DMDD FINAL PROJECT

TOPIC: Smartphone Specification and Price Classification System.

TEAM MEMBERS:

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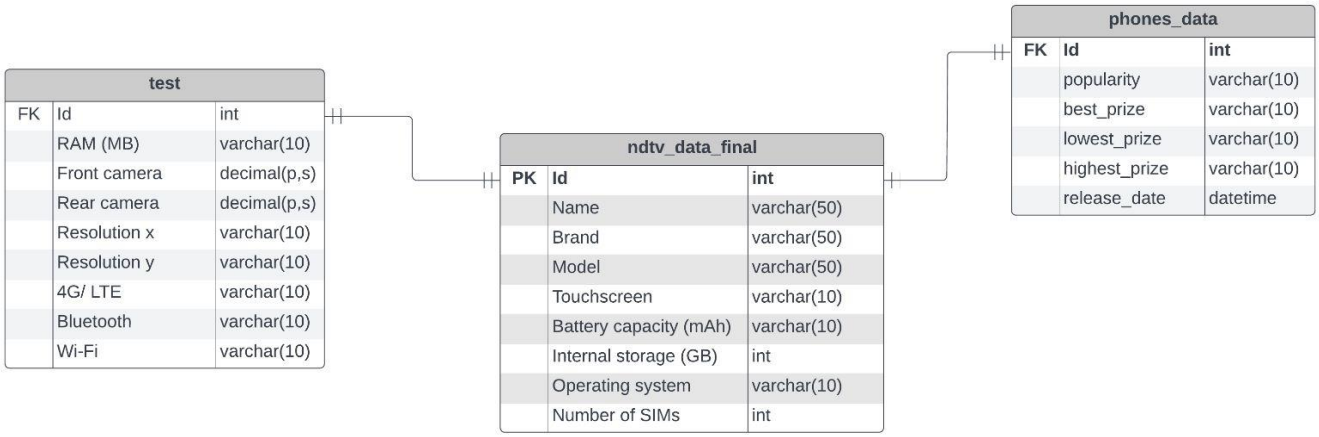
GITHUB REPOSITORY LINK:

https://github.com/Vatsal-77/Smartphone-specification-and-price-classification-system

Project objective:

The main purpose of the project is to create a database with respect to smart phones available in the market. The specifications mentioned in the database includes the names of the Brand, model, price, storage, resolution, dual sim availability, battery capacity and few other attributes. Since there are a vast number of smartphones available in the market, there is a possibility for the customer to be confused on what he wants to purchase. With this database which includes all the details about different mobile phones, it gets easier for the customer to choose which smartphone to buy according to his needs/requirements. Moreover, the database will also be beneficial for the corporate companies associated with the manufacturing of smartphones. The sales and marketing department of various brands can keep a track of the products in demand, accordingly the products customers show no interest in. On a global level various companies can be up to date with current market trends and hold their ground in such an altering market of the present generation. The extension of the project is detecting the price change of a specific smartphone and maintaining it in the database accordingly.

ER Diagram:



Snippets From Database:

1.

	Id	Name	Brand	Model	Battery ca	Screen size	Touchscre	Resolution	Resolution	Processor	RAM (MB)	Internal st	Rear came	Front cam	Operating	Wi-Fi	Bluetooth	GPS	Number of	3G	4G/ LTE	Price
0	0	OnePlus 7T	OnePlus	7T Pro Mc	4085	6.67	Yes	1440	3120	8	12000	256	48	16	Android	Yes	Yes	Yes	2	Yes	Yes	58998
1	1	Realme X2	Realme	X2 Pro	4000	6.5	Yes	1080	2400	8	6000	64	64	16	Android	Yes	Yes	Yes	2	Yes	Yes	27999
2	2	iPhone 11	Apple	iPhone 11	3969	6.5	Yes	1242	2688	6	4000	64	12	12	iOS	Yes	Yes	Yes	2	Yes	Yes	106900
3	3	iPhone 11	Apple	iPhone 11	3110	6.1	Yes	828	1792	6	4000	64	12	12	iOS	Yes	Yes	Yes	2	Yes	Yes	62900
4	4	LG G8X Thi	LG	G8X ThinQ	4000	6.4	Yes	1080	2340	8	6000	128	12	32	Android	Yes	Yes	Yes	1	No	No	49990
5	5	OnePlus 7T	OnePlus	7T	3800	6.55	Yes	1080	2400	8	8000	128	48	16	Android	Yes	Yes	No	2	Yes	Yes	34930
6	6	OnePlus 7T	OnePlus	7T Pro	4085	6.67	Yes	1440	3120	8	8000	256	48	16	Android	Yes	Yes	Yes	2	Yes	Yes	52990
7	7	Samsung G	Samsung	Galaxy No	4300	6.8	Yes	1440	3040	8	12000	256	12	10	Android	Yes	Yes	Yes	2	Yes	Yes	79699
8	8	Asus ROG	Asus	ROG Phon	6000	6.59	Yes	1080	2340	8	8000	128	48	24	Android	Yes	Yes	Yes	1	Yes	Yes	37999
9	9	Xiaomi Re	Xiaomi	Redmi K20	4000	6.39	Yes	1080	2340	8	6000	128	48	20	Android	Yes	Yes	Yes	2	No	No	23190
10	10	Oppo K3	Oppo	K3	3765	6.5	Yes	1080	2340	8	6000	64	16	16	Android	Yes	Yes	Yes	2	Yes	Yes	23990
11	11	Realme X	Realme	X	3765	6.53	Yes	1080	2340	8	4000	128	48	16	Android	Yes	Yes	Yes	2	Yes	Yes	14999
12	12	Xiaomi Re	Xiaomi	Redmi K20	4000	6.39	Yes	1080	2340	8	6000	64	48	20	Android	Yes	Yes	Yes	2	Yes	Yes	19282
13	13	OnePlus 7	OnePlus	7 Pro	4000	6.67	Yes	1440	3120	8	6000	128	48	16	Android	Yes	Yes	Yes	2	Yes	Yes	39995
14	14	Oppo Ren	Oppo	Reno 10x	4065	6.6	Yes	1080	2340	8	6000	128	48	16	Android	Yes	Yes	Yes	2	Yes	Yes	36990
15	15	Realme 3 I	Realme	3 Pro	4045	6.3	Yes	1080	2340	8	4000	64	16	25	Android	Yes	Yes	Yes	2	Yes	Yes	13999
16	16	Huawei P3	Huawei	P30 Pro	4200	6.47	Yes	1080	2340	8	8000	256	40	32	Android	Yes	Yes	No	2	Yes	Yes	54280
17	17	Redmi Not	Xiaomi	Redmi Not	4000	6.3	Yes	1080	2340	8	4000	64	48	13	Android	Yes	Yes	Yes	2	Yes	Yes	9799
18	18	Huawei M	Huawei	Mate 20 P	4200	6.39	Yes	1440	3120	8	6000	128	40	24	Android	Yes	Yes	Yes	2	Yes	Yes	63990
19	19	LG V40 Thi	LG	V40 ThinQ	3300	6.4	Yes	1440	3120	8	6000	128	12	8	Android	Yes	Yes	Yes	2	Yes	Yes	29999
20	20	OnePlus 6T	OnePlus	6T	3700	6.41	Yes	1080	2340	8	6000	128	16	16	Android	Yes	Yes	Yes	2	Yes	Yes	31999
21	21	Apple iPho	Apple	iPhone XR	2942	6.1	Yes	828	1792	6	3000	64	12	7	iOS	Yes	Yes	Yes	2	Yes	Yes	45499
22	22	Apple iPho	Apple	iPhone XS	2658	6.5	Yes	1242	2688	6	4000	64	12	7	iOS	Yes	Yes	Yes	2	Yes	Yes	69999
23	23	Apple iPho	Apple	iPhone XS	2658	5.8	Yes	1125	2436	6	4000	64	12	7	iOS	Yes	Yes	Yes	2	Yes	Yes	59999
24	24	Google Pix	Google	Pixel 3 XL	3430	6.3	Yes	1440	2960	8	4000	64	12.2	8	Android	Yes	Yes	Yes	1	Yes	Yes	47990
25	25	Google Pix	Google	Pixel 3	2915	5.5	Yes	1080	2160	8	4000	64	12.2	8	Android	Yes	Yes	Yes	1	Yes	Yes	37999
26	26	Asus ROG	Asus	ROG Phon	4000	6	Yes	1080	2160	8	8000	128	12	8	Android	Yes	Yes	Yes	2	Yes	Yes	69999

This is a cleaned data.

2.

	brand_nan	model_nai	os	popularity	best_price	lowest_pri	highest_pr	sellers_am	screen_siz	memory_s	battery_si	release_date
0	ALCATEL	1 1/8GB Bl	Android	422	1690	1529	1819	36	5	8	2000	Oct-20
1	ALCATEL	1 5033D 1/	Android	323	1803	1659	2489	36	5	16	2000	Sep-20
2	ALCATEL	1 5033D 1/	Android	299	1803	1659	2489	36	5	16	2000	Sep-20
3	ALCATEL	1 5033D 1/	Android	287	1803	1659	2489	36	5	16	2000	Sep-20
4	Nokia	1.3 1/16GI	Android	1047	1999			10	5.71	16	3000	Apr-20
5	Honor	10 6/64GB	Android	71	10865	10631	11099	2	5.8	64	3400	Jun-18
6	Honor	10 Lite 3/3	Android	424	3999			2	6.21	32	3400	Dec-18
7	Honor	10 Lite 4/6	Android	134	4973	4733	5295	6	6.21	64	3400	Jan-19
8	Honor	10 lite 3/1	Android	477	5100	4990	5222	3	6.21	128	3400	Jan-21
9	Honor	10 lite 3/6	Android	215	4948	4646	5372	8	6.21	64	3400	Dec-18
10	Honor	10 lite 3/6	Android	179	4948	4646	5372	8	6.21	64	3400	Dec-18
11	Honor	10 lite 3/6	Android	437	5165	4897	5559	7	6.21	64	3400	Dec-18
12	Nokia	105 DS 2019 Pink (16I		18	583	528	649	28	1.77	0.004	800	Oct-19
13	Nokia	105 Dual Sim 2019 Bla		262	601	539	703	31	1.77		800	Nov-19
14	Nokia	105 Dual Sim 2019 Bla		274	601	539	703	31	1.77		800	Nov-19
15	Nokia	105 Dual Sim New Bla		507	552	499	606	2	1.8	0.004	800	Sep-17
16	Nokia	105 Single Sim 2019 B		805	536	449	642	31	1.77		800	Nov-19
17	Nokia	105 Single Sim 2019 P		692	547	496	709	35	1.77		800	Nov-19
18	Nokia	105 Single Sim New B		460	663	499	1169	5	1.8	0.004	800	Sep-17
19	Nokia	105 Single Sim New B		455	663	499	1169	5	1.8	0.004	800	Sep-17
20	Nokia	105 Single Sim New B		378	474	450	499	2	1.8	0.004	800	Sep-17
21	Nokia	105 Single Sim New W		59	499			1	1.8	0.004	800	Sep-17
22	Nokia	106 New DS Grey (16I		838	596	544	699	35	1.8		800	Jan-19
23	Nokia	106 New DS Grey (16I		841	596	544	699	35	1.8		800	Jan-19
24	Honor	10i 4/128(	Android	532	5499			2	6.21	128	3400	May-19
25	Honor	10i 4/128(	Android	444	5499			2	6.21	128	3400	May-19
26	Nokia	110 Dual Sim 2019 Bla		471	710	640	1164	34	1.77		800	Nov-19

This is uncleaned data which we cleaned further.

Cleaning:

```
In [6]: import pandas as pd
        import numpy as np
        import seaborn as sns
```

```
In [7]: df = pd.read_csv("phones_data.csv")
```

```
In [8]: df.isnull().sum()
```

```
Out[8]: Unnamed: 0          0
        brand_name          0
        model_name          0
        os                197
        popularity          0
        best_price          0
        lowest_price      260
        highest_price     260
        sellers_amount      0
        screen_size         2
        memory_size       112
        battery_size       10
        release_date        0
        dtype: int64
```

```
In [9]: df1 = df.dropna()
```

```
In [11]: df1.isnull().sum()

Out[11]: Unnamed: 0        0
         brand_name        0
         model_name        0
         os                0
         popularity        0
         best_price        0
         lowest_price      0
         highest_price     0
         sellers_amount    0
         screen_size       0
         memory_size       0
         battery_size      0
         release_date      0
         dtype: int64

In [12]: df1.to_csv(r'C:\Users\Harsh\Desktop\Dmdd Ass3\output.csv', index=False, header=True)
```

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	Id	brand_nan	model_na	os	popularity	best_price	lowest_pri	highest_pr	sellers_am	screen_siz	memory_s	battery_si	release_date		
2	0	ALCATEL	1 1/8GB Bl	Android	422	1690	1529	1819	36	5	8	2000	20-Oct		
4	1	ALCATEL	1 5033D 1/	Android	323	1803	1659	2489	36	5	16	2000	20-Sep		
4	2	ALCATEL	1 5033D 1/	Android	299	1803	1659	2489	36	5	16	2000	20-Sep		
4	3	ALCATEL	1 5033D 1/	Android	287	1803	1659	2489	36	5	16	2000	20-Sep		
5	5	Honor	10 6/64GB	Android	71	10865	10631	11099	2	5.8	64	3400	18-Jun		
7	7	Honor	10 Lite 4/6	Android	134	4973	4733	5295	6	6.21	64	3400	19-Jan		
8	8	Honor	10 lite 3/1	Android	477	5100	4990	5222	3	6.21	128	3400	21-Jan		
9	9	Honor	10 lite 3/6	Android	215	4948	4646	5372	8	6.21	64	3400	18-Dec		
10	10	Honor	10 lite 3/6	Android	179	4948	4646	5372	8	6.21	64	3400	18-Dec		
11	11	Honor	10 lite 3/6	Android	437	5165	4897	5559	7	6.21	64	3400	18-Dec		
12	30	Meizu	15 4/64GB	Android	166	5272	4970	5448	3	5.45	64	3000	18-May		
13	31	Meizu	15 4/64GB	Android	125	5272	4970	5448	3	5.45	64	3000	18-May		
14	32	Meizu	15 4/64GB	Android	116	5272	4970	5448	3	5.45	64	3000	18-May		
15	40	Meizu	16 6/128G	Android	1111	5926	5290	6526	11	6	128	3100	18-Nov		
16	41	Meizu	16 6/64GB	Android	1144	5231	4599	5759	19	6	64	3100	18-Nov		
17	42	Meizu	16X 6/128	Android	663	5649	5599	5699	2	6	128	3100	20-Mar		
18	43	Meizu	16Xs 6/12	Android	900	7229	6840	7786	11	6.2	128	4000	20-Nov		
19	44	Meizu	16th 6/64	Android	1063	7776	7049	8196	9	6	64	3010	18-Sep		
20	46	ALCATEL	1B 5002H	Android	616	2408	2168	3185	31	5.5	16	3000	20-Sep		
21	47	ALCATEL	1SE 3/32G	Android	629	3249	2889	3299	38	6.22	32	4000	20-Oct		
22	48	ALCATEL	1SE 4/128	Android	790	3877	3581	3899	35	6.22	128	4000	20-Oct		
23	49	ALCATEL	1SE 4/128	Android	793	3877	3581	3899	35	6.22	128	4000	20-Oct		
24	52	Nokia	2.4 2/32GI	Android	1031	3162	2999	3299	17	6.5	32	4500	20-Sep		
25	63	Nokia	2720 Flip E	iOS	883	2530	2395	2689	26	2.8	4	1500	19-Sep		
26	68	Nokia	3.4 3/64GI	Android	1132	3899	3550	4049	24	6.39	64	4000	20-Sep		
27	69	OnePlus	3T 128GB	OxygenOS	235	6991	6195	9399	9	5.5	128	3400	17-Jan		
28	70	OnePlus	3T 128GB	OxygenOS	188	6991	6195	9399	9	5.5	128	3400	17-Jan		

This is the data after cleaning.

3.

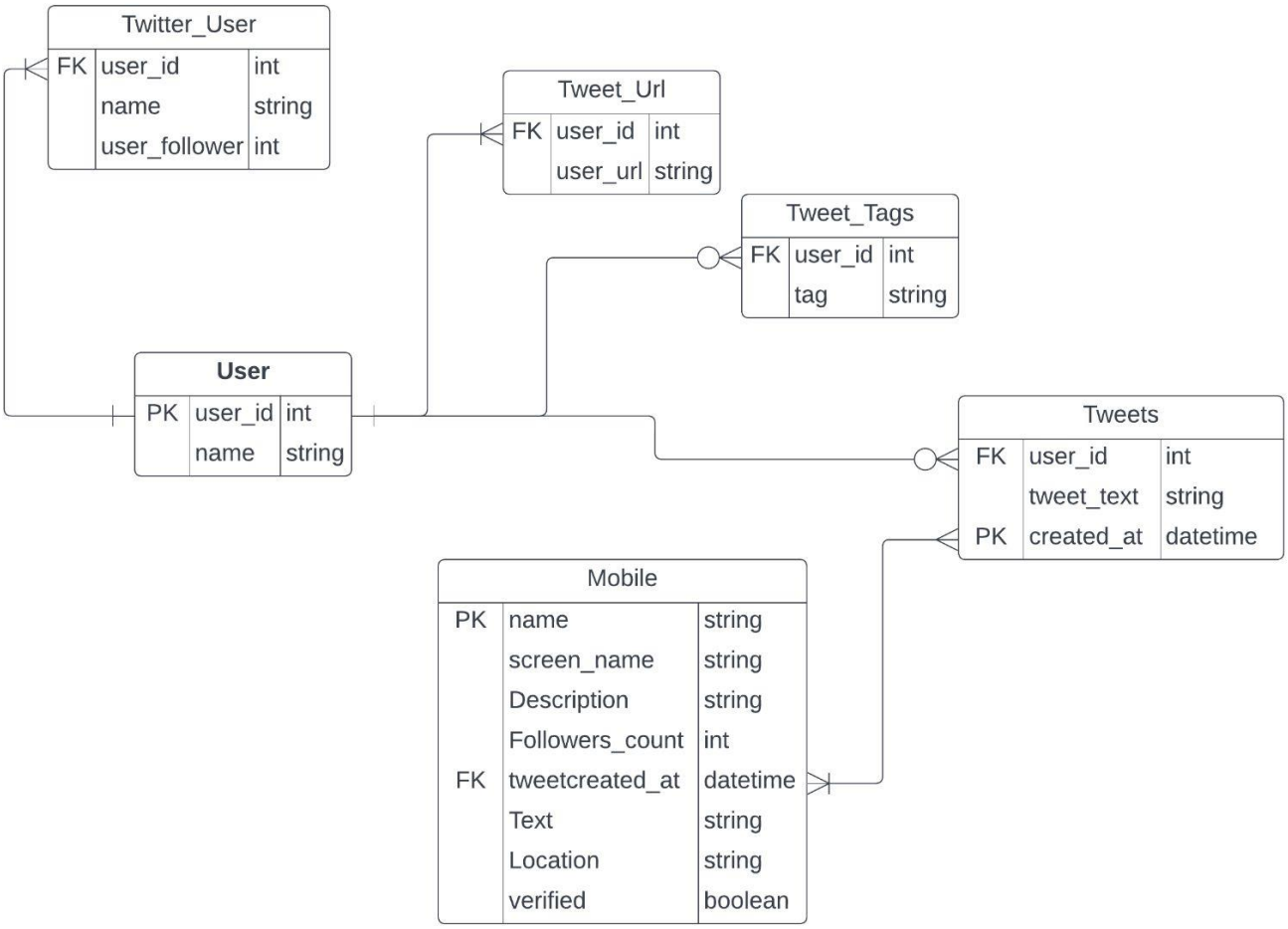
id	battery_pc	blue	clock_spe	dual_sim	fc	four_g	int_memo	m_dep	mobile_wt	n_cores	pc	px_height	px_width	ram	sc_h	sc_w	talk_time	three_g	touch_scre	wifi
1	1043	1	1.8	1	14	0	5	0.1	193	3	16	226	1412	3476	12	7	2	0	1	0
2	841	1	0.5	1	4	1	61	0.8	191	5	12	746	857	3895	6	0	7	1	0	0
3	1807	1	2.8	0	1	0	27	0.9	186	3	4	1270	1366	2396	17	10	10	0	1	1
4	1546	0	0.5	1	18	1	25	0.5	96	8	20	295	1752	3893	10	0	7	1	1	0
5	1434	0	1.4	0	11	1	49	0.5	108	6	18	749	810	1773	15	8	7	1	0	1
6	1464	1	2.9	1	5	1	50	0.8	198	8	9	569	939	3506	10	7	3	1	1	1
7	1718	0	2.4	0	1	0	47	1	156	2	3	1283	1374	3873	14	2	10	0	0	0
8	833	0	2.4	1	0	0	62	0.8	111	1	2	1312	1880	1495	7	2	18	0	1	1
9	1111	1	2.9	1	9	1	25	0.6	101	5	19	556	876	3485	11	9	10	1	1	0
10	1520	0	0.5	0	1	0	25	0.5	171	3	20	52	1009	651	6	0	5	1	0	1
11	1500	0	2.2	0	2	0	55	0.6	80	7	6	503	1336	3866	13	7	20	0	1	0
12	1343	0	2.9	0	2	1	34	0.8	171	3	6	235	1671	3911	15	8	8	1	1	1
13	900	1	1.4	1	0	0	30	1	87	2	3	829	1893	439	6	2	20	1	0	0
14	1190	1	2.2	1	5	0	19	0.9	158	5	15	227	1856	992	13	0	16	1	1	0
15	630	0	1.8	0	8	1	51	0.9	193	8	9	1315	1323	2751	17	6	3	1	1	0
16	1846	1	1	0	5	1	53	0.7	106	8	7	185	1832	563	9	5	10	1	0	1
17	1985	0	0.5	1	14	1	26	1	163	2	17	613	1511	2083	13	3	14	1	1	0
18	1042	0	2.9	0	5	1	48	0.2	186	4	15	335	532	2187	9	2	5	1	0	0
19	1231	1	1.7	1	2	1	37	0.2	194	2	3	82	1771	3902	19	12	15	1	0	1
20	1488	0	2.6	0	9	0	37	0.7	189	4	20	47	559	2524	5	0	6	0	0	0
21	968	0	0.6	0	8	1	7	0.7	151	1	17	504	1930	1357	15	1	16	1	1	0
22	529	0	2.6	1	1	0	60	0.5	101	5	5	521	1591	3456	13	11	9	0	1	0
23	1558	0	1.7	1	7	0	50	0.1	115	2	10	777	1587	1641	17	0	9	0	1	1
24	533	1	0.7	1	16	0	58	0.8	97	5	18	512	1111	2322	17	3	2	0	1	0
25	1037	0	1.7	1	1	0	5	0.7	125	3	6	1194	1321	3862	17	4	7	1	1	0
26	1025	0	1.6	1	6	1	43	0.7	122	3	16	1003	1306	557	15	10	14	1	1	1
27	1858	0	3	1	0	0	17	0.6	124	4	1	575	1200	2427	16	11	13	1	1	0

test

Scrapped data from twitter:

	A	B	C	D	E	F	G	H	I	J
1	field1	ID	UserName	ScreenName	Description	Followers	Created_at	Text	Location	Verified
2	0	1.59E+18	Auction Network	Auction_Network	Weekly Live Online Auctions of	1190	11/12/2022 22:15	b'RCM 2015 Fine Pure Silver $250. Coin - Looney Tunes Ensemble Cast, Mintage 750 -	Unionville, Ontario	FALSE
3	1	1.59E+18	Offerte del Giorno	offertedi_oggi	Pubblichiamo le migliori	1971	11/12/2022 22:09	b'\xf0\x9f\x91\x80 Samsung Galaxy Buds2 Cuffie Bluetooth, True Wireless\n\xf0\x9f\	Italia	FALSE
4	2	1.59E+18	Super Offerte dal Web!	SuperOfferteXyz	Pubblichiamo le migliori	258	11/12/2022 22:09	b'\xf0\x9f\x91\x80 Samsung Galaxy Buds2 Cuffie Bluetooth, True Wireless\n\xf0\x9f\	Italia	FALSE
5	3	1.59E+18	Auction Network	Auction_Network	Weekly Live Online Auctions of	1190	11/12/2022 20:15	b'18kt Yellow & White Gold Custom 3 Rows of Diamonds Band Ring = 1.25ct. Ap	Unionville, Ontario	FALSE
6	4	1.59E+18	Coupon Matrix	MatrixCoupon	couponMatrix - Offers And Pron	18	11/12/2022 18:32	b'Samsung HW-Q990B Dolby Atmos Soundbar\nMSRP $1,897.00\n\xe2\x80\x9cAs D	London	FALSE
7	5	1.59E+18	Eren JÃ¤ger	Red01Phoenix		3	11/12/2022 17:26	b'Deal alert: Samsung Galaxy A73 5G Smartphone 120Hz Super AMOLED Plus 5000mAh Battery 108MP (		FALSE
8	6	1.59E+18	PromOferta Web | PromoÃ	PromOfertaWeb	Melhores Links, com	40	11/12/2022 15:59	b"30% DE CASHBACK\nSmartphone Samsung Galaxy M31 128gb 4g Wi-Fi Tela 6.4'' Dual Chip 6gb Ram\n'		FALSE
9	7	1.59E+18	Profertas	ProfertasOfc	As melhores promoÃ§Ãµes,	776	11/12/2022 15:55	b'(parceiro magalu) Tablet Samsung Galaxy A7 Lite 8,7\xe2\x80\x9d 4G Wi-Fi 32GB de	Brasil	FALSE
10	8	1.59E+18	DealShop99.com	dealshop999	Top Deals save up to 80% on yc	7051	11/12/2022 15:30	b'\xf0\x9f\x93\xb1 Samsung Galaxy M13 5G (4GB, 64GB Storage) 5000mAh Battery\n\nM.R.P.: \xe2\x82		FALSE
11	9	1.59E+18	MeteoPerugia	Meteo_Perugia	Stazione Meteorologica di	300	11/12/2022 14:00	b'WebCam 12/11/22 ore 15:00\nhttps://t.co/Sk3W62p4Ga\n(Samsung Galaxy GT-S5	Perugia	FALSE
12	10	1.59E+18	Back from Vacay! Will resur	yourswithcoffee	DMs open! ðŸ'Œ MOD: JnT Dire	258	11/12/2022 11:48	b'BATCH 2 WILL PROCEED \xf0\x9f\x92\x8e\n\nWonwoo Phone Case\n\nwts lfb svt p	feedbacks âž¡ï¸	FALSE
13	11	1.59E+18	Lite Pocket Deals India	price_drop_IN	Follow us to be first to be notifi	222	11/12/2022 10:07	b'https://t.co/7e7YF1W4Yc\n\nDURACELL Wall Charger PD & Quick Charge 36W,	India	FALSE
14	12	1.59E+18	Matt	Matt42417739	Aston Villa FC 1874	291	11/12/2022 10:07	b"@Beno_ldn @EE Probably because they're Apple devices, they're so overpriced. The	Dudley, England	FALSE
15	13	1.59E+18	Rose	Rose96860188	Hello	0	11/12/2022 10:00	b'Hi\nSmartwatch\nFitbit Versa 3, $157.00, 32% off\nGarmin Venu, $179.99, 49% off\nSamsung Galaxy		FALSE
16	14	1.59E+18	Daniele Camorani	ilcamo1682	ciao a tutti quanti e benvenuto!	6	11/12/2022 9:20	b'Samsung Galaxy Buds Live Auricolari True Wireless Open-type senza tappi In-Ear\n\r	Emilia Romagna, It	FALSE
17	15	1.59E+18	Ù‹	yuhaengcarts	ðŸŽ±ðŸ–‡ðŸ""â˜ï¸ ð"ƒ #ï„¸ë¸í‹´ (	418	11/12/2022 8:23	b'wts lfb ph \xe2\x8c\x87 #yhgsales\n\xe2\x98\xbb jk galaxy s21 + jaehwan change \x	viel Ë™áµ•Ë™ they.	FALSE
18	16	1.59E+18	selvaganesh	selva_gnsh	Founder and Chief Editor At htt	38	11/12/2022 8:12	b'AndroidInfotec: Samsung Galaxy A13 5G at $194.99 (Save $55.00) with eligible trad	India	FALSE
19	17	1.59E+18	selvaganesh	selva_gnsh	Founder and Chief Editor At htt	38	11/12/2022 8:12	b'AndroidInfotec: Samsung Galaxy A20 at $194.99 (Save $55.00) with eligible trade-in	India	FALSE
20	18	1.59E+18	selvaganesh	selva_gnsh	Founder and Chief Editor At htt	38	11/12/2022 8:12	b'AndroidInfotec: Samsung Galaxy A23 5G at $244.99 (Save $55.00) with eligible trad	India	FALSE
21	19	1.59E+18	selvaganesh	selva_gnsh	Founder and Chief Editor At htt	38	11/12/2022 8:12	b'AndroidInfotec: Samsung Galaxy A32 5G at $224.99 (Save $55.00) with eligible trad	India	FALSE
22	20	1.59E+18	selvaganesh	selva_gnsh	Founder and Chief Editor At htt	38	11/12/2022 8:12	b'AndroidInfotec: Samsung Galaxy A13 at $134.99 (Save $55.00) with eligible trade-in	India	FALSE
23	21	1.59E+18	Android Infotech	AndroidInfotec	Android Tips, Tutorials, Guide, F	284	11/12/2022 7:32	b'Samsung Galaxy A13 5G at $194.99 (Save $55.00) with eligible trade-in or $5.42/mc	Karaikkudi, India	FALSE
24	22	1.59E+18	Android Infotech	AndroidInfotec	Android Tips, Tutorials, Guide, F	284	11/12/2022 7:28	b'Samsung Galaxy A20 at $194.99 (Save $55.00) with eligible trade-in or $5.42/mo fo	Karaikkudi, India	FALSE
25	23	1.59E+18	Android Infotech	AndroidInfotec	Android Tips, Tutorials, Guide, F	284	11/12/2022 7:24	b'Samsung Galaxy A23 5G at $244.99 (Save $55.00) with eligible trade-in or $6.81/mc	Karaikkudi, India	FALSE
26	24	1.59E+18	Android Infotech	AndroidInfotec	Android Tips, Tutorials, Guide, F	284	11/12/2022 7:19	b'Samsung Galaxy A32 5G at $224.99 (Save $55.00) with eligible trade-in or $6.26/mc	Karaikkudi, India	FALSE
27	25	1.59E+18	Android Infotech	AndroidInfotec	Android Tips, Tutorials, Guide, F	284	11/12/2022 7:16	b'Samsung Galaxy A13 at $134.99 (Save $55.00) with eligible trade-in or $3.76/mo fo	Karaikkudi, India	FALSE
28	26	1.59E+18	selvaganesh	selva_gnsh	Founder and Chief Editor At htt	38	11/12/2022 7:12	b'AndroidInfotec: Samsung Galaxy A12 at $124.99 (Save $55.00) with eligible trade-in	India	FALSE
29	27	1.59E+18	selvaganesh	selva_gnsh	Founder and Chief Editor At htt	38	11/12/2022 7:12	b'AndroidInfotec: Samsung Galaxy A03s at $104.99 (Save $55.00) with eligible trade-i	India	FALSE
30	28	1.59E+18	selvaganesh	selva_gnsh	Founder and Chief Editor At htt	38	11/12/2022 7:12	b'AndroidInfotec: Samsung Galaxy S22 Ultra at $599.99 (Save $600.00) with eligible t	India	FALSE

