

EKSPLORASI ETL TOOLS

DATA WAREHOUSE



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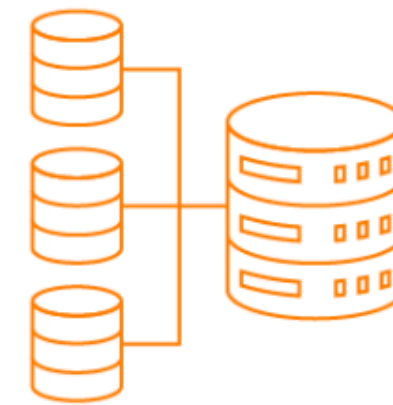
ETL (EXTRACT TRANSFORM LOAD)

Extract, transform, load (ETL) adalah proses komputasi tiga tahap di mana data diekstrak dari sumber input, ditransformasikan (termasuk pembersihan), dan dimuat ke dalam wadah data output. Data dapat dikumpulkan dari satu atau beberapa sumber dan juga dapat dikeluarkan ke satu atau beberapa tujuan. Menurut Pusadan (2013), proses ETL berfungsi untuk mengekstrak dan mengintegrasikan data dari berbagai sumber ke dalam data warehouse dalam selang waktu tertentu.

PROSES ETL

Sumber: The Customize Windows
<https://thecustomizewindows.com/2019/08/what-is-etl-extract-transform-and-load/>

The ETL Process Explained



Extract

Retrieves and verifies data from various sources



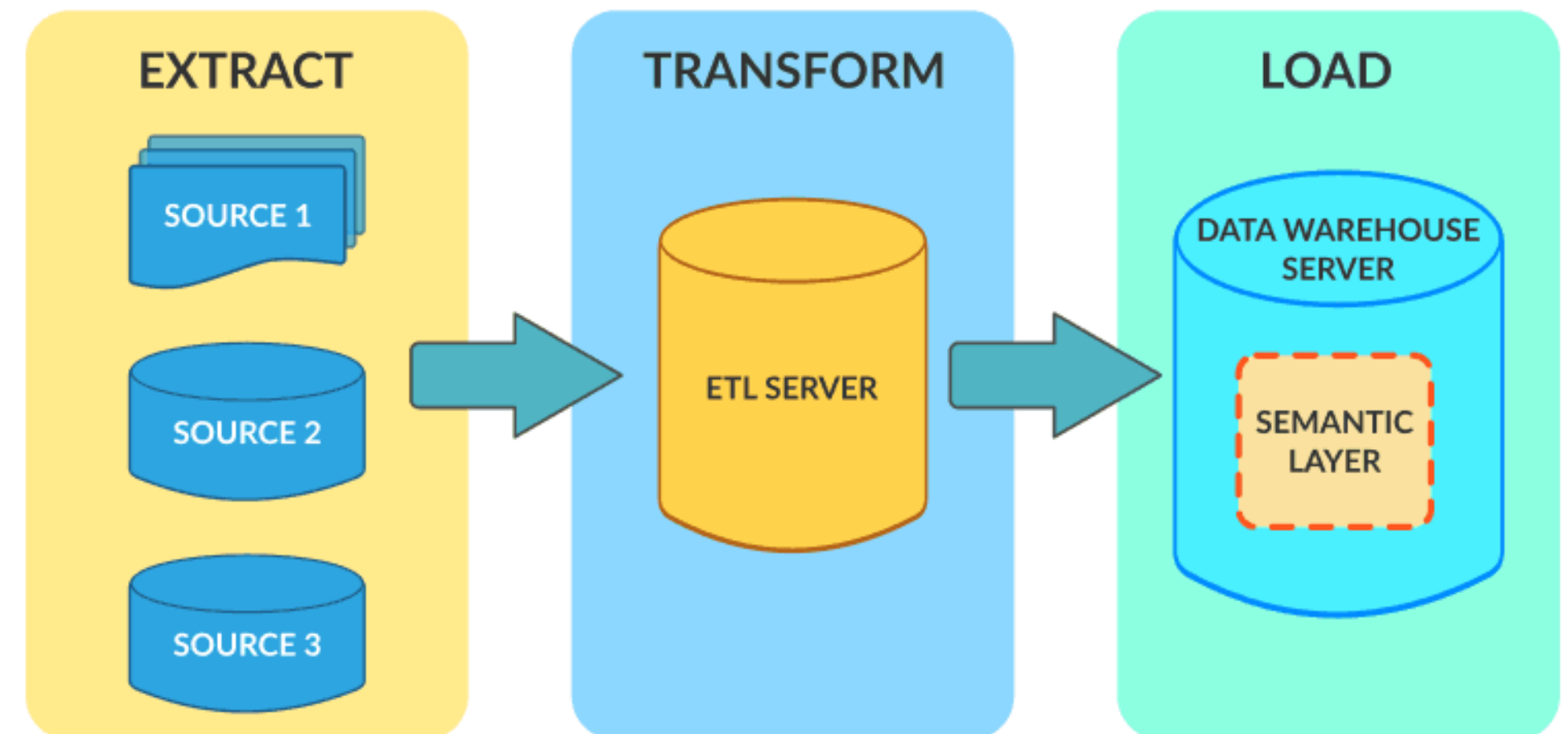
Transform

Processes and organizes extracted data so it is usable



Load

Moves transformed data to a data repository



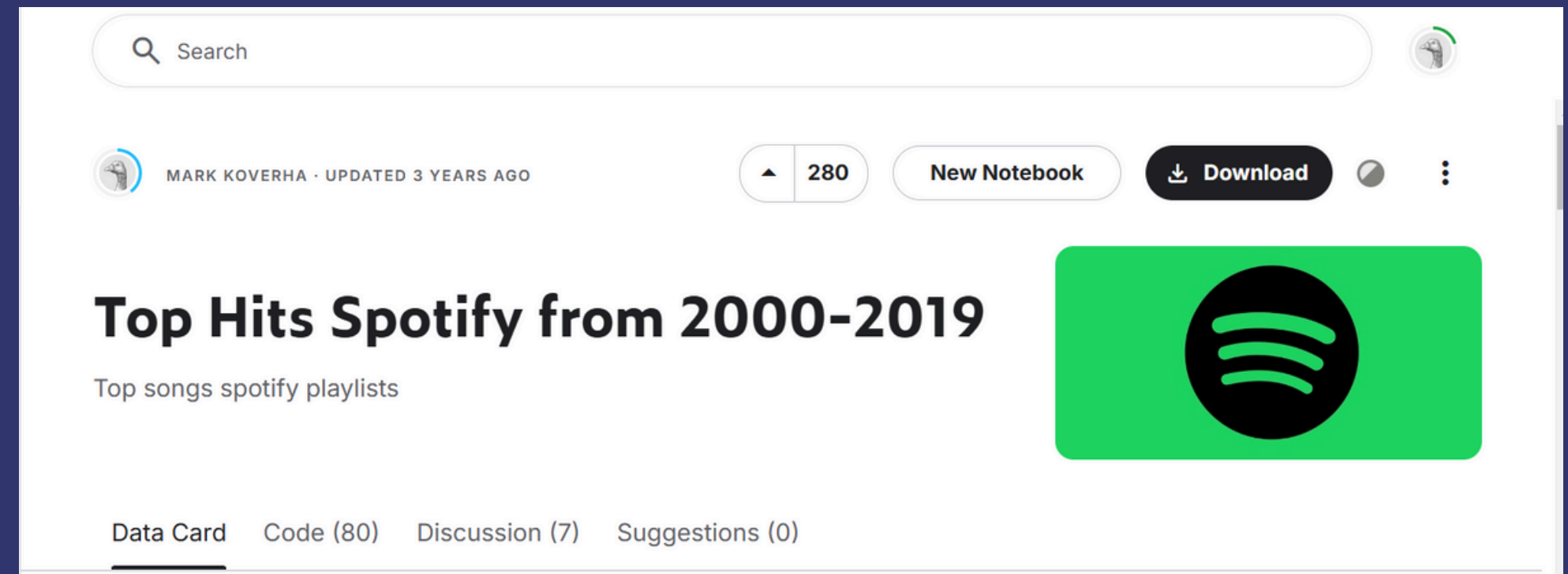
TOOLS YANG DIGUNAKAN



DATASET

Dataset ini berisi statistik audio dari 2000 lagu teratas di Spotify dari tahun 2000 hingga 2019. Data ini berisi sekitar 18 kolom yang masing-masing menjelaskan lagu dan kualitasnya (artist, song, duration_ms, explicit, year, popularity, danceability, energy, key, loudness, mode, speechiness, acousticness, instrumentalness, liveness, valence, tempo, genre).

