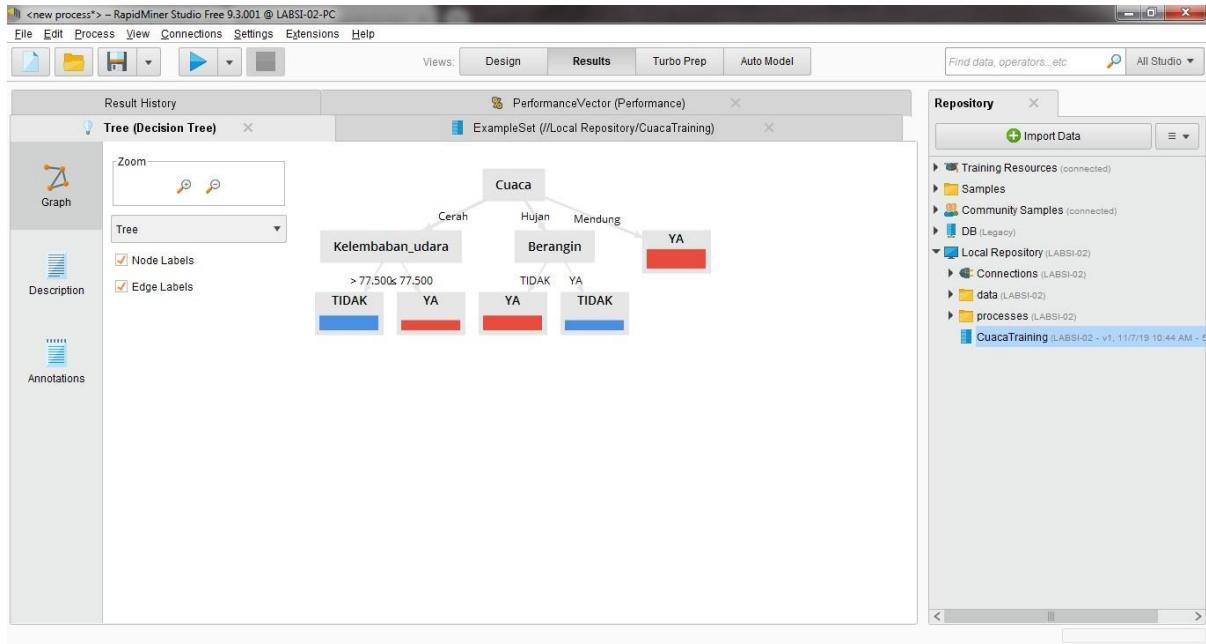
Tree (Decision Tree)

PerformanceVector (Performance)

accuracy: 60.00% +/- 45.95% (micro average: 64.29%)				
		true TIDAK	true YA	class precision
pred. TIDAK		2	2	50.00%
pred. YA		3	7	70.00%
class recall		40.00%	77.78%	

Repository

- Import Data
- Training Resources (connected)
- Samples
- Community Samples (connected)
- DB (Legacy)
- Local Repository (LABSI-02)
 - Connections (LABSI-02)
 - data (LABSI-02)
 - processes (LABSI-02)
 - CuacaTraining (LABSI-02 - v1, 11/7/19 10:44 AM -)



➤ Tugas

1. Table

Cuaca	Suhu	Kelembaban_udara	Berangin	Bermain_Tenis
Cerah	75	65	TIDAK	YA
Cerah	80	68	YA	YA
Cerah	83	87	YA	TIDAK
Mendung	70	96	TIDAK	YA
Mendung	68	81	TIDAK	YA
Hujan	65	75	TIDAK	YA
Hujan	64	85	YA	TIDAK

2. Weka

a. Tree

Classifier output

```

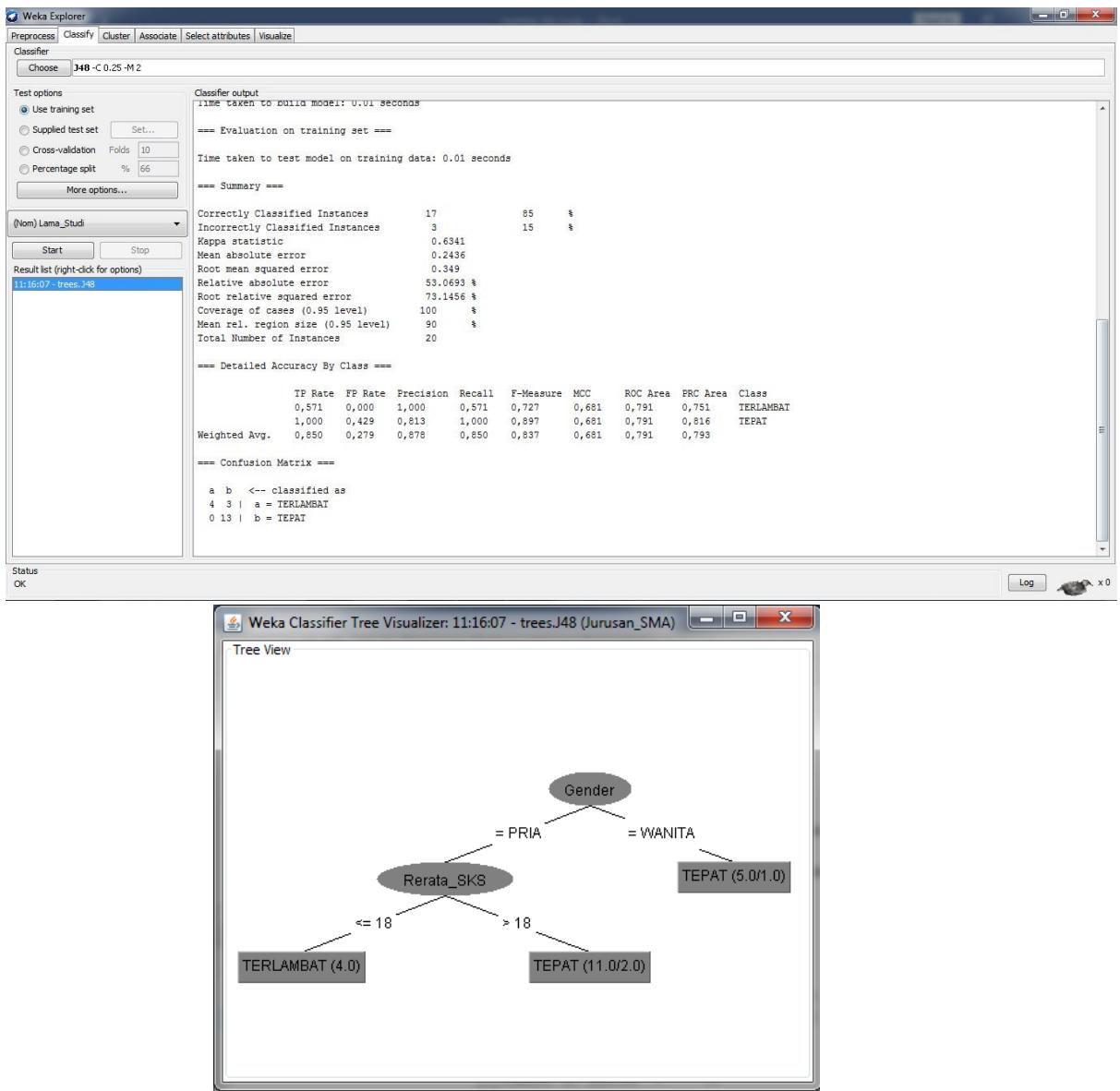
    === Run information ===
    Scheme: weka.classifiers.trees.J48 -C 0.25 -M 2
    Relation: Jurusan_SMA
    Instances: 20
    Attributes: 6
    Jurusan_SMA
    Gender
    Asal_Sekolah
    Rerata_SKS
    Asisten
    Lama_Studi
    Test mode: evaluate on training data

    === Classifier model (full training set) ===
    J48 pruned tree
    -----
    Gender = PRIA
    |   Rerata_SKS <= 18: TERLAMBAT (4.0)
    |   Rerata_SKS > 18: TEPAT (11.0/2.0)
    Gender = WANITA: TEPAT (5.0/1.0)

    Number of Leaves : 3
    Size of the tree : 5

    Time taken to build model: 0.01 seconds

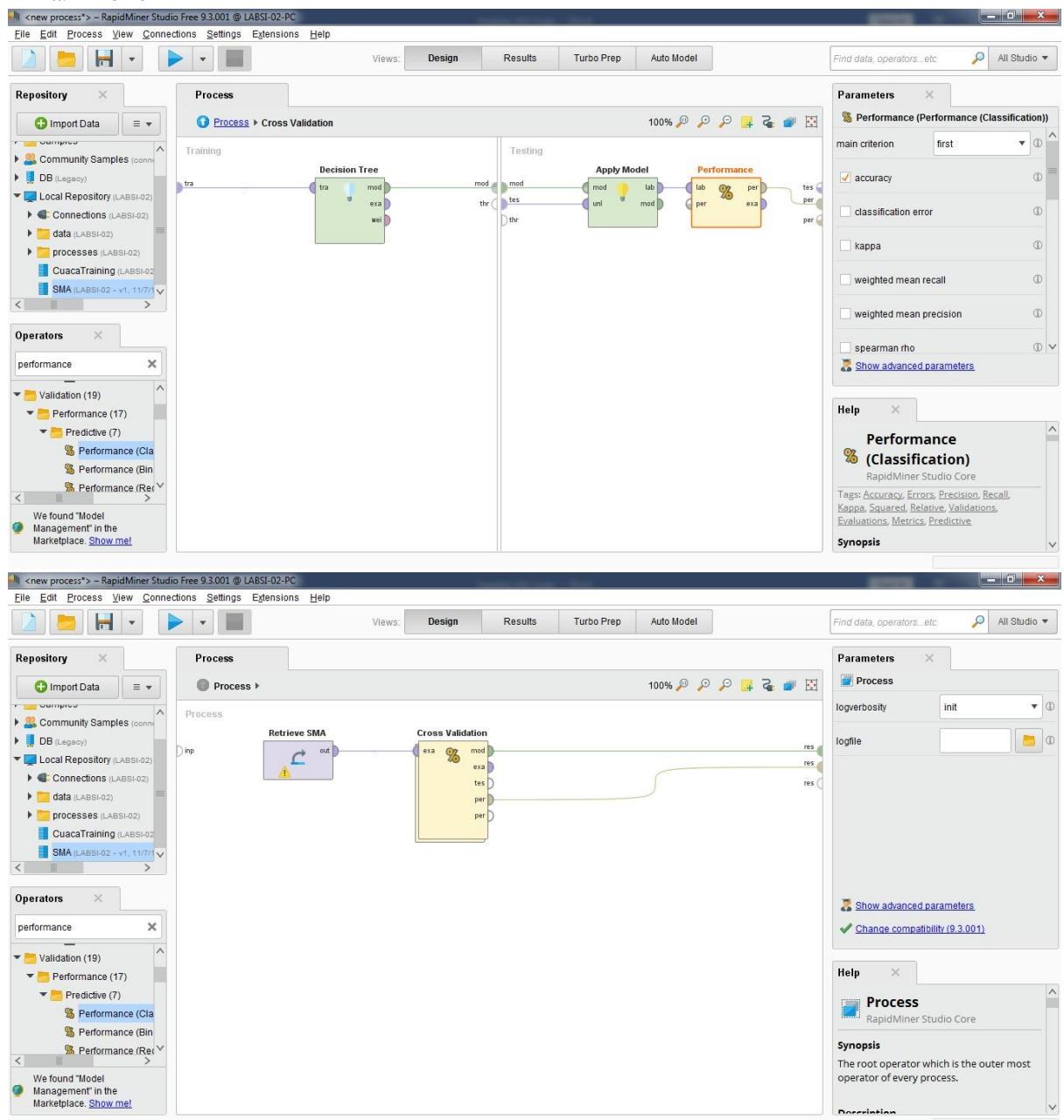
    === Evaluation on training set ===
  