ER diagram of scrapped data from twitter:

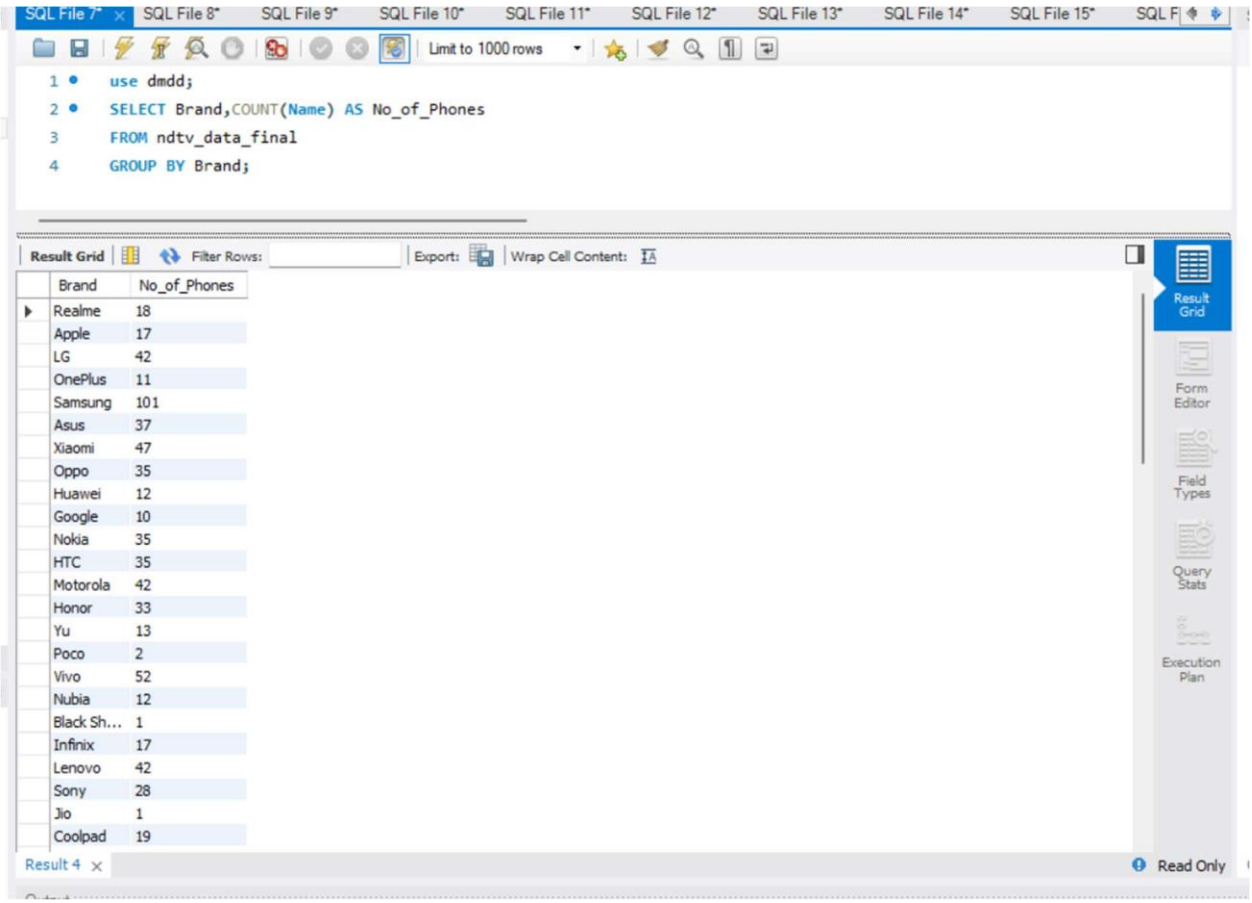


USE CASES:

Data Gathering, Munging and Cleaning:

1. Which brand have what quantity of phones?

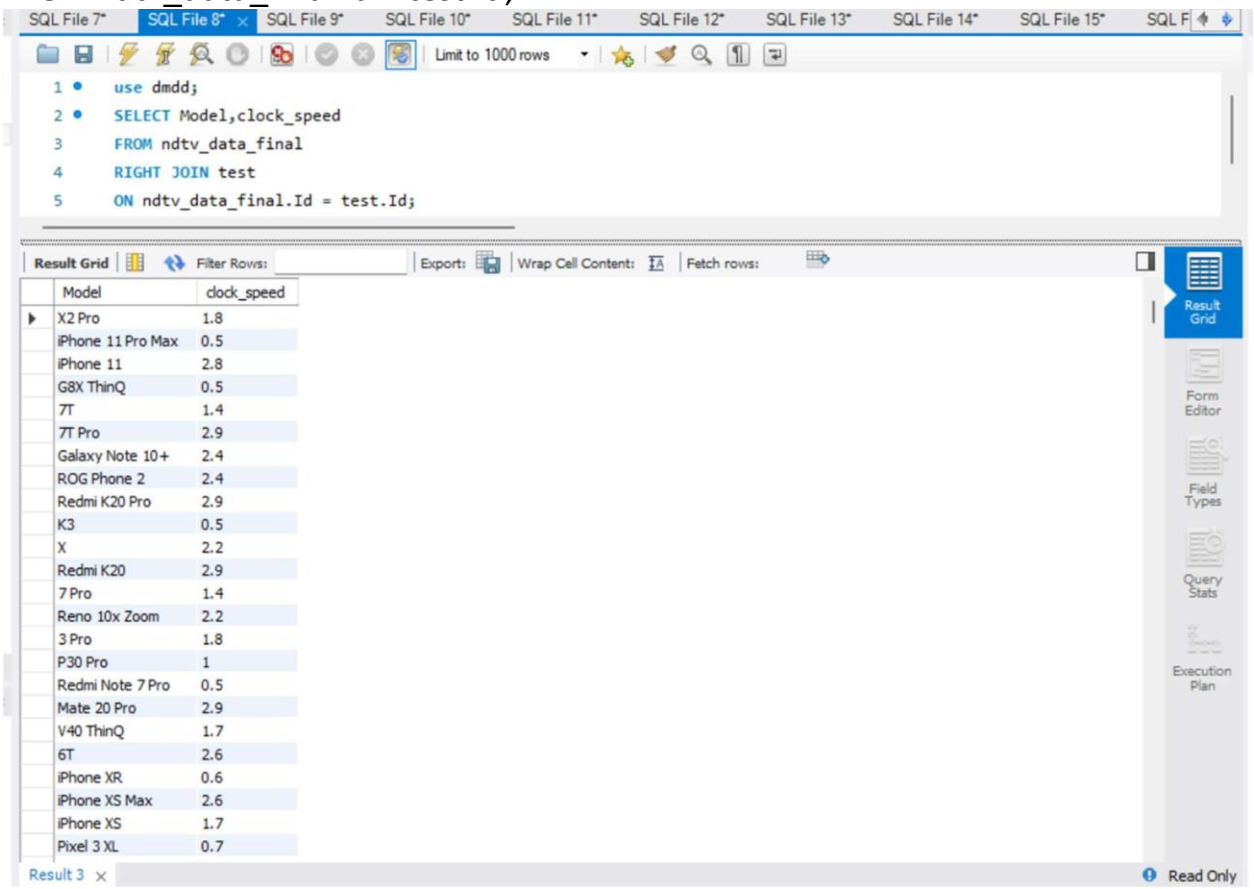
```
use dmdd;
SELECT Brand,COUNT(Name) AS
No_of_PhonesFROM
ndtv_data_final
GROUP BY Brand;
```



Brand	No_of_Phones
Realme	18
Apple	17
LG	42
OnePlus	11
Samsung	101
Asus	37
Xiaomi	47
Oppo	35
Huawei	12
Google	10
Nokia	35
HTC	35
Motorola	42
Honor	33
Yu	13
Poco	2
Vivo	52
Nubia	12
Black Sh...	1
Infinix	17
Lenovo	42
Sony	28
Jio	1
Coolpad	19

2. Which model of the smartphone has what clockspeed?

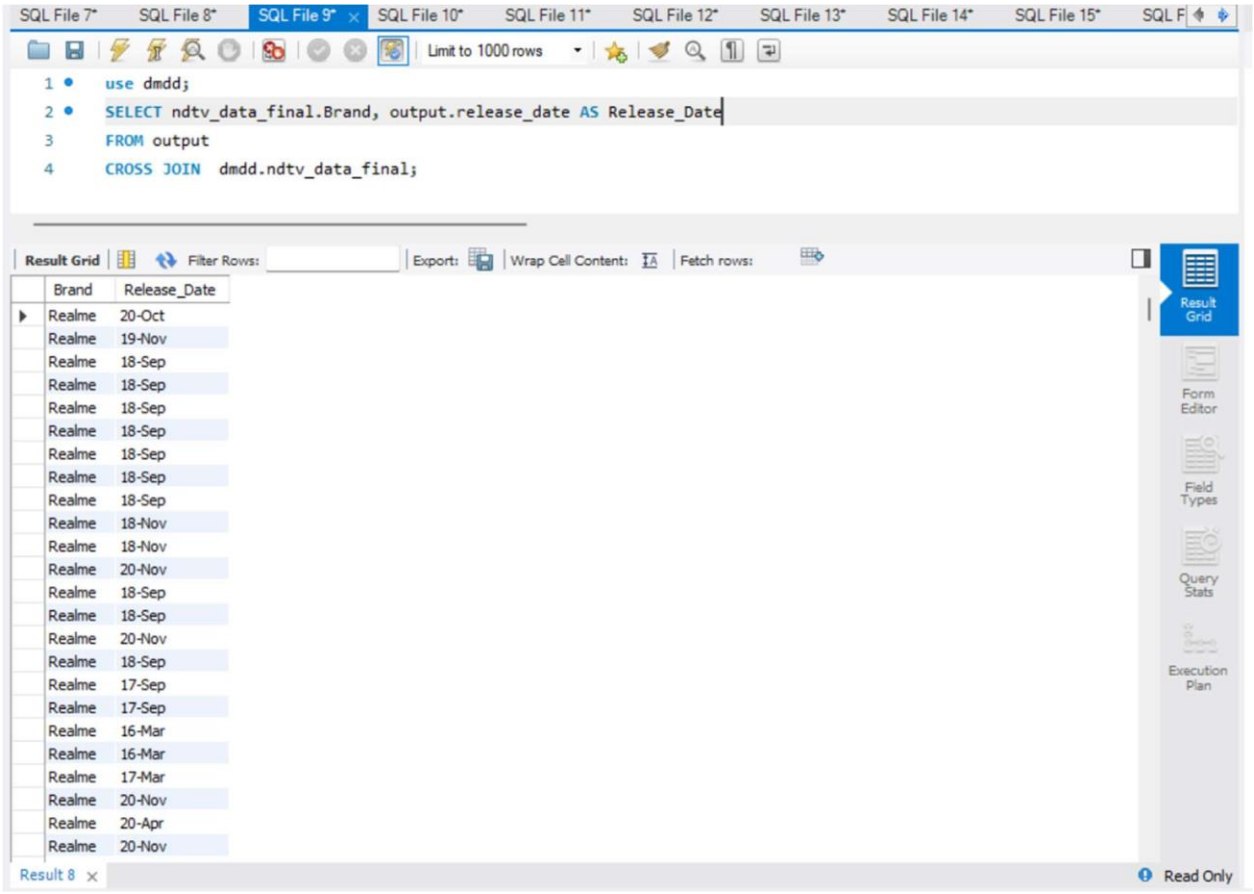
```
use dmdd;
SELECT
Model,clock_spee
dFROM
ndtv_data_final
RIGHT JOIN test
ON ndtv_data_final.Id = test.Id;
```



Model	clock_speed
X2 Pro	1.8
iPhone 11 Pro Max	0.5
iPhone 11	2.8
G8X ThinQ	0.5
7T	1.4
7T Pro	2.9
Galaxy Note 10+	2.4
ROG Phone 2	2.4
Redmi K20 Pro	2.9
K3	0.5
X	2.2
Redmi K20	2.9
7 Pro	1.4
Reno 10x Zoom	2.2
3 Pro	1.8
P30 Pro	1
Redmi Note 7 Pro	0.5
Mate 20 Pro	2.9
V40 ThinQ	1.7
6T	2.6
iPhone XR	0.6
iPhone XS Max	2.6
iPhone XS	1.7
Pixel 3 XL	0.7

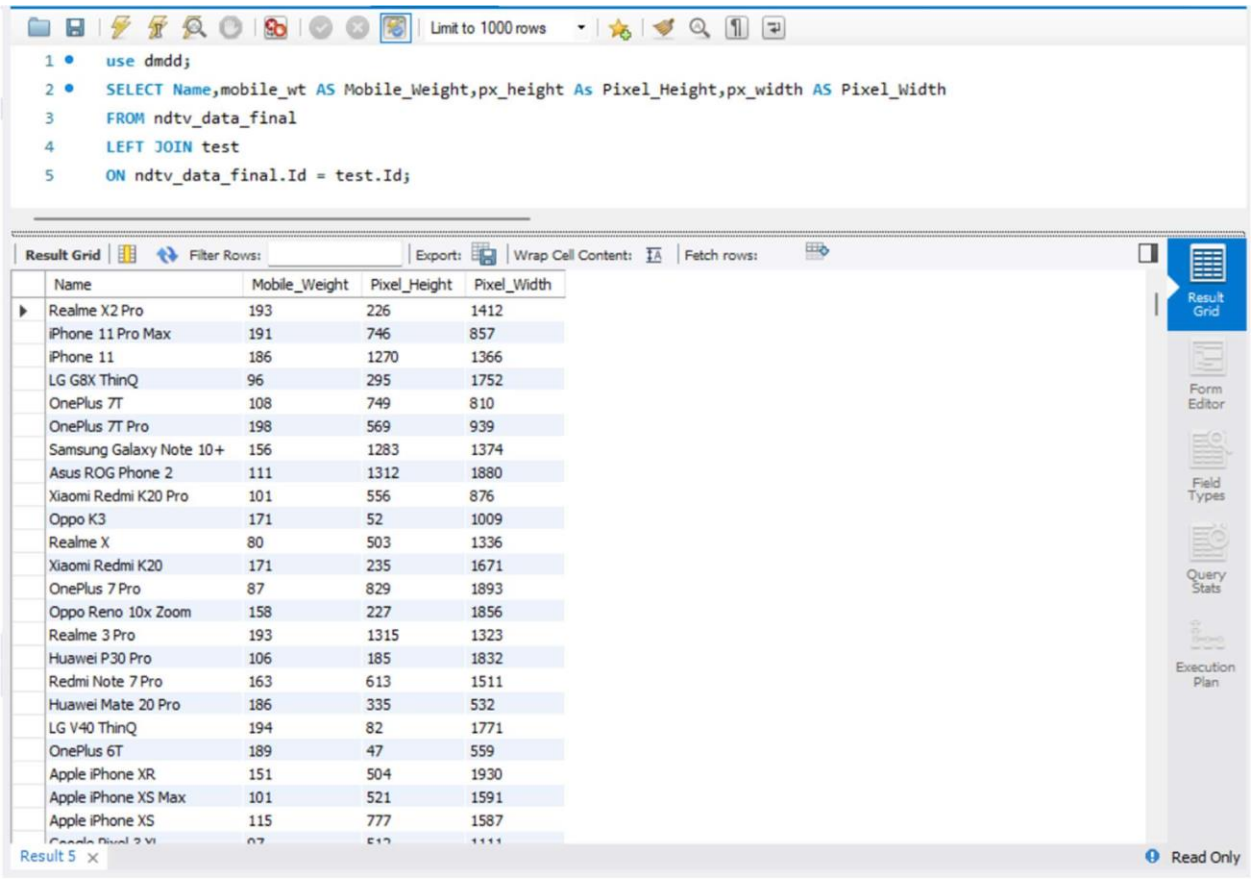
3. Which brand has what release dates of its phones? (cross join)

```
use dmdd;
SELECT ndtv_data_final.Brand, output.release_date
AS Release_DateFROM output
CROSS JOIN  dmdd.ndtv_data_final;
```



4. Which smartphone has what weight, pixel height and pixel width?

```
use dmdd;
SELECT Name,mobile_wt AS Mobile_Weight,px_height As
Pixel_Height,px_width AS Pixel_WidthFROM ndtv_data_final
LEFT JOIN test
ON ndtv_data_final.Id = test.Id;
```



```
use dmdd;
SELECT Name,mobile_wt AS Mobile_Weight,px_height As Pixel_Height,px_width AS Pixel_Width
FROM ndtv_data_final
LEFT JOIN test
ON ndtv_data_final.Id = test.Id;
```

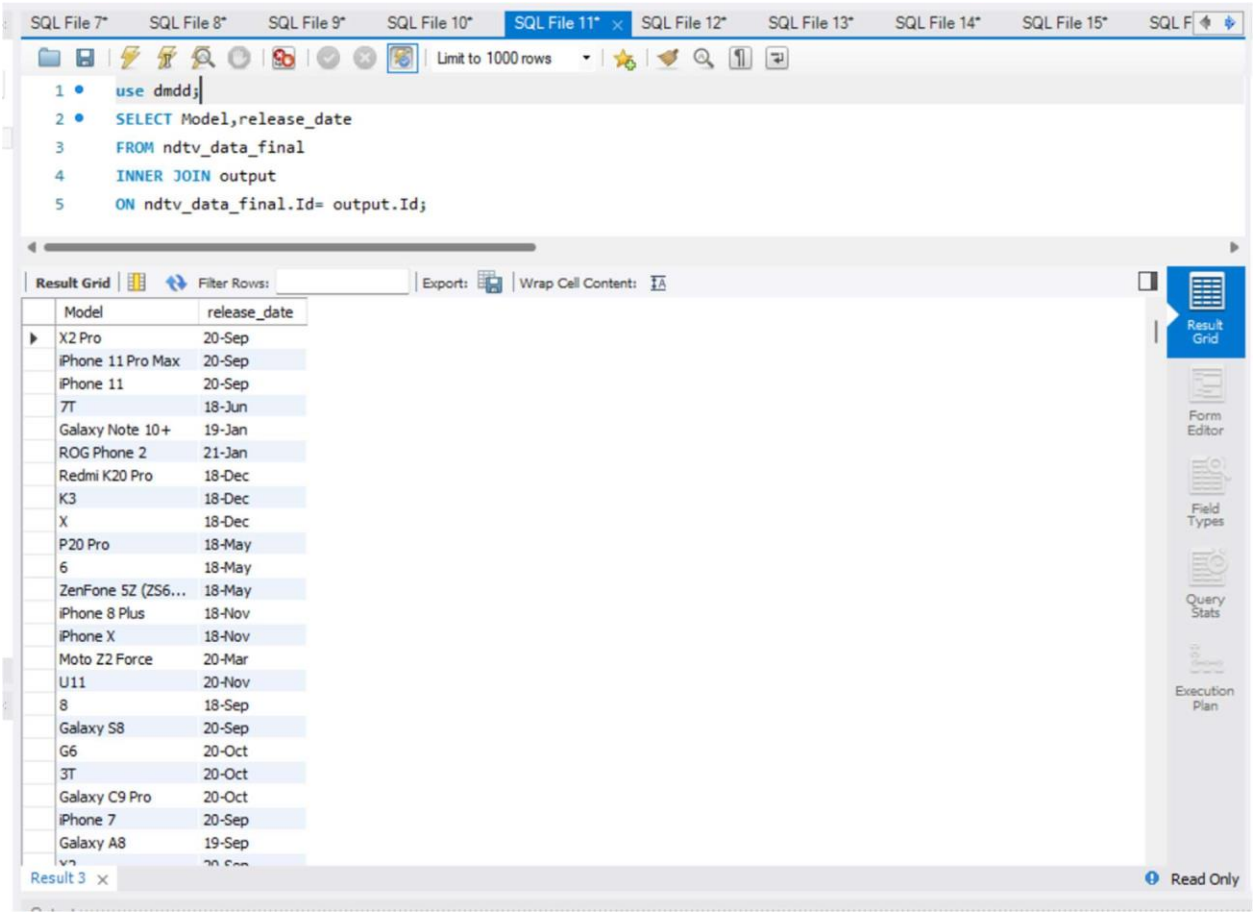
Result Grid | Filter Rows: | Export: | Wrap Cell Content: | Fetch rows:

Name	Mobile_Weight	Pixel_Height	Pixel_Width
Realme X2 Pro	193	226	1412
iPhone 11 Pro Max	191	746	857
iPhone 11	186	1270	1366
LG G8X ThinQ	96	295	1752
OnePlus 7T	108	749	810
OnePlus 7T Pro	198	569	939
Samsung Galaxy Note 10+	156	1283	1374
Asus ROG Phone 2	111	1312	1880
Xiaomi Redmi K20 Pro	101	556	876
Oppo K3	171	52	1009
Realme X	80	503	1336
Xiaomi Redmi K20	171	235	1671
OnePlus 7 Pro	87	829	1893
Oppo Reno 10x Zoom	158	227	1856
Realme 3 Pro	193	1315	1323
Huawei P30 Pro	106	185	1832
Redmi Note 7 Pro	163	613	1511
Huawei Mate 20 Pro	186	335	532
LG V40 ThinQ	194	82	1771
OnePlus 6T	189	47	559
Apple iPhone XR	151	504	1930
Apple iPhone XS Max	101	521	1591
Apple iPhone XS	115	777	1587

Result 5 | Read Only

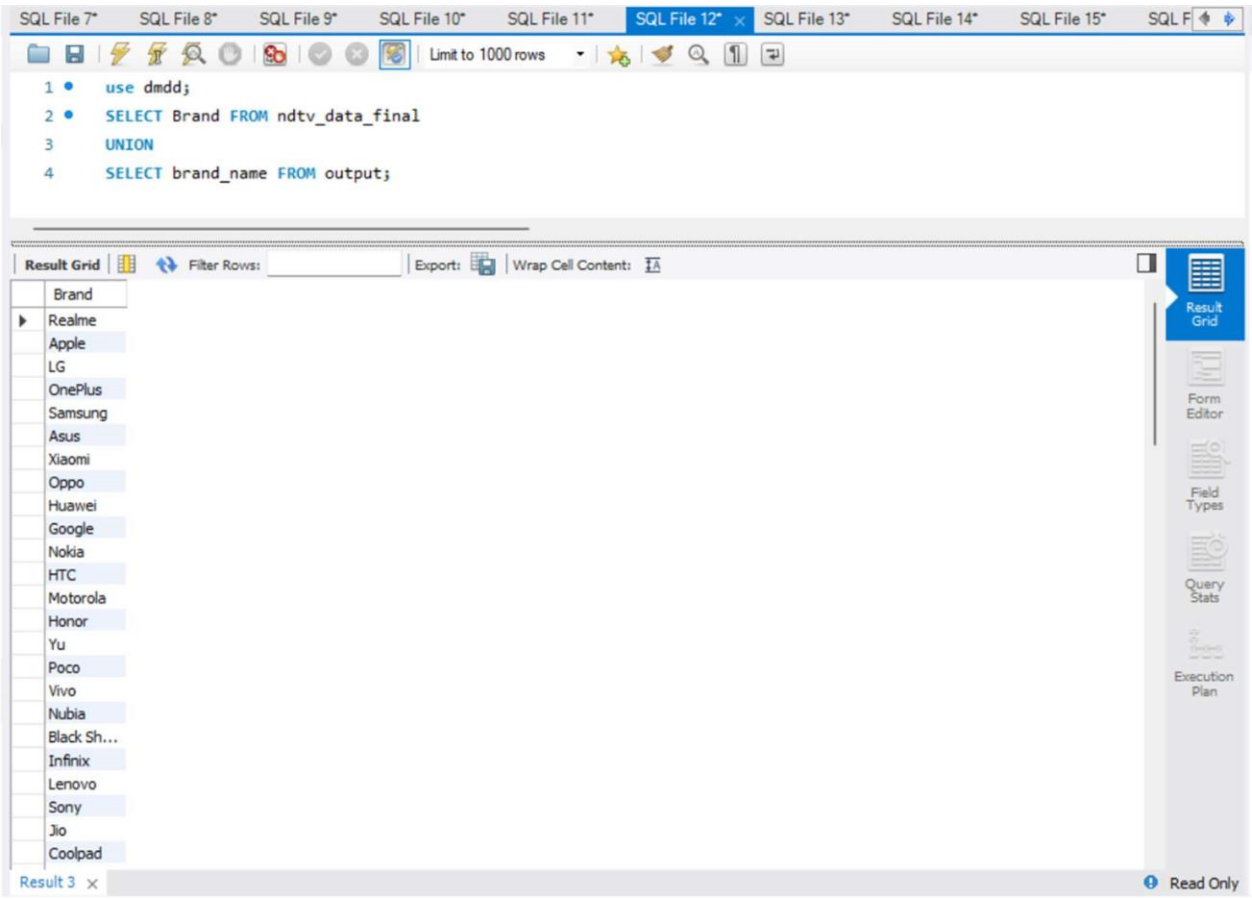
5. Which phone model has what release date? (inner join)

```
use dmdd;
SELECT
Model,release_date
FROM
ndtv_data_final
INNER JOIN output
ON ndtv_data_final.Id= output.Id;
```



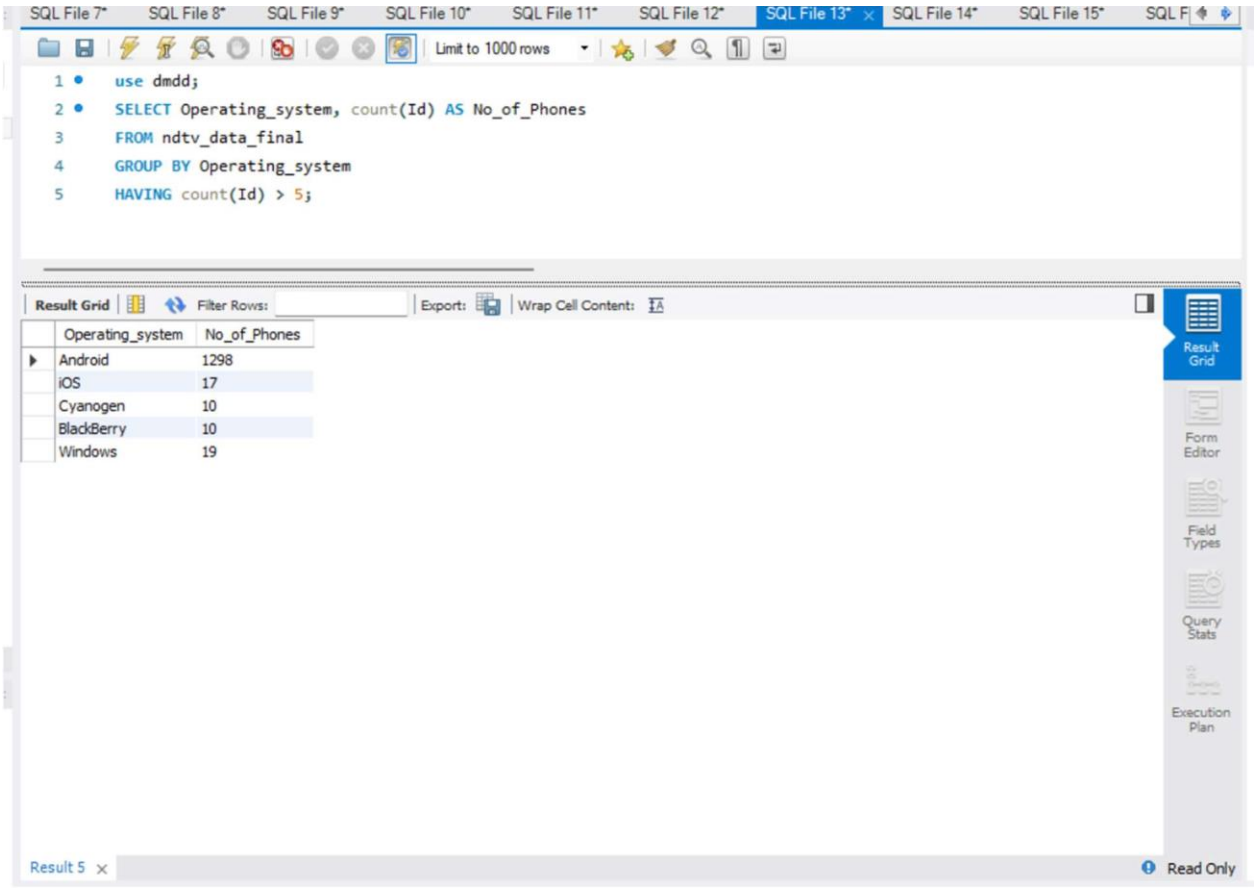
6. What is the total number of brands?

```
use dmdd;
SELECT Brand FROM
ndtv_data_finalUNION
SELECT brand_name FROM output;
```



7. What is the operating system for what number of phones?

```
use dmdd;
SELECT Operating_system, count(Id) AS
No_of_Phones FROM ndtv_data_final
GROUP BY
Operating_system
HAVING count(Id) > 5;
```