<https://www.kaggle.com/paradis enjoy/top-hits-spotify-from-20002019>

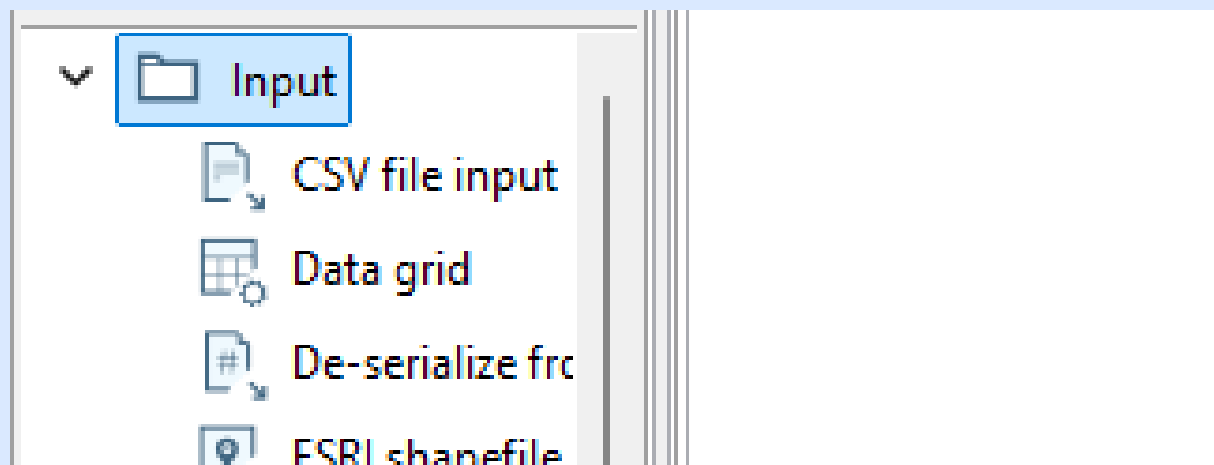


Data Explorer

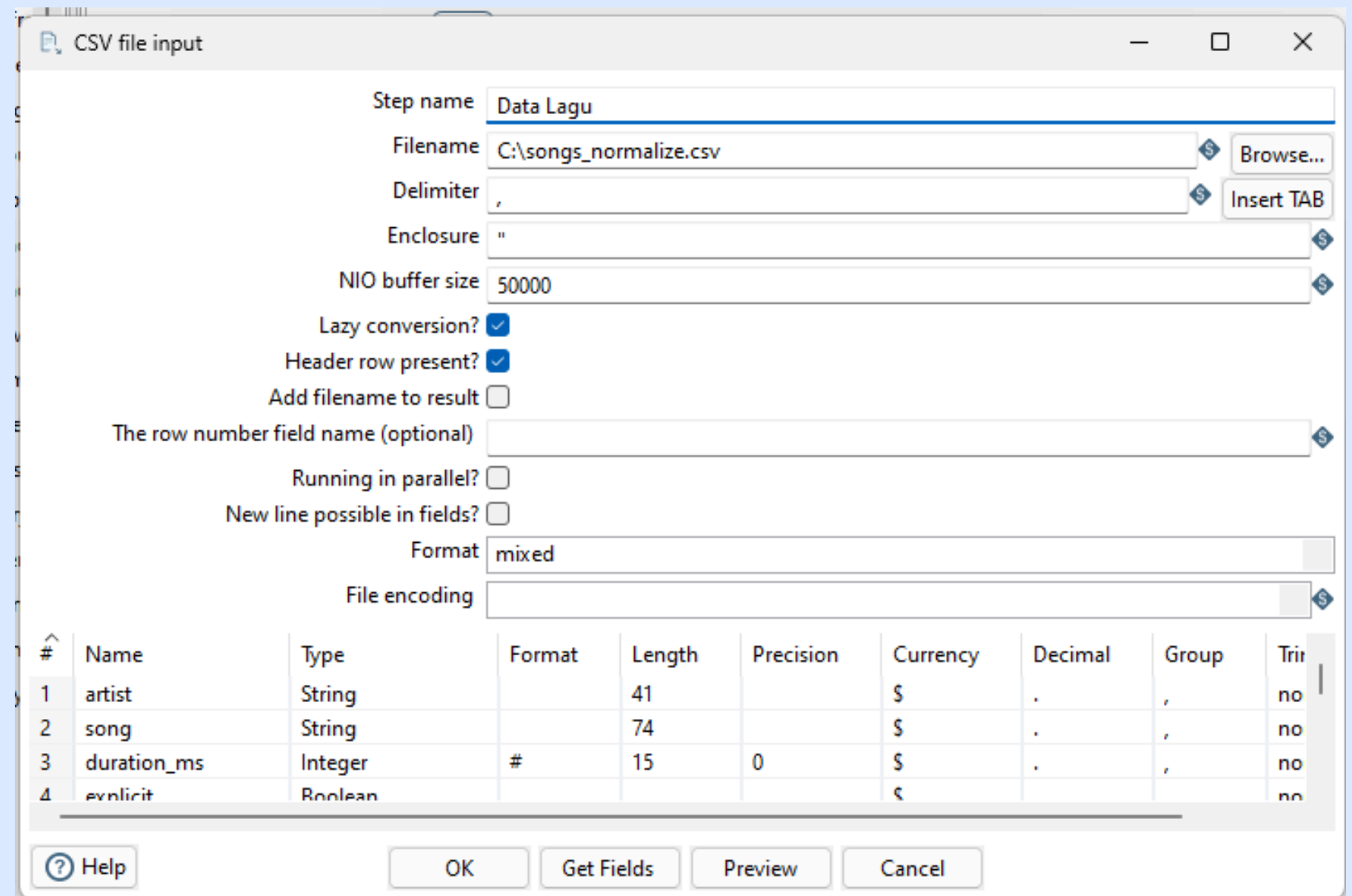
254.99 kB

 songs_normalize.csv

PERCOBAAN TOOL PENTAHO



Extraks terlebih dahulu sumber data yang akan diproses dan sesuaikan jenis sumber datanya, disini kami mengambil data set dari kaggle dengan ekstensi csv



Examine preview data

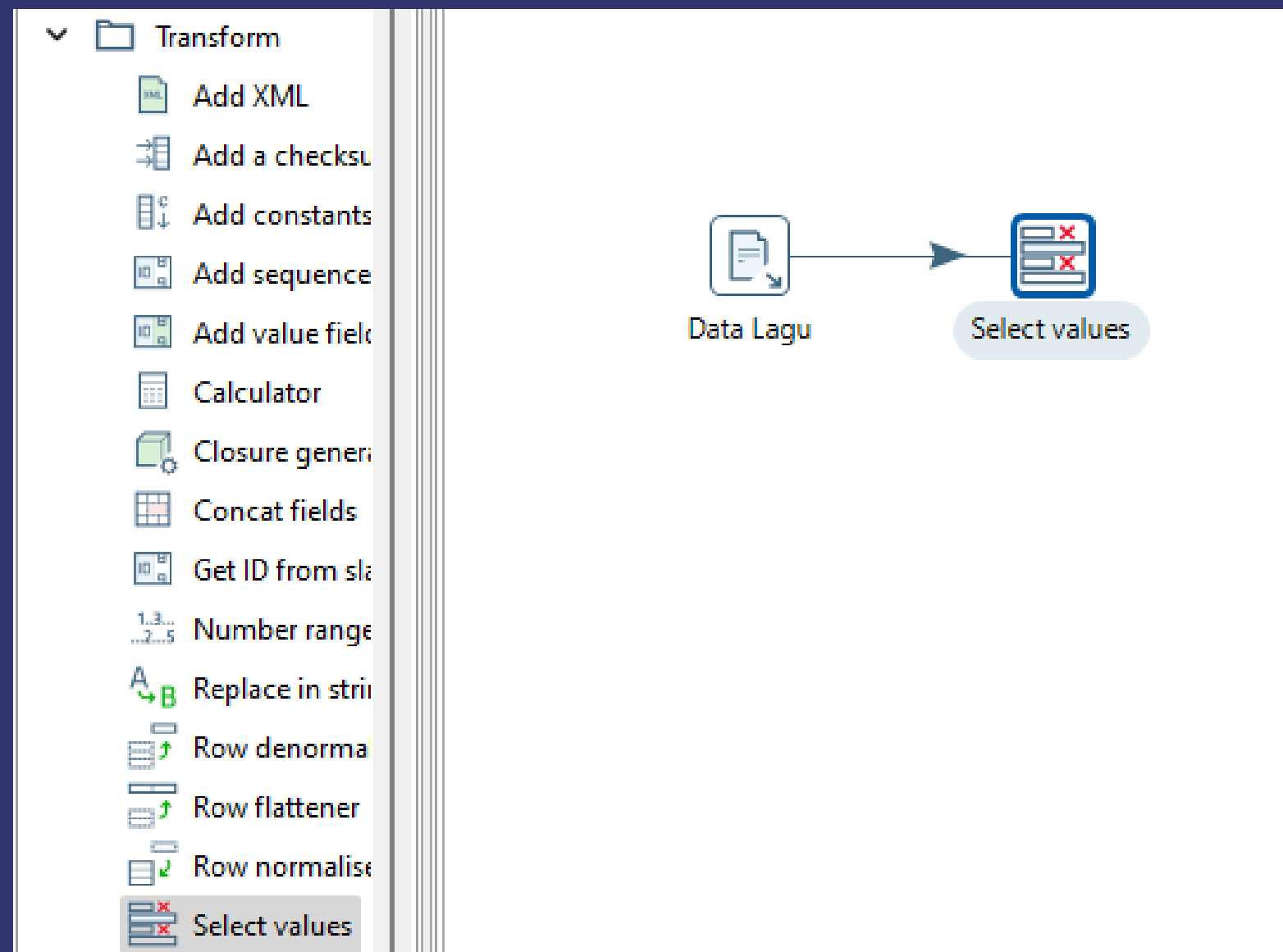
Rows of step: Data Lagu (1000 rows)