```



- b. Carilah nilai-nilai parameter berikut:
- Jumlah simpul daun pada pohon keputusan = **3**
 - Jumlah simpul keseluruhan pada pohon kerputusan = **5**
 - Waktu yang dibutuhkan untuk proses pelatihan = **0.01** detik
 - Tingkat ketepatan klasifikasi = **85 %**
 - Tingkat ketidaktepatan klasifikasi = **15 %**

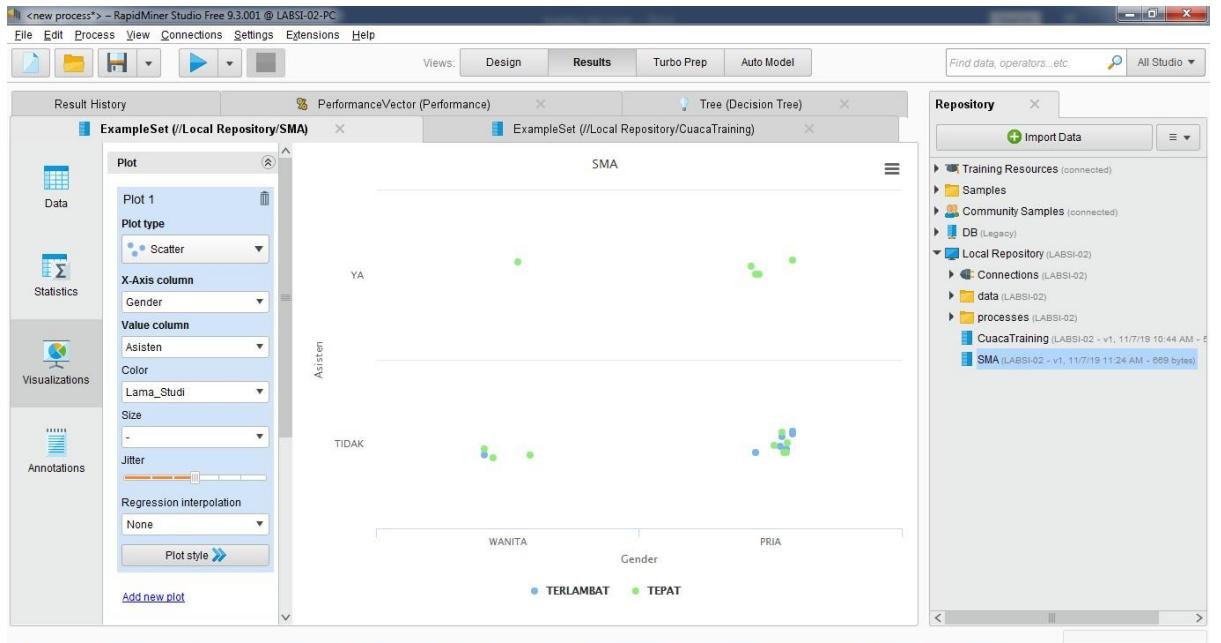
3. RapidMiner

a. Pohon





b. Plot View



4. Klasifikasi yang terbentuk yaitu :

- i. Seseorang akan lama_studi (TERLAMBAT) jika kondisi sebagai berikut:
 - Gender = PRIA, Rerata_SKS \leq 18 (nilai atribut lain diabaikan)
- ii. Seseorang akan lama_studi (TERLAMBAT) jika kondisi sebagai berikut:
 - Gender = WANITA (nilai atribut lain diabaikan)
 - Gender = PRIA, Rerata_SKS $>$ 18 (nilai atribut lain diabaikan)

MODUL 10

➤ Kegiatan

Table showing student data:

	A	B	C	D	E	F	G
1	NO_SISWA	NAMA	B.IND	B.ING			
2	S_101	JOKO	8,54	8,4			
3	S_102	AGUS	9,98	6,81			
4	S_103	SUSI	6,2	9,15			
5	S_104	DYAH	5,24	7,26			
6	S_105	WATI	5,7	5,71			
7	S_106	IKA	8,57	5,87			
8	S_107	EKO	7,7	7,71			
9	S_108	YANTO	6,6	5,7			
10	S_109	WAWAN	9	8,12			
11	S_110	MAHMUD	9,81	9,58			
12							
13							
14							
15							

RapidMiner Studio Free 9.3.001 process flow:

```
graph LR; RD[Retrieve Data_NilaiUjian] --> Clustering[Clustering]; Clustering --> SVD[SVD];
```

The process starts with a "Retrieve Data_NilaiUjian" operator, which feeds into a "Clustering" operator. The output of the "Clustering" operator is then fed into an "SVD" operator.

Parameters for the Clustering (K-Means) operator:

- k: 3
- max runs: 10
- determine good start values: checked
- measure types: Numerical
- numerical measure: EuclideanDistance
- max optimization: 100

Help section for k-Means:

This Operator performs clustering using the k-means algorithm.

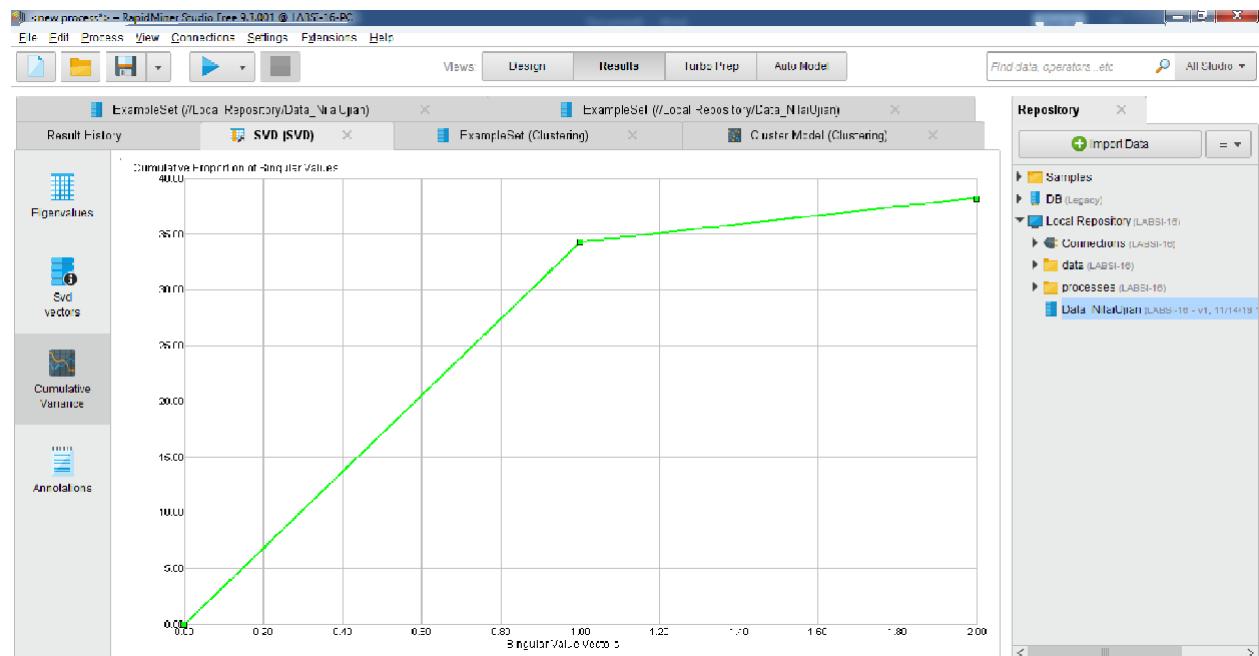
Result History SVD (SVD) ExampleSet (Clustering) ExampleSet (SVD) Clusher Model (Clustering) Import Data | ▾

SVD 2 02 8 246 000 processed (LABO-1)