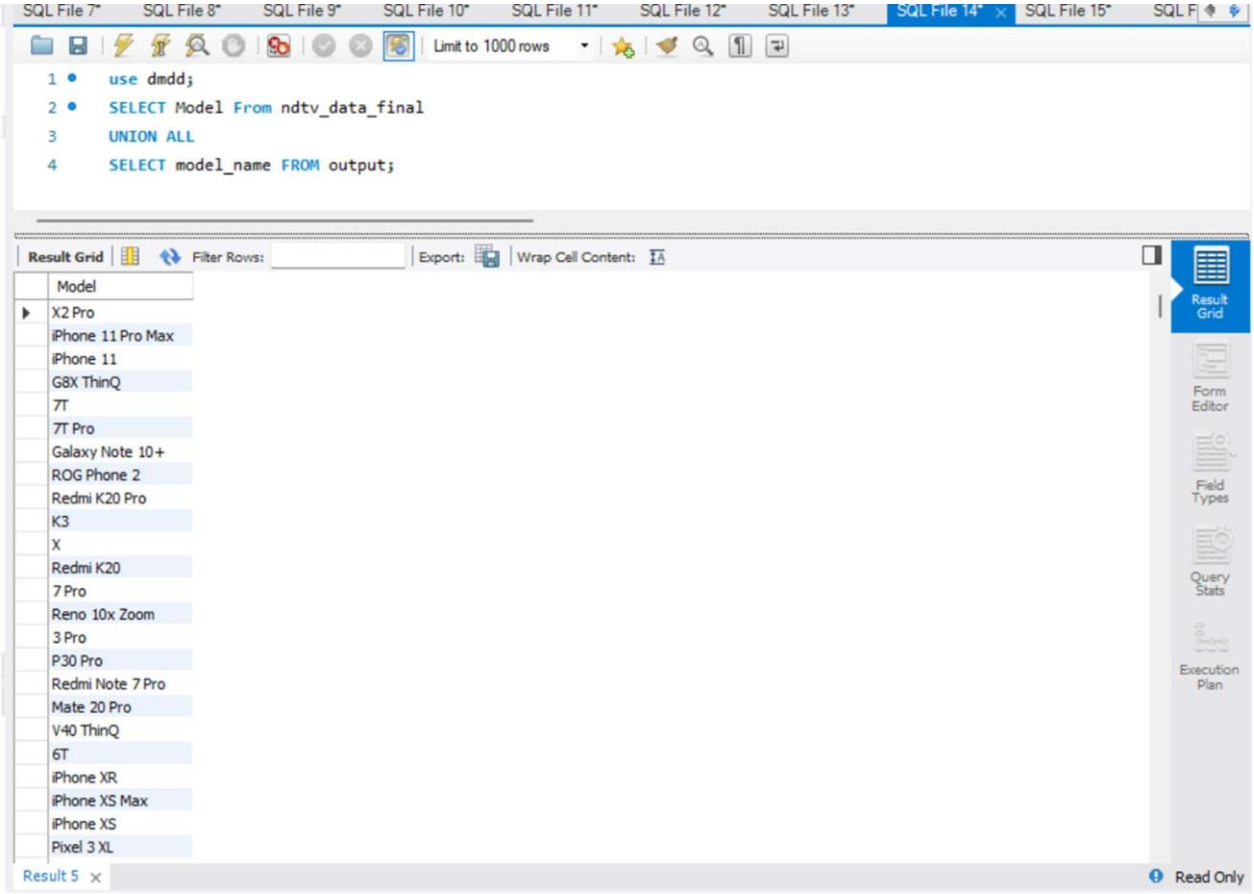
8. What is the total number of phones from both the dataset?

use dmdd;

SELECT Model From

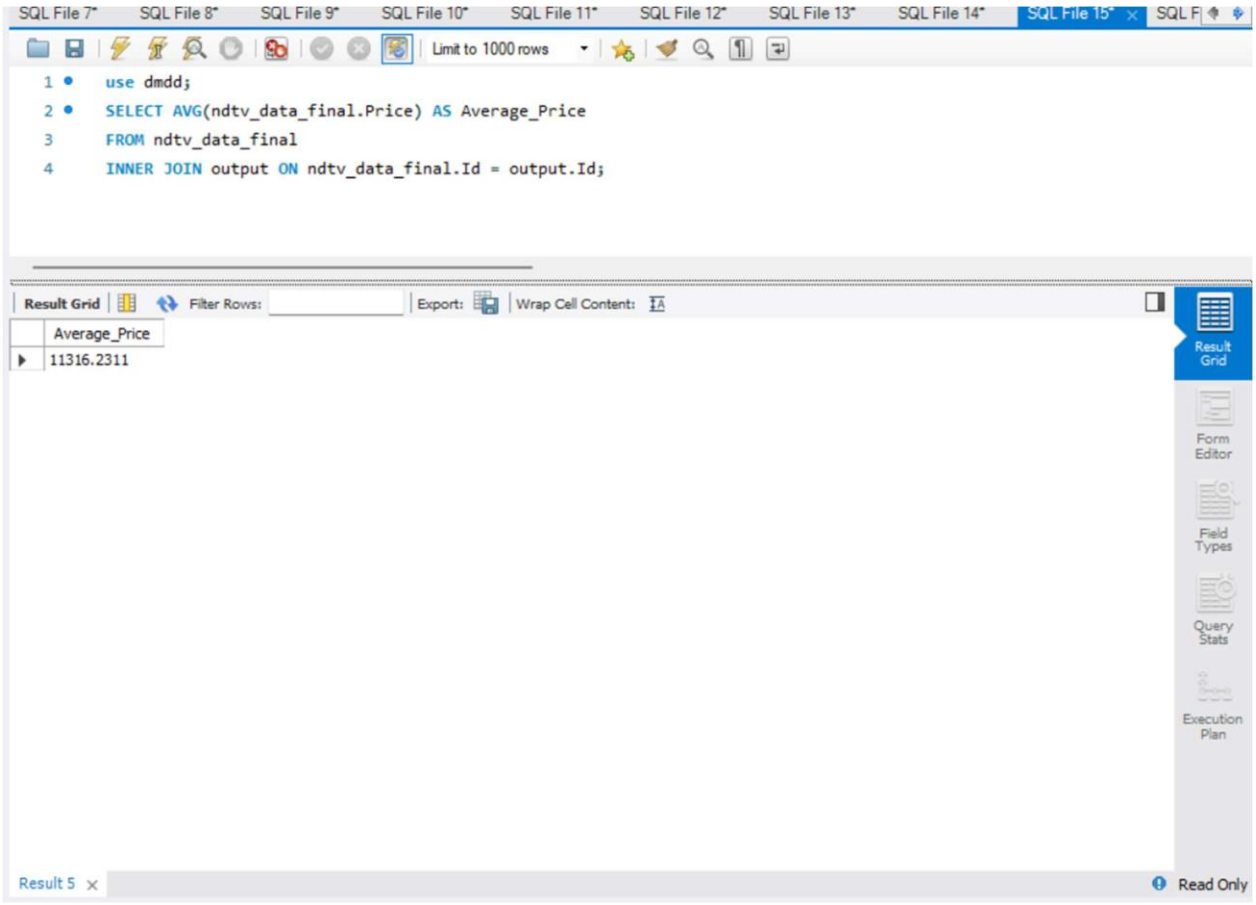
ndtv_data_finalUNION ALL

SELECT model_name FROM output;



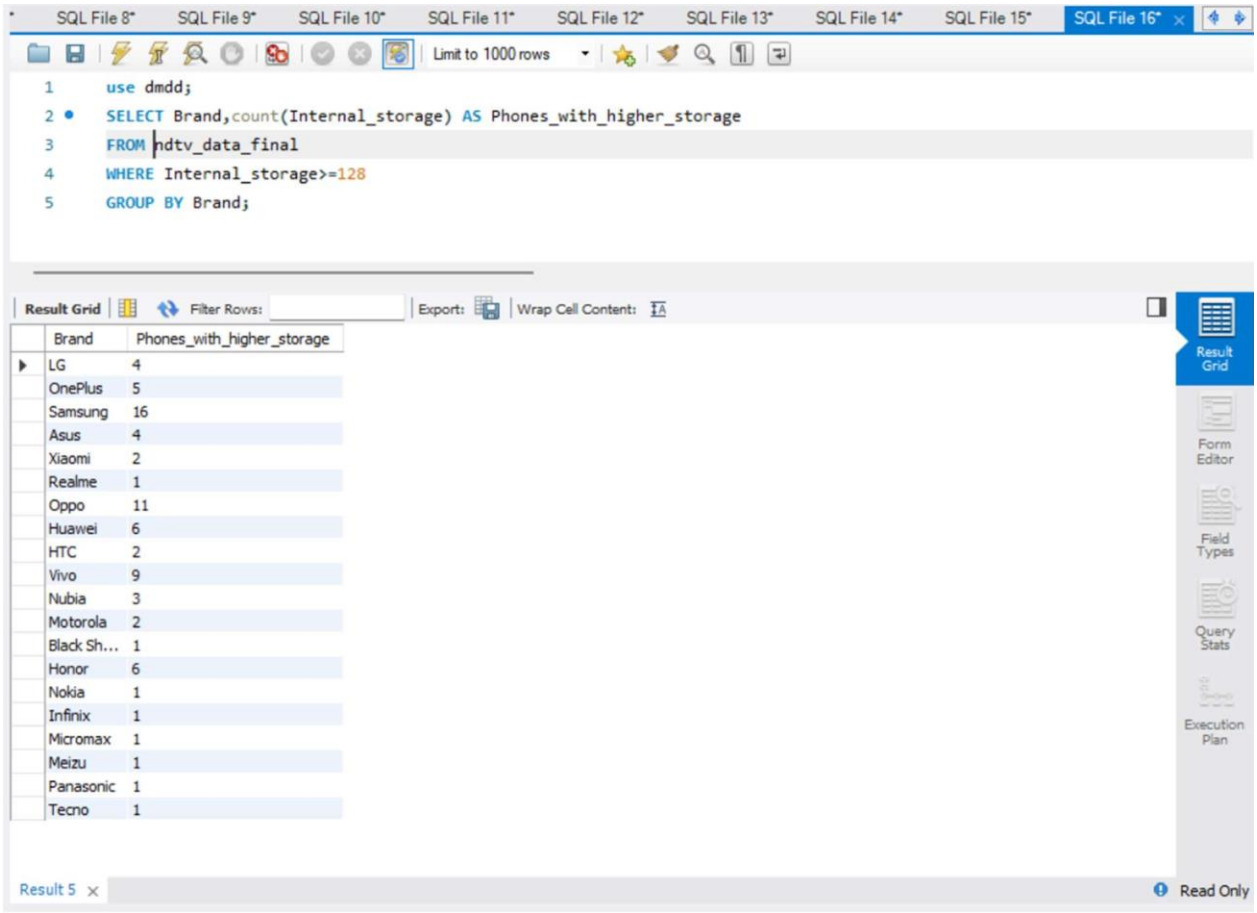
9. What is the average price of all the smartphones?

```
use dmdd;
SELECT AVG(ndtv_data_final.Price) AS
Average_PriceFROM ndtv_data_final
INNER JOIN output ON ndtv_data_final.Id = output.Id;
```



10. Which brands have what number of phones with internal storage more than 128GB?

```
use dmdd;

SELECT Brand,count(Internal_storage) AS

Phones_with_higher_storageFROM ndtv_data_final

WHERE

Internal_storage>=128

GROUP BY Brand;
```



11. Which phones have what processor count and

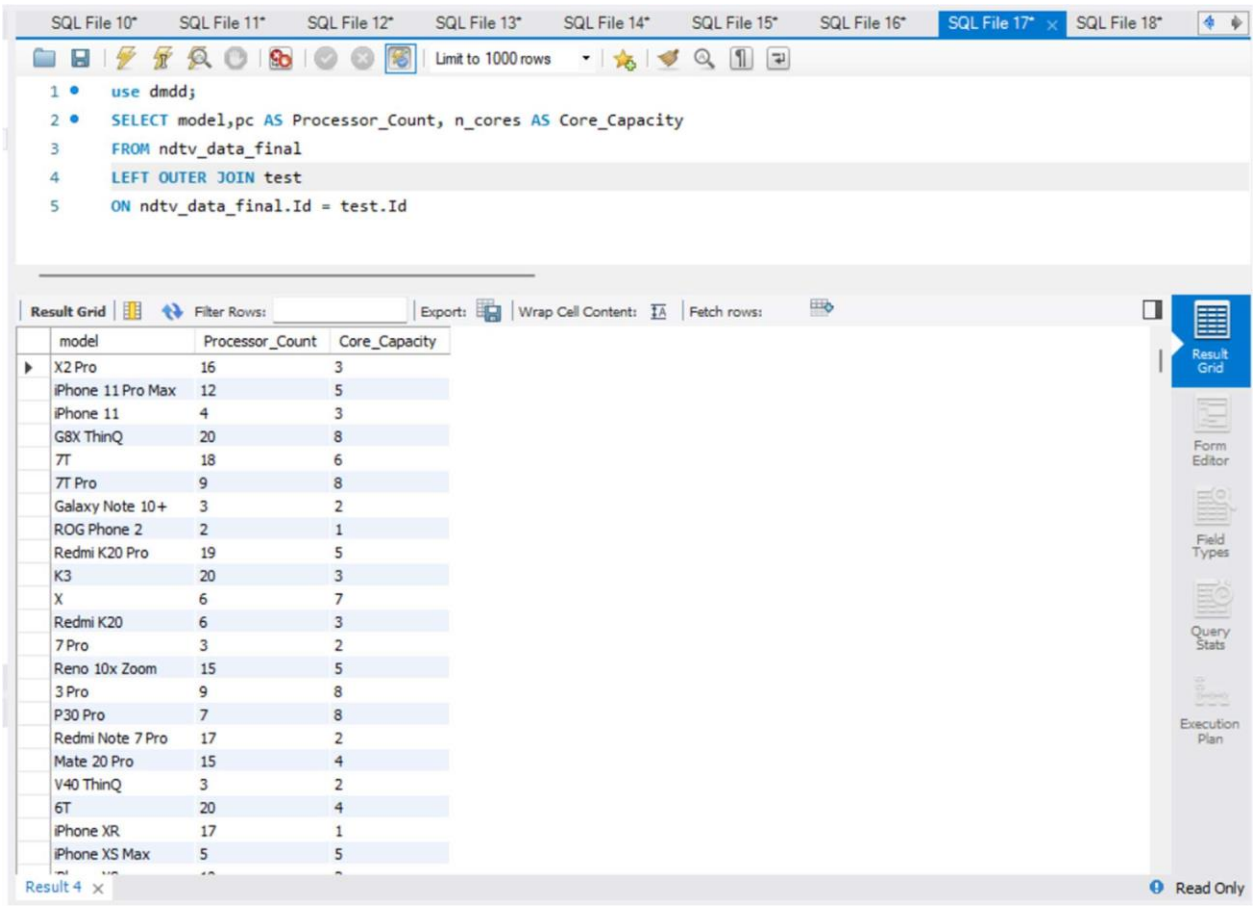
    core capacity?use dmdd;

    SELECT model,pc AS Processor_Count, n_cores AS

    Core_CapacityFROM ndtv_data_final

    LEFT OUTER JOIN test

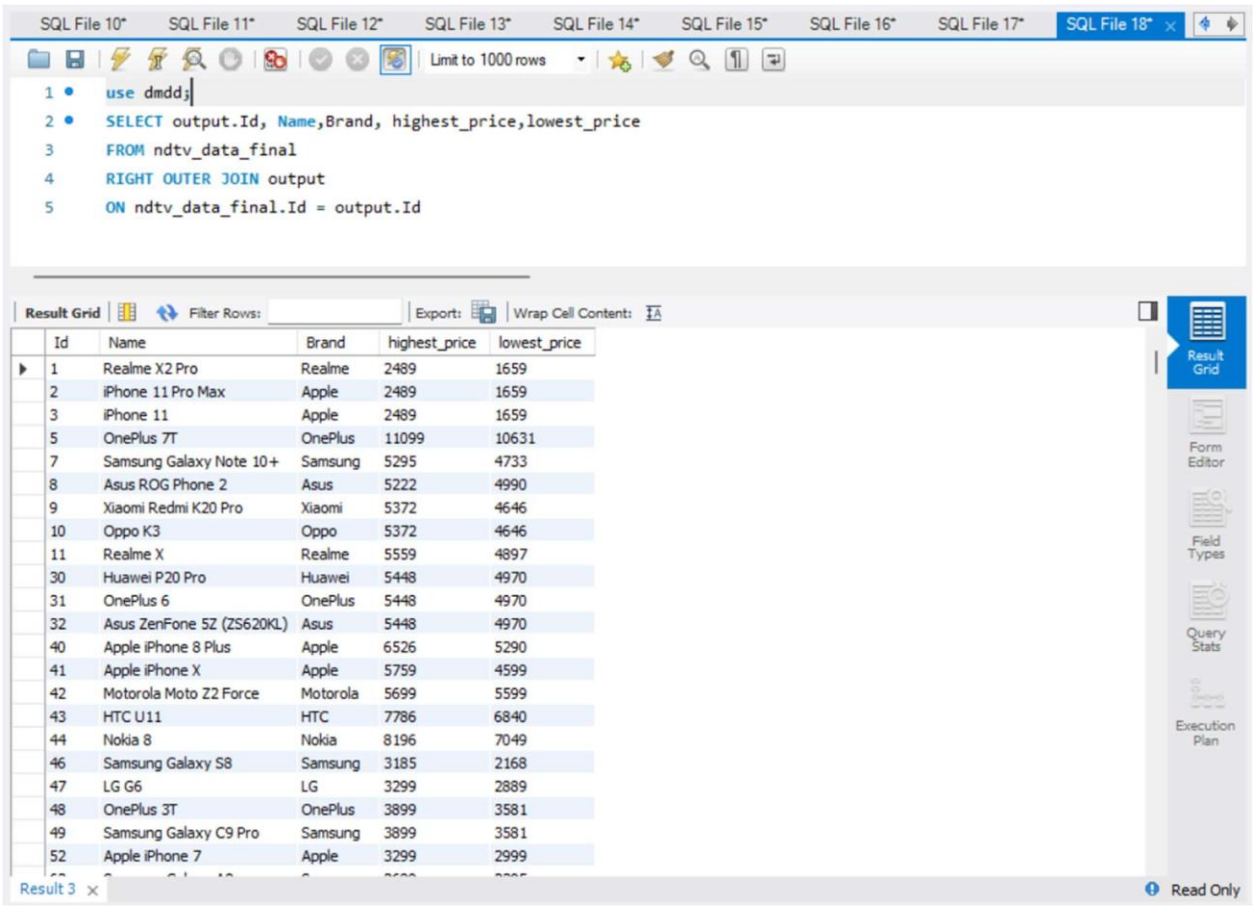
    ON ndtv_data_final.Id = test.Id



model	Processor_Count	Core_Capacity
X2 Pro	16	3
iPhone 11 Pro Max	12	5
iPhone 11	4	3
G8X ThinQ	20	8
7T	18	6
7T Pro	9	8
Galaxy Note 10+	3	2
ROG Phone 2	2	1
Redmi K20 Pro	19	5
K3	20	3
X	6	7
Redmi K20	6	3
7 Pro	3	2
Reno 10x Zoom	15	5
3 Pro	9	8
P30 Pro	7	8
Redmi Note 7 Pro	17	2
Mate 20 Pro	15	4
V40 ThinQ	3	2
6T	20	4
iPhone XR	17	1
iPhone XS Max	5	5

12. What is the highest and lowest price of the phones of each brand?

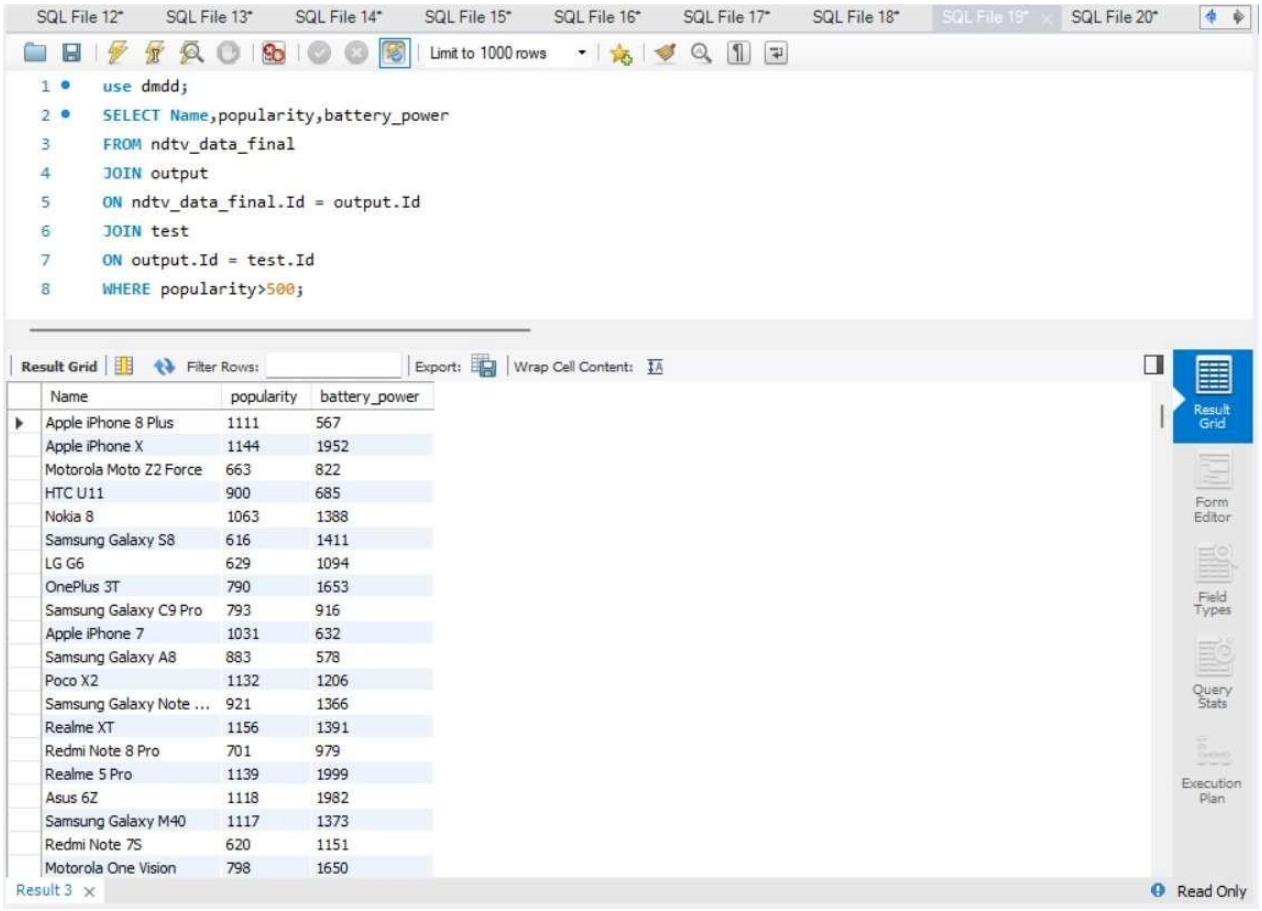
```
use dmdd;
SELECT output.Id, Name,Brand,
highest_price,lowest_priceFROM
ndtv_data_final
RIGHT OUTER JOIN output
ON ndtv_data_final.Id = output.Id
```



Id	Name	Brand	highest_price	lowest_price
1	Realme X2 Pro	Realme	2489	1659
2	iPhone 11 Pro Max	Apple	2489	1659
3	iPhone 11	Apple	2489	1659
5	OnePlus 7T	OnePlus	11099	10631
7	Samsung Galaxy Note 10+	Samsung	5295	4733
8	Asus ROG Phone 2	Asus	5222	4990
9	Xiaomi Redmi K20 Pro	Xiaomi	5372	4646
10	Oppo K3	Oppo	5372	4646
11	Realme X	Realme	5559	4897
30	Huawei P20 Pro	Huawei	5448	4970
31	OnePlus 6	OnePlus	5448	4970
32	Asus ZenFone 5Z (ZS620KL)	Asus	5448	4970
40	Apple iPhone 8 Plus	Apple	6526	5290
41	Apple iPhone X	Apple	5759	4599
42	Motorola Moto Z2 Force	Motorola	5699	5599
43	HTC U11	HTC	7786	6840
44	Nokia 8	Nokia	8196	7049
46	Samsung Galaxy S8	Samsung	3185	2168
47	LG G6	LG	3299	2889
48	OnePlus 3T	OnePlus	3899	3581
49	Samsung Galaxy C9 Pro	Samsung	3899	3581
52	Apple iPhone 7	Apple	3299	2999

13. What is the name, popularity and battery power for each mobile phone where popularity is greater than 500?

```
use dmdd;
SELECT
Name,popularity,battery_power
FROM ndtv_data_final
JOIN output
ON ndtv_data_final.Id =
output.IdJOIN test
ON output.Id =
test.Id WHERE
popularity>500;
```



Name	popularity	battery_power
Apple iPhone 8 Plus	1111	567
Apple iPhone X	1144	1952
Motorola Moto Z2 Force	663	822
HTC U11	900	685
Nokia 8	1063	1388
Samsung Galaxy S8	616	1411
LG G6	629	1094
OnePlus 3T	790	1653
Samsung Galaxy C9 Pro	793	916
Apple iPhone 7	1031	632
Samsung Galaxy A8	883	578
Poco X2	1132	1206
Samsung Galaxy Note ...	921	1366
Realme XT	1156	1391
Redmi Note 8 Pro	701	979
Realme 5 Pro	1139	1999
Asus 6Z	1118	1982
Samsung Galaxy M40	1117	1373
Redmi Note 7S	620	1151
Motorola One Vision	798	1650

14. Which phones have the mobile weight

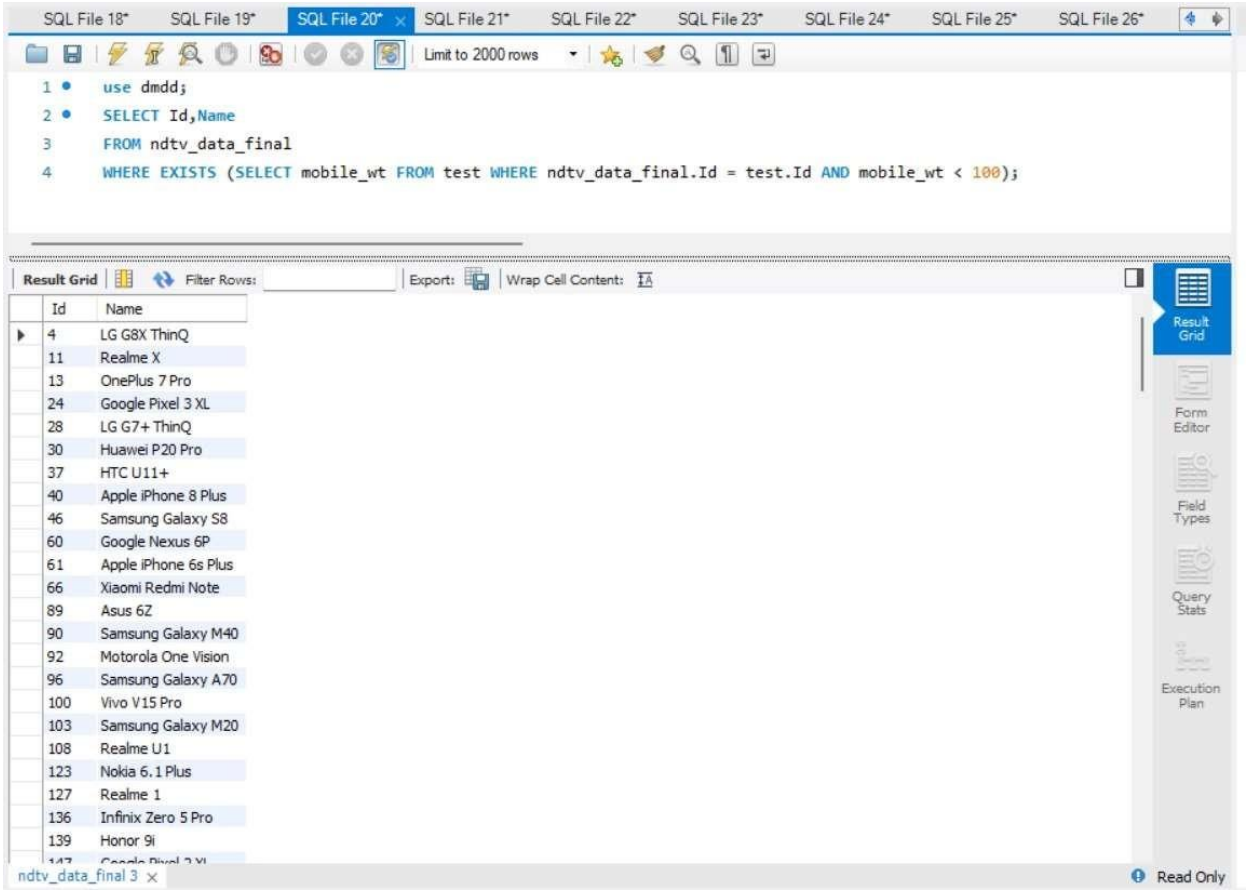
    less than 100?use dmdd;