artist	song	duration_ms	explicit	year	popularity	danceability	energy	key	loudness	mode	speechiness	acousticness	instrumentalness	liveness	valence	tempo	genre
Britney Spears	Oops!...I Did It Again	211160	N	2000	77	0.8	0.8	1	-5.4	0	0	0.3	1.77e-05	0.4	0.9	95.1	pop
blink-182	All The Small Things	167066	N	1999	79	0.4	0.9	0	-4.9	1	0	0.0103	0.0	0.6	0.7	148.7	rock, pop
Faith Hill	Breathe	250546	N	1999	66	0.5	0.5	7	-9	1	0	0.173	0.0	0.3	0.3	136.9	pop, country
Bon Jovi	It's My Life	224493	N	2000	78	0.6	0.9	0	-4.1	0	0	0.0263	1.35e-05	0.3	0.5	120	rock, metal
*NSYNC	Bye Bye Bye	200560	N	2000	65	0.6	0.9	8	-4.8	0	0.1	0.0408	0.00104	0.1	0.9	172.7	pop
Sisqo	Thong Song	253733	Y	1999	69	0.7	0.9	2	-7	1	0.1	0.119	9.64e-05	0.1	0.7	121.5	hip hop, pop, R&B
Eminem	The Real Slim Shady	284200	Y	2000	86	0.9	0.7	5	-4.2	0	0.1	0.0302	0.0	0	0.8	104.5	hip hop
Robbie Williams	Rock DJ	258560	N	2000	68	0.7	0.8	7	-4.3	1	0	0.0267	0.0	0.5	0.9	103	pop, rock
Destiny's Child	Say My Name	271333	N	1999	75	0.7	0.7	5	-3.5	0	0.1	0.273	0.0	0.1	0.7	138	pop, R&B
Modjo	Lady - Hear Me Tonight	307153	N	2001	77	0.7	0.8	6	-5.6	1	0	0.00793	0.0293	0.1	0.9	126	Dance/Electronic
Gigi D'Agostino	L'Amour Toujours	238759	N	2011	1	0.6	0.7	7	-7.9	1	0	0.0328	0.0482	0.4	0.8	139.1	pop
Eiffel 65	Move Your Body - Gabry Ponte Original Radio Edit	268863	N	1999	56	0.7	1	7	-9.7	1	0	0.0813	0.324	0.5	1	130	pop
Bomfunk MC's	Freestyler	306333	N	2000	55	0.8	0.9	11	-5.8	0	0.1	0.0291	0.325	0.3	0.6	163.8	pop
Sting	Desert Rose	285960	N	1999	62	0.6	0.7	0	-7.9	0	0	0.011	0.0	0.1	0.1	112	rock, pop
Melanie C	Never Be The Same Again	294200	N	1999	61	0.7	0.7	3	-5.2	1	0	0.0921	0.0	0.1	0.4	160.1	pop, Dance/Electronic
Aaliyah	Try Again	284000	N	2002	53	0.8	0.6	6	-5.6	0	0.3	0.0807	0.0	0.1	0.7	93	hip hop, pop, R&B
Anastacia	I'm Outta Love - Radio Edit	245400	N	1999	64	0.8	0.7	10	-5.8	0	0.1	0.396	0.0	0.1	0.6	119.4	pop
Alice DeeJay	Better Off Alone	214883	N	2000	73	0.7	0.9	8	-6.1	0	0.1	0.00181	0.691	0.3	0.8	137	pop
Gigi D'Agostino	The Riddle	285426	N	1999	64	0.7	0.9	6	-6.9	0	0	0.0173	0.00152	0.1	0.8	127	pop
Dr. Dre	The Next Episode	161506	Y	1999	82	0.9	0.9	10	-2.4	0	0.3	0.0281	0.0	0.1	0.3	95.3	hip hop
Linkin Park	In the End	216880	N	2000	83	0.6	0.9	3	-5.9	0	0.1	0.00958	0.0	0.2	0.4	105.1	rock, metal
Tom Jones	Sexbomb	211893	N	1999	65	0.8	0.9	8	-3.9	0	0	0.144	1.38e-05	0.1	0.9	123	rock, Folk/Acoustic, ea
Sonique	It Feels So Good	240866	N	2000	62	0.6	0.7	5	-7.3	0	0	0.0117	0.00103	0.1	0.6	135	pop
M.O.P.	Cold as Ice	244466	Y	2000	54	0.7	0.9	11	-5.4	0	0.1	0.0421	0.0	0.3	0.8	85.6	hip hop
Melanie C	I Turn To You	352173	N	1999	54	0.5	0.8	1	-5.8	1	0	0.00117	0.00167	0.3	0.1	135.2	pop, Dance/Electronic
Limp Bizkit	Take A Look Around	321040	N	2000	72	0.4	0.9	11	-5.6	1	0	0.0175	0.306	0.1	0.5	102	metal
Darude	Sandstorm	225493	N	2001	69	0.5	1	11	-8	0	0	0.141	0.985	0.1	0.6	136.1	pop, Dance/Electronic
Da Brat	What'chu Like (feat. Tyrese)	221160	Y	2000	53	0.9	0.7	10	-9	0	0.2	0.017	0.0	0.1	0.8	100	hip hop, pop, R&B
Moloko	The Time Is Now	318280	N	2000	54	0.7	0.7	9	-10.6	0	0.2	0.35	0.000129	0.3	0.5	128	pop, Dance/Electronic
Chicane	Don't Give Up	210786	N	2016	47	0.6	0.7	10	-9.6	0	0	0.00145	0.504	0.1	0.5	132	Dance/Electronic
DMX	Party Up	268866	Y	1999	71	0.5	0.9	11	-3.3	1	0.3	0.0738	0.0	0.5	0.5	201.9	hip hop, pop
Deborah Morgan	Dance with Me	220106	N	2000	49	0.8	0.7	7	-8	0	0	0.309	0.000645	0	0.7	115	pop, R&B
Madonna	Music	225973	N	2000	58	0.7	0.8	7	-8.5	1	0.1	0.00149	0.0876	0.1	0.9	119.9	pop
Ruff Endz	No More	242560	N	2000	52	0.8	0.6	10	-5.7	0	0.1	0.0324	4.56e-06	0.1	0.9	97	R&B
Britney Spears	Born to Make You Happy	243533	N	1999	58	0.6	0.9	11	-4.8	0	0	0.116	0.000465	0.1	0.7	84.1	pop
Montell Jordan	Get It On Tonite	276266	N	1999	59	0.8	0.5	10	-9.9	0	0.1	0.241	4.61e-05	0.1	0.9	99	hip hop, pop, R&B
Kylie Minogue	Spinning Around	207866	N	2000	55	0.8	0.7	6	-7.6	0	0.1	0.292	6.19e-05	0.1	0.6	120	pop, Dance/Electronic
JAY-Z	Big Pimpin'	283066	Y	1999	69	0.9	0.8	11	-6.3	0	0.1	0.168	0.00672	0.1	0.9	138.1	hip hop
LeAnn Rimes	I Need You	229826	N	2001	61	0.5	0.7	7	-7.1	1	0	0.02	9.58e-05	0.1	0.6	144.7	pop, country
Avant	Separated	255600	N	2000	55	0.8	0.5	0	-5.6	1	0	0.247	0.0	0.2	0.6	108.2	pop, R&B
Enrique Iglesias	Be With You	219360	N	1999	54	0.7	0.9	1	-5.4	0	0	0.0395	0.00161	0	0.5	122	pop, latin
Toni Braxton	He Wasn't Man Enough	261933	N	2000	66	0.7	0.9	11	-1.9	0	0	0.00916	3.14e-05	0.3	0.8	88	pop, R&B
Bow Wow	Bounce With Me (feat. Xscape) - Edited Album Version	175893	N	2000	36	0.9	0.8	8	-5.2	1	0.2	0.434	0.0	0.3	0.9	72	hip hop, pop, R&B
Dr. Dre	Forgot About Dre	222293	Y	1999	79	0.9	0.7	8	-1.3	1	0.1	0.0827	0.0	0.2	0.6	134	hip hop
Missy Elliott	Hot Boyz	215466	Y	1998	49	0.7	0.4	1	-11.2	1	0.3	0.339	0.0	0.2	0.5	81.1	hip hop, pop, R&B
Backstreet Boys	Show Me the Meaning of Being Lonely	234960	N	1999	68	0.6	0.6	6	-5.1	0	0	0.231	0.0	0.1	0.7	168	pop