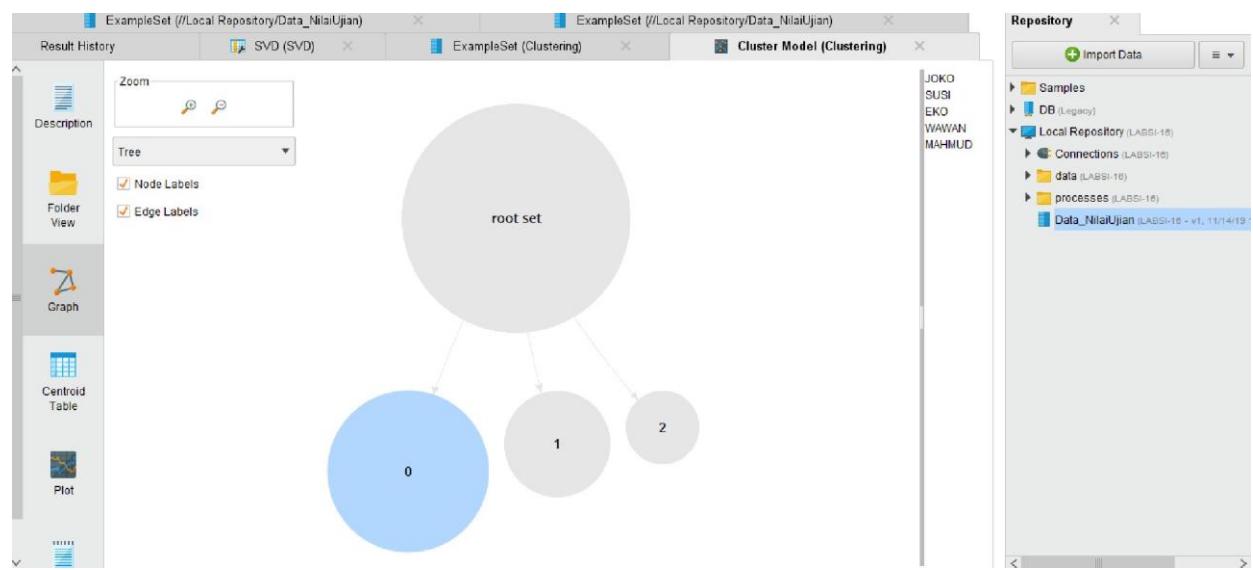
Cum late

Ari n'Oral Ons

-new process' -> [Pa dks Skid+aFree9.Tt+@LABO-16-](#)
File dix ro ce View C onne dians 8etting exten lans help
y y i... Design Restis Turba Prep AMio flia del
Ex ample Set (/Lo c al R ep a sit ory/D at a Mil alUji an) ExampleSet (/Lo c al R ep a sit ory/D at a NilaiUjian)
Resu tHletor @ DVD DVD Ex am le Set Clusterin Clust er Ma del Clusterin Re







Result History SVD (SVD) ExampleSet (Clustering) Cluster Model (Clustering) Import Data



1 2



Result History SVD (SVD) ExampleSet (Clustering) Cluster Model (Clustering) Import Data



Tab

b|e

2

1



➤ Tugas

1. Tabel nilai ujian 3 siswa secara random

	A	B	C	D	E	F	G
1	NO_SISWA	NAMA	B.IND	B.ING	MTK	IPA	
2	S_101	JKO	9,95	5,40	7,41	8,32	
3	S_102	AGUS	9,37	5,91	8,56	6,43	
4	S_103	SUSI	8,77	5,14	5,38	5,94	
5	S_104	DYAH	7,62	6,02	5,38	9,02	
6	S_105	WATI	9,61	6,45	7,94	8,39	
7	S_106	IKA	7,72	7,22	6,24	8,89	
8	S_107	EKO	5,07	8,25	5,73	7,81	
9	S_108	YANTO	7,42	9,97	8,87	9,70	
10	S_109	WAWAN	5,50	7,04	8,91	8,33	
11	S_110	MAHMUD	8,82	9,13	8,51	9,64	
12	S_111	BUDI	9,17	8,05	5,74	5,55	
13	S_112	SANTI	6,77	5,11	5,52	6,80	
14	S_113	DIAN	7,85	9,90	9,37	5,10	
15	S_114	DANI	8,60	6,21	7,38	7,83	
16	S_115	AHMAD	6,31	8,64	9,23	6,14	
17	S_116	BAYU	8,86	6,67	8,81	5,35	
18	S_117	RISA	6,18	6,86	6,42	7,78	
19	S_118	RANI	9,04	8,00	9,82	7,16	
20	S_119	YANI	5,20	5,24	5,59	8,50	
21	S_120	RATIH	7,96	5,64	8,72	6,15	
22	S_121	INDAH	7,45	6,29	8,15	9,06	
23	S_122	JONO	6,76	8,89	6,39	8,09	
24	S_123	SARAH	8,51	7,64	6,95	6,06	
25	S_124	RAMA	6,42	6,07	7,63	5,89	
26	S_125	BAMBANG	9,06	7,71	8,52	7,41	
27	S_126	HADI	5,41	5,65	6,66	5,48	
28	S_127	NANA	5,81	8,43	7,01	6,43	
29	S_128	FEBRI	7,56	7,84	8,25	7,67	
30	S_129	DENI	9,51	9,82	7,64	6,70	

2. RapidMiner

Process View:

```

graph LR
    A[Retrieve Tugas_NilaiUjian] --> B(Clustering)
    B --> C[SVD]
    
```

Parameters View:

Parameter	Value
dimensionality reduction	fixed number
dimensions	1

Results View:

Result History:

- ExampleSet (/Local Repository/Data_NilaiUjian)
- Cluster Model (Clustering)
- SVD (SVD)
- ExampleSet (Clustering)
- ExampleSet (SVD)

Eigenvalues Table:

Component	Singular Value	Proportion of Singular Values	Cumulative Singular Values	Cumulative Proportion of Sing...
SVD 1	82.312	0.792	82.312	0.792
SVD 2	8.172	0.079	90.484	0.871
SVD 3	7.462	0.072	97.947	0.943
SVD 4	5.968	0.057	103.914	1.000

Annotations View:

- Eigenvalues
- Svd vectors
- Cumulative Variance
- Annotations

Repository View:

- Samples
- DB (Legacy)
- Local Repository (LABSI-16)
 - Connections (LABSI-16)
 - data (LABSI-16)
 - processes (LABSI-16)
 - Data_NilaiUjian (LABSI-16 - v1, 11/14/19)
 - Tugas_NilaiUjian (LABSI-16 - v1, 11/14/19)

RapidMiner Studio Free 9.3.001 @ LABSI-16-PC

File Edit Process View Connections Settings Extensions Help

Views: Design Results Turbo Prep Auto Model

Find data, operators... etc All Studio

ExampleSet (/Local Repository/Data_NilaiUjian) ExampleSet (/Local Repository/Data_NilaiUjian)

Cluster Model (Clustering) ExampleSet (/Local Repository/Tugas_NilaiUjian)

Result History SVD (SVD) ExampleSet (Clustering) ExampleSet (SVD)

Eigenvalues

Attribute	SVD Vector 1	SVD Vector 2	SVD Vector 3
B.IND	0.520	-0.111	0.489
B.ING	0.470	-0.770	-0.075
MTK	0.524	0.581	0.325
IPA	0.483	0.238	-0.806

Svd vectors

Cumulative Variance

Annotations

Repository

- Import Data
- Samples
- DB (Legacy)
- Local Repository (LABSI-16)
 - Connections (LABSI-16)
 - data (LABSI-16)
 - processes (LABSI-16)
 - Data_NilaiUjian (LABSI-16 - v1, 11/14/19)
 - Tugas_NilaiUjian (LABSI-16 - v1, 11/14/19)

RapidMiner Studio Free 9.3.001 @ LABSI-16-PC

File Edit Process View Connections Settings Extensions Help

Views: Design Results Turbo Prep Auto Model

Find data, operators... etc All Studio

ExampleSet (/Local Repository/Data_NilaiUjian) ExampleSet (/Local Repository/Data_NilaiUjian)

Cluster Model (Clustering) ExampleSet (/Local Repository/Tugas_NilaiUjian)

Result History SVD (SVD) ExampleSet (Clustering) ExampleSet (SVD)

Eigenvalues

Svd vectors

Cumulative Variance

Annotations

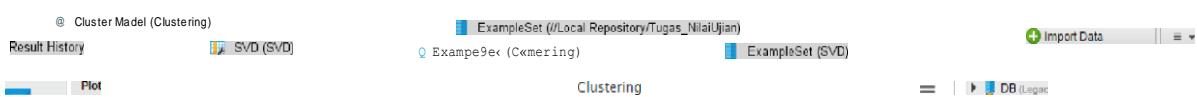
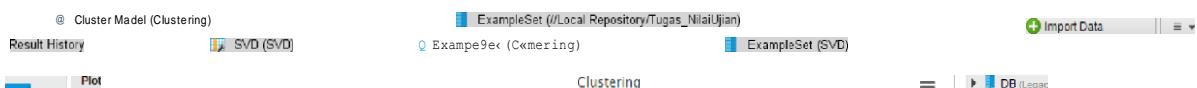
Repository

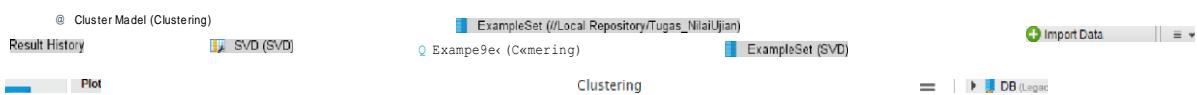
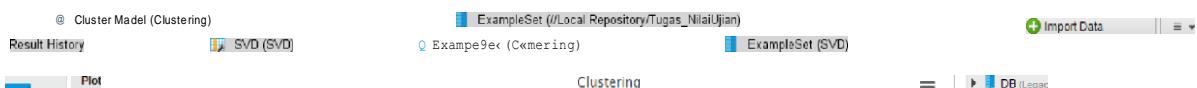
- Import Data
- Samples
- DB (Legacy)
- Local Repository (LABSI-16)
 - Connections (LABSI-16)
 - data (LABSI-16)
 - processes (LABSI-16)
 - Data_NilaiUjian (LABSI-16 - v1, 11/14/19)
 - Tugas_NilaiUjian (LABSI-16 - v1, 11/14/19)