    SELECT Id,Name

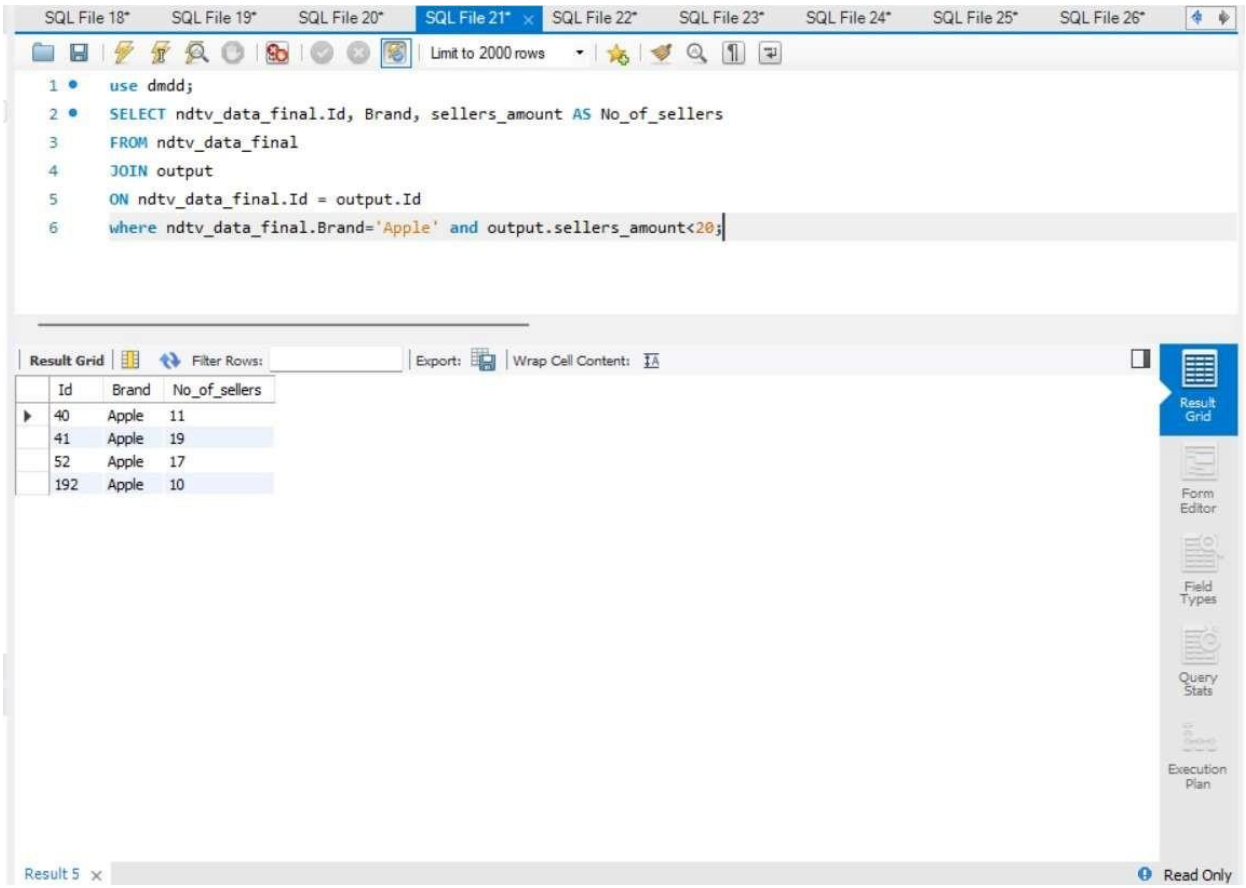
    FROM

    ndtv_data_final

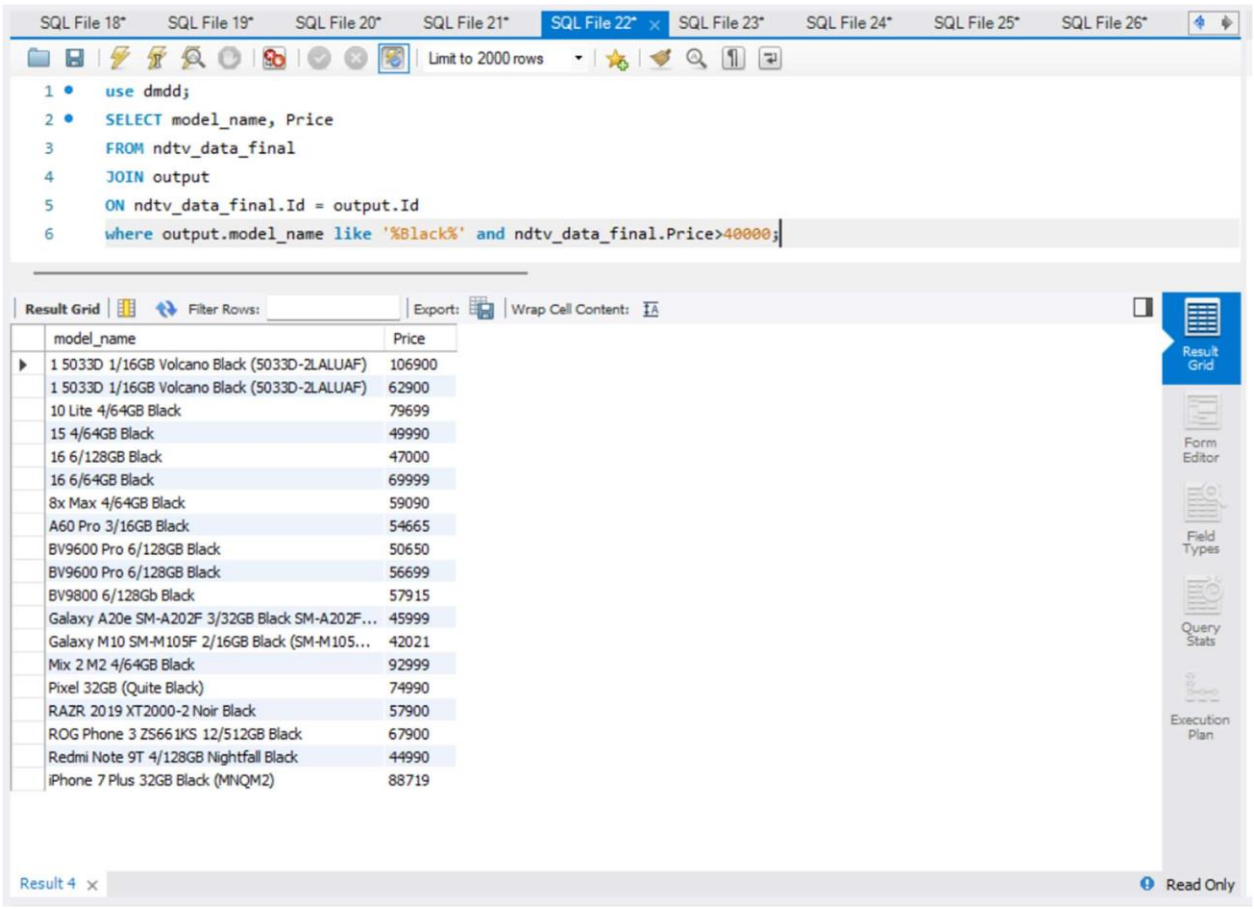
    WHERE EXISTS (SELECT mobile_wt FROM test WHERE ndtv_data_final.Id = test.Id ANDmobile_wt < 100);



15. The brand name APPLE has what number of sellers?use dmdd;
SELECT ndtv_data_final.Id, Brand, sellers_amount AS No_of_sellersFROM ndtv_data_final
JOIN output
ON ndtv_data_final.Id = output.Id
where ndtv_data_final.Brand='Apple' and output.sellers_amount<20;

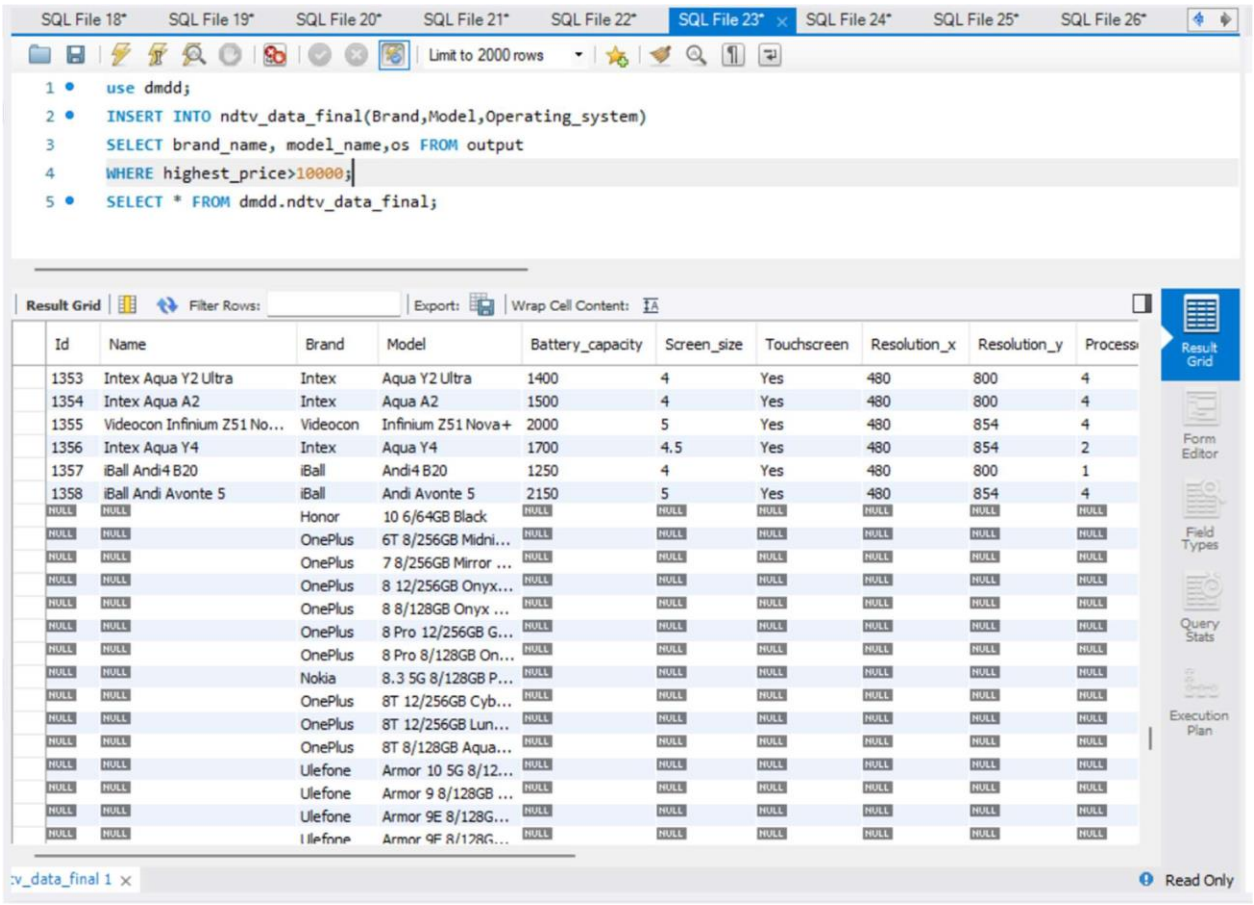


16. Which of the following mobile phones are black in colour with their prices above 40000?use dmdd;
SELECT
model_name, Price
FROM
ndtv_data_final JOIN
output
ON ndtv_data_final.Id = output.Id
where output.model_name like '%Black%' and ndtv_data_final.Price>40000;



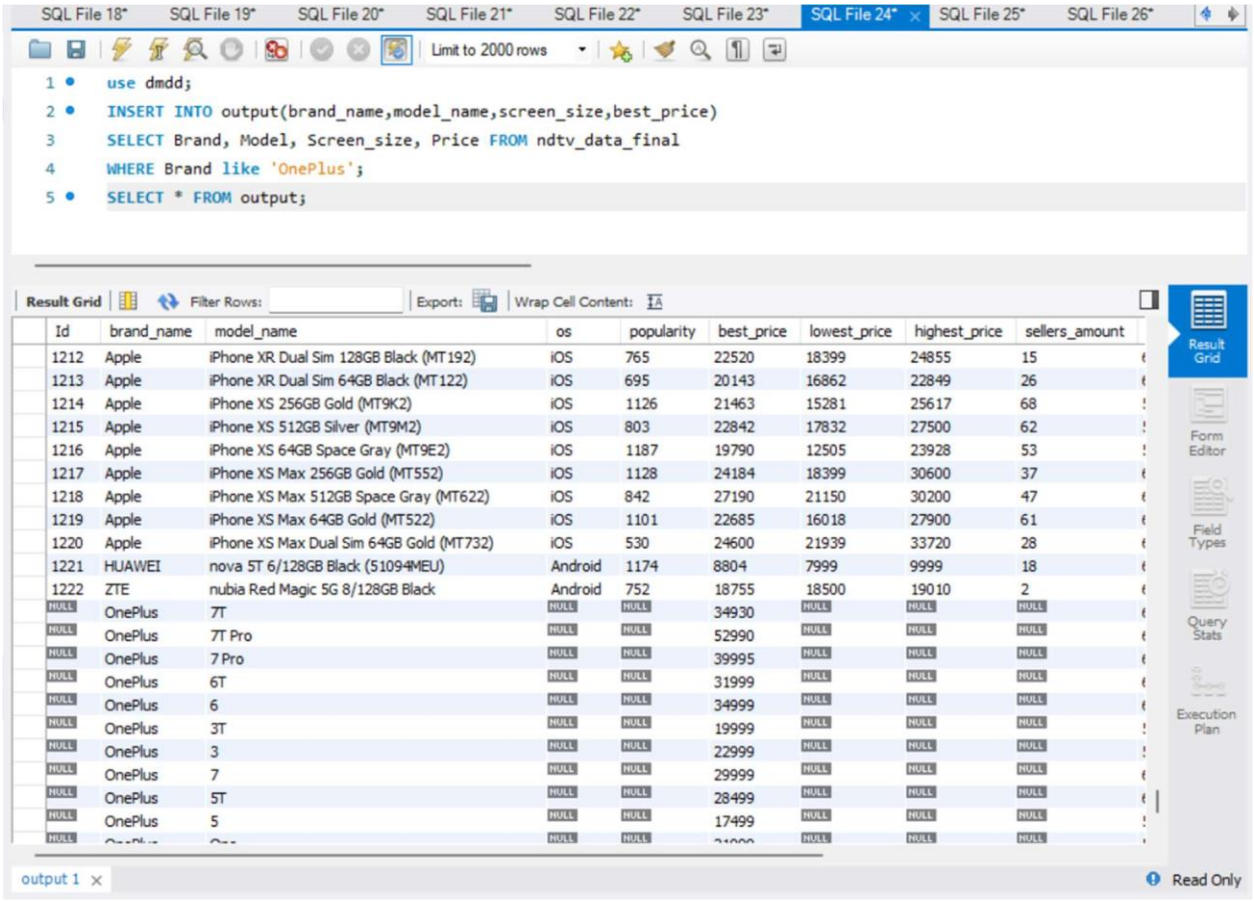
17. Brand name, Operating systems and model name of one of the dataset were inserted intoanother dataset with similar attributes whose price is greater than 10000

```
use dmdd;
INSERT INTO
ndtv_data_final(Brand,Model,Operating_system)
SELECT brand_name, model_name,os FROM
output
WHERE highest_price>10000;
SELECT * FROM dmdd.ndtv_data_final;
```



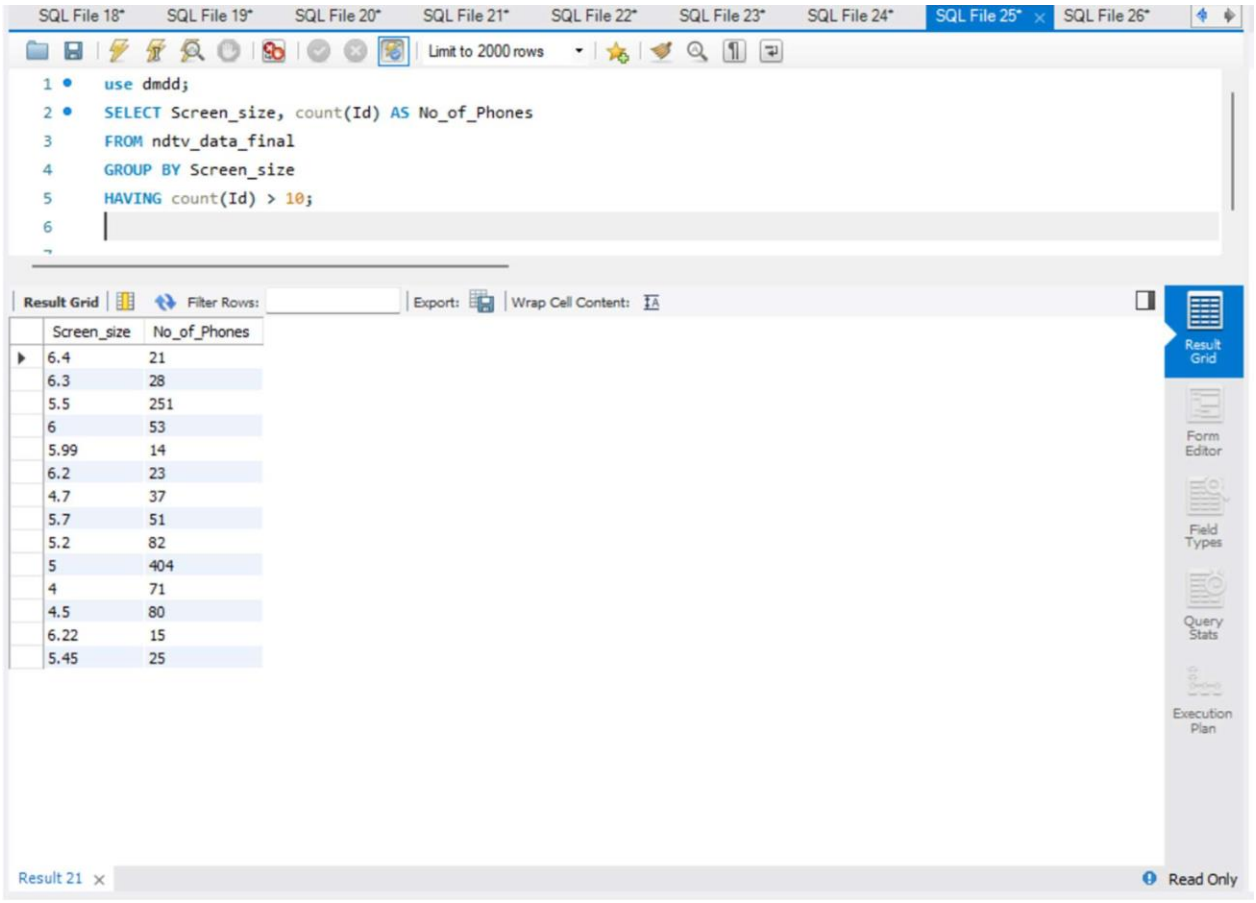
18. Brand name, Operating systems and model name of one of the dataset were inserted intoanother dataset with similar attributes whose brand name is Oneplus

```
use dmdd;
INSERT INTO
output(brand_name,model_name,screen_size,best_price)
SELECT Brand, Model, Screen_size, Price FROM
ndtv_data_final
WHERE Brand like
'OnePlus';SELECT *
FROM output;
```



19. Which of the following mobile phones have following screen size, where the quantity is above 10?

```
use dmdd;
SELECT Screen_size, count(Id) AS
No_of_PhonesFROM ndtv_data_final
GROUP BY
Screen_size
HAVING
count(Id)>10;
```



20. Self joined brands from both the tables

```
use dmdd;
SELECT ndtv_data_final.Brand,
output.brand_nameFROM
ndtv_data_final, output
WHERE ndtv_data_final.Id <> output.Id
```

SQL File 18* SQL File 19* SQL File 20* SQL File 21* SQL File 22* SQL File 23* SQL File 24* SQL File 25* SQL File 26*

Limit to 2000 rows

```
use dmdd;
SELECT ndtv_data_final.Brand, output.brand_name
FROM ndtv_data_final, output
WHERE ndtv_data_final.Id <> output.Id
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: | Fetch rows:

Brand	brand_name
Realme	ZTE
Realme	HUAWEI
Realme	Apple
Realme	Apple
Realme	Apple
Realme	Apple
Realme	Apple
Realme	Apple
Realme	Apple
Realme	Apple
Realme	Apple
Realme	Apple
Realme	Apple
Realme	Apple
Realme	Apple
Realme	Apple
Realme	Apple
Realme	Apple
Realme	Apple
Realme	Apple
Realme	Apple
Realme	Apple
Realme	Apple

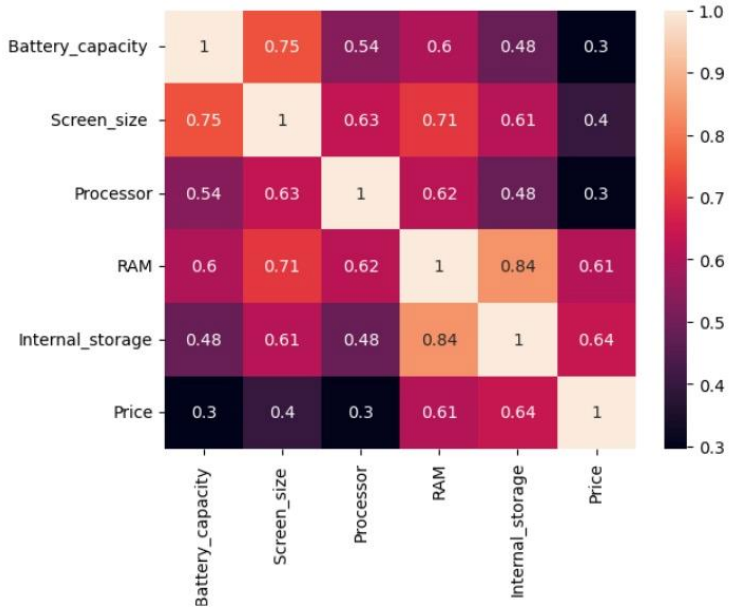
Result Grid | Form Editor | Field Types | Query Stats | Execution Plan

Result 1 | Read Only

Analyzing and visualizing the data:

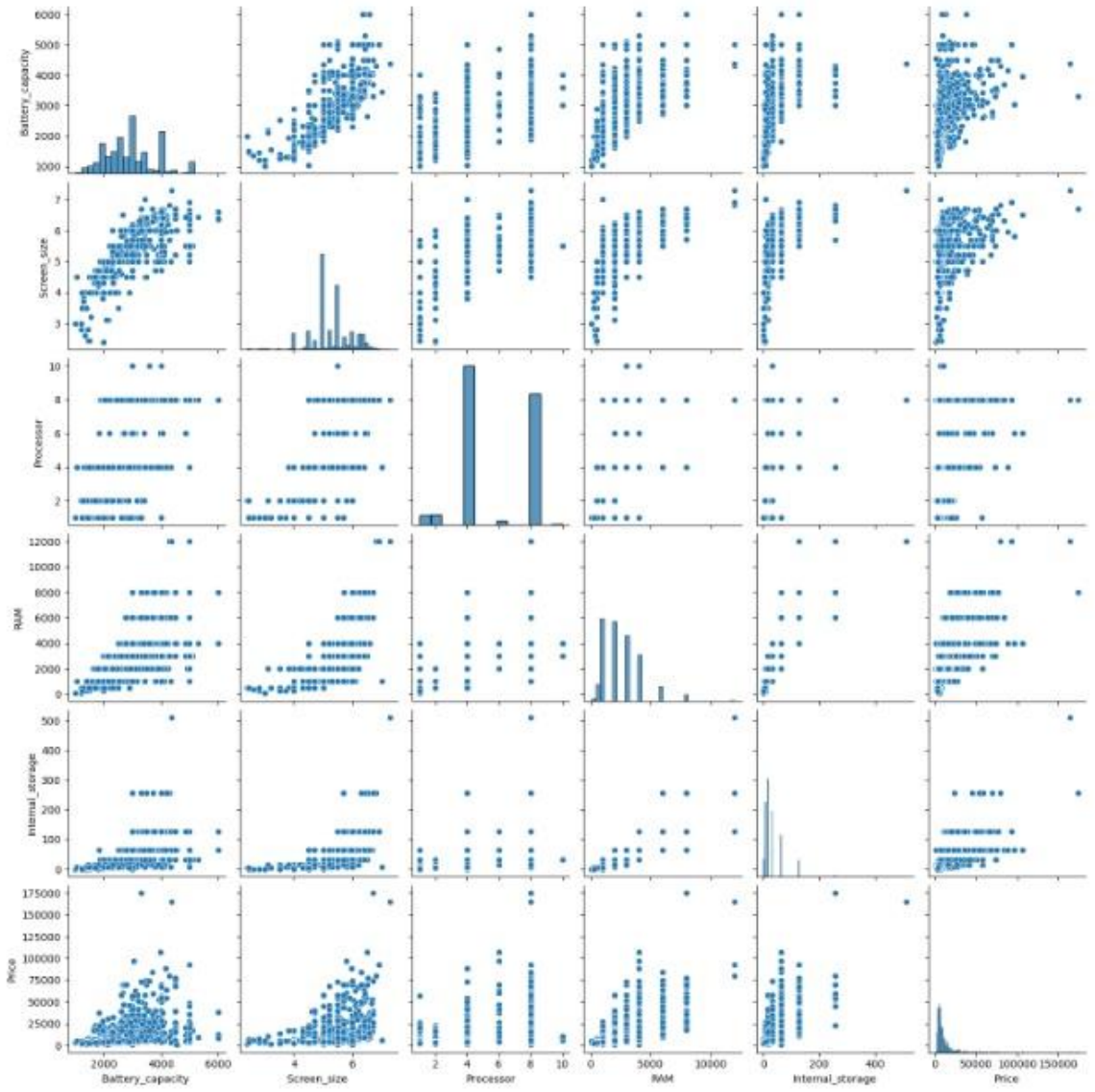
In [24]:
```
#Producing heatmap of the specific attributes of mobile data
sns.heatmap(corelation,xticklabels=corelation.columns, yticklabels=corelation.columns, annot=True)
```

Out[24]: <AxesSubplot:>



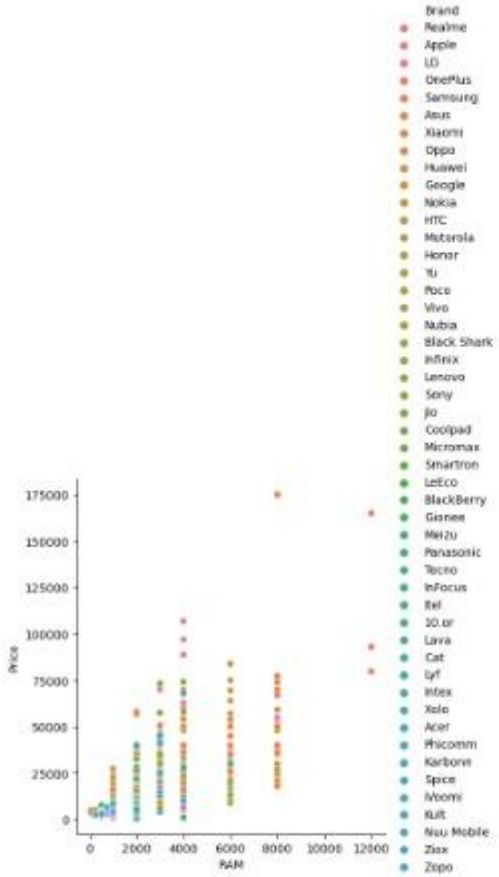
In [25]:
```
#Pairplot of each attribute with another
sns.pairplot(mobile)
```

Out[25]:
```
<seaborn.axisgrid.PairGrid at 0x22e77def190>
```



In [31]:
```
#Relational plot of RAM and Price sorted according to the Brand
sns.relplot(x= 'RAM', y='Price',hue='Brand',data=mobile)
```

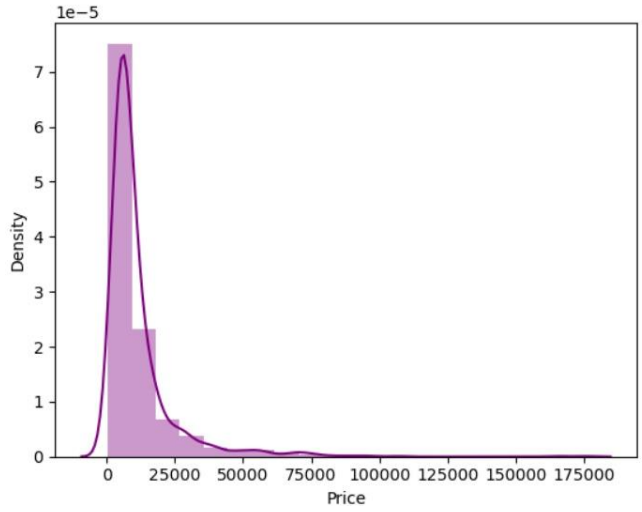
Out[31]:
```
<seaborn.axisgrid.FacetGrid at 0x22e78c1ddc0>
```



In [49]:
```
#Displot of Price vs Density
sns.distplot(mobile['Price'],bins=20, color='purple')
```

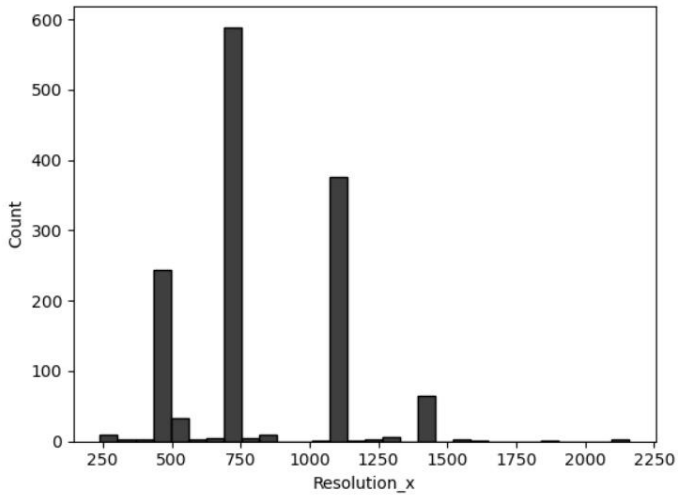
```
C:\Users\Harsh\anaconda3\lib\site-packages\seaborn\distributions.py:2619: FutureWarning: `distplot` is a deprecated function and will be removed in a future version. Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `histplot` (an axes-level function for histograms).
  warnings.warn(msg, FutureWarning)
```

Out[49]: <AxesSubplot:xlabel='Price', ylabel='Density'>



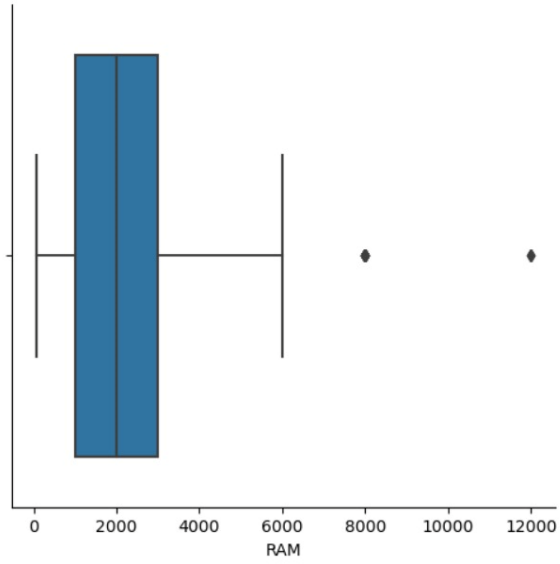
In [52]:
```
#Histplot of Price vs Count
sns.histplot(data['Resolution_x'], bins=30, color='black')
```

Out[52]: <AxesSubplot:xlabel='Resolution_x', ylabel='Count'>



In [61]:
```
#Catplot of RAM attribute
sns.catplot(x='RAM', kind= 'box', data=mobile)
```

Out[61]:
```
<seaborn.axisgrid.FacetGrid at 0x22e0210e5e0>
```

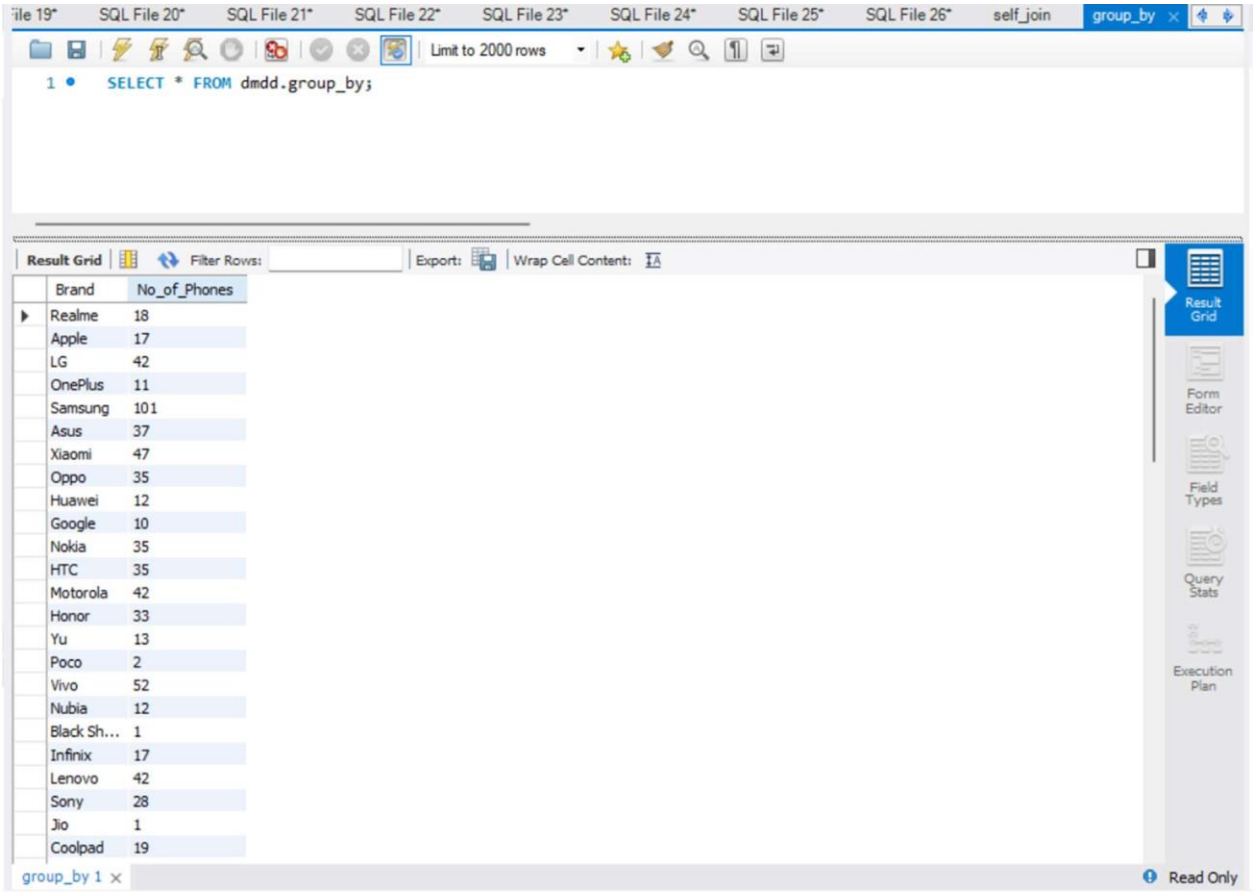


Normalization of Data:

Views:

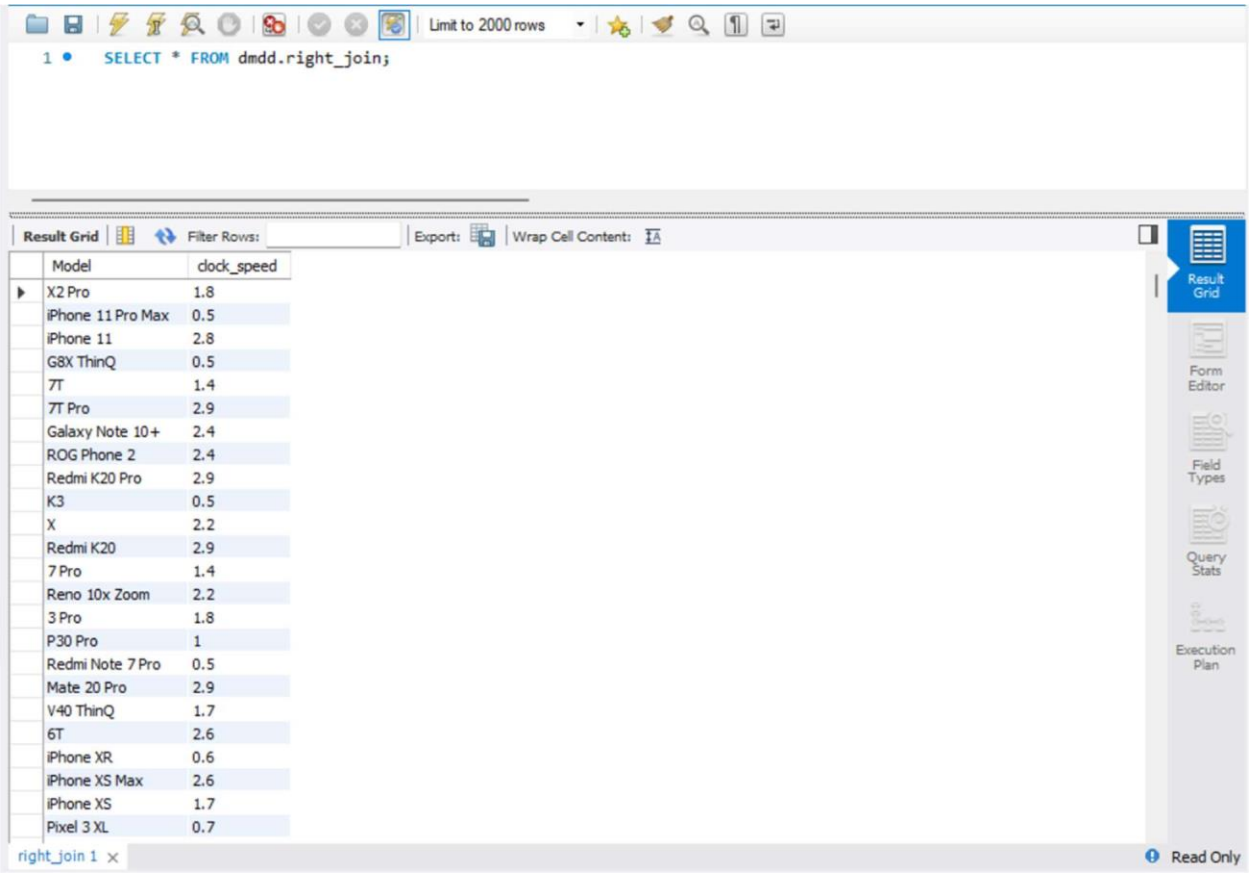
Q1. Which brand have what quantity of phones?