Close

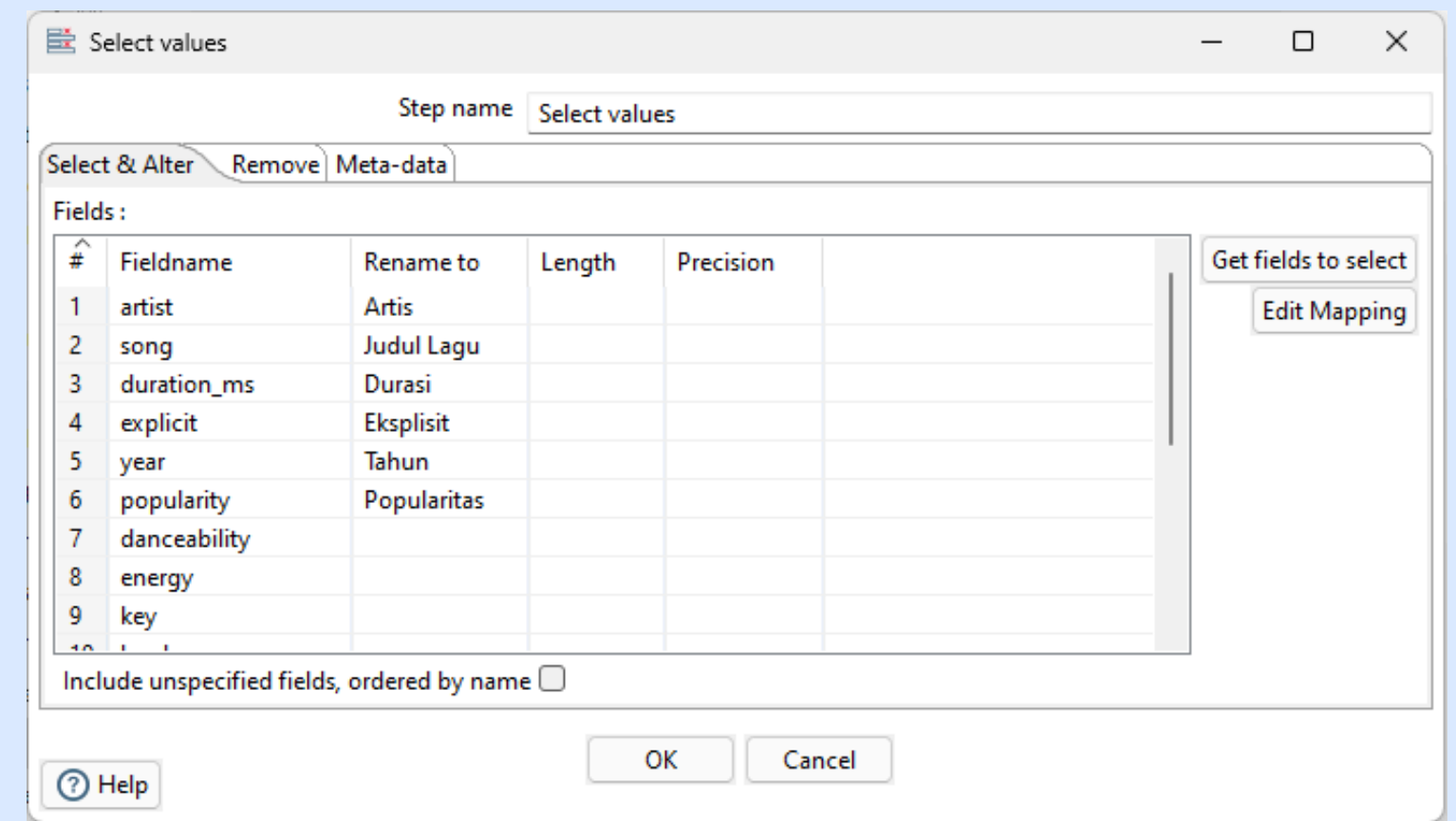
Show Log

Preview data inputan

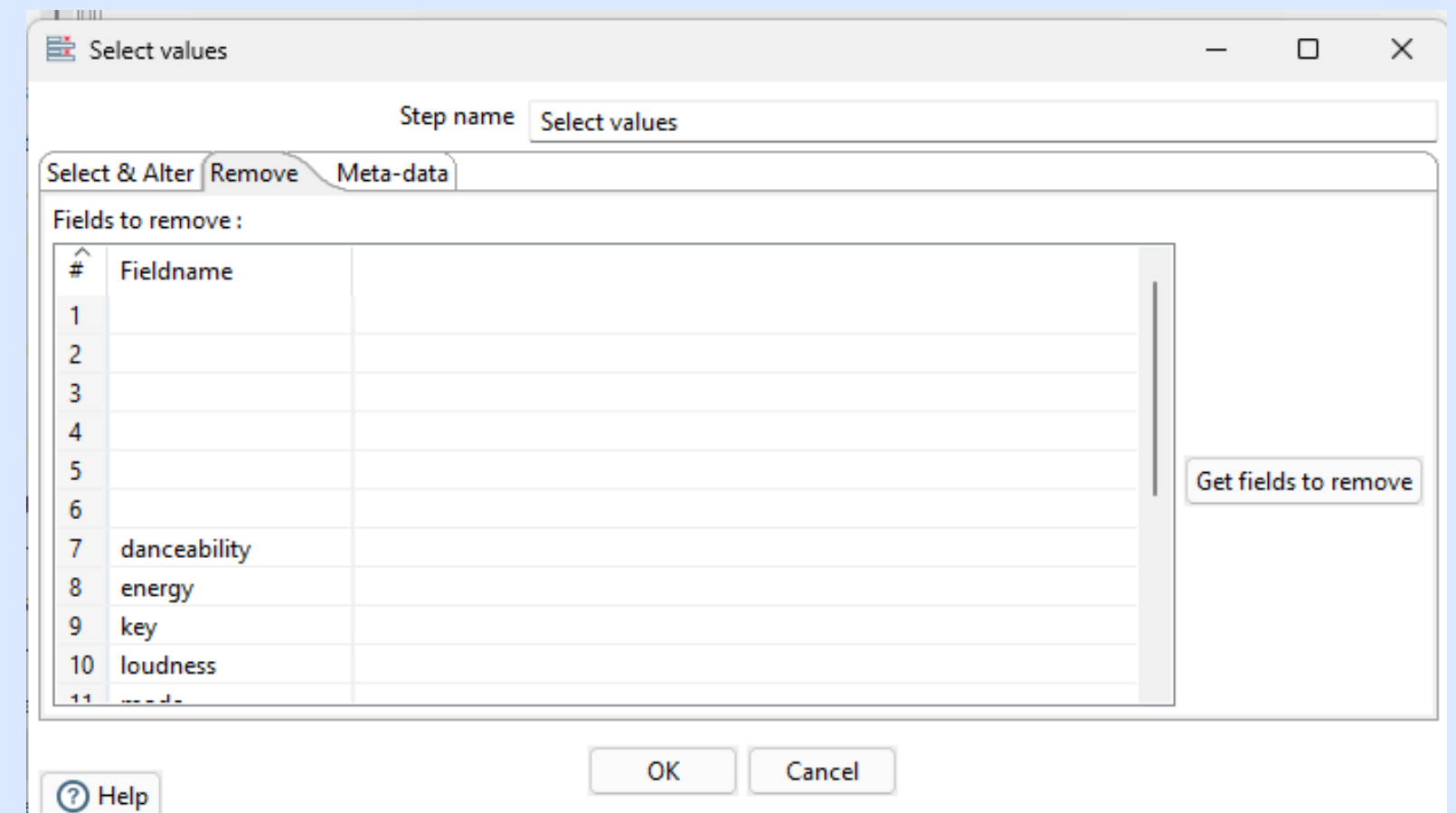


Transform data

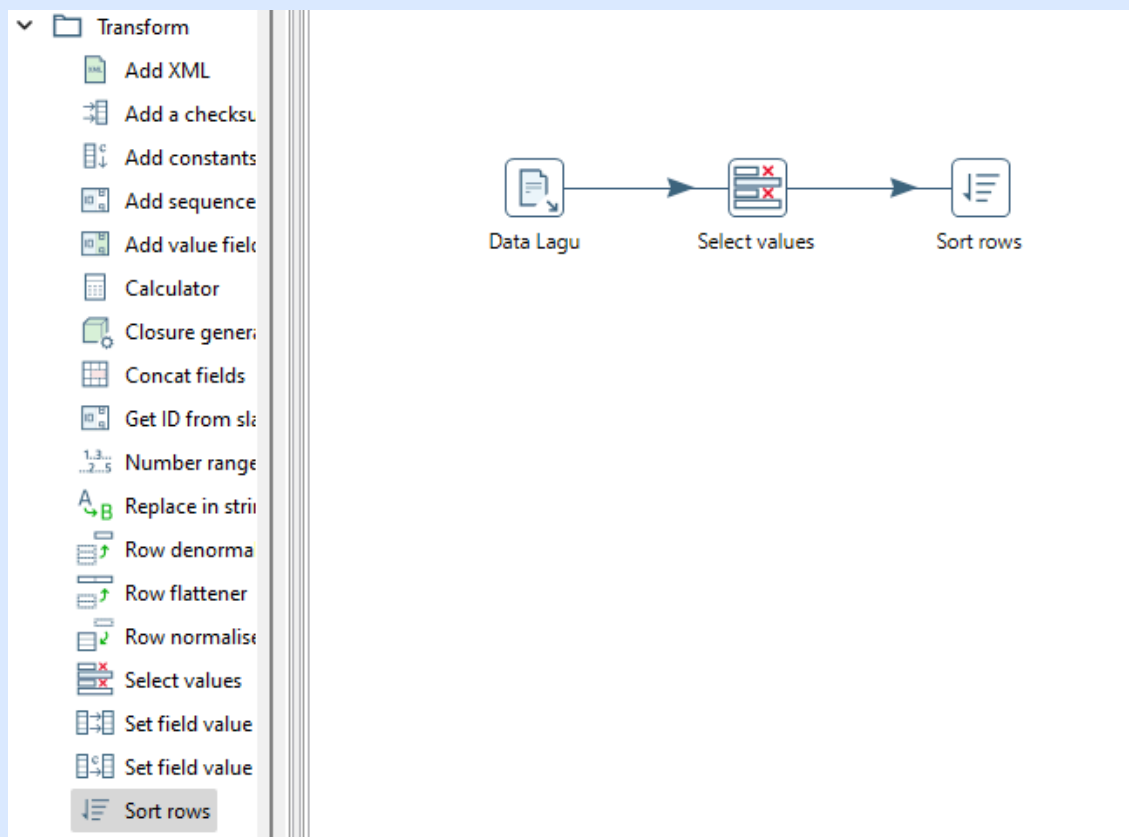
Digunakan untuk menyortir kolom kolom yang dibutuhkan dan tidak dibutuhkan