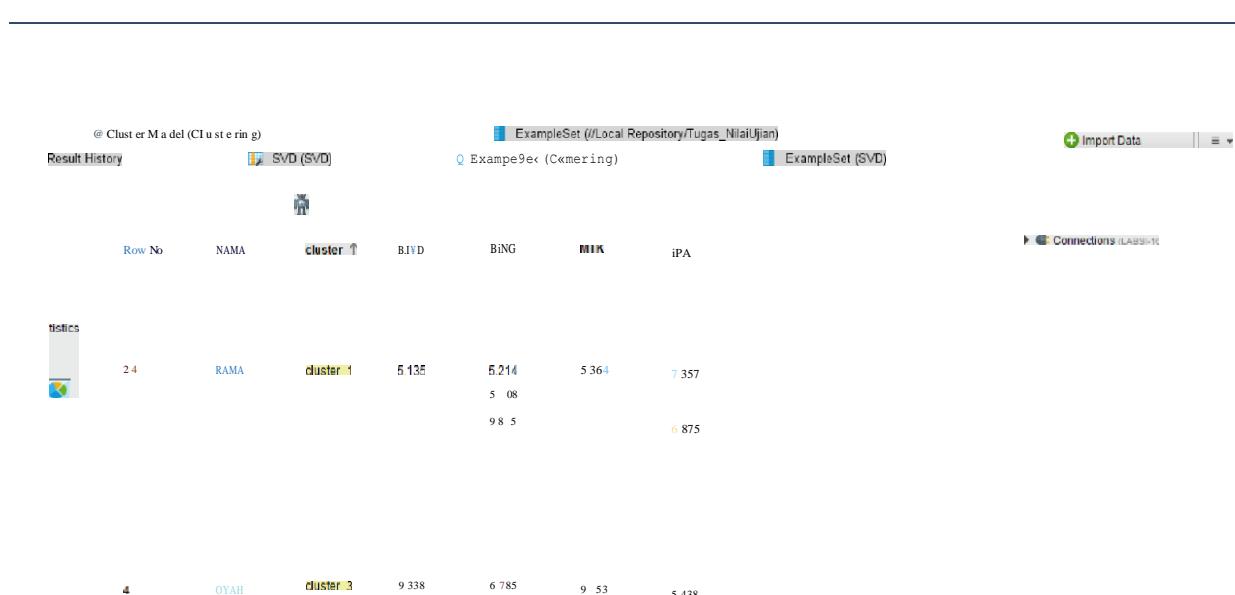
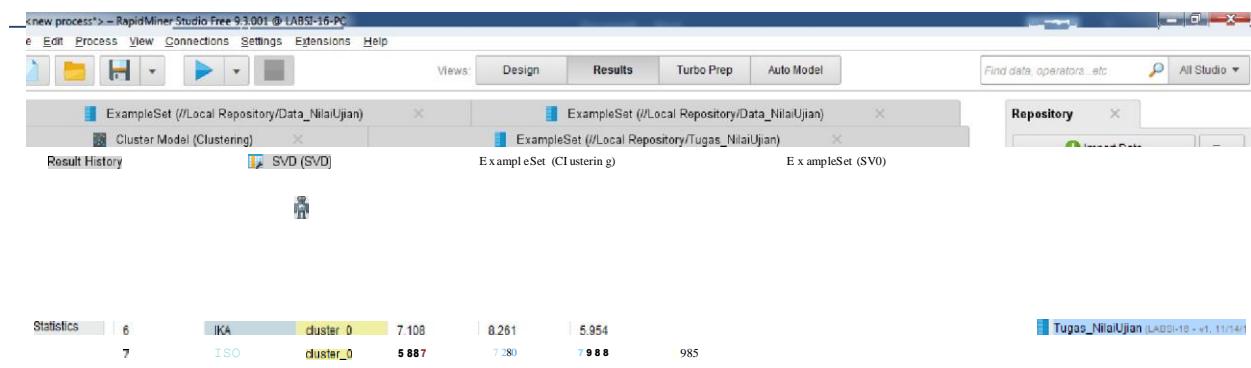
Cumulative Proportion of Singular Values

Singular Value Vectors	Cumulative Proportion (%)
0.00	0.00
1.00	83.00
2.00	90.00
3.00	96.00
4.00	105.00

Singular Value Vectors







Data View:

Row No.	NAMA	cluster ↑	B.IND	B.ING	MTK	IPA
1	JOKO	cluster_2	8.384	9.815	9.782	6.875
11	BUDI	cluster_2	9.862	7.676	9.172	7.827
14	DANI	cluster_2	9.699	7.158	9.680	8.909
15	AHMAD	cluster_2	8.748	8.450	9.205	8.268
28	FEBRI	cluster_2	9.453	9.779	9.820	9.317
30	TONI	cluster_2	9.960	6.408	9.359	9.251
4	DYAH	cluster_3	9.338	6.785	9.153	5.438
17	RISA	cluster_3	8.679	5.779	8.231	7.768
19	YANI	cluster_3	9.516	6.542	9.608	6.306
21	INDAH	cluster_3	7.959	5.186	8.518	6.843
25	BAMBANG	cluster_3	6.303	5.548	8.530	5.503
27	NANA	cluster_3	8.606	5.720	9.228	6.506
29	DENI	cluster_3	6.038	7.337	9.835	6.172

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

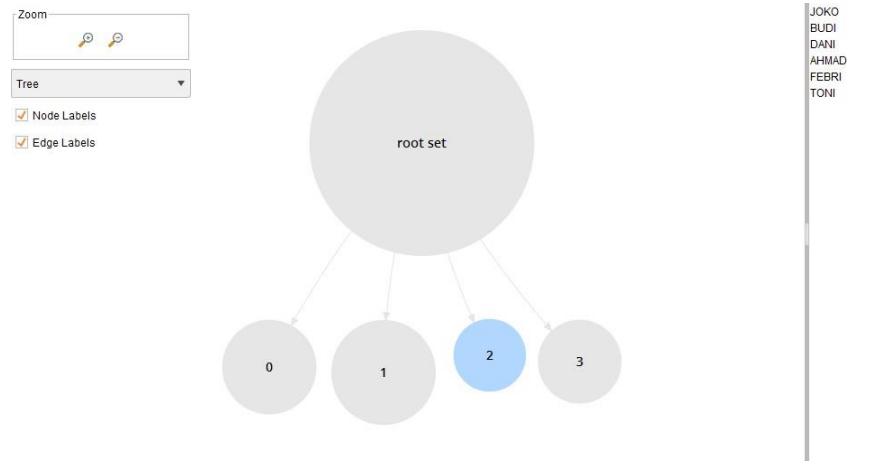
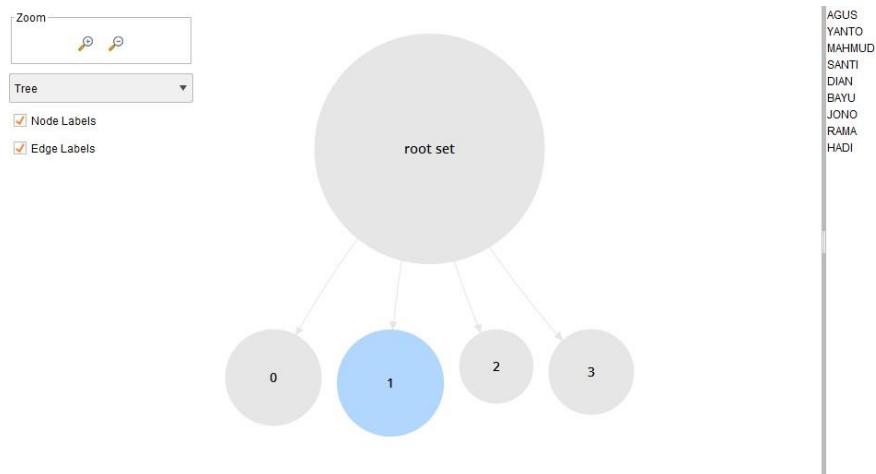
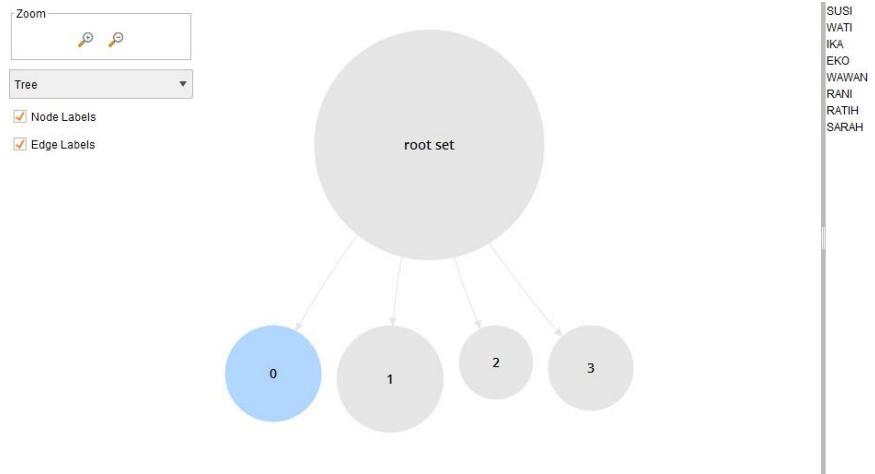
Cluster Model (Clustering) Results:

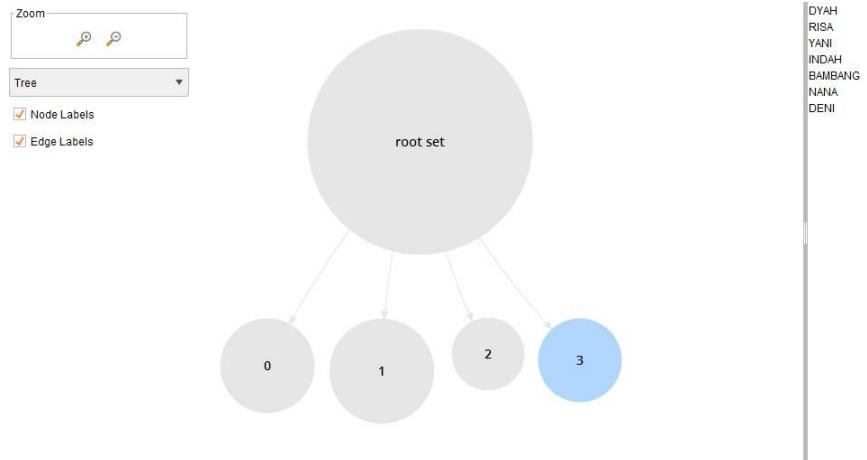
Description:

Cluster 0: 8 items
Cluster 1: 9 items
Cluster 2: 6 items
Cluster 3: 7 items
Total number of items: 30

3. Nama siswa yang terdapat dalam cluster :

- Cluster 0 : Susi, Wati, Ika, Eko, Wawan, Rani, Ratih, Sarah
- Cluster 1 : Agus, Yanto, Mahmud, Santi, Dian, Bayu, Jono, Rama, Hadi
- Cluster 2 : Joko, Budi, Dani, Ahmad, Febri, Toni
- Cluster 3 : Dyah, Risa, Yani, Indah, Bambang, Nana, Deni

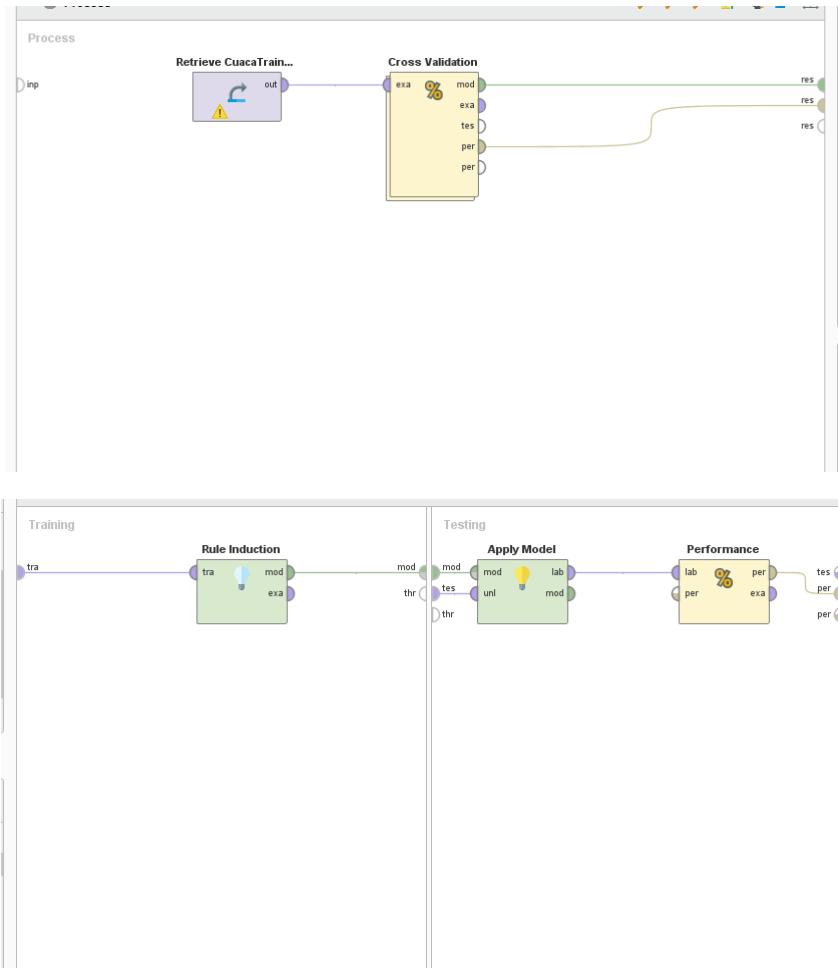




MODUL 11

➤ Kegiatan

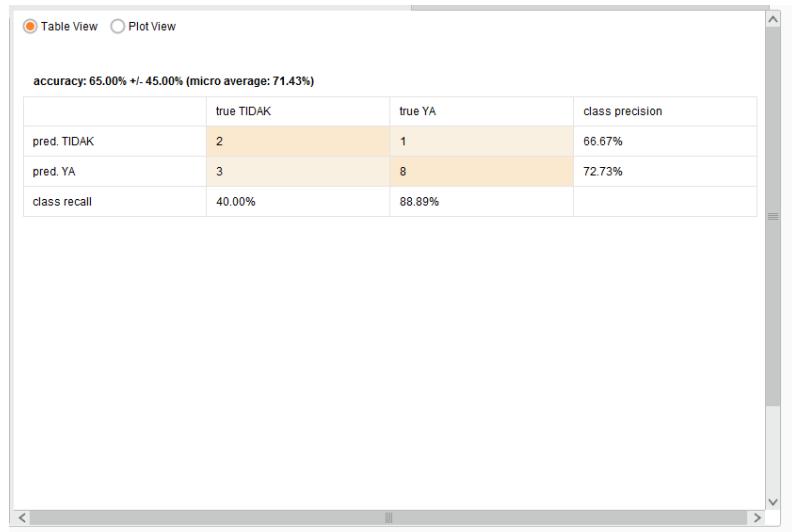
1. Induksi Aturan Cuaca



RuleModel

```
if Kelembaban_udara ≤ 82.500 then YA  (1 / 6)
if Cuaca = Cerah then TIDAK (3 / 0)
if Cuaca = Mendung then YA (0 / 2)
if Suhu ≤ 70.500 then YA (0 / 1)
else TIDAK (0 / 0)

correct: 12 out of 13 training examples.
```



2. Aturan Asosiasi Data Cuaca



a) Frequent Item Set

The screenshot shows the KNIME Analytics Platform interface with two main windows displaying data.

Top Window:

- Left Panel:** Contains a "Data" node icon and an "Annotations" section with dropdowns for "Min. Size" (1), "Max. Size" (4), and "Contains Item". A "Update View" button is also present.
- Table:** Shows frequent item sets for size 1 to 2. The columns are "Size", "Support", "Item 1", "Item 2", "Item 3", and "Item 4".
- Bottom Window:** Shows the same frequent item sets for size 2. The columns are "Size", "Support", "Item 1", "Item 2", "Item 3", and "Item 4".
- Repository:** On the right, under the "Local Repository" section, the "CuacaTraining" node is selected.

Bottom Window:

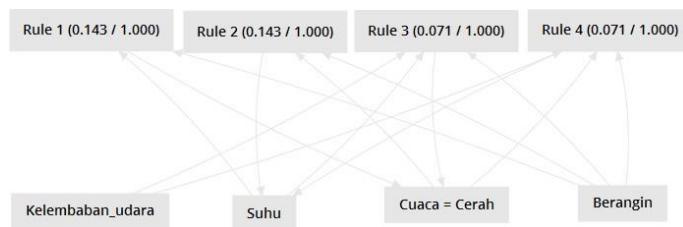
- Left Panel:** Contains a "Data" node icon and an "Annotations" section with dropdowns for "Min. Size" (1), "Max. Size" (4), and "Contains Item". A "Update View" button is also present.
- Table:** Shows frequent item sets for size 2 to 4. The columns are "Size", "Support", "Item 1", "Item 2", "Item 3", and "Item 4".
- Bottom Window:** Shows the same frequent item sets for size 2 to 4. The columns are "Size", "Support", "Item 1", "Item 2", "Item 3", and "Item 4".
- Repository:** On the right, under the "Local Repository" section, the "CuacaTraining" node is selected.

b) **Association Rules**
i. **Table View**

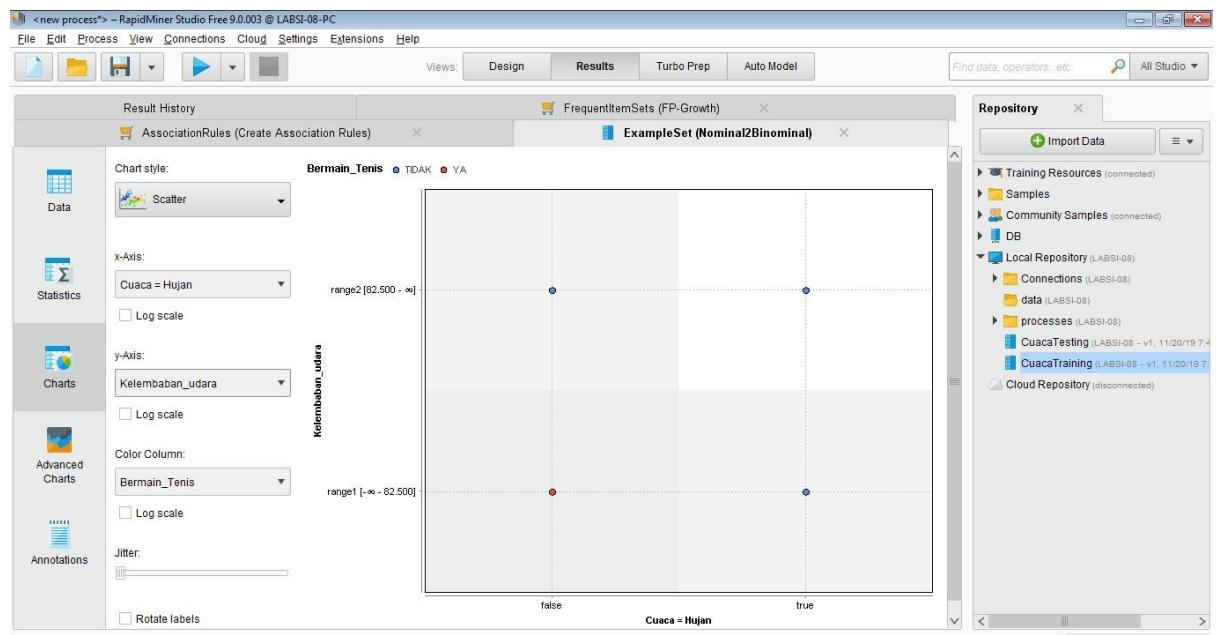
No.	Premises	Conclusion	Support
1	Berangin, Suhu	Cuaca = Cerah	0.143
2	Berangin, Cuaca = Cerah	Suhu	0.143
3	Kelembaban_udara, Berangin, Suhu	Cuaca = Cerah	0.071
4	Kelembaban_udara, Berangin, Cuaca = Cerah	Suhu	0.071