```
use dmdd;
CREATE VIEW group_by AS
SELECT Brand,COUNT(Name) AS No_of_Phones
FROM ndtv_data_final
GROUP BY Brand;
```



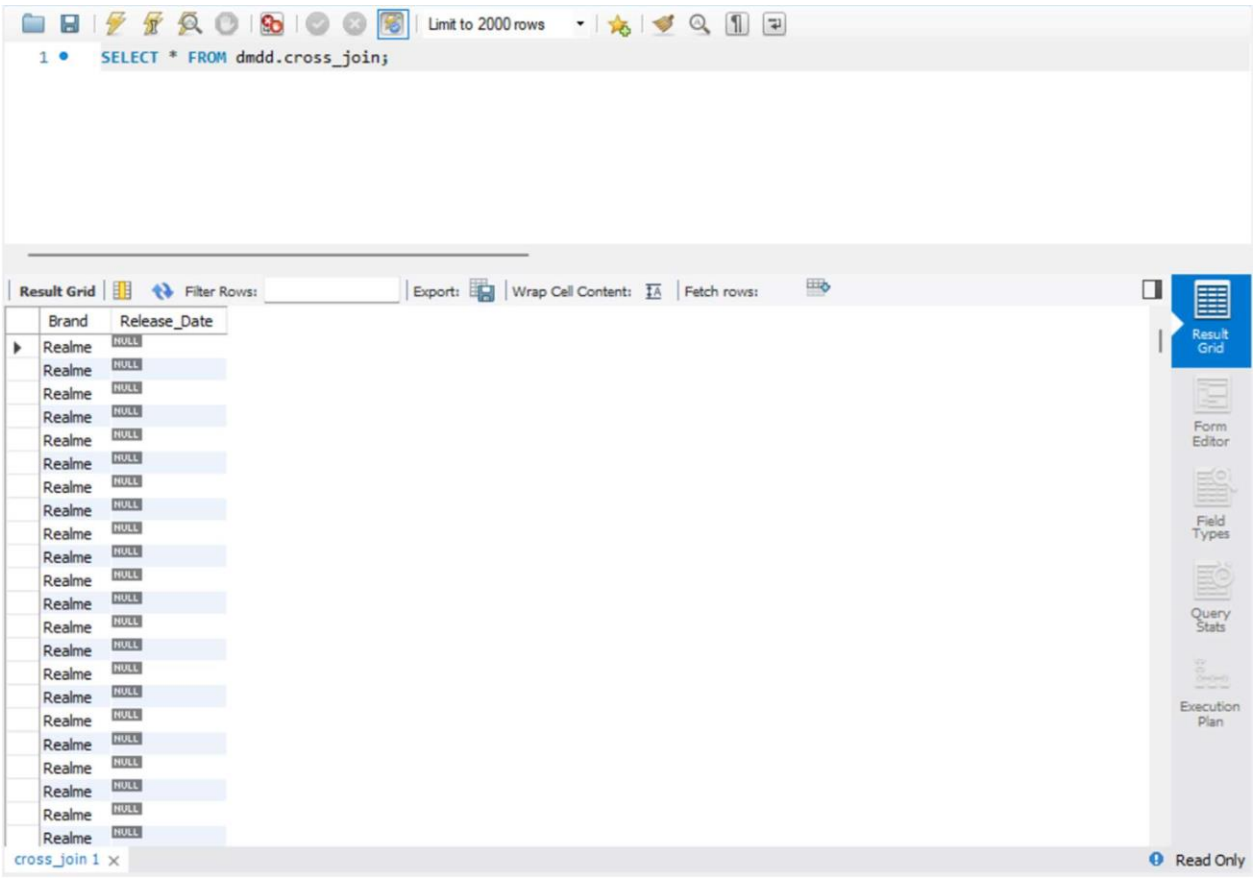
Q2. Which model of the smartphone has what clockspeed?

```
use dmdd;
CREATE VIEW right_join AS
SELECT Model,clock_speed
FROM ndtv_data_final
RIGHT JOIN test
ON ndtv_data_final.Id = test.Id;
```



Q3. Which brand has what release dates of its phones? (cross join)

```
use dmdd;
CREATE VIEW cross_join AS
SELECT ndtv_data_final.Brand, output.release_date AS Release_Date
FROM output
CROSS JOIN  dmdd.ndtv_data_final;
```



Q4. Which smartphone has what weight, pixel height and pixel width?

use dmdd;

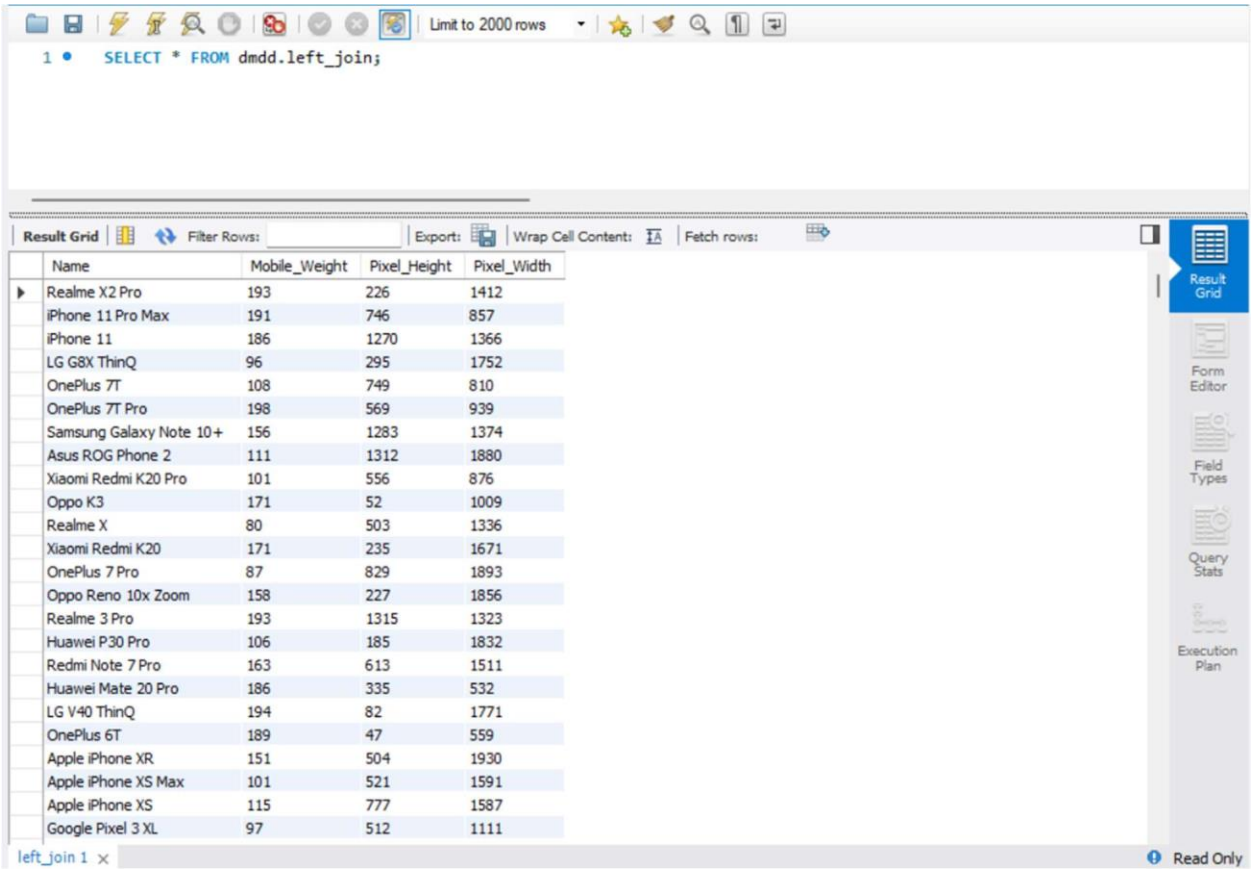
CREATE VIEW left_join AS

SELECT Name,mobile_wt AS Mobile_Weight,px_height As Pixel_Height,px_width AS Pixel_Width

FROM ndtv_data_final

LEFT JOIN test

ON ndtv_data_final.Id = test.Id;



Name	Mobile_Weight	Pixel_Height	Pixel_Width
Realme X2 Pro	193	226	1412
iPhone 11 Pro Max	191	746	857
iPhone 11	186	1270	1366
LG G8X ThinQ	96	295	1752
OnePlus 7T	108	749	810
OnePlus 7T Pro	198	569	939
Samsung Galaxy Note 10+	156	1283	1374
Asus ROG Phone 2	111	1312	1880
Xiaomi Redmi K20 Pro	101	556	876
Oppo K3	171	52	1009
Realme X	80	503	1336
Xiaomi Redmi K20	171	235	1671
OnePlus 7 Pro	87	829	1893
Oppo Reno 10x Zoom	158	227	1856
Realme 3 Pro	193	1315	1323
Huawei P30 Pro	106	185	1832
Redmi Note 7 Pro	163	613	1511
Huawei Mate 20 Pro	186	335	532
LG V40 ThinQ	194	82	1771
OnePlus 6T	189	47	559
Apple iPhone XR	151	504	1930
Apple iPhone XS Max	101	521	1591
Apple iPhone XS	115	777	1587
Google Pixel 3 XL	97	512	1111

Q5. Which phone model has what release date? (inner join)

use dmdd;

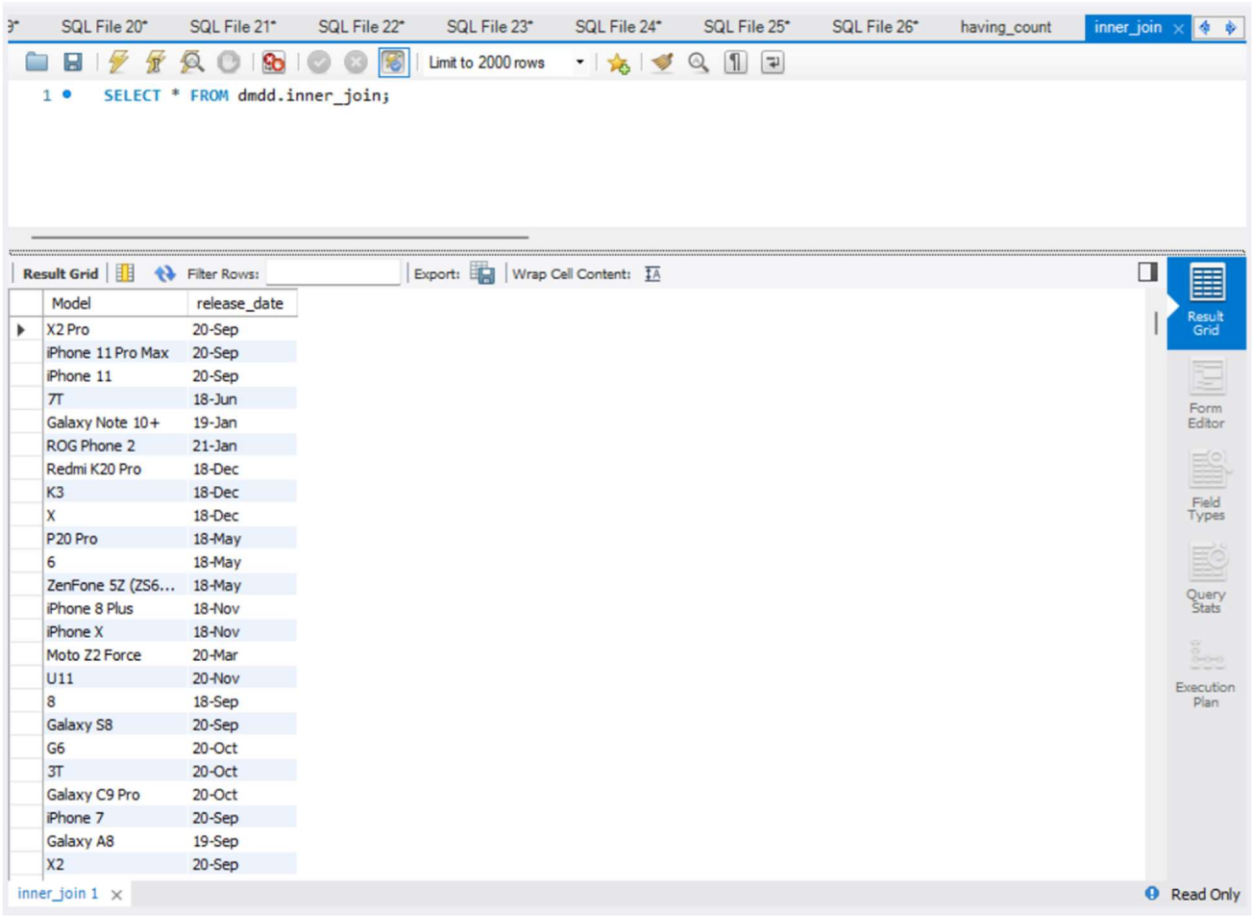
CREATE VIEW inner_join AS

SELECT Model,release_date

FROM ndtv_data_final

INNER JOIN output

ON ndtv_data_final.Id= output.Id;



Q6. What is the total number of brands?

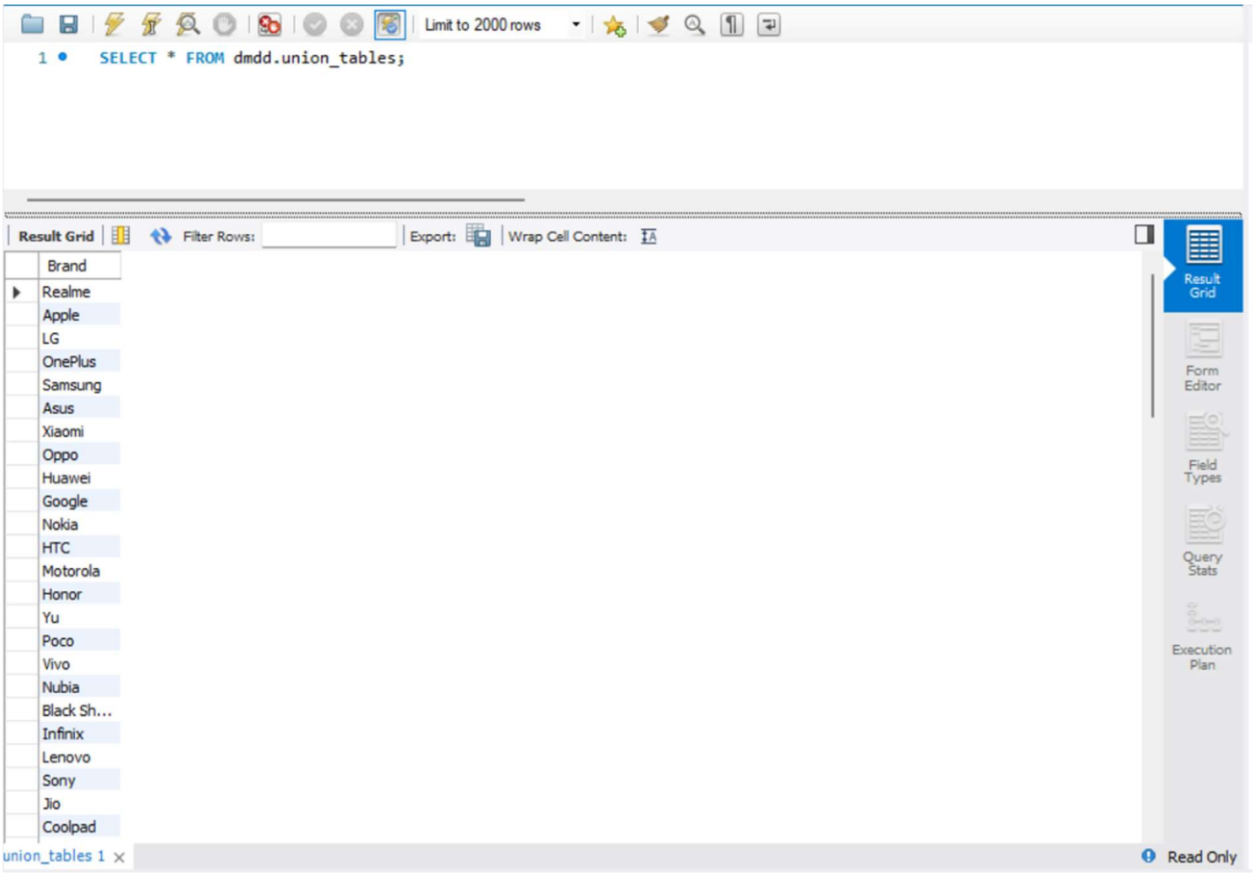
use dmdd;

CREATE VIEW union_tables AS

SELECT Brand FROM ndtv_data_final

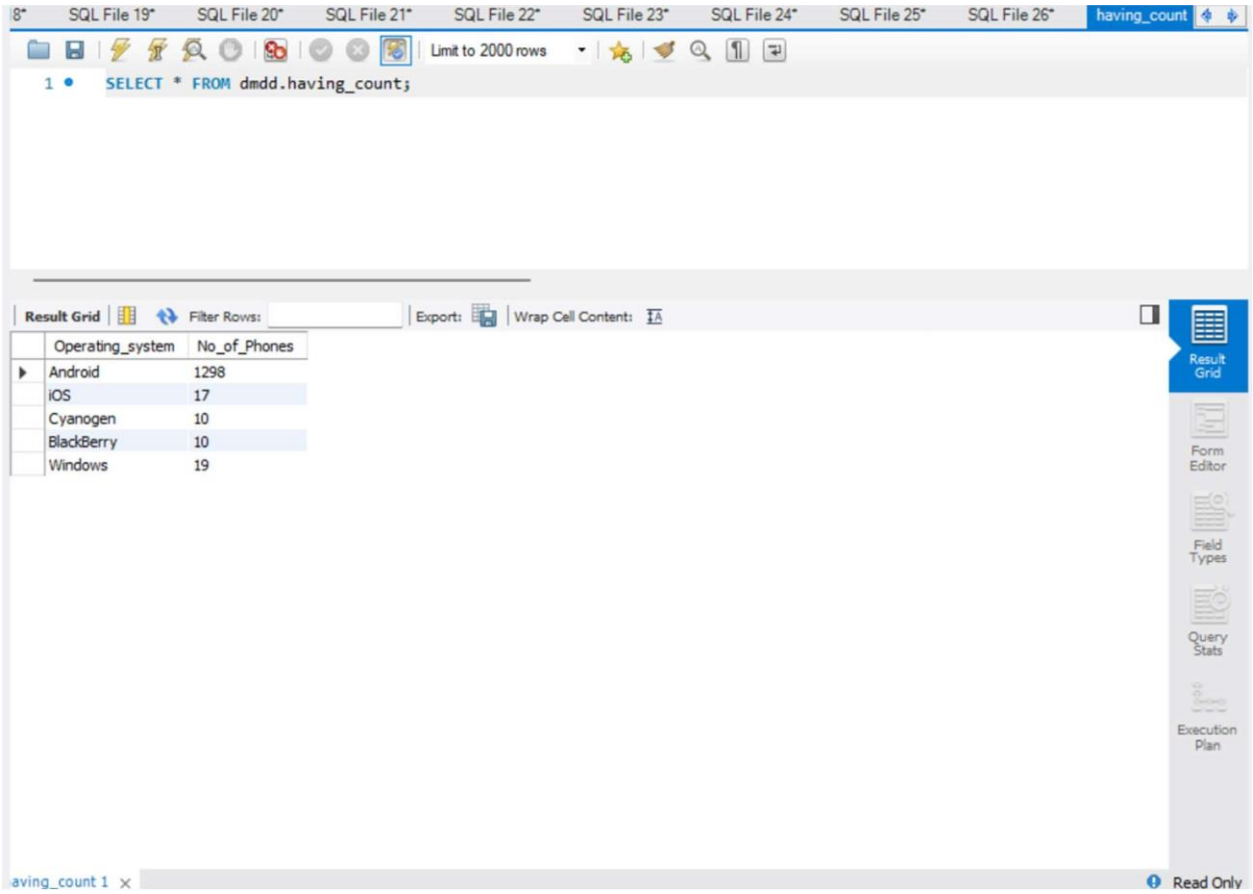
UNION

SELECT brand_name FROM output;



Q7. What is the operating system for what number of phones?

```
use dmdd;

CREATE VIEW having_count AS

SELECT Operating_system, count(Id) AS No_of_Phones

FROM ndtv_data_final

GROUP BY Operating_system

HAVING count(Id) > 5;
```



Q8. What is the total number of phones from both the dataset?

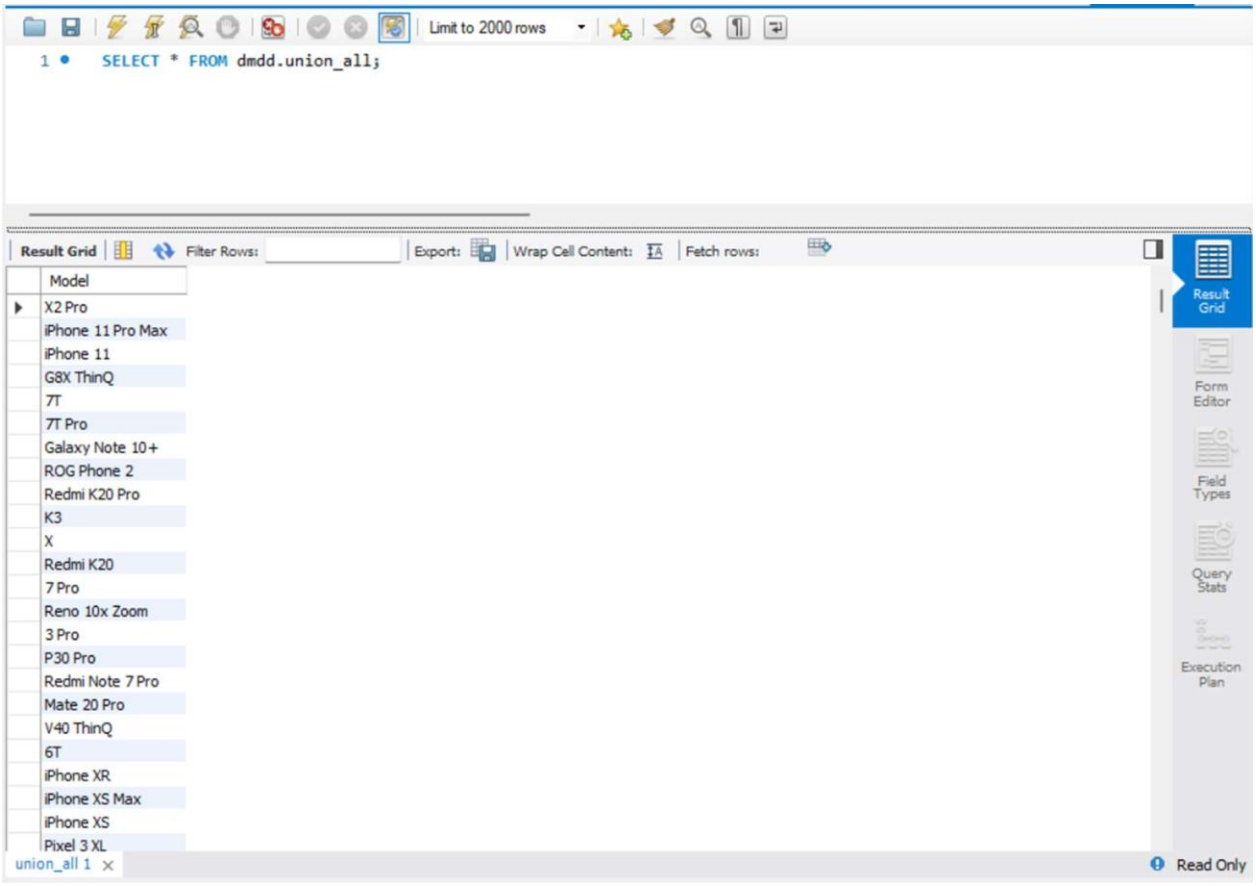
use dmdd;

CREATE VIEW union_all AS

SELECT Model From ndtv_data_final

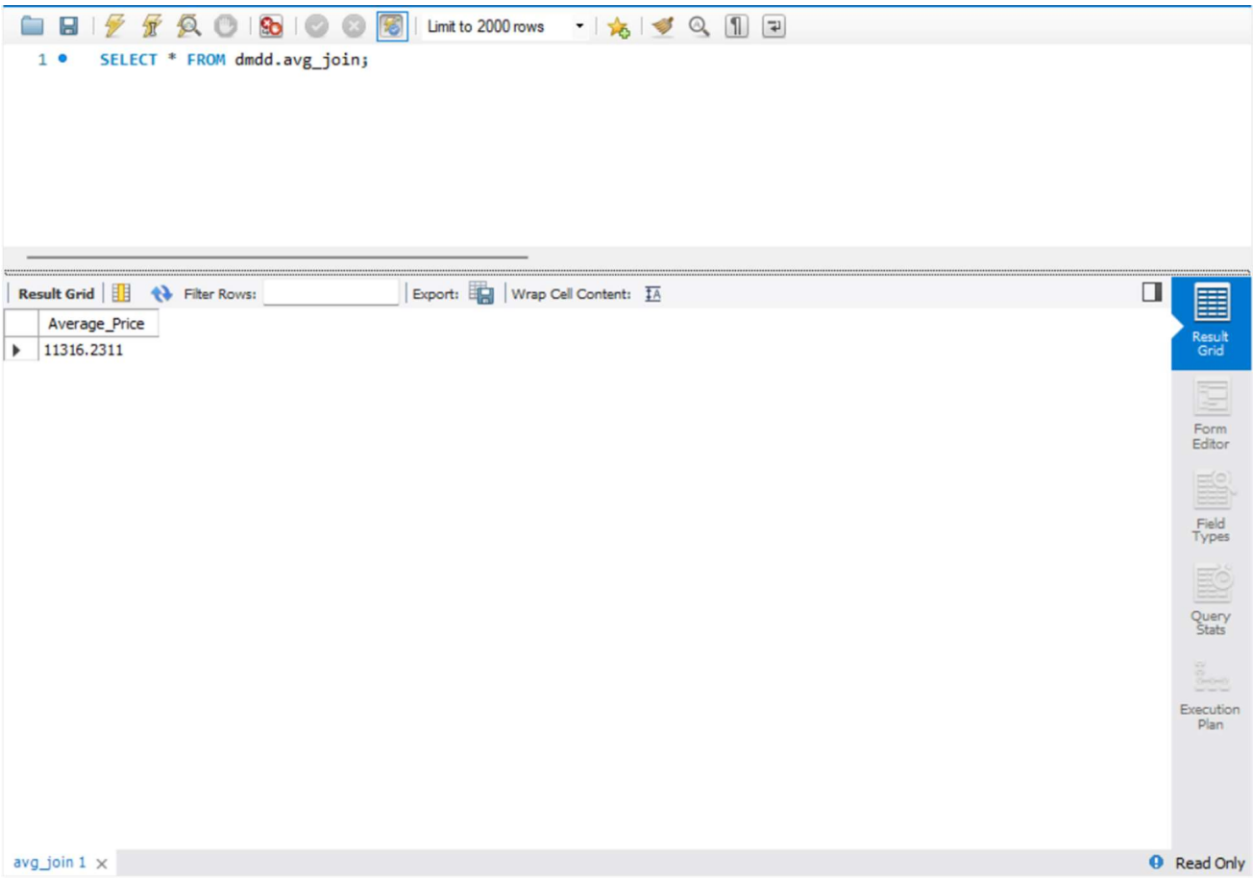
UNION ALL

SELECT model_name FROM output;



Q9. What is the average price of all the smartphones?