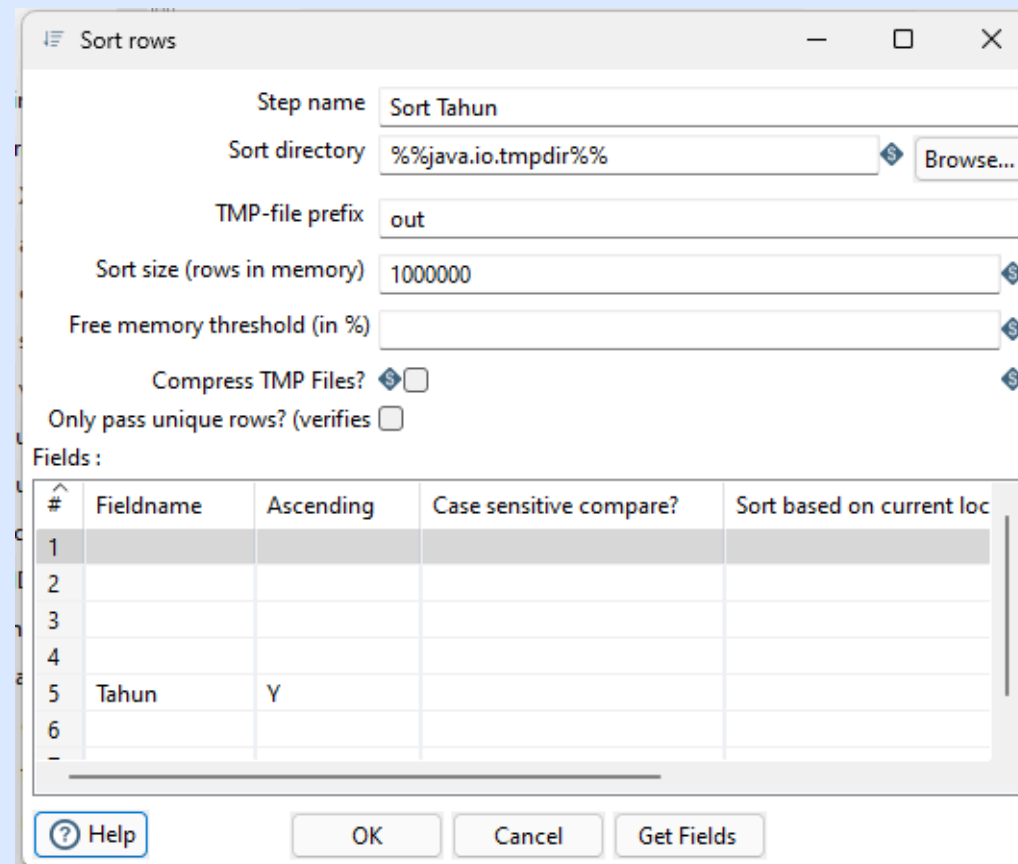
Rename kolom yang akan digunakan



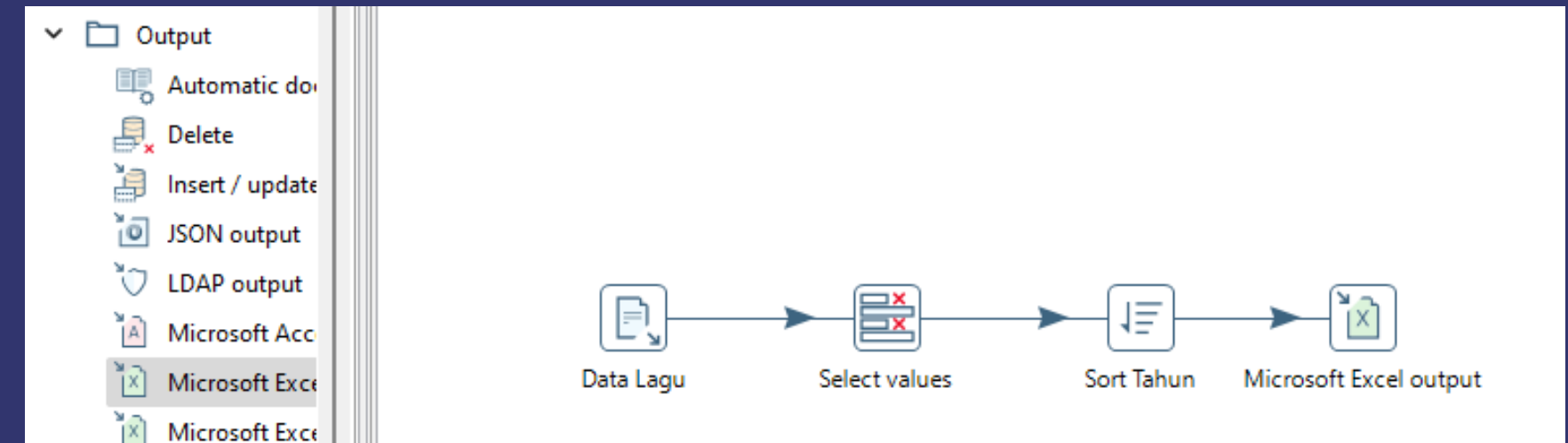
Hapus kolom yang tidak digunakan



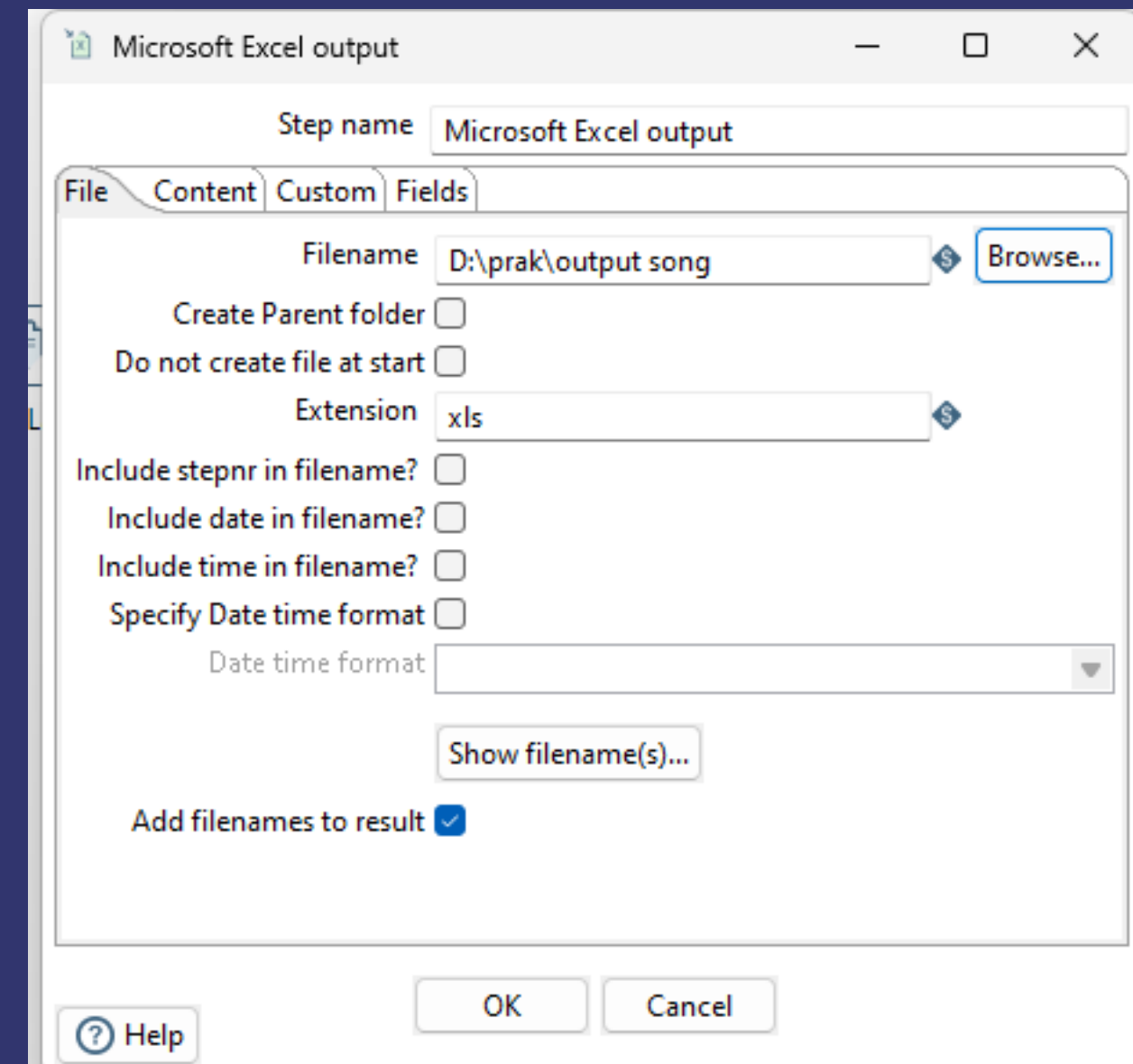
Sort data berdasarkan baris tertentu

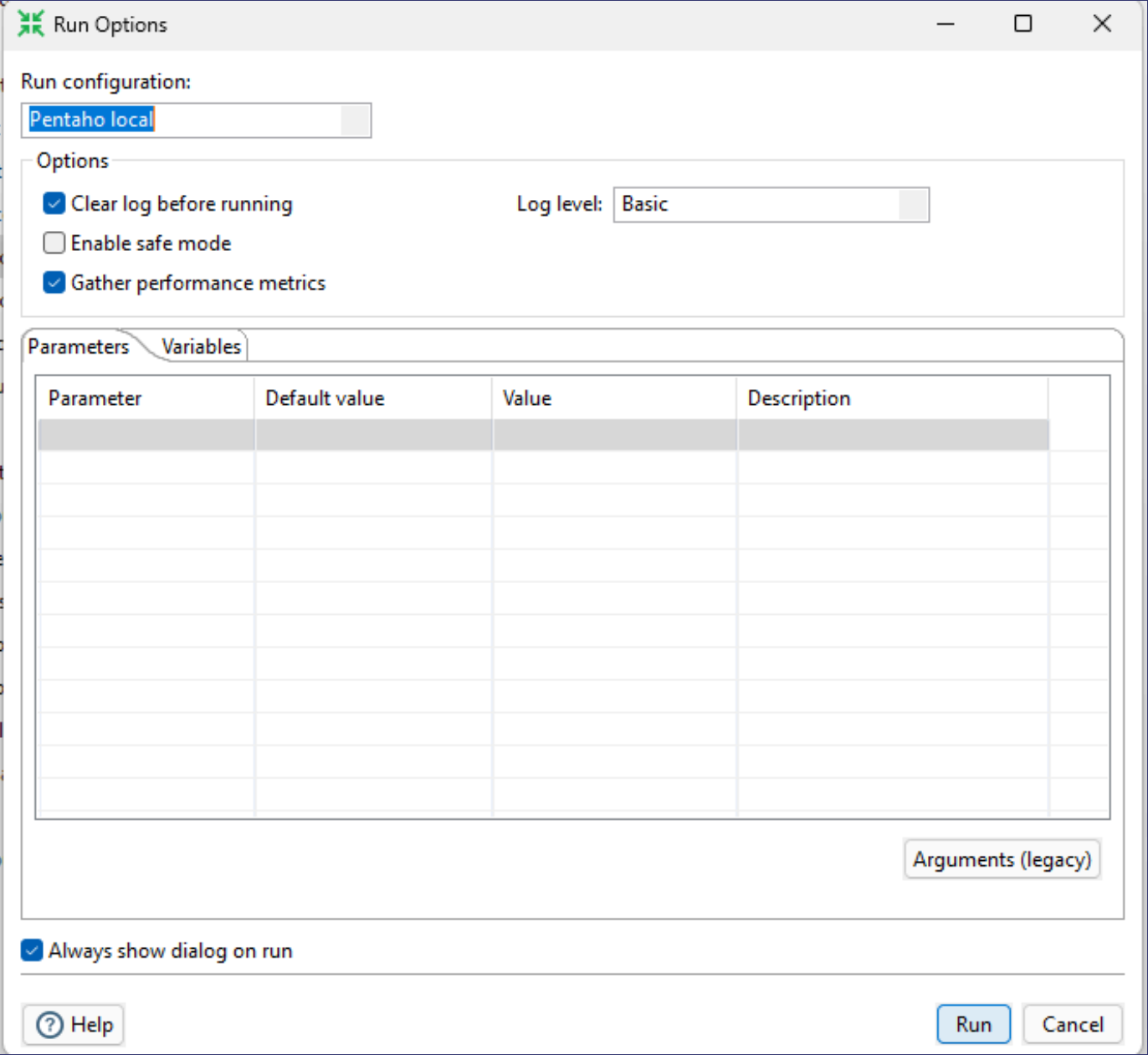


Sort berdasarkan tahun



Pilih jenis file output





Running proses transform

```
graph LR; A[Data Lagu] --> B[Select values]; B --> C[Sort Tahun]; C --> D[Microsoft Excel output];
```

Execution Results

Logging | Execution History | Step Metrics | Performance Graph | Metrics | Preview data

2024/12/05 05:32:59 - Spoon - Save file as...

2024/12/05 05:33:00 - Spoon - Transformation opened.

2024/12/05 05:33:00 - Spoon - Launching transformation [Transformationsong]...

2024/12/05 05:33:00 - Spoon - Started the transformation execution.

2024/12/05 05:33:00 - Transformationsong - Dispatching started for transformation [Transformationsong]

2024/12/05 05:33:00 - Data Lagu.0 - Header row skipped in file 'C:\songs_normalize.csv'

2024/12/05 05:33:00 - Data Lagu.0 - Finished processing (I=2001, O=0, R=0, W=2000, U=0, E=0)

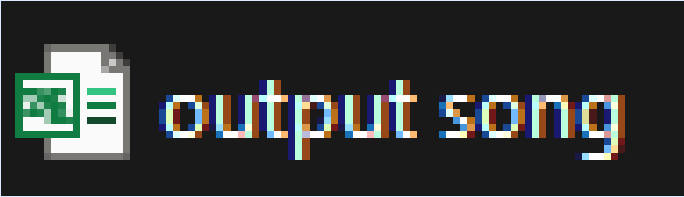
2024/12/05 05:33:00 - Select values.0 - Finished processing (I=0, O=0, R=2000, W=2000, U=0, E=0)

2024/12/05 05:33:00 - Sort Tahun.0 - Finished processing (I=0, O=0, R=2000, W=2000, U=0, E=0)

2024/12/05 05:33:01 - Microsoft Excel output.0 - Finished processing (I=0, O=2000, R=2000, W=2000, U=0, E=0)




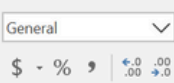
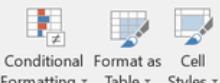


2024/12/05 05:33:01 - Spoon - The transformation has finished!!