	Support	Confidence	LaPlace	Gain	p-s	Lift	Convicti...
	0.143	1	1	-0.143	0.092	2.800	∞
	0.143	1	1	-0.143	0.082	2.333	∞
	0.071	1	1	-0.071	0.046	2.800	∞
	0.071	1	1	-0.071	0.041	2.333	∞

ii. Graph View



c) Example set



➤ Tugas

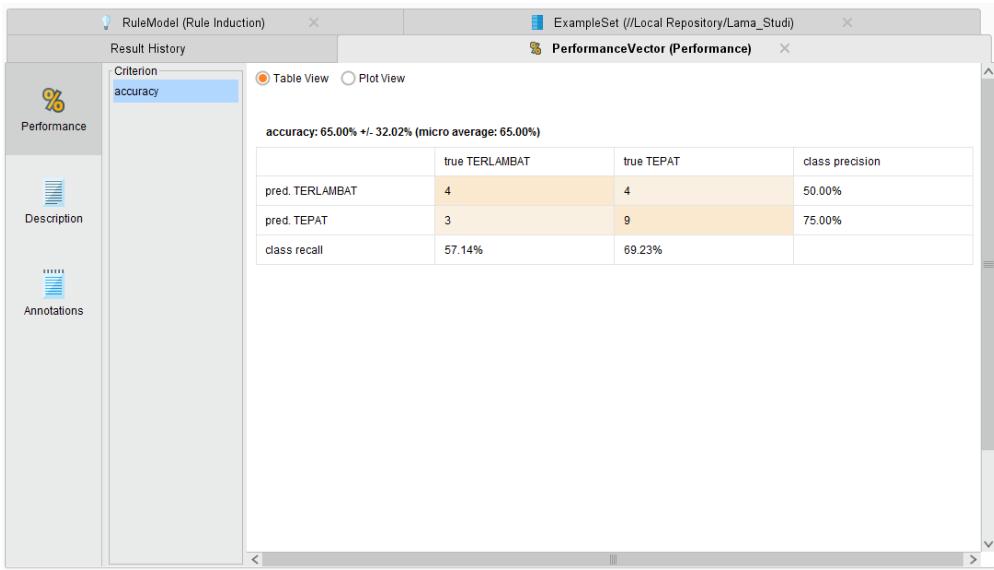
1. Rule Model dan Nilai Performance Vector



RuleModel

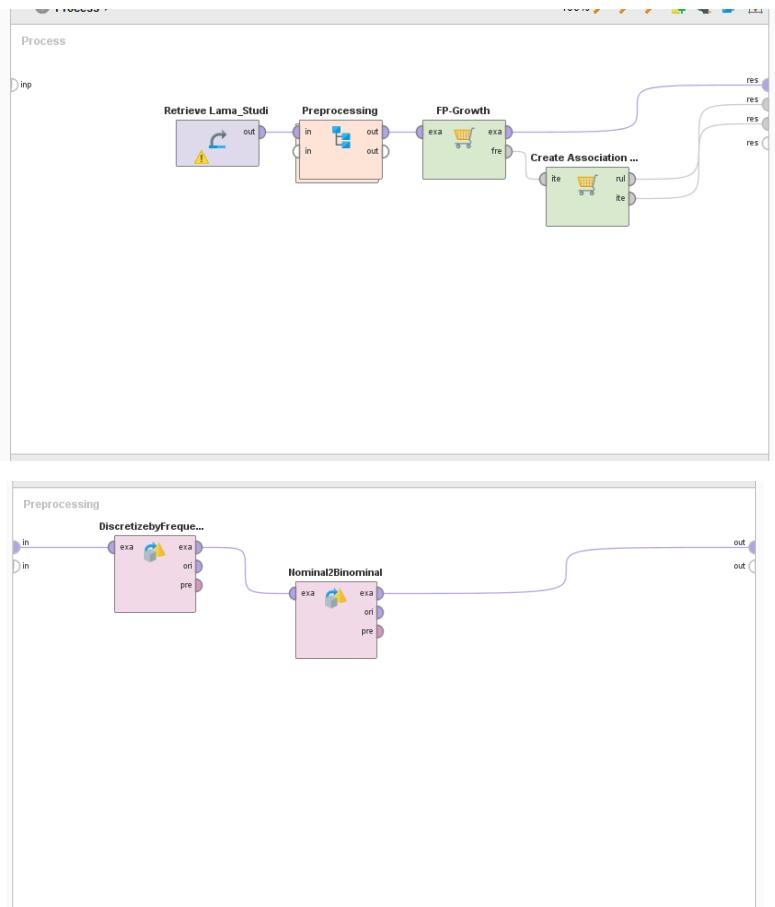
```
if Rerata_SKS > 18.500 then TEPAT (2 / 10)
if Gender = PRIA then TERLAMBAT (4 / 0)
if Jurusan_SMA = IPA then TEPAT (0 / 2)
if Jurusan_SMA = IPS then TERLAMBAT (1 / 0)
else TEPAT (0 / 0)

correct: 17 out of 19 training examples.
```



2. Nilai :

- a) *number of bins = 2*



Views: Design Results Turbo Prep Auto Model

ExampleSet (Nominal2BinomInal)

Result History

No. of Sets: 55

	Size	Support	Item 1	Item 2	Item 3	Item 4	Item 5
Max. Size: 5	1	0.000	Asal_Sekolah				
Contains Item:	1	0.300	Jurusan_SMA = ...				
	2	0.350	Gender	Jurusan_SMA = ...			
	2	0.350	Gender	Jurusan_SMA = ...			
	2	0.250	Gender	Rerata_SKS			
	2	0.150	Jurusan_SMA = ... Asal_Sekolah				
	2	0.200	Jurusan_SMA = ... Asisten				

Views: Design Results Turbo Prep Auto Model

E Ham eSe Nominal2Binomial

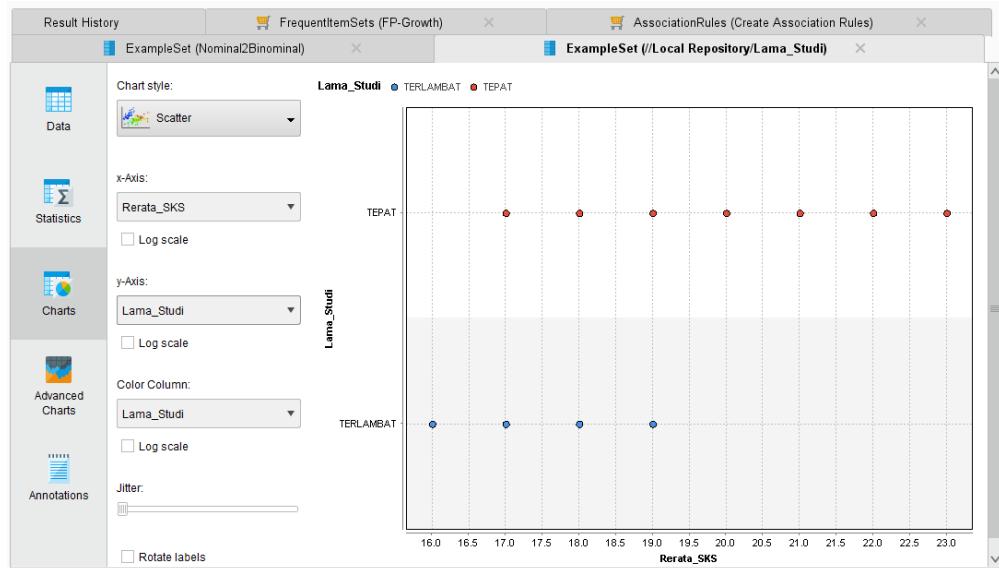
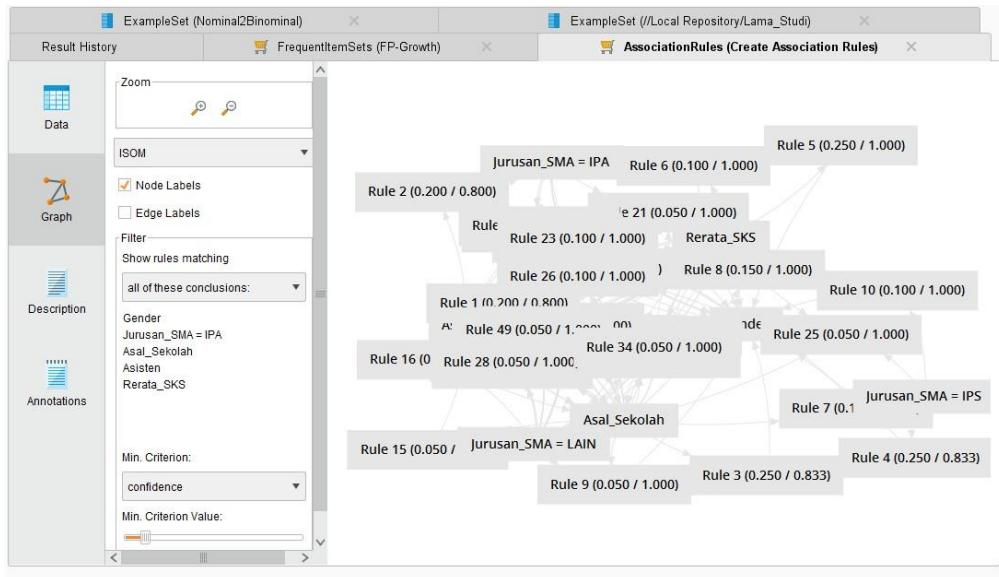
Result History