```
use dmdd;
CREATE VIEW avg_join AS
SELECT AVG(ndtv_data_final.Price) AS Average_Price
FROM ndtv_data_final
INNER JOIN output ON ndtv_data_final.Id = output.Id;
```



Q10. Which brands have what number of phones with internal storage more than 128GB?

use dmdd;

CREATE VIEW where_group_by AS

SELECT Brand,count(Internal_storage) AS Phones_with_higher_storage

FROM ndtv_data_final

WHERE Internal_storage>=128

GROUP BY Brand;

```
1 •  SELECT * FROM dmdd.where_group_by;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Brand	Phones_with_higher_storage
LG	4
OnePlus	5
Samsung	16
Asus	4
Xiaomi	2
Realme	1
Oppo	11
Huawei	6
HTC	2
Vivo	9
Nubia	3
Motorola	2
Black Sh...	1
Honor	6
Nokia	1
Infinix	1
Micromax	1
Meizu	1
Panasonic	1
Tecno	1

Result Grid | Form Editor | Field Types | Query Stats | Execution Plan

e_group_by 1 ×

Read Only

Q11. Which phones have what processor count and core capacity?

use dmdd;

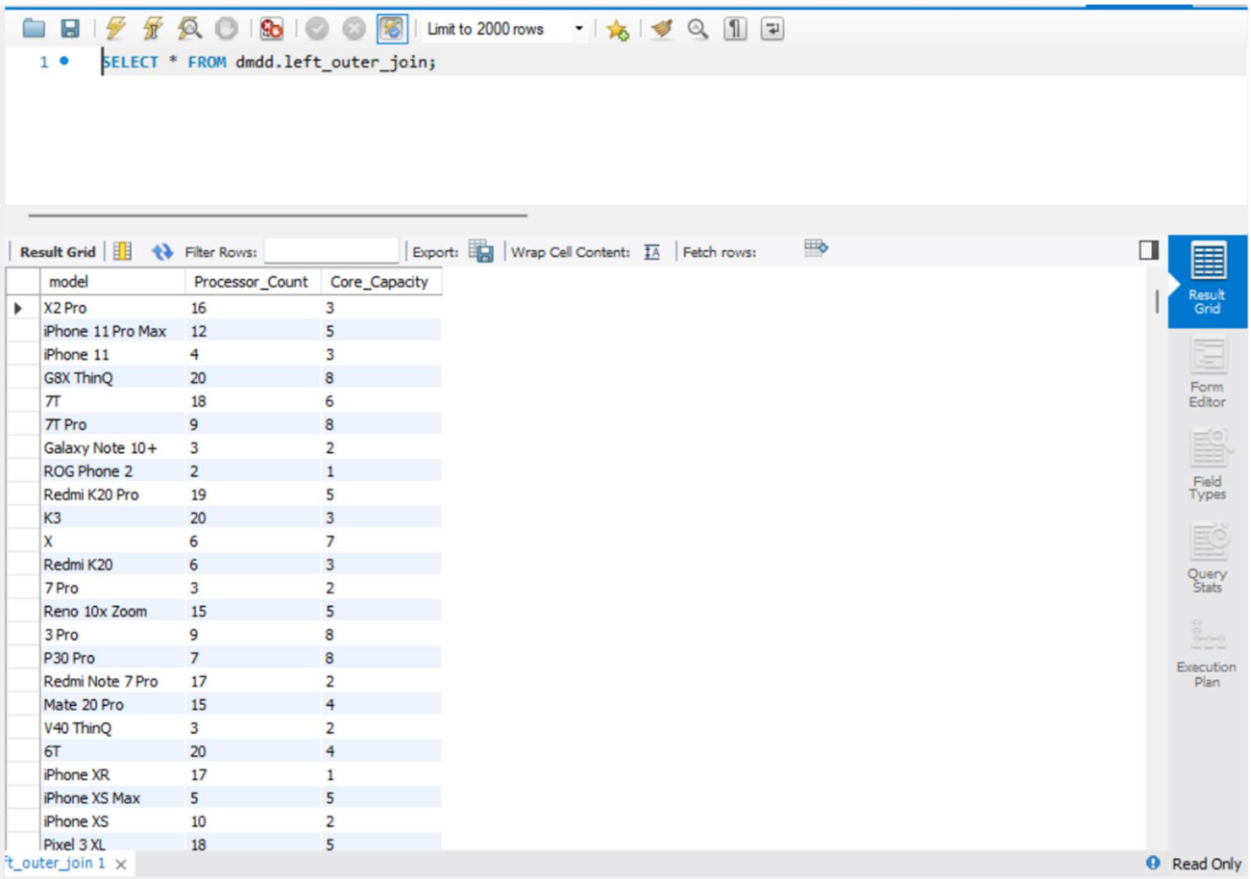
CREATE VIEW left_outer_join AS

SELECT model,pc AS Processor_Count, n_cores AS Core_Capacity

FROM ndtv_data_final

LEFT OUTER JOIN test

ON ndtv_data_final.Id = test.Id



model	Processor_Count	Core_Capacity
X2 Pro	16	3
iPhone 11 Pro Max	12	5
iPhone 11	4	3
G8X ThinQ	20	8
7T	18	6
7T Pro	9	8
Galaxy Note 10+	3	2
ROG Phone 2	2	1
Redmi K20 Pro	19	5
K3	20	3
X	6	7
Redmi K20	6	3
7 Pro	3	2
Reno 10x Zoom	15	5
3 Pro	9	8
P30 Pro	7	8
Redmi Note 7 Pro	17	2
Mate 20 Pro	15	4
V40 ThinQ	3	2
6T	20	4
iPhone XR	17	1
iPhone XS Max	5	5
iPhone XS	10	2
Pixel 3 XL	18	5

Q12. What is the highest and lowest price of the phones of each brand?

use dmdd;

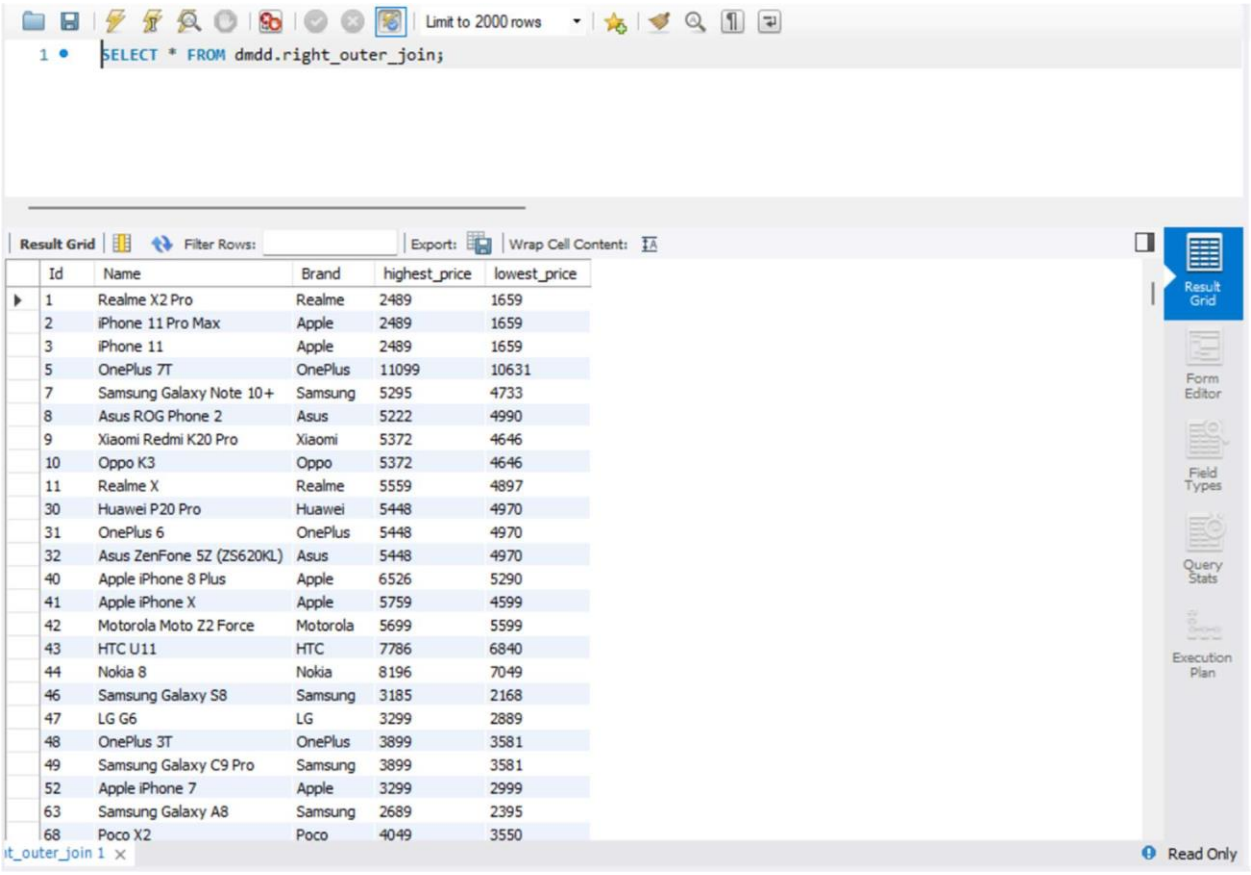
CREATE VIEW right_outer_join AS

SELECT output.Id, Name,Brand, highest_price,lowest_price

FROM ndtv_data_final

RIGHT OUTER JOIN output

ON ndtv_data_final.Id = output.Id



Id	Name	Brand	highest_price	lowest_price
1	Realme X2 Pro	Realme	2489	1659
2	iPhone 11 Pro Max	Apple	2489	1659
3	iPhone 11	Apple	2489	1659
5	OnePlus 7T	OnePlus	11099	10631
7	Samsung Galaxy Note 10+	Samsung	5295	4733
8	Asus ROG Phone 2	Asus	5222	4990
9	Xiaomi Redmi K20 Pro	Xiaomi	5372	4646
10	Oppo K3	Oppo	5372	4646
11	Realme X	Realme	5559	4897
30	Huawei P20 Pro	Huawei	5448	4970
31	OnePlus 6	OnePlus	5448	4970
32	Asus ZenFone 5Z (ZS620KL)	Asus	5448	4970
40	Apple iPhone 8 Plus	Apple	6526	5290
41	Apple iPhone X	Apple	5759	4599
42	Motorola Moto Z2 Force	Motorola	5699	5599
43	HTC U11	HTC	7786	6840
44	Nokia 8	Nokia	8196	7049
46	Samsung Galaxy S8	Samsung	3185	2168
47	LG G6	LG	3299	2889
48	OnePlus 3T	OnePlus	3899	3581
49	Samsung Galaxy C9 Pro	Samsung	3899	3581
52	Apple iPhone 7	Apple	3299	2999
63	Samsung Galaxy A8	Samsung	2689	2395
68	Poco X2	Poco	4049	3550

Q13. What is the name, popularity and battery power for each mobile phone where popularity is greater than 500?

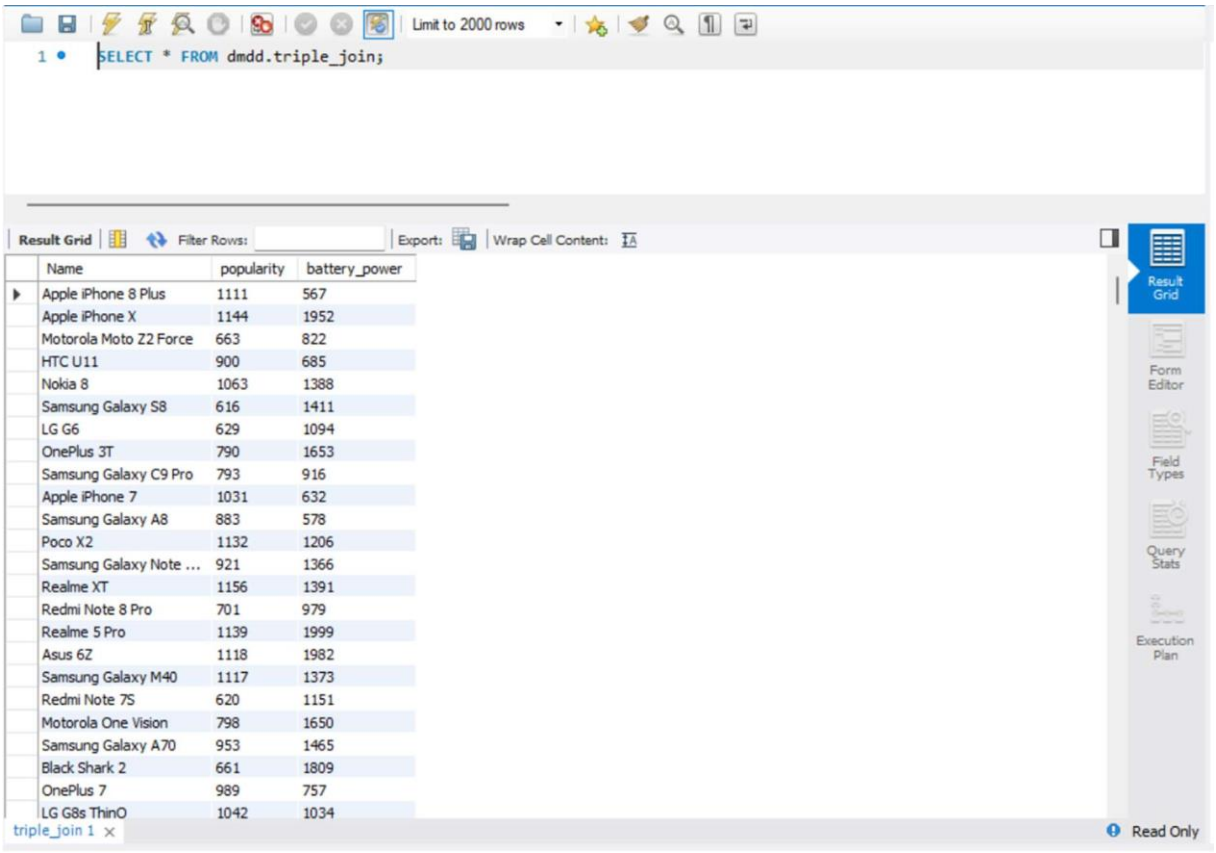
```
use dmdd;

CREATE VIEW triple_join AS

SELECT Name,popularity,battery_power

FROM ndtv_data_final

JOIN output
```

ON ndtv_data_final.Id = output.Id

JOIN test

ON output.Id = test.Id

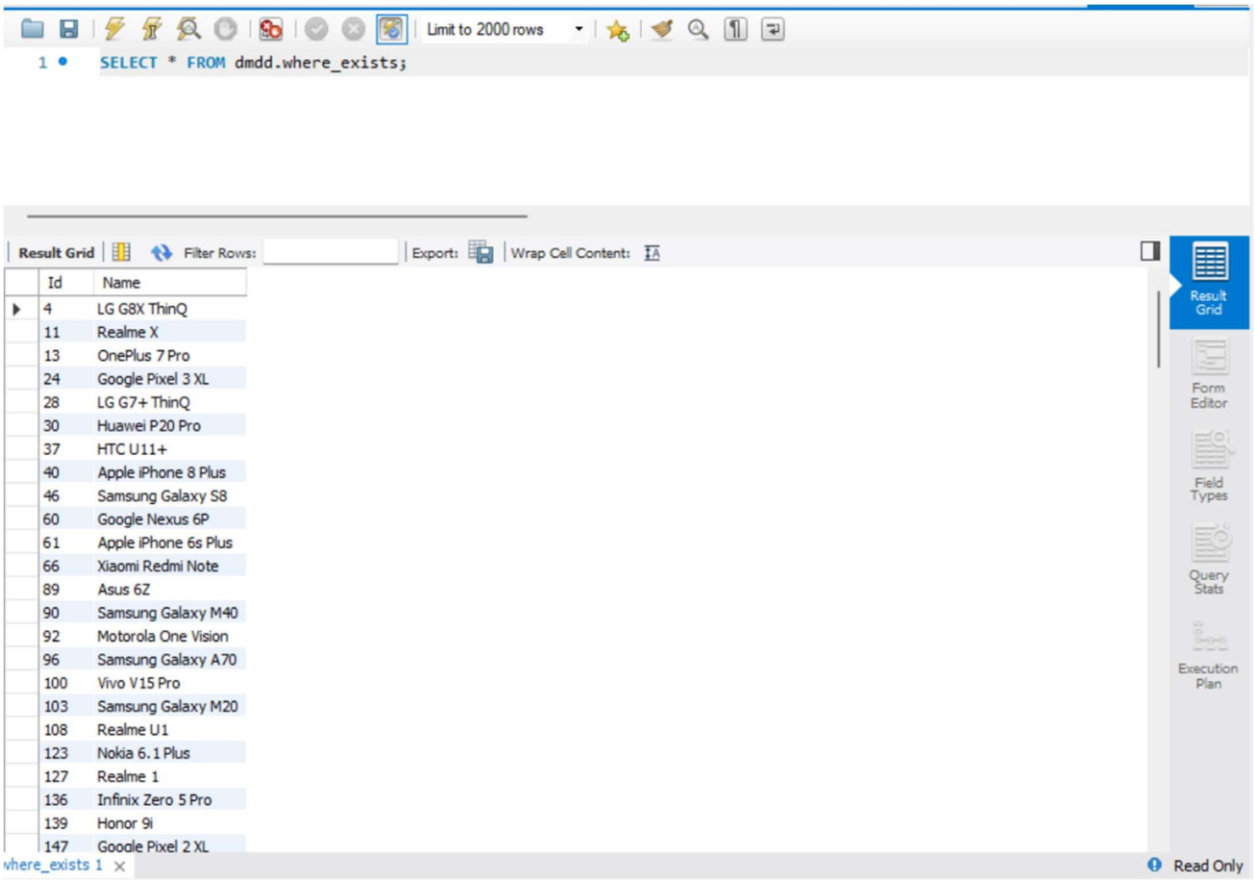
WHERE popularity>500;



Name	popularity	battery_power
Apple iPhone 8 Plus	1111	567
Apple iPhone X	1144	1952
Motorola Moto Z2 Force	663	822
HTC U11	900	685
Nokia 8	1063	1388
Samsung Galaxy S8	616	1411
LG G6	629	1094
OnePlus 3T	790	1653
Samsung Galaxy C9 Pro	793	916
Apple iPhone 7	1031	632
Samsung Galaxy A8	883	578
Poco X2	1132	1206
Samsung Galaxy Note ...	921	1366
Realme XT	1156	1391
Redmi Note 8 Pro	701	979
Realme 5 Pro	1139	1999
Asus 6Z	1118	1982
Samsung Galaxy M40	1117	1373
Redmi Note 7S	620	1151
Motorola One Vision	798	1650
Samsung Galaxy A70	953	1465
Black Shark 2	661	1809
OnePlus 7	989	757
LG G8s ThinQ	1042	1034

Q14. Which phones have the mobile weight less than 100?

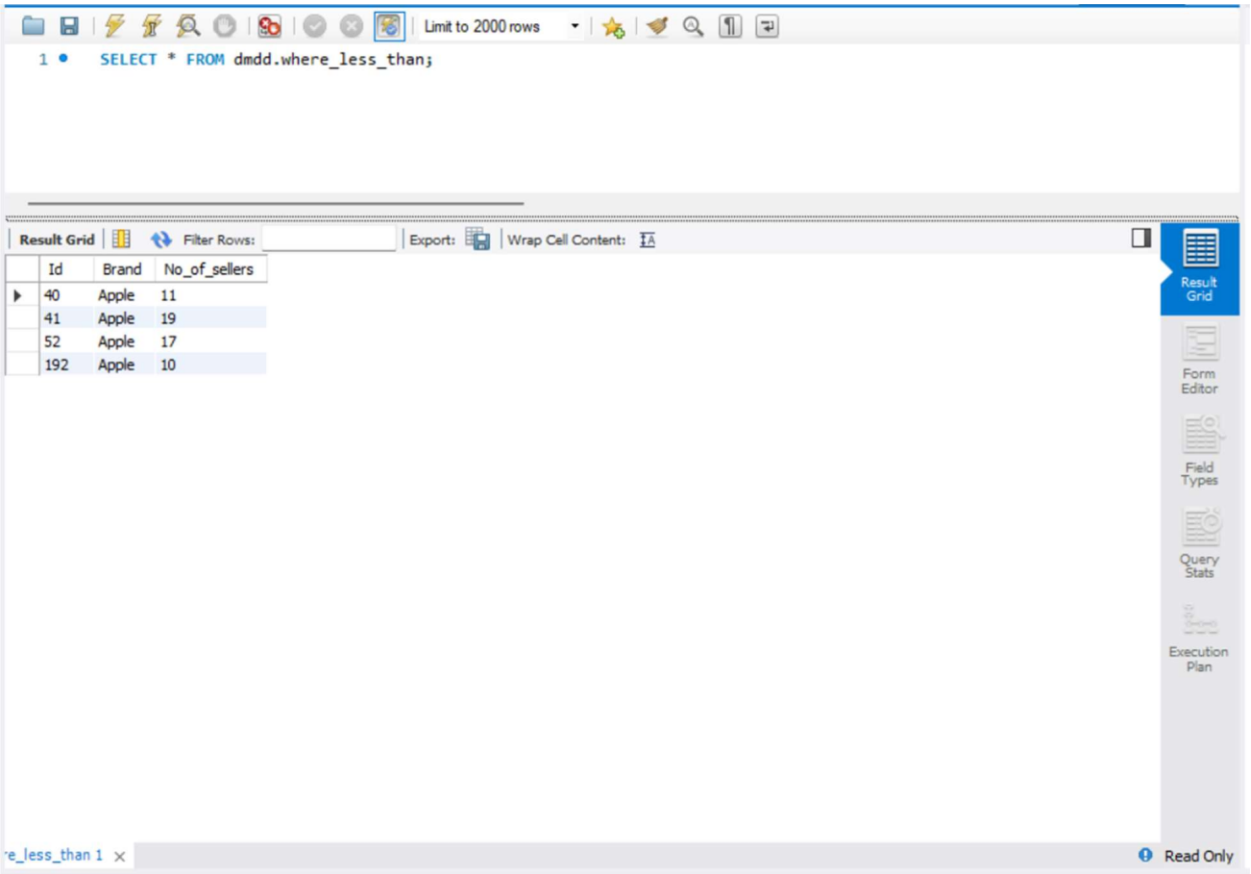
```
use dmdd;

CREATE VIEW where_exists AS

SELECT Id,Name

FROM ndtv_data_final

WHERE EXISTS (SELECT mobile_wt FROM test WHERE ndtv_data_final.Id = test.Id
AND mobile_wt < 100);
```



Id	Name
4	LG G8X ThinQ
11	Realme X
13	OnePlus 7 Pro
24	Google Pixel 3 XL
28	LG G7+ ThinQ
30	Huawei P20 Pro
37	HTC U11+
40	Apple iPhone 8 Plus
46	Samsung Galaxy S8
60	Google Nexus 6P
61	Apple iPhone 6s Plus
66	Xiaomi Redmi Note
89	Asus 6Z
90	Samsung Galaxy M40
92	Motorola One Vision
96	Samsung Galaxy A70
100	Vivo V15 Pro
103	Samsung Galaxy M20
108	Realme U1
123	Nokia 6.1 Plus
127	Realme 1
136	Infinix Zero 5 Pro
139	Honor 9i
147	Google Pixel 2 XL

Q15. The brand name APPLE has what number of sellers?

```
use dmdd;
CREATE VIEW where_less_than AS
SELECT ndtv_data_final.Id, Brand, sellers_amount AS No_of_sellers
FROM ndtv_data_final
JOIN output
ON ndtv_data_final.Id = output.Id
where ndtv_data_final.Brand='Apple' and output.sellers_amount<20;
```



Q16. Which of the following mobile phones are black in colour with their prices above 40000?

use dmdd;

CREATE VIEW where_like AS

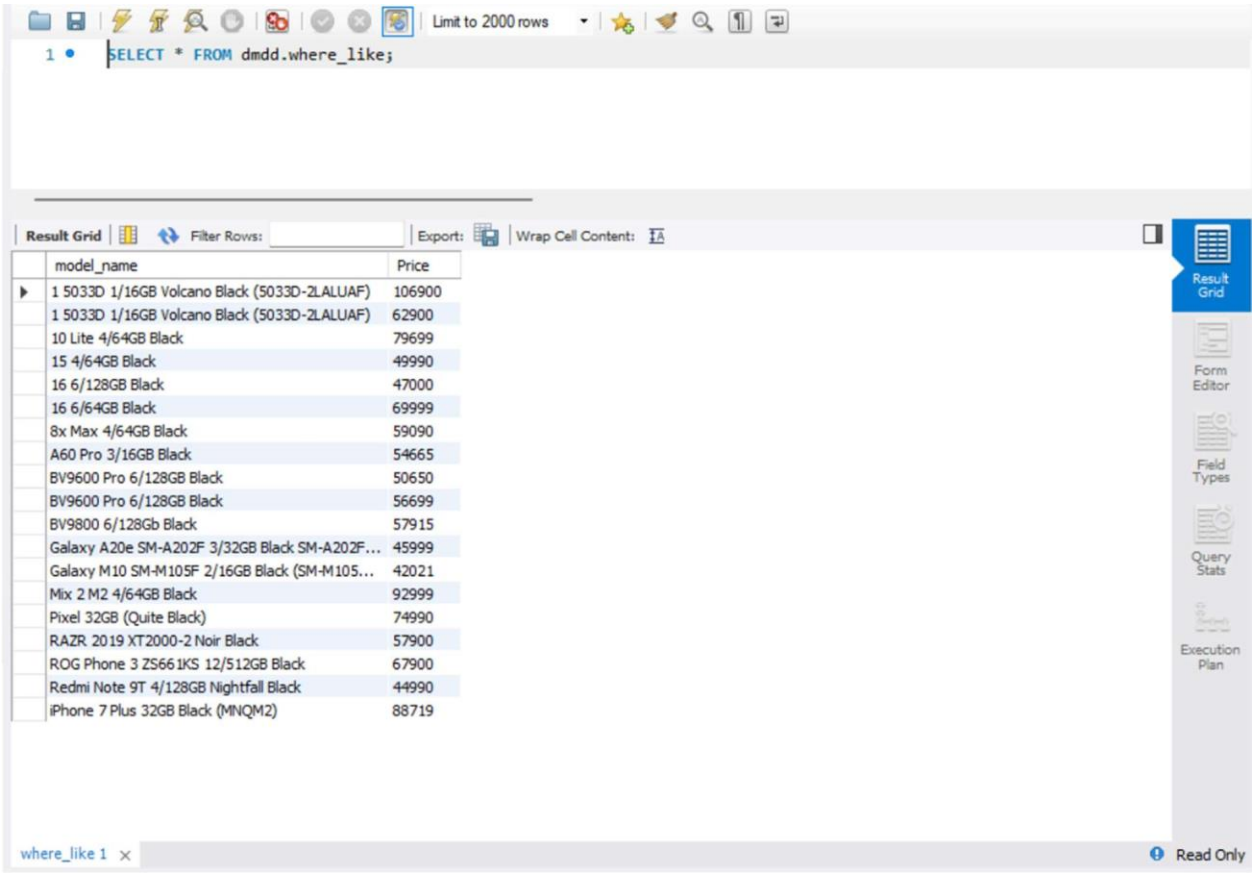
SELECT model_name, Price

FROM ndtv_data_final

JOIN output

ON ndtv_data_final.Id = output.Id

where output.model_name like '%Black%' and ndtv_data_final.Price>40000;



Q17. Brand name, Operating systems and model name of one of the dataset were inserted into another dataset with similar attributes whose price is greater than 10000

use dmdd;

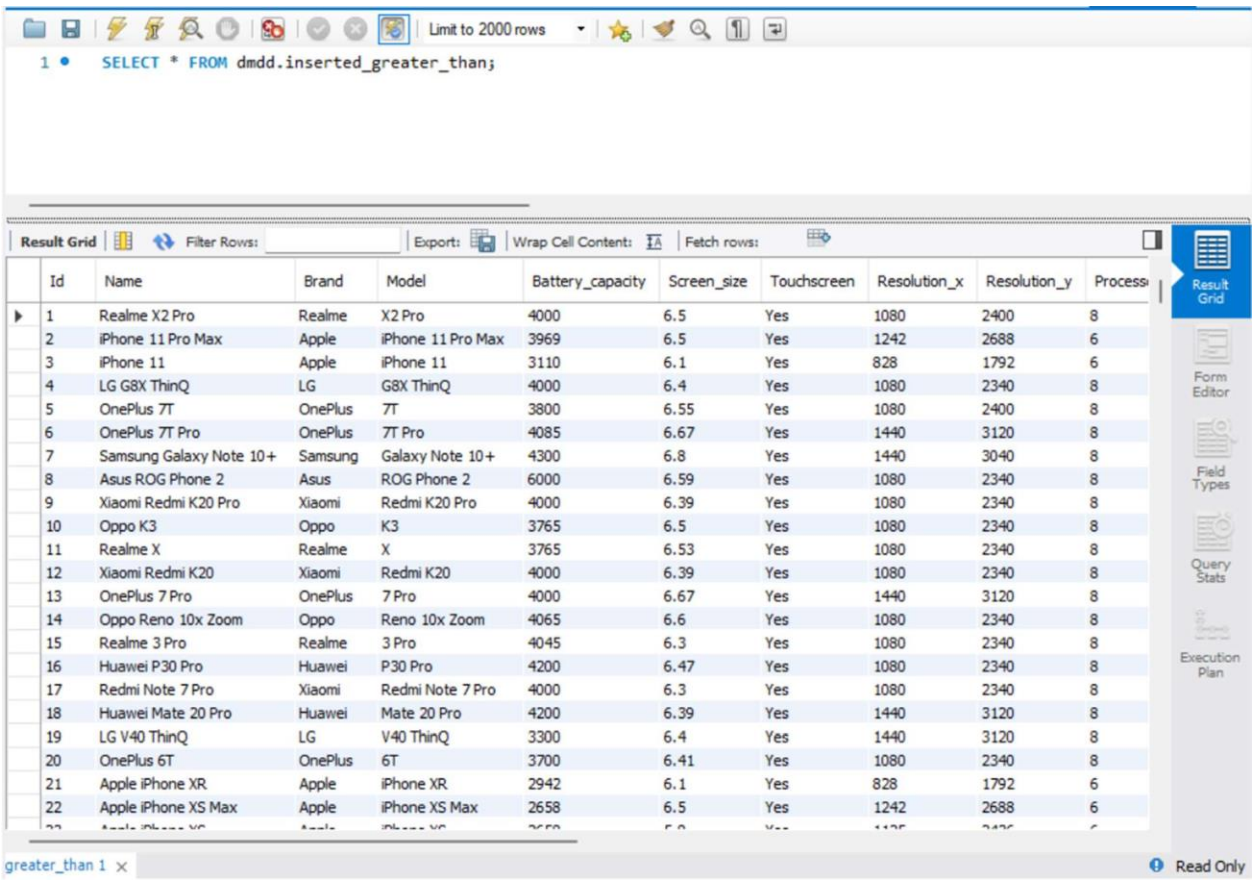
INSERT INTO ndtv_data_final(Brand,Model,Operating_system)