Running success














Hasil file csv

PERBANDINGAN

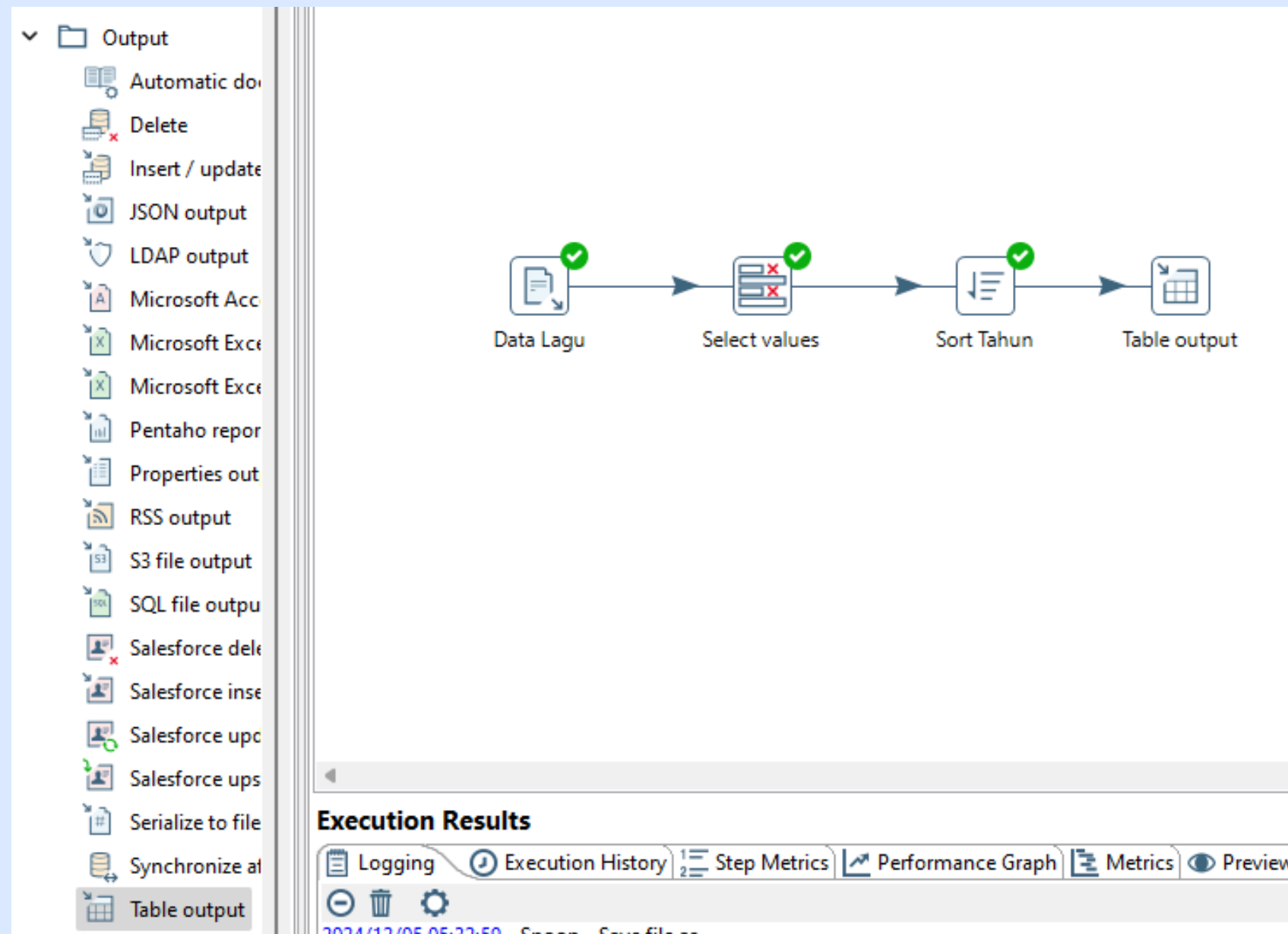
File		Home		Insert		Page Layout		Formulas		Data		Review		View		Help		Nitro Pro 10		Tell me what you want to do		Share	
		Calibri 11																					
Clipboard		Font		Alignment		Number		Styles		Cells		Editing											
A1		artist																					
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S				
1	artist	song	duration	explicit	year	popularity	danceabi	energy	key	loudness	mode	speech	chinese	acoustic	instrumen	liveness	valence	tempo	genre				
2	Britney Sp	Oops!...I D	211160	FALSE	2000	77	0.751	0.834	1	-5.444	0	0.0437	0.3	1.77E-05	0.355	0.894	95.053	pop					
3	blink-182	All The Sm	167066	FALSE	1999	79	0.434	0.897	0	-4.918	1	0.0488	0.0103	0	0.612	0.684	148.726	rock, pop					
4	Faith Hill	Breathe	250546	FALSE	1999	66	0.529	0.496	7	-9.007	1	0.029	0.173	0	0.251	0.278	136.859	pop, country					
5	Bon Jovi	It's My Lif	224493	FALSE	2000	78	0.551	0.913	0	-4.063	0	0.0466	0.0263	1.35E-05	0.347	0.544	119.992	rock, metal					
6	*NSYNC	Bye Bye B	200560	FALSE	2000	65	0.614	0.928	8	-4.806	0	0.0516	0.0408	0.00104	0.0845	0.879	172.656	pop					
7	Sisqo	Thong Sor	253733	TRUE	1999	69	0.706	0.888	2	-6.959	1	0.0654	0.119	9.64E-05	0.07	0.714	121.549	hip hop, pop, R&B					
8	Eminem	The Real S	284200	TRUE	2000	86	0.949	0.661	5	-4.244	0	0.0572	0.0302	0	0.0454	0.76	104.504	hip hop					
9	Robbie Wi	Rock DJ	258560	FALSE	2000	68	0.708	0.772	7	-4.264	1	0.0322	0.0267	0	0.467	0.861	103.035	pop, rock					
10	Destiny's	(Say My Na	271333	FALSE	1999	75	0.713	0.678	5	-3.525	0	0.102	0.273	0	0.149	0.734	138.009	pop, R&B					
11	Modjo	Lady - Hea	307153	FALSE	2001	77	0.72	0.808	6	-5.627	1	0.0379	0.00793	0.0293	0.0634	0.869	126.041	Dance/Electronic					
12	Gigi D'Ago	L'Amour T	238759	FALSE	2011	1	0.617	0.728	7	-7.932	1	0.0292	0.0328	0.0482	0.36	0.808	139.066	pop					
13	Eiffel 65	Move You	268863	FALSE	1999	56	0.745	0.958	7	-9.664	1	0.0287	0.0813	0.324	0.533	0.96	129.962	pop					
14	Bomfunk I	Freestyler	306333	FALSE	2000	55	0.822	0.922	11	-5.798	0	0.0989	0.0291	0.325	0.252	0.568	163.826	pop					
15	Sting	Desert Ro	285960	FALSE	1999	62	0.586	0.659	0	-7.92	0	0.0304	0.011	0	0.106	0.147	111.989	rock, pop					
16	Melanie C	Never Be T	294200	FALSE	1999	61	0.689	0.685	3	-5.153	1	0.0478	0.0921	0	0.119	0.398	160.067	pop, Dance/Electronic					
17	Aaliyah	Try Again	284000	FALSE	2002	53	0.797	0.622	6	-5.642	0	0.29	0.0807	0	0.0841	0.731	93.02	hip hop, pop, R&B					
18	Anastacia	I'm Outta	245400	FALSE	1999	64	0.761	0.716	10	-5.8	0	0.056	0.396	0	0.0771	0.649	119.41	pop					
19	Alice Deej	Better Off	214883	FALSE	2000	73	0.671	0.88	8	-6.149	0	0.0552	0.00181	0.691	0.285	0.782	136.953	pop					
20	Gigi D'Ago	The Riddle	285426	FALSE	1999	64	0.74	0.876	6	-6.87	0	0.0369	0.0173	0.00152	0.0785	0.825	127.002	pop					
21	Dr. Dre	The Next E	161506	TRUE	1999	82	0.922	0.909	10	-2.429	0	0.27	0.0281	0	0.0856	0.309	95.295	hip hop					