FrequentItemSets (FP Growth)

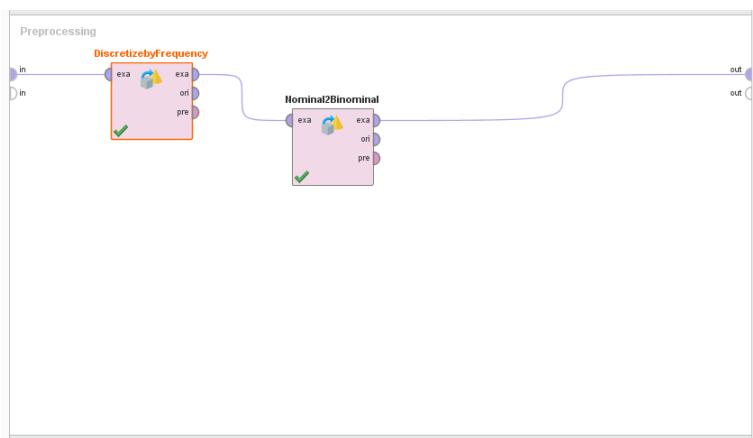
Show rules matching

No.	P	Conclusion	Support
17	Asal_Sekolah, Jurusan_SMA = LAIN	Rerata_SKS	0.100
26	Gender, Asal_Sekolah, Asisten	Rerata_SKS	0.050
33	Asal_Sekolah, Jurusan_SMA = LAIN	Gender, Rerata_SKS	0.050
39	Gender, Asisten, Jurusan_SMA = LAIN	Rerata_SKS	0.050
44	Asal_Sekolah, Jurusan_SMA = LAIN	Asisten, Rerata_SKS	0.050
46	Asal_Sekolah, Asisten, Jurusan_SMA = LAIN	Rerata_SKS	0.050
50	Gender, Jurusan_SMA = IPA, Asal_Sekolah, Asisten	Rerata_SKS	0.050
54	Asal_Sekolah, Jurusan_SMA = LAIN	Gender, Asisten, Rerata_SKS	0.050
56	Asisten, Jurusan_SMA = LAIN	Gender, Asal_Sekolah, Rerata_SKS	0.050
57	Gender, Asisten, Jurusan_SMA = LAIN	Asal_Sekolah, Rerata_SKS	0.050

Min. Criterion Value:



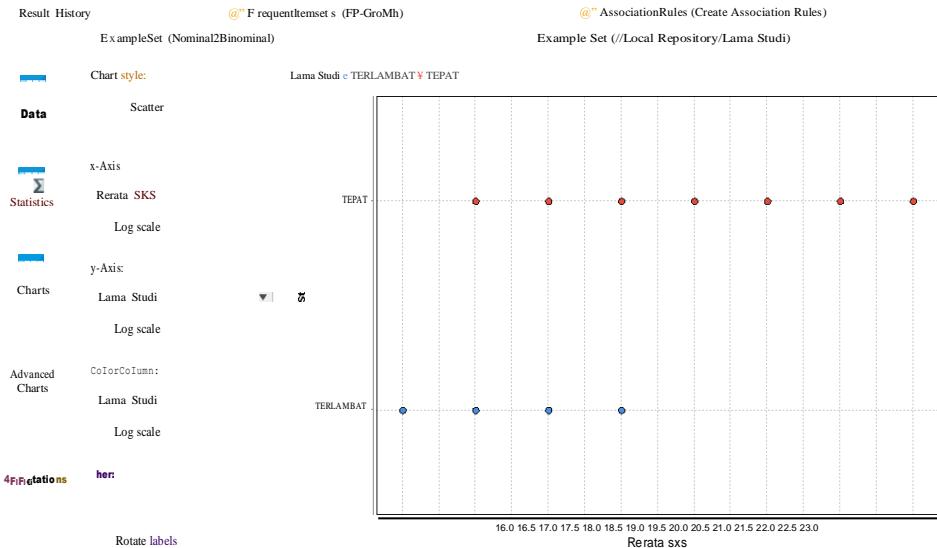
b) number of bins = 3



No. of Sets	Size	support	zem1	Item 2	Item 3	zem4	nems
1	0.250	Asisten					
1	0.200	Jurusan_SMA =					
2	0.250	Gender	Asal_Sekolah				

Asal_Sekolah	5	Rerata_SKS = range2[18.500 - 19.500]	Gender	0.250
Rerata_SKS = range3[19.500 - ∞]	6	Rerata_SKS = range3[19.500 - ∞]	Gender	0.250
	10	Rerata_SKS = range2[18.500 - 19.500], Jurusan_SMA =	Gender	0.050
	12	Asal_Sekolah, Rerata_SKS = range3[19.500 - ∞]	Gender	0.00
	13	Asal_Sekolah, Jurusan_SMA = LAIN	Gender	0.050
	14	t_ppzz_K = vey_9y... Juusa_SY =PS, ReaBKB=ange3{h?0...}	Gender	0.00
Min. Criterion Value:	17	Rerata_SKS = range3[19.500 - ∞], Jurusan_SMA =	Gender	0.050

Result History	FrequentItemSets (FP-Growth)	AssociationRules (Create Association Rules)
Data		Rule 1 (0.100 / 1.00)
		Rule 4 (0.250 / 0.83) ↳ IPS
	✓ Node Labels	"!" 17 (0.050) Rule 25 (0.050 / 1.000) 0.050 / 1.000
		em " " ipm / 1.000j nuie as tooso / 1.000j • 4.000)
Description	" "	Rule 6 (0.250 / 4.000) (0.00 / 1.000)
	Gender	Rule 8 (0.100 / 4.000) R Rule 32 (0.100 / 1.000) 50 / 1.000
	Jurusan_SMA = IPA	Rule 28 (0.050 / 1.000) Rule 56 (0.050 / 4.000) 050 / 1.000
Annotations	Rerata_SKS = range3[19.500 - ∞]	Rule 57 (0.050 / 1.000)
		Rule 19 (0.050 / 1.000j
	nerata sts = range zt4 8.800 - 1s.800j	Jurusan_SMA = IPA SKS = range1 [-∞ - 18.500]
		Rule 18 (0.050 / 4.000j

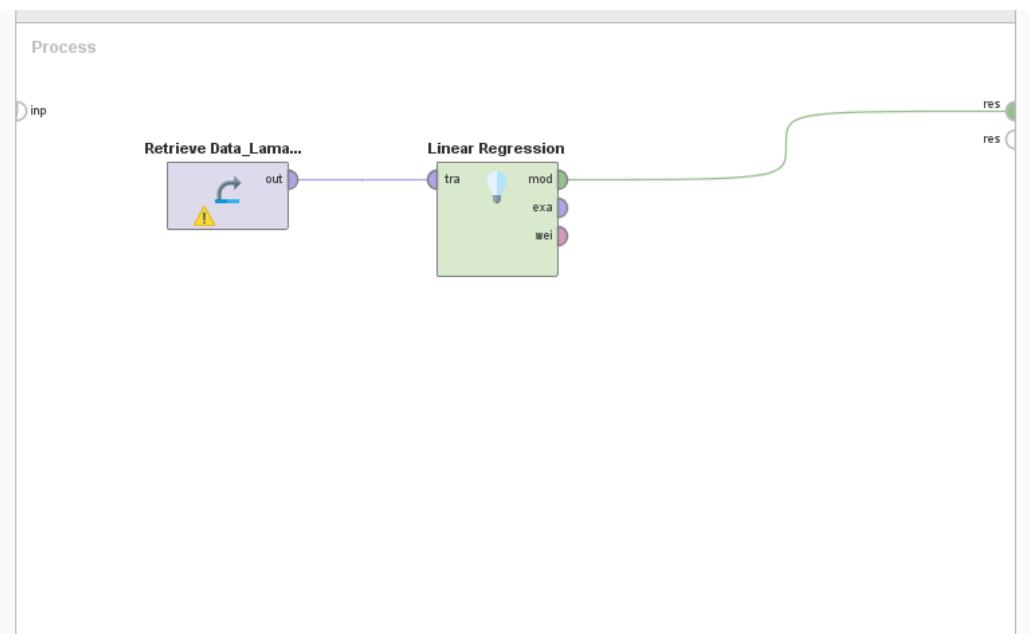


MODUL 12

➤ Kegiatan

1. Mencari nilai t-hitung dan model regresi linear

	A	B	C	D	E
1	NO_SISWA	NAMA	LAMA BELAJAR (JAM)	NILAI	
2	S-101	JOKO	15	783	
3	S-102	AGUS	18	877	
4	S-103	SUSI	7	505	
5	S-104	DYAH	9	860	
6	S-105	WATI	15	968	
7	S-106	IKA	17	793	
8	S-107	EKO	10	752	
9	S-108	YANTO	5	571	
10	S-109	WAWAN	8	667	
11	S-110	MAHMUD	15	723	
12					



LinearRegression (Linear Regression)