SELECT brand_name, model_name,os FROM output

WHERE highest_price>10000;

CREATE VIEW inserted_greater_than AS

SELECT * FROM dmdd.ndtv_data_final;



Id	Name	Brand	Model	Battery_capacity	Screen_size	Touchscreen	Resolution_x	Resolution_y	Process
1	Realme X2 Pro	Realme	X2 Pro	4000	6.5	Yes	1080	2400	8
2	iPhone 11 Pro Max	Apple	iPhone 11 Pro Max	3969	6.5	Yes	1242	2688	6
3	iPhone 11	Apple	iPhone 11	3110	6.1	Yes	828	1792	6
4	LG G8X ThinQ	LG	G8X ThinQ	4000	6.4	Yes	1080	2340	8
5	OnePlus 7T	OnePlus	7T	3800	6.55	Yes	1080	2400	8
6	OnePlus 7T Pro	OnePlus	7T Pro	4085	6.67	Yes	1440	3120	8
7	Samsung Galaxy Note 10+	Samsung	Galaxy Note 10+	4300	6.8	Yes	1440	3040	8
8	Asus ROG Phone 2	Asus	ROG Phone 2	6000	6.59	Yes	1080	2340	8
9	Xiaomi Redmi K20 Pro	Xiaomi	Redmi K20 Pro	4000	6.39	Yes	1080	2340	8
10	Oppo K3	Oppo	K3	3765	6.5	Yes	1080	2340	8
11	Realme X	Realme	X	3765	6.53	Yes	1080	2340	8
12	Xiaomi Redmi K20	Xiaomi	Redmi K20	4000	6.39	Yes	1080	2340	8
13	OnePlus 7 Pro	OnePlus	7 Pro	4000	6.67	Yes	1440	3120	8
14	Oppo Reno 10x Zoom	Oppo	Reno 10x Zoom	4065	6.6	Yes	1080	2340	8
15	Realme 3 Pro	Realme	3 Pro	4045	6.3	Yes	1080	2340	8
16	Huawei P30 Pro	Huawei	P30 Pro	4200	6.47	Yes	1080	2340	8
17	Redmi Note 7 Pro	Xiaomi	Redmi Note 7 Pro	4000	6.3	Yes	1080	2340	8
18	Huawei Mate 20 Pro	Huawei	Mate 20 Pro	4200	6.39	Yes	1440	3120	8
19	LG V40 ThinQ	LG	V40 ThinQ	3300	6.4	Yes	1440	3120	8
20	OnePlus 6T	OnePlus	6T	3700	6.41	Yes	1080	2340	8
21	Apple iPhone XR	Apple	iPhone XR	2942	6.1	Yes	828	1792	6
22	Apple iPhone XS Max	Apple	iPhone XS Max	2658	6.5	Yes	1242	2688	6

Q18. Brand name, Operating systems and model name of one of the dataset were inserted into another dataset with similar attributes whose brand name is Oneplus

use dmdd;

INSERT INTO output(brand_name,model_name,screen_size,best_price)

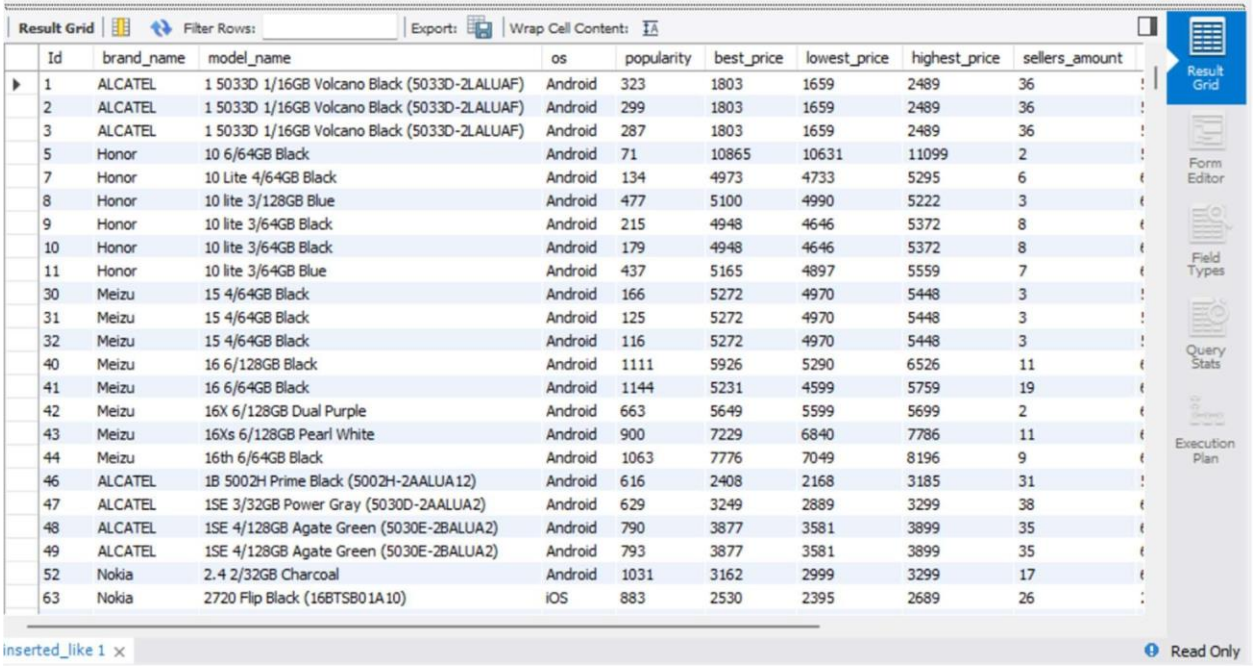
SELECT Brand, Model, Screen_size, Price FROM ndtv_data_final

WHERE Brand like 'OnePlus';

CREATE VIEW inserted_like AS

SELECT * FROM output;

```
1 •  SELECT * FROM dmdd.inserted_like;
```



Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Id	brand_name	model_name	os	popularity	best_price	lowest_price	highest_price	sellers_amount
1	ALCATEL	1 5033D 1/16GB Volcano Black (5033D-2LALUAF)	Android	323	1803	1659	2489	36
2	ALCATEL	1 5033D 1/16GB Volcano Black (5033D-2LALUAF)	Android	299	1803	1659	2489	36
3	ALCATEL	1 5033D 1/16GB Volcano Black (5033D-2LALUAF)	Android	287	1803	1659	2489	36
5	Honor	10 6/64GB Black	Android	71	10865	10631	11099	2
7	Honor	10 Lite 4/64GB Black	Android	134	4973	4733	5295	6
8	Honor	10 lite 3/128GB Blue	Android	477	5100	4990	5222	3
9	Honor	10 lite 3/64GB Black	Android	215	4948	4646	5372	8
10	Honor	10 lite 3/64GB Black	Android	179	4948	4646	5372	8
11	Honor	10 lite 3/64GB Blue	Android	437	5165	4897	5559	7
30	Meizu	15 4/64GB Black	Android	166	5272	4970	5448	3
31	Meizu	15 4/64GB Black	Android	125	5272	4970	5448	3
32	Meizu	15 4/64GB Black	Android	116	5272	4970	5448	3
40	Meizu	16 6/128GB Black	Android	1111	5926	5290	6526	11
41	Meizu	16 6/64GB Black	Android	1144	5231	4599	5759	19
42	Meizu	16X 6/128GB Dual Purple	Android	663	5649	5599	5699	2
43	Meizu	16Xs 6/128GB Pearl White	Android	900	7229	6840	7786	11
44	Meizu	16th 6/64GB Black	Android	1063	7776	7049	8196	9
46	ALCATEL	1B 5002H Prime Black (5002H-2AALUA12)	Android	616	2408	2168	3185	31
47	ALCATEL	1SE 3/32GB Power Gray (5030D-2AALUA2)	Android	629	3249	2889	3299	38
48	ALCATEL	1SE 4/128GB Agate Green (5030E-2BALUA2)	Android	790	3877	3581	3899	35
49	ALCATEL	1SE 4/128GB Agate Green (5030E-2BALUA2)	Android	793	3877	3581	3899	35
52	Nokia	2.4 2/32GB Charcoal	Android	1031	3162	2999	3299	17
63	Nokia	2720 Flip Black (16BTSB01A10)	iOS	883	2530	2395	2689	26

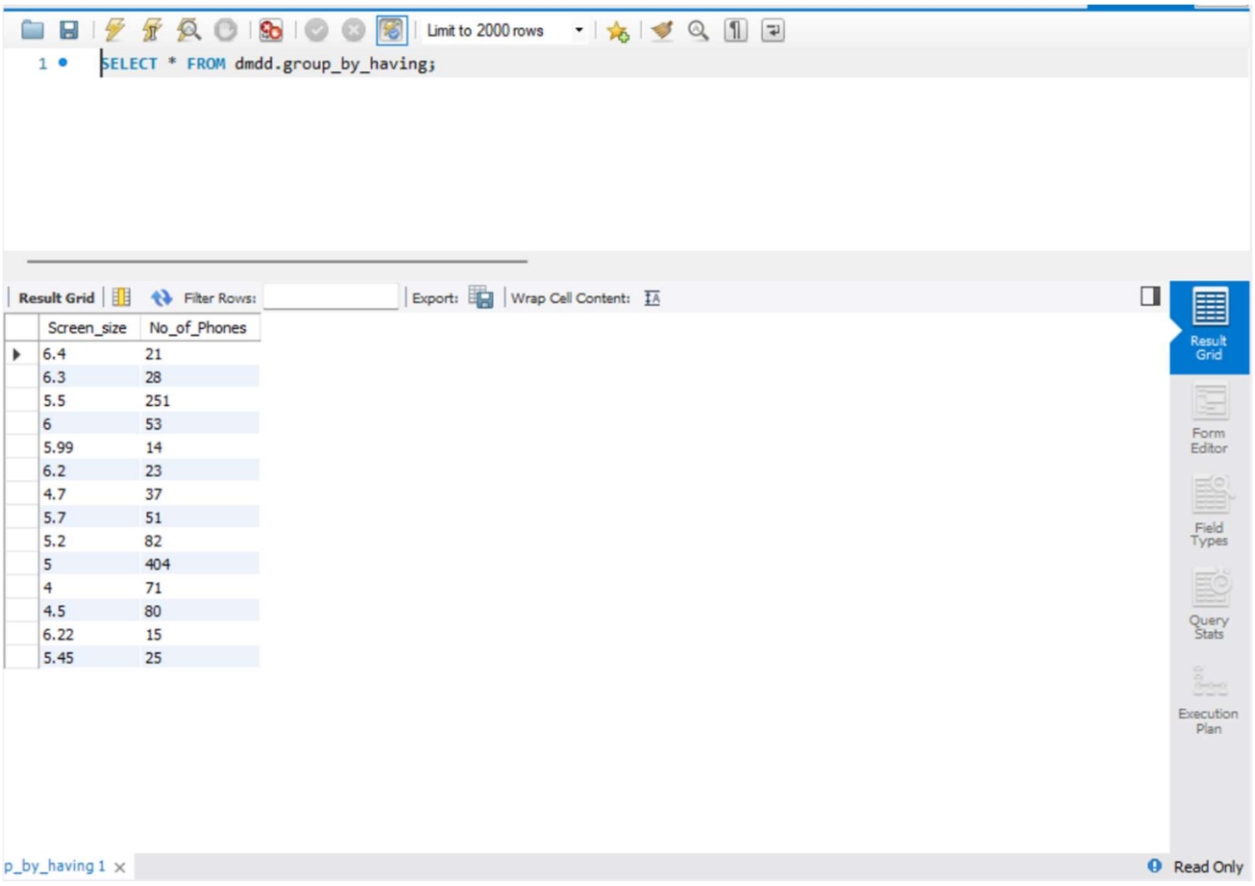
Result Grid | Form Editor | Field Types | Query Stats | Execution Plan

inserted_like 1 ×

Read Only

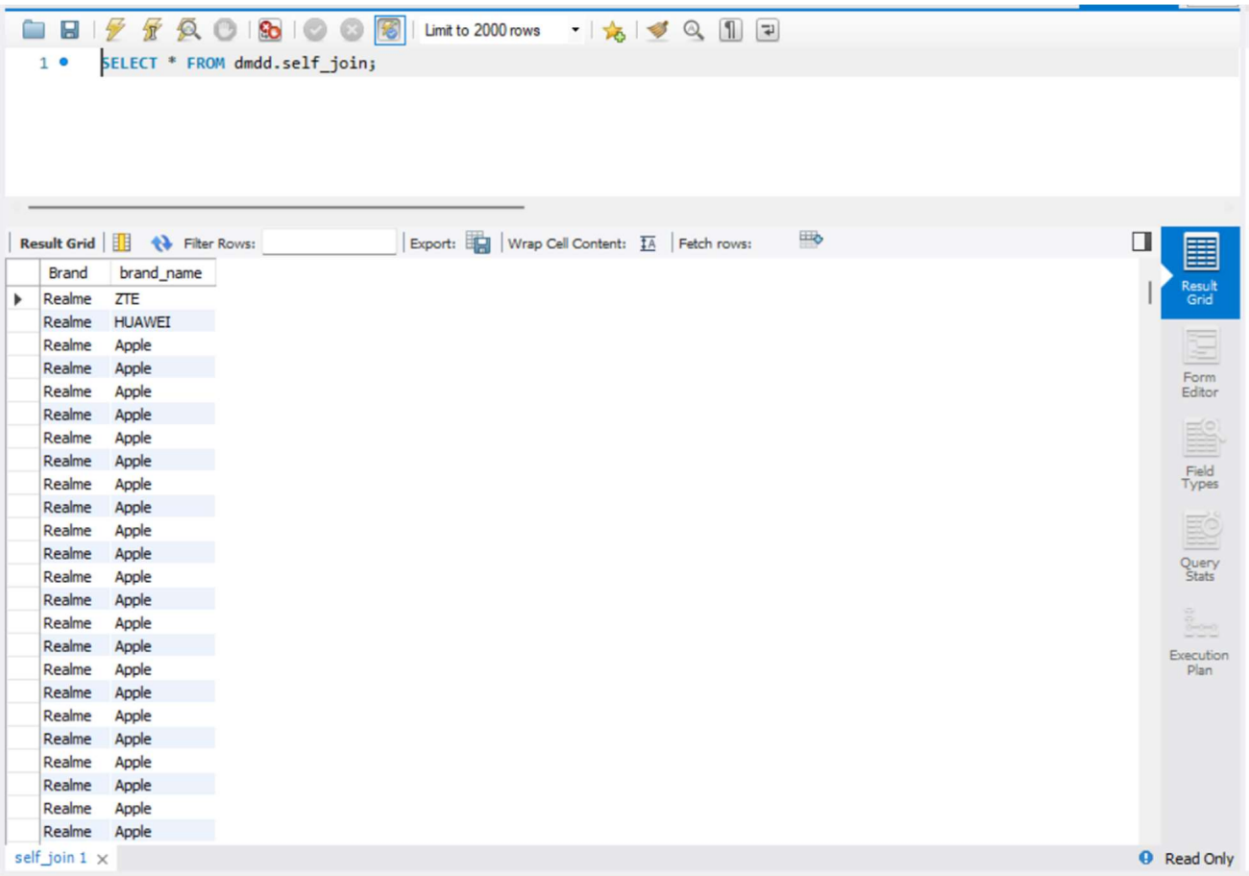
Q19. Which of the following mobile phones have following screen size, where the quantity is above 10?

```
use dmdd;

CREATE VIEW group_by_having AS

SELECT Screen_size, count(Id) AS No_of_Phones

FROM ndtv_data_final

GROUP BY Screen_size

HAVING count(Id) > 10;
```



Q20. Self joined brands from both the tables

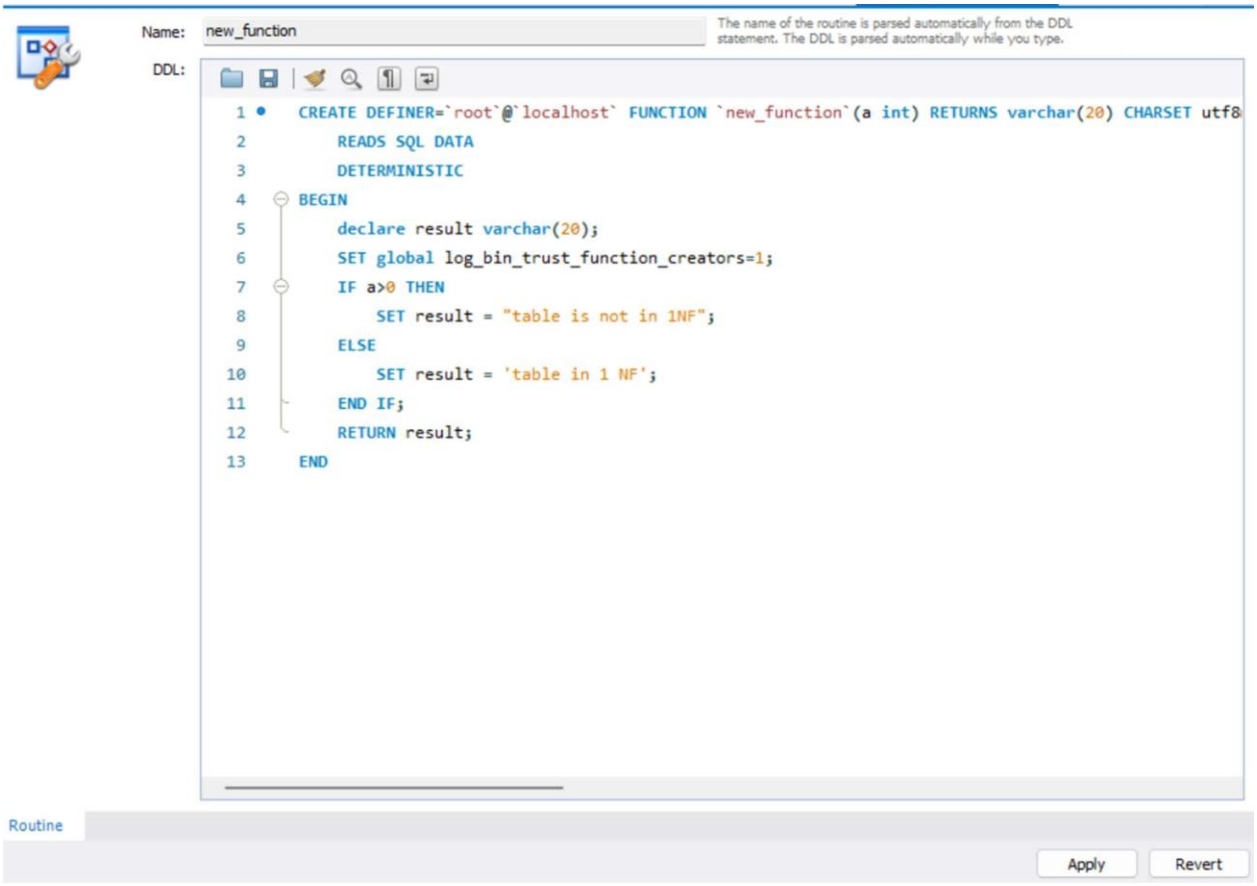
```
use dmdd;
CREATE VIEW self_join AS
SELECT ndtv_data_final.Brand, output.brand_name
FROM ndtv_data_final, output
WHERE ndtv_data_final.Id <> output.Id
```



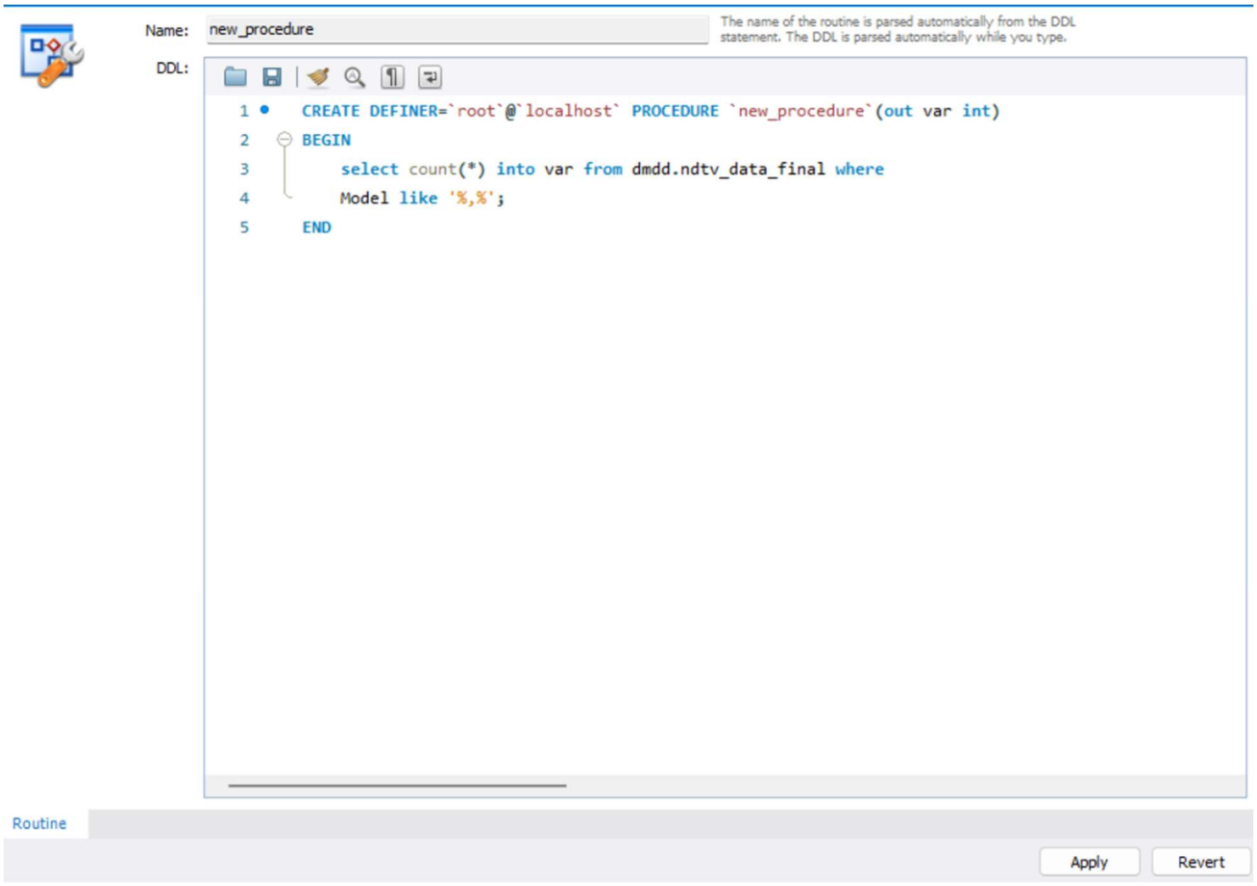
Normalization:

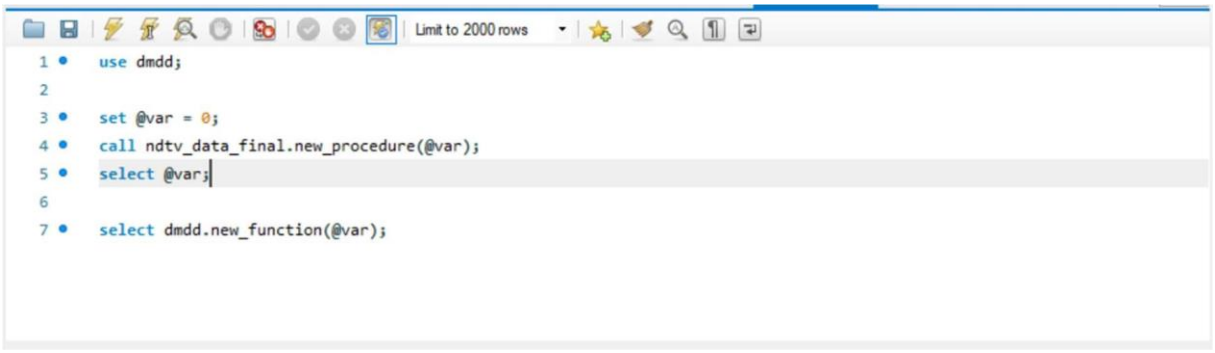
1. 1NF:
   First Normal Form: Satisfies 1NF requirements
   The table has a primary key attribute identified as Id
   No multi-value attributes present
   No repeating groups

Function:

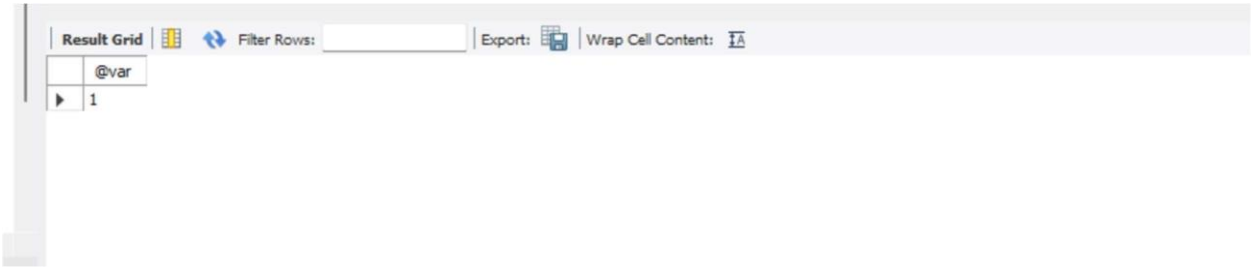

Name:
new_function
The name of the routine is parsed automatically from the DDL statement. The DDL is parsed automatically while you type.
DDL:
1 CREATE DEFINER=`root`@`localhost` FUNCTION `new_function`(a int) RETURNS varchar(20) CHARSET utf8
2 READS SQL DATA
3 DETERMINISTIC
4 BEGIN
5 declare result varchar(20);
6 SET global log_bin_trust_function_creators=1;
7 IF a>0 THEN
8 SET result = "table is not in 1NF";
9 ELSE
10 SET result = 'table in 1 NF';
11 END IF;
12 RETURN result;
13 END
Routine
Apply
Revert

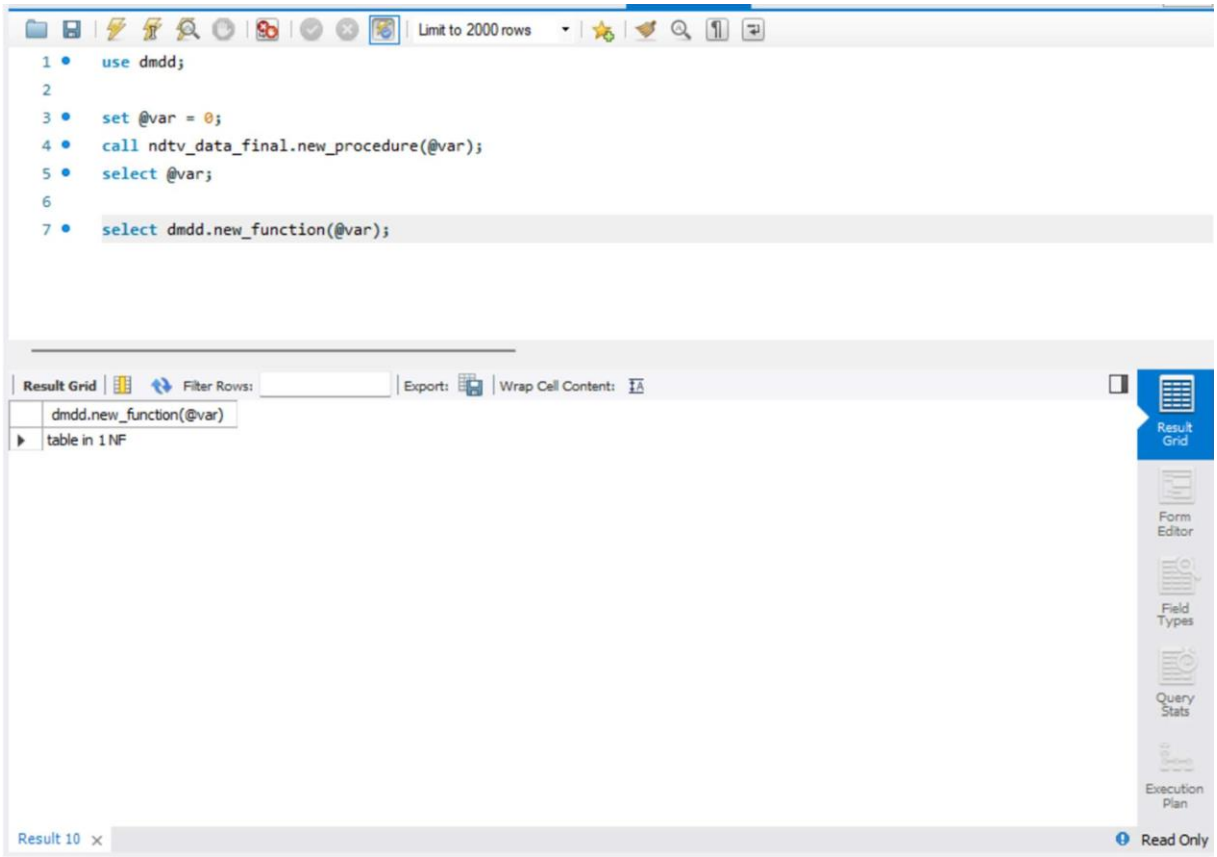
Procedure:


Name:
new_procedure
The name of the routine is parsed automatically from the DDL statement. The DDL is parsed automatically while you type.
DDL:
1 • CREATE DEFINER=`root`@`localhost` PROCEDURE `new_procedure`(out var int)
2 BEGIN
3 select count(*) into var from dmdd.ndtv_data_final where
4 Model like '%,%';
5 END
Routine
Apply
Revert


Limit to 2000 rows
1 • use dmdd;
2
3 • set @var = 0;
4 • call ndtv_data_final.new_procedure(@var);
5 • select @var;
6
7 • select dmdd.new_function(@var);

Outputs:


Result Grid
Filter Rows:
Export:
Wrap Cell Content:
@var
1


Limit to 2000 rows
1 use dmdd;
2
3 set @var = 0;
4 call ndtv_data_final.new_procedure(@var);
5 select @var;
6
7 select dmdd.new_function(@var);
Result Grid
Filter Rows:
Export:
Wrap Cell Content:
dmdd.new_function(@var)
table in 1 NF
Result Grid
Form Editor
Field Types
Query Stats
Execution Plan
Result 10
Read Only

2. 2NF:

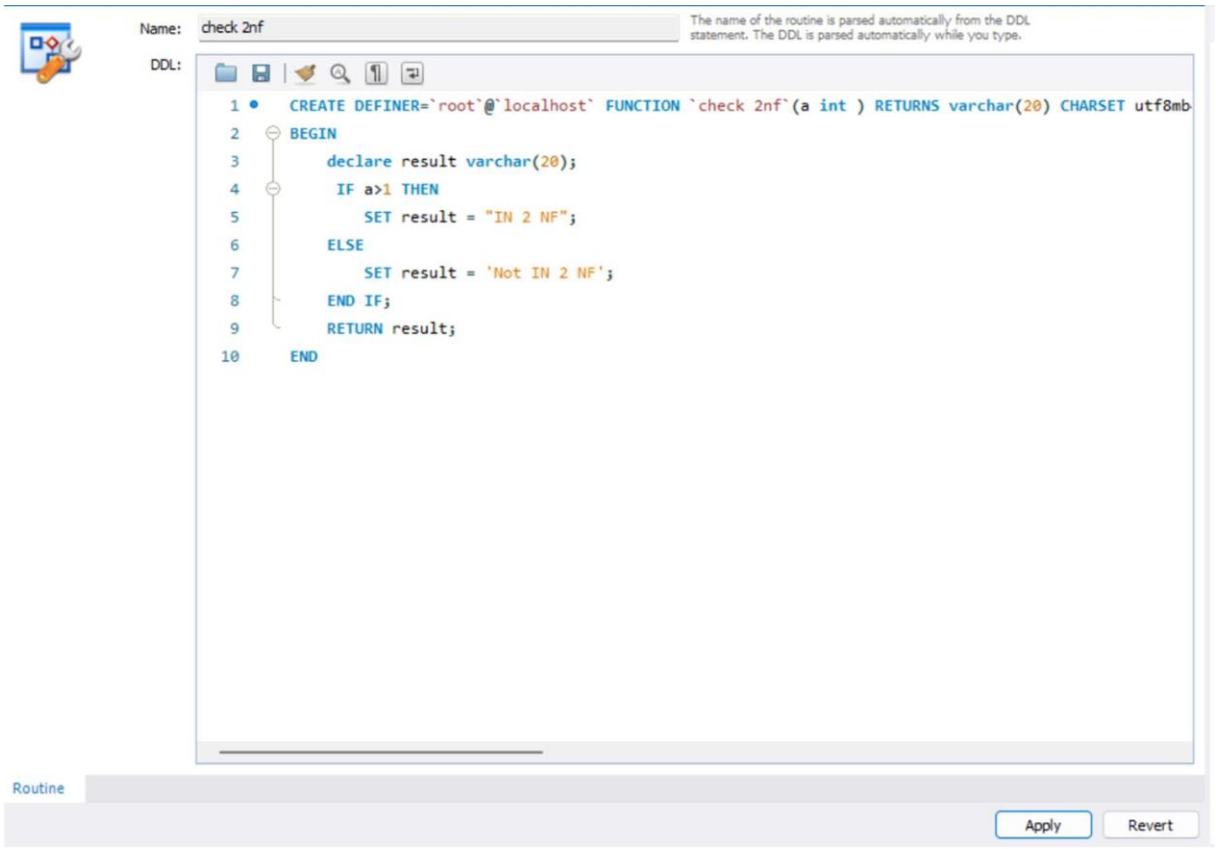
   Satisfies 2NF requirements

   All requirements for 1NF met

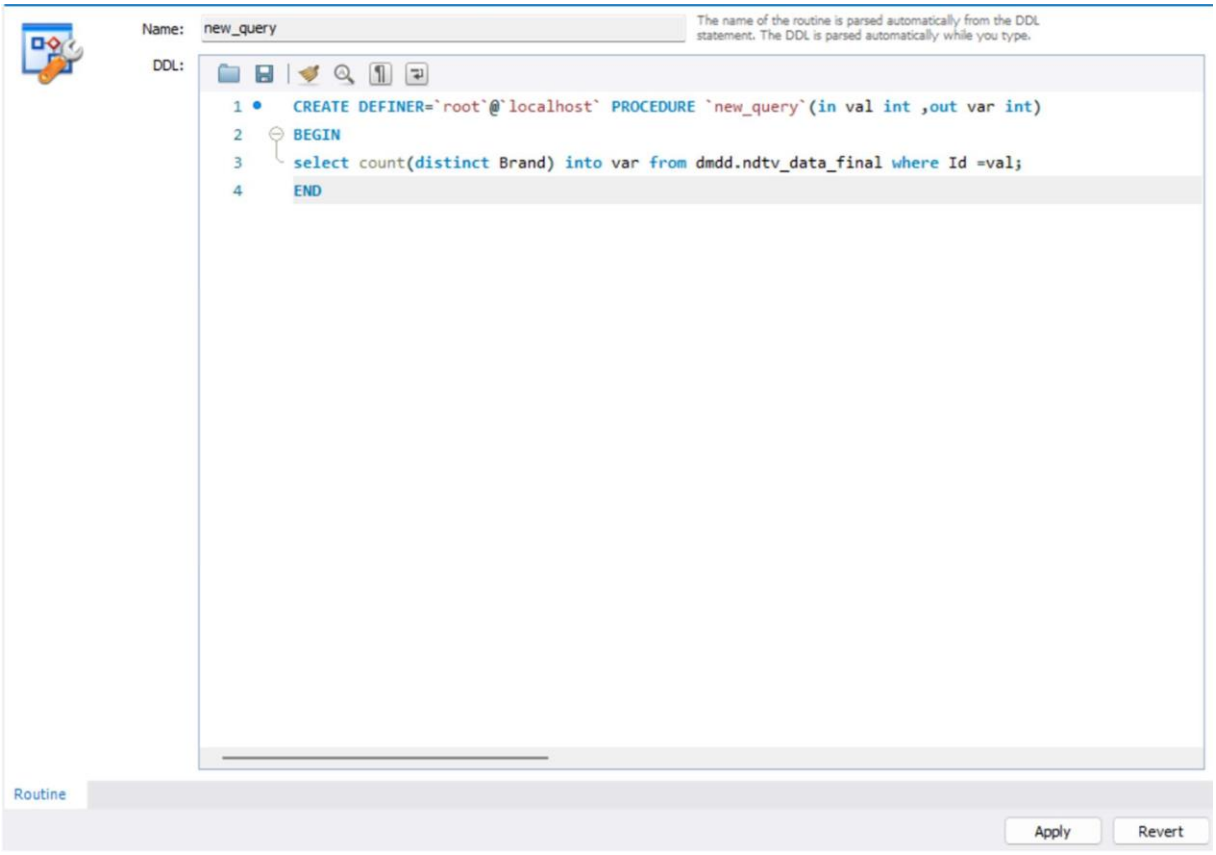
   No partial dependency on any column

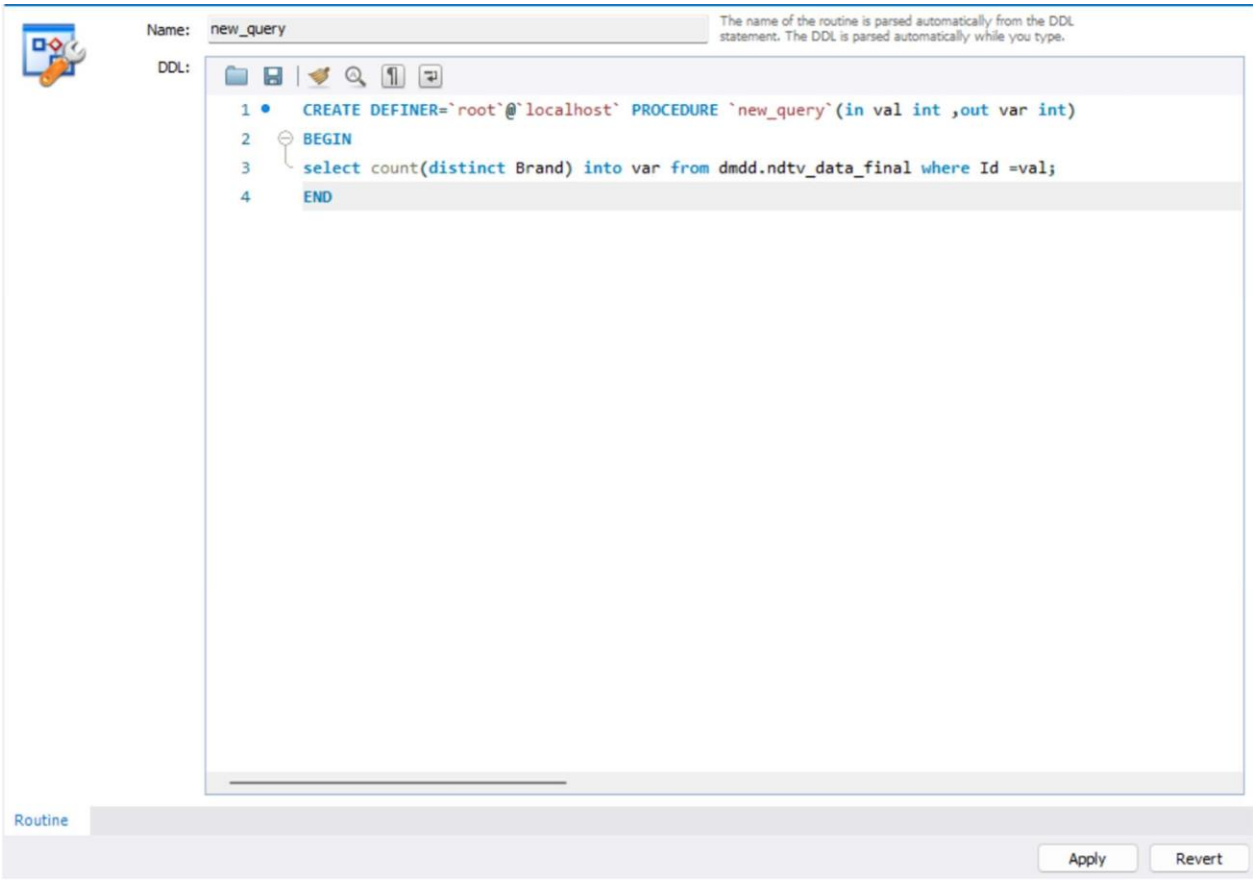
   None of the fields have data calculated from other fields

Function:

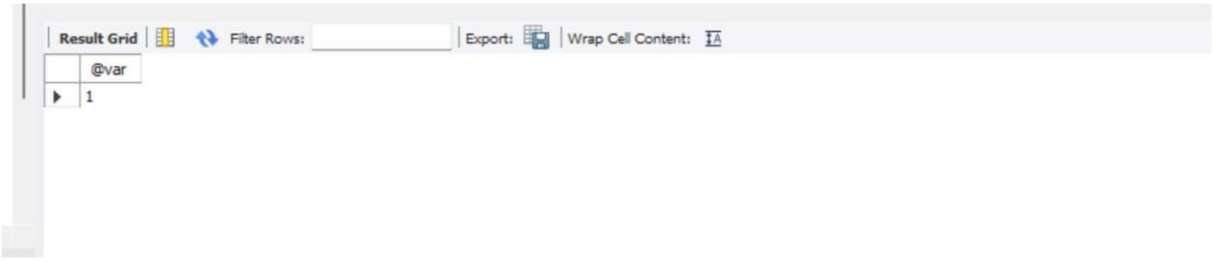


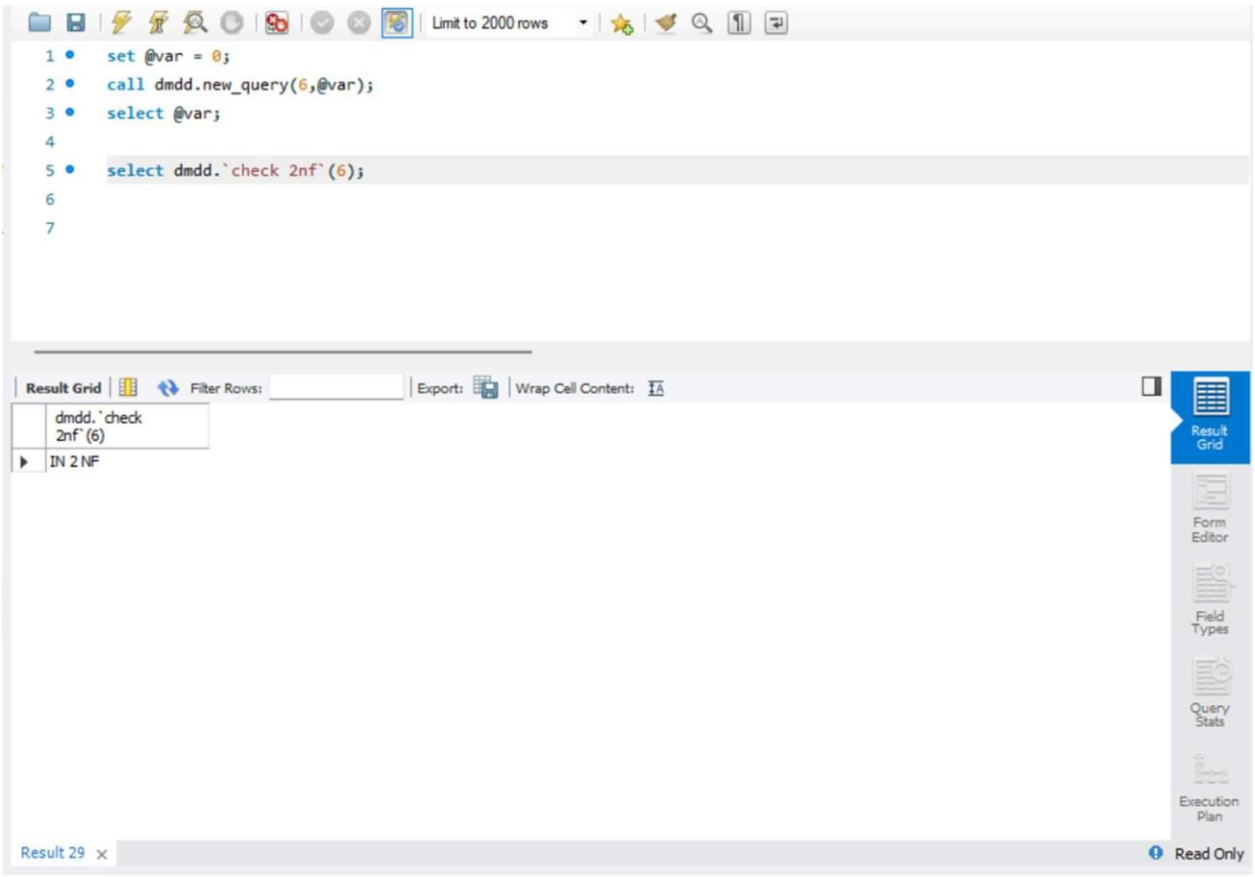
Procedure:


Name:
new_query
The name of the routine is parsed automatically from the DDL statement. The DDL is parsed automatically while you type.
DDL:
1 CREATE DEFINER=`root`@`localhost` PROCEDURE `new_query`(in val int ,out var int)
2 BEGIN
3 select count(distinct Brand) into var from dmdd.ndtv_data_final where Id =val;
4 END
Routine
Apply
Revert


Name:
new_query
The name of the routine is parsed automatically from the DDL statement. The DDL is parsed automatically while you type.
DDL:
1 CREATE DEFINER=`root`@`localhost` PROCEDURE `new_query`(in val int ,out var int)
2 BEGIN
3 select count(distinct Brand) into var from dmdd.ndtv_data_final where Id =val;
4 END
Routine
Apply
Revert

Outputs:


Result Grid
Filter Rows:
Export:
Wrap Cell Content:
@var
1



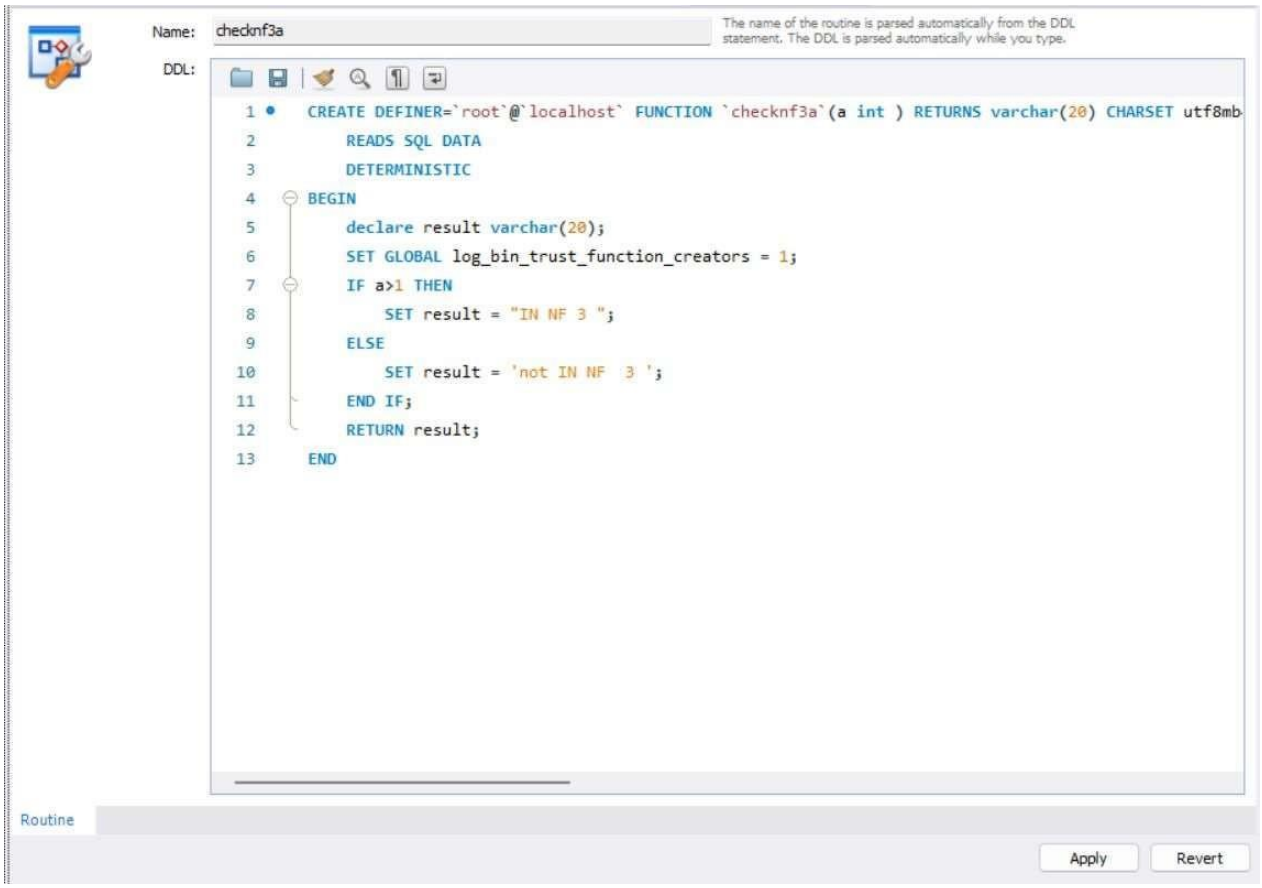
3. 3NF:

Satisfies 3NF requirements

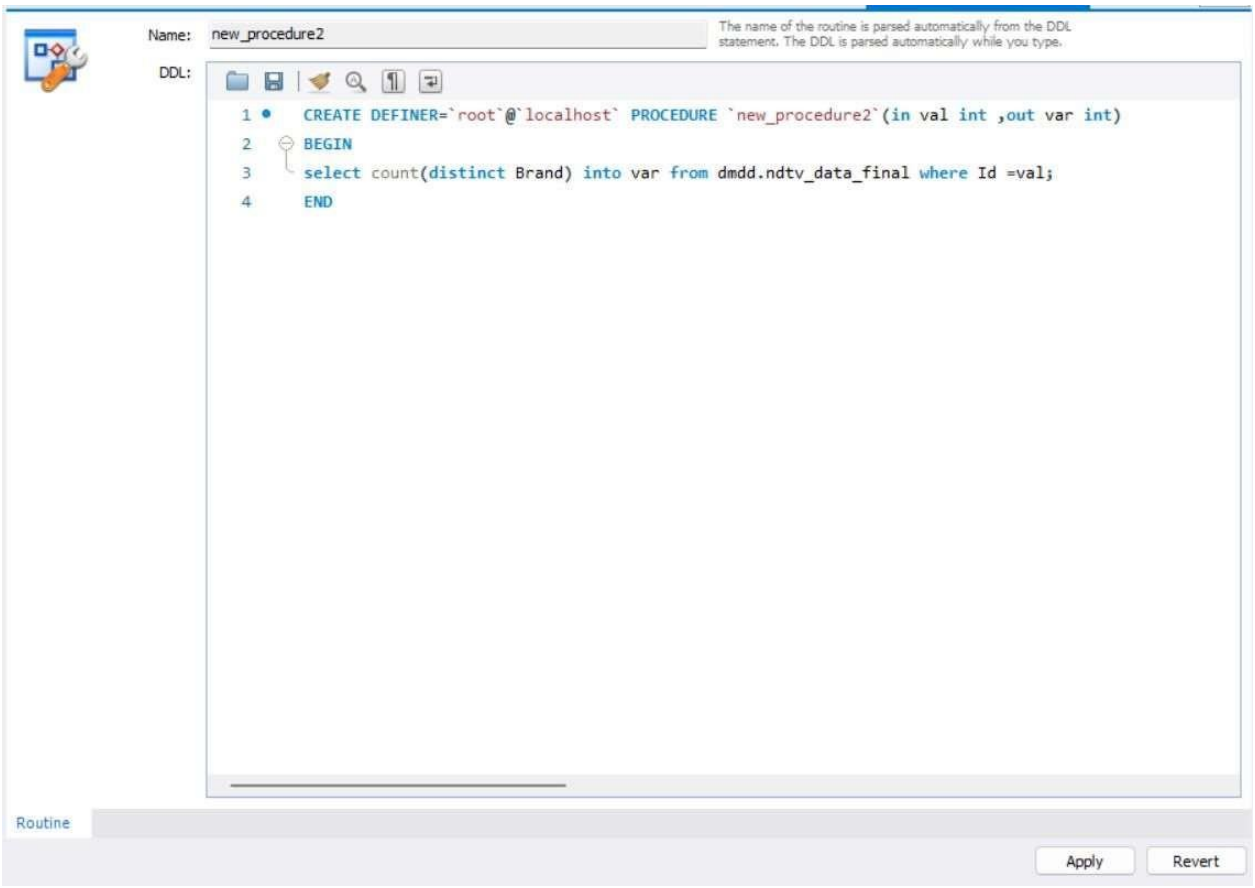
2NF requirements satisfied

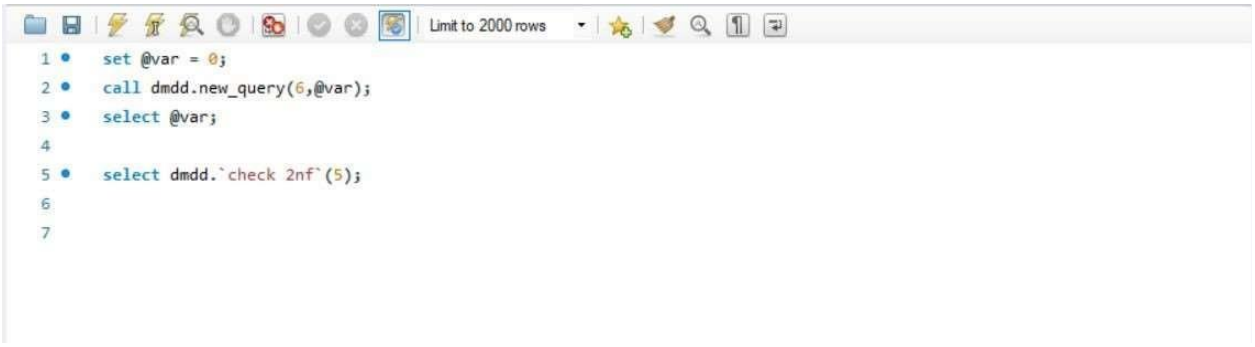
No transitive dependency

Function:

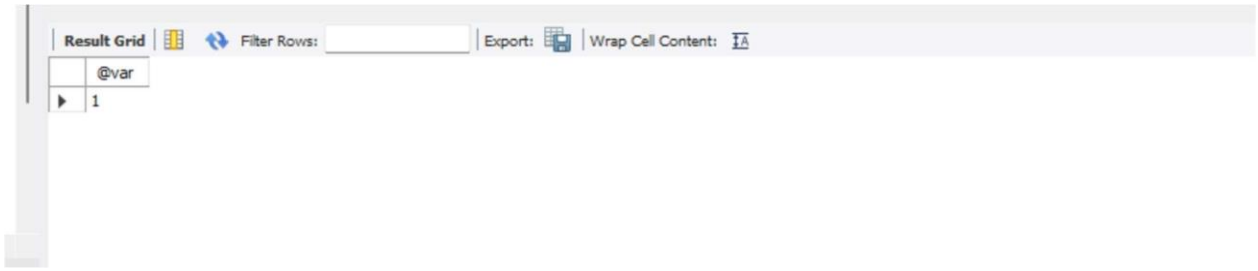


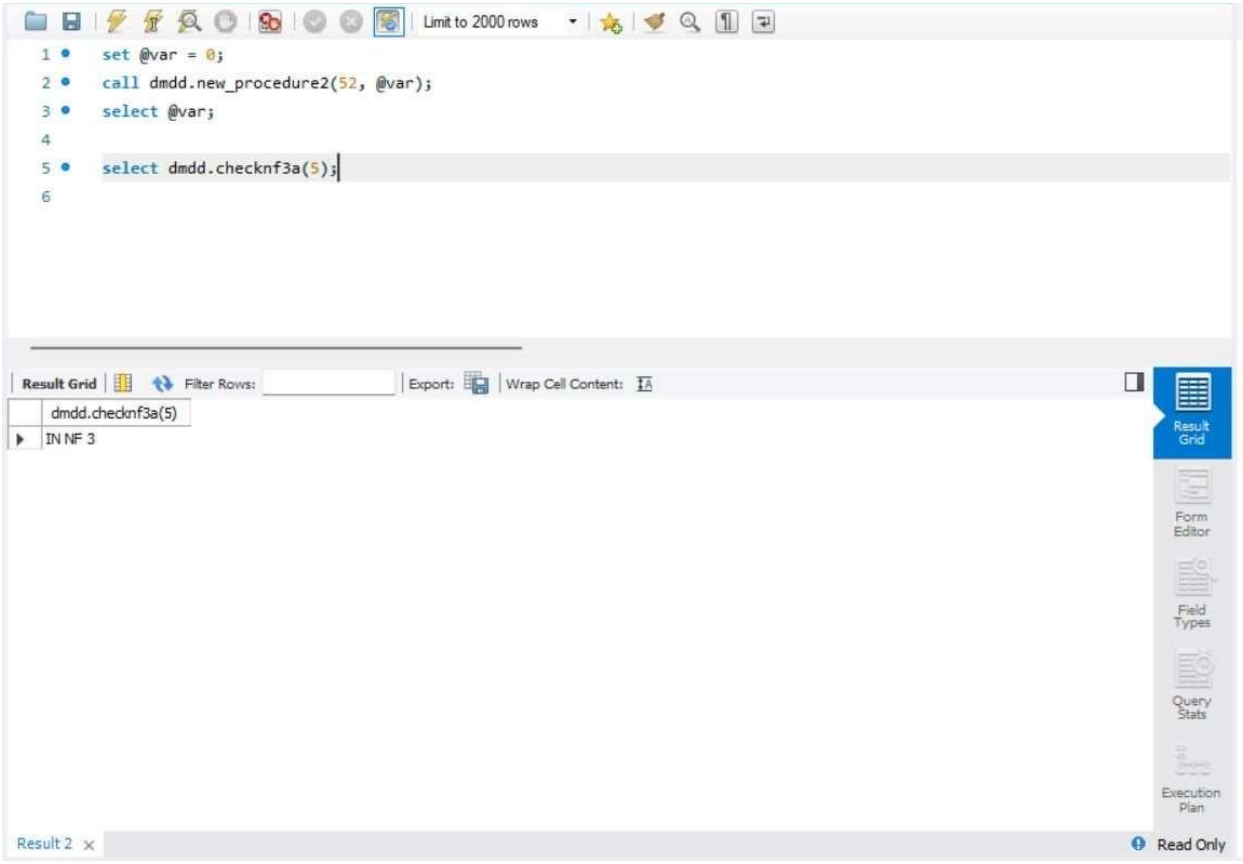
Procedure:


Name:
new_procedure2
The name of the routine is parsed automatically from the DDL statement. The DDL is parsed automatically while you type.
DDL:
1 • CREATE DEFINER=`root`@`localhost` PROCEDURE `new_procedure2`(in val int ,out var int)
2 BEGIN
3 select count(distinct Brand) into var from dmdd.ndtv_data_final where Id =val;
4 END
Routine
Apply
Revert


Limit to 2000 rows
1 • set @var = 0;
2 • call dmdd.new_query(6,@var);
3 • select @var;
4
5 • select dmdd.`check 2nf`(5);
6
7

Outputs:


Result Grid
Filter Rows:
Export:
Wrap Cell Content:
@var
1


Limit to 2000 rows
1 set @var = 0;
2 call dmdd.new_procedure2(52, @var);
3 select @var;
4
5 select dmdd.checknf3a(5);
6
Result Grid
Filter Rows:
Export:
Wrap Cell Content:
dmdd.checknf3a(5)
IN NF 3
Result Grid
Form Editor
Field Types
Query Stats
Execution Plan
Result 2
Read Only