songs_normalize

Dataset

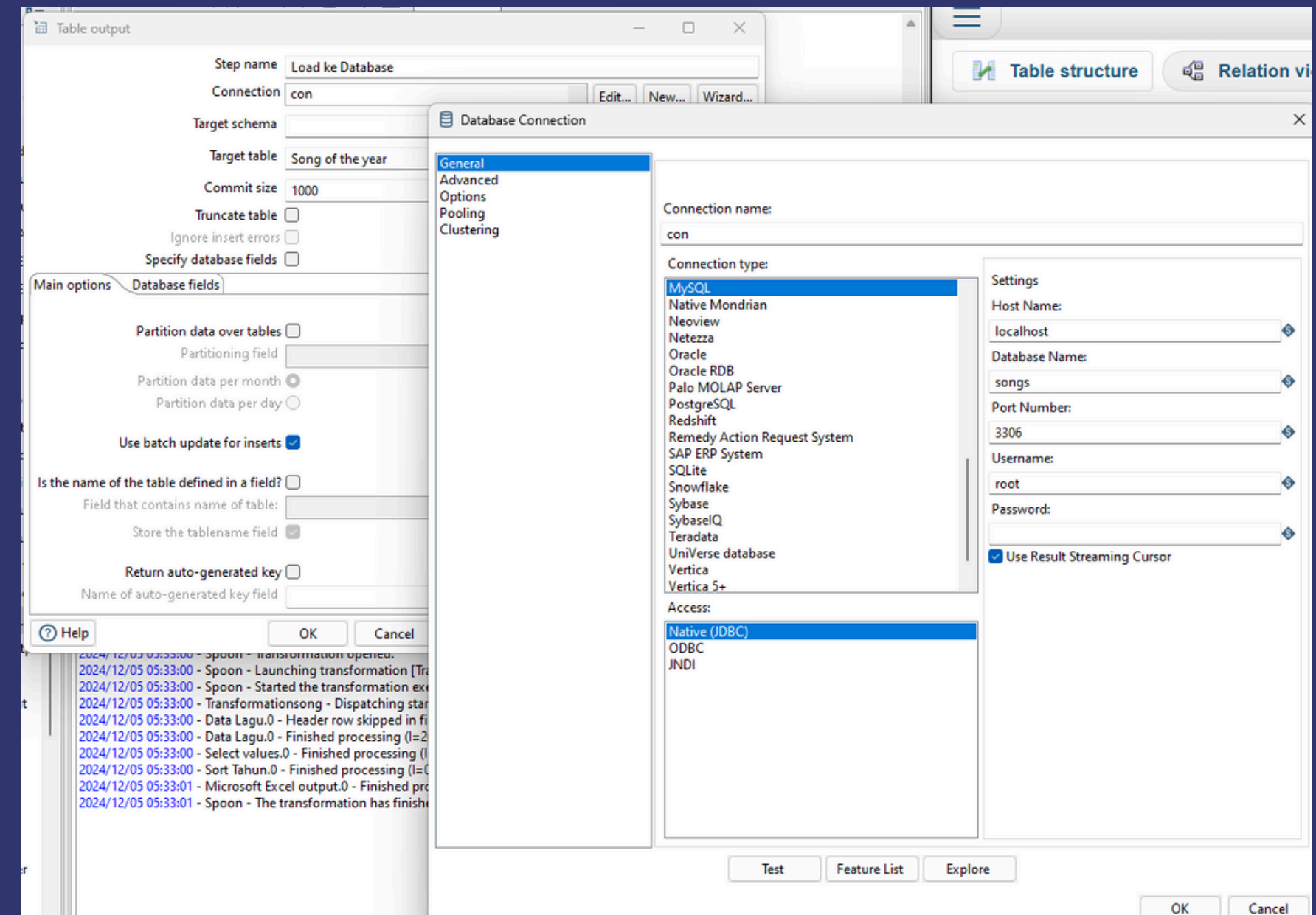
File		Home		Insert		Page Layout		Formulas		Data		Review		View		Help		Nitro Pro 10		Tell me what you want to do		Share							
 		<div>Arial</div> <div>10</div> <div>A⁺ A⁻</div>				<div></div> <div>Wrap Text</div>				<div>General</div>				<div> Conditional Formatting</div>		<div> Format as Table</div>		<div> Cell Styles</div>		<div> Insert</div>		<div> Delete</div>		<div> Format</div>		<div> Sort & Find & Filter</div>		<div> Select</div>	
Clipboard		Font				Alignment				Number				Styles		Cells		Editing											
A1		Artis																											
	A	B	C	D	E	F	G																						
1	Artis	Judul Lagu	Durasi	Explicit	Tahun	Popularitas	Allran																						
2	Missy Elliott	Hot Boyz	215.466.00	Y	1.998.00	49.00	hip hop, pop, R&B																						
3	blink-182	All The Small Things	167.066.00	N	1.999.00	79.00	rock, pop																						
4	Faith Hill	Breathe	250.546.00	N	1.999.00	66.00	pop, country																						
5	Sisqo	Thong Song	253.733.00	Y	1.999.00	69.00	hip hop, pop, R&B																						
6	Destiny's Child	Say My Name	271.333.00	N	1.999.00	75.00	pop, R&B																						
7	Eiffel 65	Move Your Body - Gabry Ponte Original Radio Edit	268.863.00	N	1.999.00	56.00	pop																						
8	Sting	Desert Rose	285.960.00	N	1.999.00	62.00	rock, pop																						
9	Melanie C	Never Be The Same Again	294.200.00	N	1.999.00	61.00	pop, Dance/Electronic																						
10	Anastacia	I'm Outta Love - Radio Edit	245.400.00	N	1.999.00	64.00	pop																						
11	Gigi D'Agostino	The Riddle	285.426.00	N	1.999.00	64.00	pop																						
12	Dr. Dre	The Next Episode	161.506.00	Y	1.999.00	82.00	hip hop																						
13	Tom Jones	Sexbomb	211.893.00	N	1.999.00	65.00	rock, Folk/Acoustic, easy listenin																						
14	Melanie C	I Turn To You	352.173.00	N	1.999.00	54.00	pop, Dance/Electronic																						
15	DMX	Party Up	268.866.00	Y	1.999.00	71.00	hip hop, pop																						
16	Britney Spears	Born to Make You Happy	243.533.00	N	1.999.00	58.00	pop																						
17	Montell Jordan	Get It On Tonite	276.266.00	N	1.999.00	59.00	hip hop, pop, R&B																						
18	JAY-Z	Big Pimpin'	283.066.00	Y	1.999.00	69.00	hip hop																						
19	Enrique Iglesias	Be With You	219.360.00	N	1.999.00	54.00	pop, latin																						
20	Dr. Dre	Forgot About Dre	222.293.00	Y	1.999.00	79.00	hip hop																						
21	Backstreet Boys	Show Me the Meaning of Being Lonely	234.960.00	N	1.999.00	68.00	pop																						
22	Sisqo	Incomplete	274.226.00	Y	1.999.00	60.00	hip hop, pop, R&B																						
23	Mariah Carey	Thank God I Found You (feat. Joe & 98A°)	257.360.00	N	1.999.00	59.00	pop, R&B																						
24	Donell Jones	U Know What's Up (feat. Lisa "Left Eye" Lopes)	243.733.00	Y	1.999.00	63.00	pop, R&B																						
25	Christina Aguilera	I Turn to You	273.706.00	N	1.999.00	61.00	pop																						
26	Red Hot Chili Peppers	Otherside	255.373.00	N	1.999.00	78.00	rock																						
27	Santana	Maria Maria (feat. The Product G&B)	261.973.00	N	1.999.00	66.00	rock, blues, latin																						

Hasil file CSV

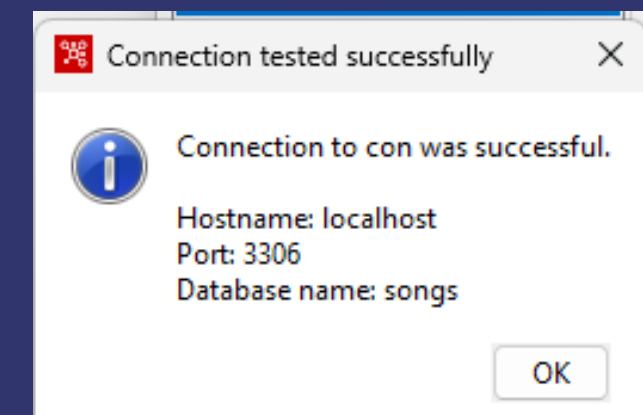


Load

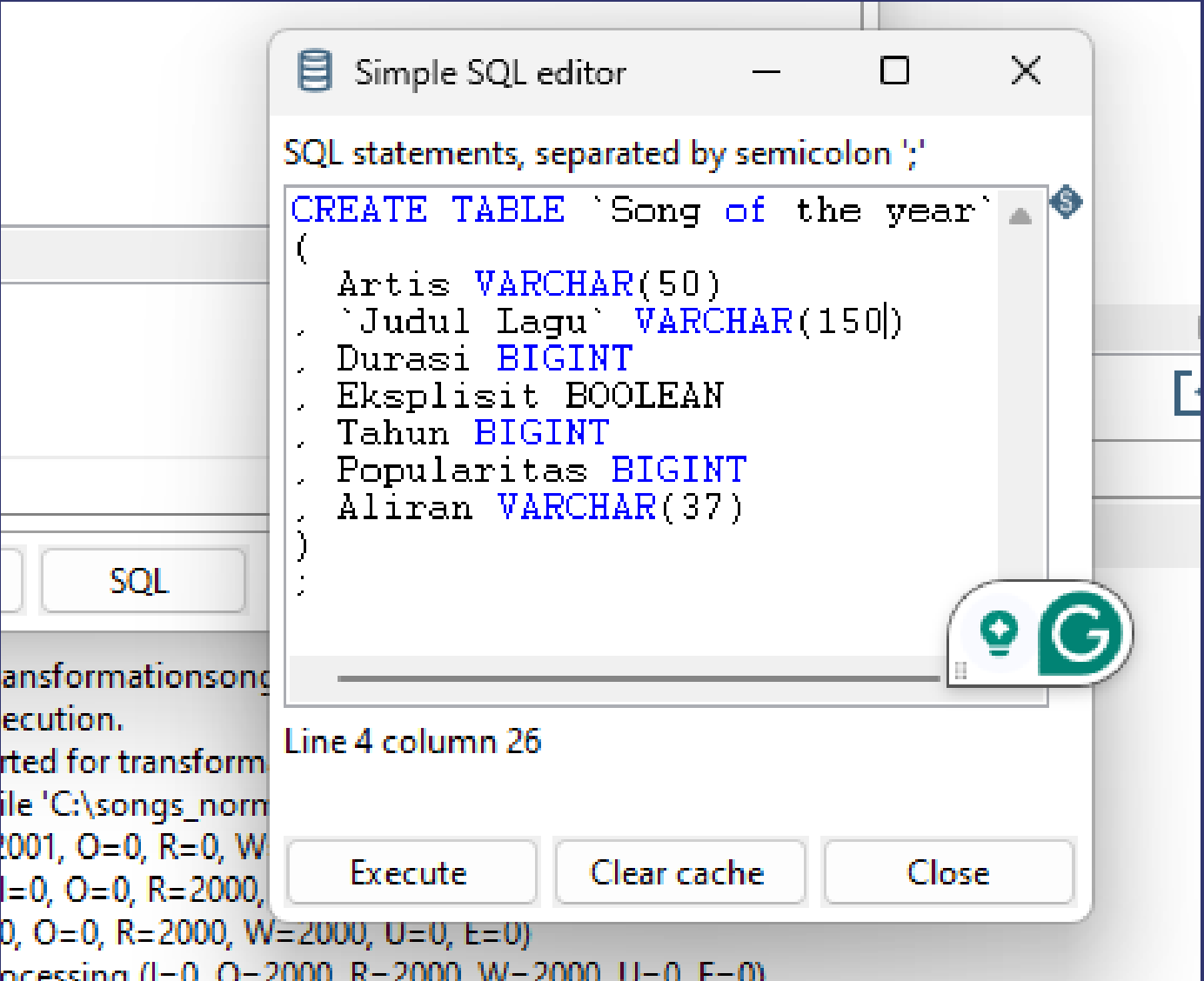
Digunakan untuk memindahkan
hasil transform tadi ke repositori
local/database