Attribute	Coefficient	Std. Error	Std. Coefficient	Tolerance	t-Stat	p-Value	Code
LAMA BELAJAR (JAM)	21.608	7.645	0.707	1	2.827	0.022	**
(Intercept)	492.769	96.909	?	?	5.085	0.001	****

Repository

- Training Resources (connected)
 - Samples
 - Community Samples (connected)
- DB
- Local Repository (user)
 - data (user)
 - processes (user)
 - Data_LamaBelajardanNilaiUjian (user - selected)
- Cloud Repository (disconnected)

Table View

LinearRegression

21.608 * LAMA BELAJAR (JAM)
+ 492.769

Repository

- Training Resources (connected)
 - Samples
 - Community Samples (connected)
- DB
- Local Repository (user)
 - data (user)
 - processes (user)
 - Data_LamaBelajardanNilaiUjian (user - selected)
- Cloud Repository (disconnected)

Text View

2. Mencari nilai t dan model regresi linier menggunakan RapidMiner

	A	B	C	D
1	NO_SISWA	NAMA	LAMA BELAJAR (JAM)	
2	S-111	BUDI	12	
3	S-112	SANTI	13	
4	S-113	DIAN	14	
5	S-114	DANI	11	
6	S-115	AHMAD	5	
7	S-116	BAYU	13	
8	S-117	RISA	9	
9	S-118	RANI	10	
10	S-119	YANI	10	
11	S-120	RATIH	9	
12				

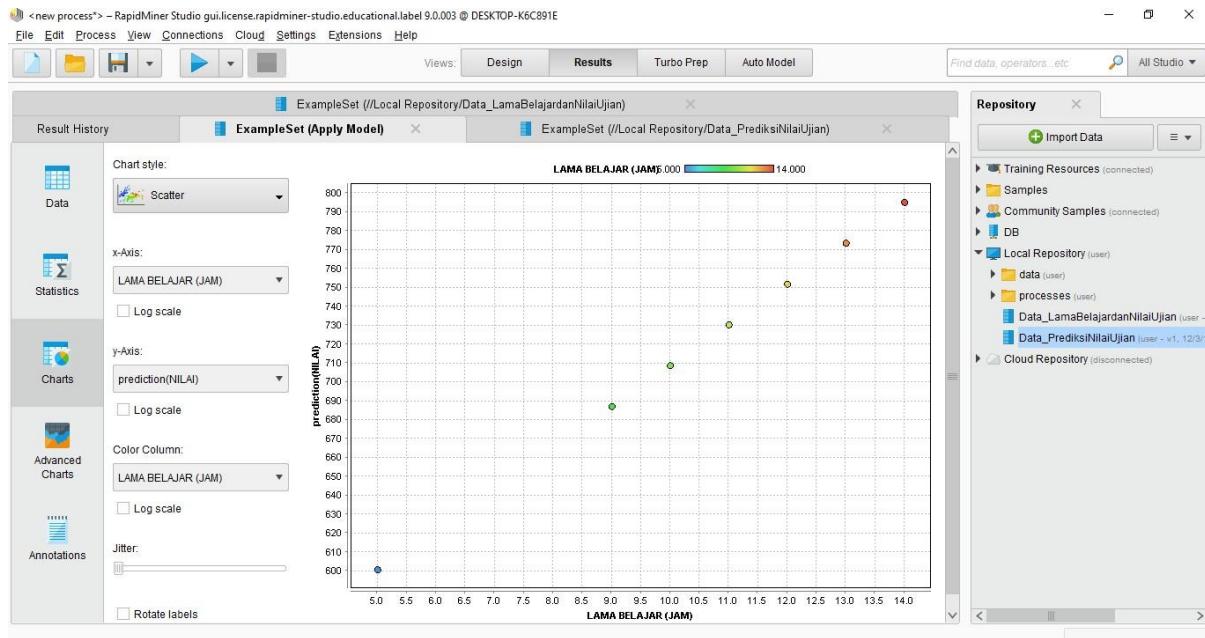
Retrieve Data_Lama... **Linear Regression** **Apply Model**

out

mod

mod

lab



3. Pembuktian Model Regresi

	A	B	C	D	E	F
1	NO_SISWA	NAMA	LAMA BELAJAR (JAM)	Prediction(NILAI) Tabel	Prediction(NILAI) Model Regresi	
2	S-111	BUDI	12	752,061	752,065	
3	S-112	SANTI	13	773,668	773,673	
4	S-113	DIAN	14	795,276	795,281	
5	S-114	DANI	11	730,453	730,457	
6	S-115	AHMAD	5	600,807	600,809	
7	S-116	BAYU	13	773,668	773,673	
8	S-117	RISA	9	687,238	687,241	
9	S-118	RANI	10	708,845	708,849	
10	S-119	YANI	10	708,845	708,849	
11	S-120	RATIH	9	687,238	687,241	
12						
13						

➤ Tugas

1. Excel

	A	B	C	D	E
1	NO. RESPONDEN	PENDAPATAN (RUPIAH)	JUMLAH ANGGOTA KELUARGA	DAYA BELI (RUPIAH)	
2	1	1.000.000	6	834.000	
3	2	1.400.000	7	1.200.000	
4	3	200.000	3	134.000	
5	4	1.400.000	6	1.167.000	
6	5	500.000	3	334.000	
7	6	1.700.000	5	1.360.000	
8	7	400.000	3	267.000	
9	8	1.900.000	5	1.520.000	
10	9	300.000	3	200.000	
11	10	500.000	4	375.000	
12	11	700.000	7	600.000	
13	12	1.900.000	3	1.267.000	
14	13	800.000	4	600.000	
15	14	1.500.000	4	1.125.000	
16	15	1.300.000	7	1.115.000	
17					
18					
19					

2. Proses Regresi Linier Sederhana

Retrieve Tugae
| *E* !!

Linear Regression
tra mod
exa
Rei)

...

Leverage the **Wisdom of Crowds** to get operator recommendations based on your process design!

a. Table View

Attribute	Coefficient	Std. Error	Std. Coefficient	Tolerance	t-Stat	p-Value	Code
PENDAPATAN (RUPIAH)	0.739	0.021	0.924	0.857	35.037	0.000	****
JUMLAH ANGGOTA KELUARGA	47807.624	7833.319	0.161	0.857	6.103	0.000	****
(Intercept)	-180222.487	36497.284	?	?	-4.938	0.000	****

b. Text View

LinearRegression

```
0.739 * PENDAPATAN (RUPIAH)
+ 47807.624 * JUMLAH ANGGOTA KELUARGA
- 180222.487
```

3. Berdasarkan aturan statistik, variable x tidak mempengaruhi secara signifikan terhadap y karena nilai t-hitung > t-table

4. Model persamaan regresi linier sederhana yang terbentuk

The screenshot shows the RapidMiner Studio interface with the 'LinearRegression (Linear Regression)' process selected. The 'Results' tab is active. The model output is displayed as:

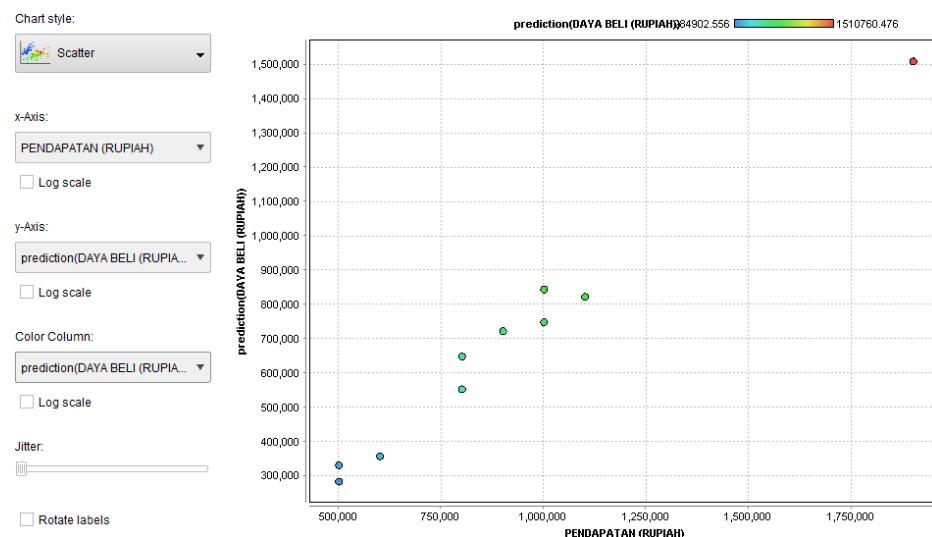
$$0.739 \times \text{PENDAPATAN (RUPIAH)} + 47807.624 \times \text{JUMLAH ANGGOTA KELUARGA} - 180222.487$$

5. Data Testing

A	B	C	D	E	F
NO. RESPONDEN	PENDAPATAN (RUPIAH)	JUMLAH ANGGOTA KELUARGA	Prediction(Daya Beli(Rupiah)) Tabel	Prediction(Daya Beli(Rupiah)) Model Regresi	
1	900.000	5	723933,263	723915,633	
2	800.000	3	554416,056	554400,385	
3	500.000	2	284902,556	284892,761	
4	1.900.000	6	1510760,476	1510723,257	
5	600.000	2	358804,515	358792,761	
6	800.000	5	650031,304	650015,633	
7	1.000.000	6	845642,845	845623,257	
8	1.100.000	4	823929,557	823908,009	
9	1.000.000	4	750027,598	750008,009	
10	500.000	3	332710,179	332700,385	
11					
12					
13					
14					

6. Plot View

- a) x-Axis = Pendapatan (Rupiah),
- y-Axis = Prediction (Daya Beli (Rupiah)),
- Color Column = Prediction (Daya Beli (Rupiah))



- b) x-Axis = Jumlah Anggota Keluarga,
y-Axis = Prediction (Daya Beli (Rupiah)),
Color Column = Prediction (Daya Beli (Rupiah))