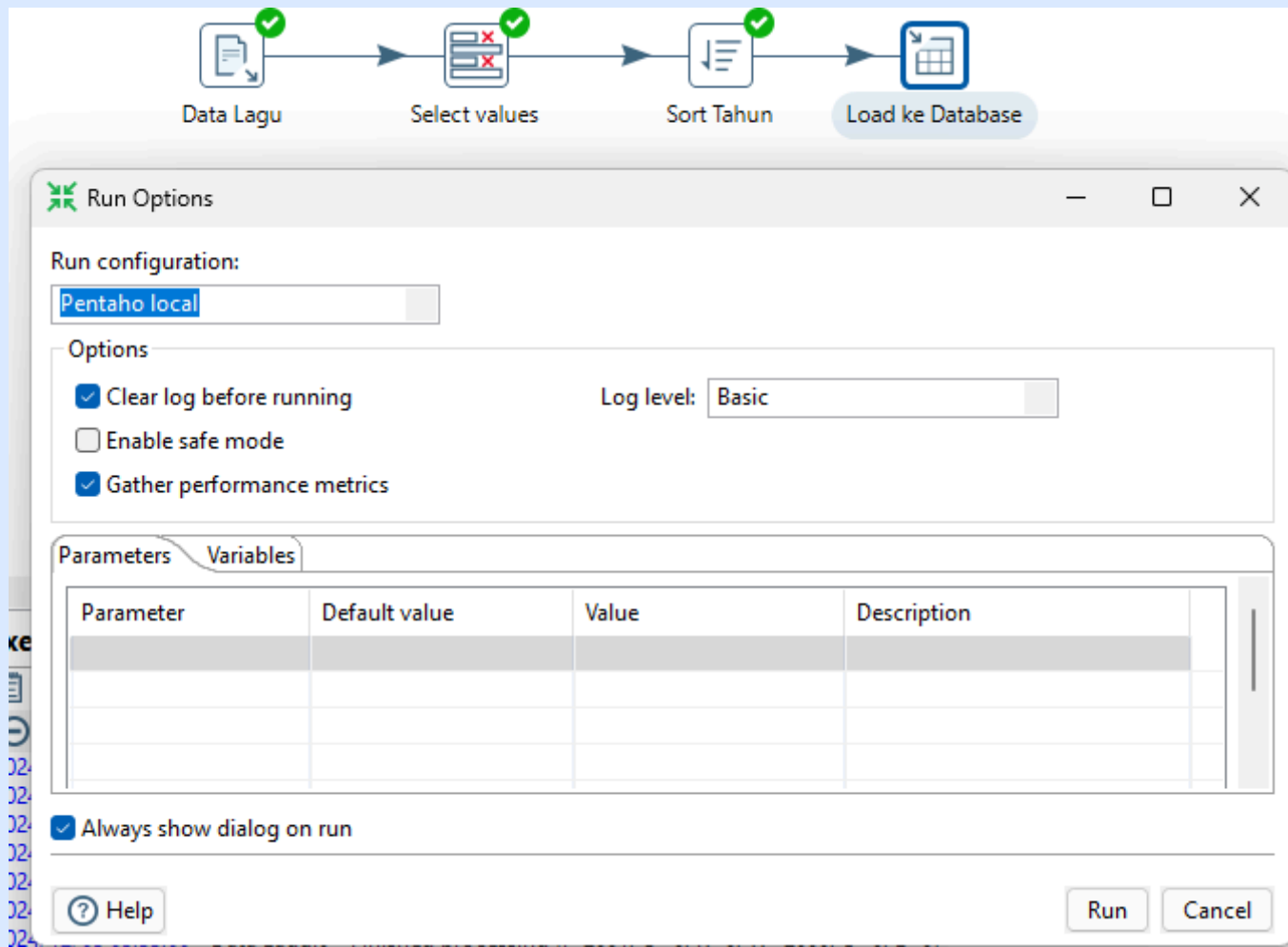
Koneksi ke Database



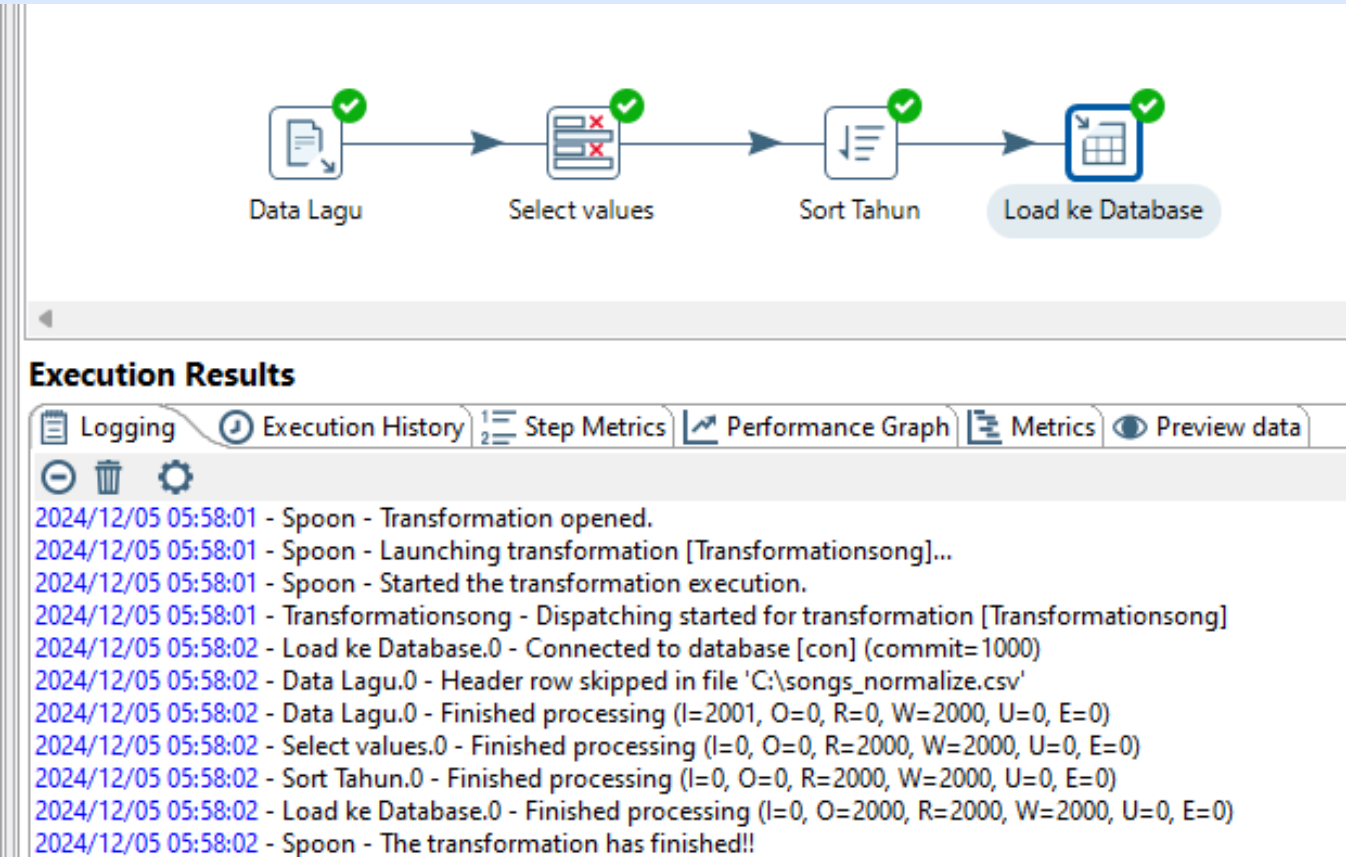
Cek koneksi



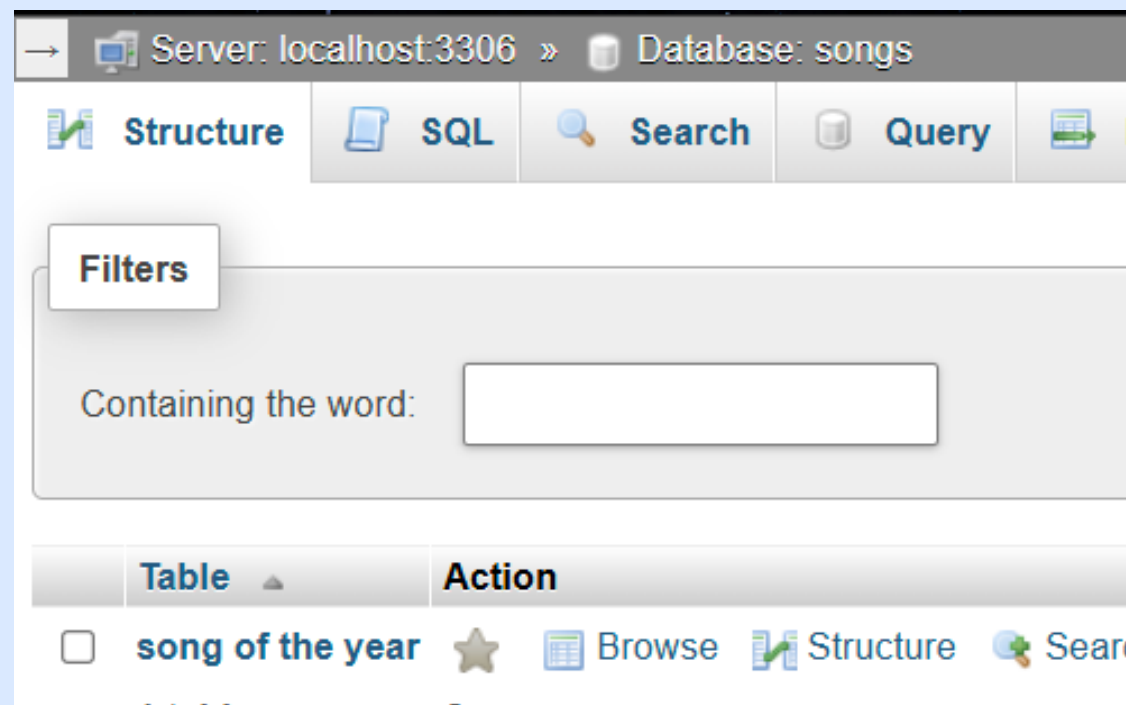
Buat tabel dan
sesuaikan ukuran data



Running ulang



Running succes



Hasil database dan tabel

Server: localhost:3306 » Database: songs » Table: song of the year						
Browse Structure SQL Search Insert Export Import Privileges Operations Triggers						
Artis	Judul Lagu	Durasi	Eksplisit	Tahun	Popularitas	Aliran
Missy Elliott	Hot Boyz	215466	1	1998	49	hip hop, pop, R&B
blink-182	All The Small Things	167066	0	1999	79	rock, pop
Faith Hill	Breathe	250546	0	1999	66	pop, country
Sisqo	Thong Song	253733	1	1999	69	hip hop, pop, R&B
Destiny's Child	Say My Name	271333	0	1999	75	pop, R&B
Eiffel 65	Move Your Body - Gabry Ponte Original Radio Edit	268863	0	1999	56	pop
Sting	Desert Rose	285960	0	1999	62	rock, pop
Melanie C	Never Be The Same Again	294200	0	1999	61	pop, Dance/Electronic
Anastacia	I'm Outta Love - Radio Edit	245400	0	1999	64	pop
Gigi D'Agostino	The Riddle	285426	0	1999	64	pop
Dr. Dre	The Next Episode	161506	1	1999	82	hip hop
Tom Jones	Sexbomb	211893	0	1999	65	rock, Folk/Acoustic, easy listening
Melanie C	I Turn To You	352173	0	1999	54	pop, Dance/Electronic
DMX	Party Up	268866	1	1999	71	hip hop, pop
Britney Spears	Born to Make You Happy	243533	0	1999	58	pop
Montell Jordan	Get It On Tonite	276266	0	1999	59	hip hop, pop, R&B
JAY-Z	Big Pimpin'	283066	1	1999	69	hip hop
Enrique Iglesias	Be With You	219360	0	1999	54	pop, latin
Dr. Dre	Forgot About Dre	222293	1	1999	79	hip hop
Backstreet Boys	Show Me the Meaning of Being Lonely	234960	0	1999	68	pop
Sisqo	Incomplete	274226	1	1999	60	hip hop, pop, R&B
Mariah Carey	Thank God I Found You (feat. Joe & 98°)	257360	0	1999	59	pop, R&B
Donell Jones	U Know What's Up (feat. Lisa "Left Eye" Lopes)	243733	1	1999	63	pop, R&B
Christina Aguilera	I Turn to You	273706	0	1999	61	pop
Red Hot Chili Peppers	Otherside	255373	0	1999	78	rock

1 > >> | Number of rows: 25 | Filter rows: Search this table

Query results operations
Console

Hasil data di repositori local/database



Thank You