

Result Screenshots 1-27 & Answers 28-32

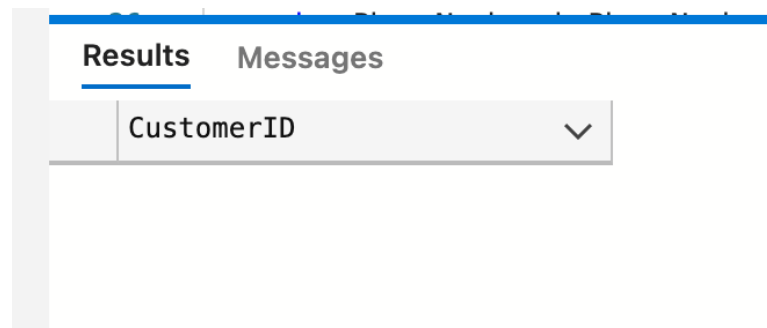
1. 1110 row affected.

	PersonID	FullName	PhoneNumber	FaxNumber	company_phone	company_fax	company
1	2	Kayla Woodcock	(415) 555-0102	(415) 555-0103	(415) 555-0102	(415) 555-0103	wideworldimporters
2	3	Hudson Onslow	(415) 555-0102	(415) 555-0103	(415) 555-0102	(415) 555-0103	wideworldimporters
3	4	Isabella Rupp	(415) 555-0102	(415) 555-0103	(415) 555-0102	(415) 555-0103	wideworldimporters
4	5	Eva Muirden	(415) 555-0102	(415) 555-0103	(415) 555-0102	(415) 555-0103	wideworldimporters
5	6	Sophia Hinton	(415) 555-0102	(415) 555-0103	(415) 555-0102	(415) 555-0103	wideworldimporters
6	7	Amy Trefl	(415) 555-0102	(415) 555-0103	(415) 555-0102	(415) 555-0103	wideworldimporters
7	8	Anthony Grosse	(415) 555-0102	(415) 555-0103	(415) 555-0102	(415) 555-0103	wideworldimporters
8	9	Alica Fatnowna	(415) 555-0102	(415) 555-0103	(415) 555-0102	(415) 555-0103	wideworldimporters
9	10	Stella Rosenhain	(415) 555-0102	(415) 555-0103	(415) 555-0102	(415) 555-0103	wideworldimporters
10	11	Ethan Onslow	(415) 555-0102	(415) 555-0103	(415) 555-0102	(415) 555-0103	wideworldimporters
11	12	Henry Forlonge	(415) 555-0102	(415) 555-0103	(415) 555-0102	(415) 555-0103	wideworldimporters
12	13	Hudson Hollinworth	(415) 555-0102	(415) 555-0103	(415) 555-0102	(415) 555-0103	wideworldimporters
13	14	Lily Code	(415) 555-0102	(415) 555-0103	(415) 555-0102	(415) 555-0103	wideworldimporters
14	15	Taj Shand	(415) 555-0102	(415) 555-0103	(415) 555-0102	(415) 555-0103	wideworldimporters
15	16	Archer Lamble	(415) 555-0102	(415) 555-0103	(415) 555-0102	(415) 555-0103	wideworldimporters
16	17	Piper Koch	(415) 555-0102	(415) 555-0103	(415) 555-0102	(415) 555-0103	wideworldimporters
17	18	Katie Darwin	(415) 555-0102	(415) 555-0103	(415) 555-0102	(415) 555-0103	wideworldimporters
18	19	Jai Shand	(415) 555-0102	(415) 555-0103	(415) 555-0102	(415) 555-0103	wideworldimporters
19	20	Jack Potter	(415) 555-0102	(415) 555-0103	(415) 555-0102	(415) 555-0103	wideworldimporters
20	21	Reio Kabin	(847) 555-0100	(847) 555-0101	(847) 555-0100	(847) 555-0101	A Datum Corporati...
21	22	Oliver Kivi	(847) 555-0100	(847) 555-0101	(847) 555-0100	(847) 555-0101	A Datum Corporati...
22	23	Hanna Mihhailov	(360) 555-0100	(360) 555-0101	(360) 555-0100	(360) 555-0101	Contoso, Ltd.
23	24	Paulus Lippmaa	(360) 555-0100	(360) 555-0101	(360) 555-0100	(360) 555-0101	Contoso, Ltd.
24	25	Kerstin Parn	(415) 555-0100	(415) 555-0101	(415) 555-0100	(415) 555-0101	Consolidated Mess...
25	26	Helen Ahven	(415) 555-0100	(415) 555-0101	(415) 555-0100	(415) 555-0101	Consolidated Mess...
26	27	Bill Lawson	(203) 555-0107	(203) 555-0107	(203) 555-0104	(203) 555-0108	Fabrikam, Inc.
27	28	Helen Moore	(203) 555-0104	(203) 555-0107	(203) 555-0104	(203) 555-0108	Fabrikam, Inc.
28	29	Penny Buck	(406) 555-0107	(406) 555-0109	(406) 555-0105	(406) 555-0106	Graphic Design In...
29	30	Donna Smith	(406) 555-0101	(406) 555-0109	(406) 555-0105	(406) 555-0106	Graphic Design In...
30	31	Madelaine Cartier	(423) 555-0101	(423) 555-0100	(423) 555-0105	(423) 555-0100	Humongous Insuran...
31	32	Annette Talon	(423) 555-0106	(423) 555-0100	(423) 555-0105	(423) 555-0100	Humongous Insuran...
32	33	Elias Myllari	(209) 555-0101	(209) 555-0106	(209) 555-0108	(209) 555-0104	Litware, Inc.
33	34	Vilma Niva	(209) 555-0103	(209) 555-0106	(209) 555-0108	(209) 555-0104	Litware, Inc.
34	35	Prem Prabhu	(423) 555-0102	(423) 555-0108	(423) 555-0103	(423) 555-0105	Lucerne Publishing
35	36	Sunita Jadhav	(423) 555-0101	(423) 555-0108	(423) 555-0103	(423) 555-0105	Lucerne Publishing
36	37	Marcos Costa	(252) 555-0106	(252) 555-0101	(252) 555-0100	(252) 555-0101	Nod Publishers
37	38	Matheus Oliveira	(252) 555-0107	(252) 555-0101	(252) 555-0100	(252) 555-0101	Nod Publishers
38	39	Eliza Soderberq	(201) 555-0101	(201) 555-0106	(201) 555-0105	(201) 555-0104	Northwind Electri...

2. (663 rows affected)

	CustomerName	▼
1	Tailspin Toys (Head Office)	
2	Tailspin Toys (Sylvanite, MT)	
3	Tailspin Toys (Peeples Valley, AZ)	
4	Tailspin Toys (Medicine Lodge, KS)	
5	Tailspin Toys (Gasport, NY)	
6	Tailspin Toys (Jessie, ND)	
7	Tailspin Toys (Frankewing, TN)	
8	Tailspin Toys (Bow Mar, CO)	
9	Tailspin Toys (Netcong, NJ)	
10	Tailspin Toys (Wimbledon, ND)	
11	Tailspin Toys (Devault, PA)	
12	Tailspin Toys (Biscay, MN)	
13	Tailspin Toys (Stonefort, IL)	
14	Tailspin Toys (Long Meadow, MD)	
15	Tailspin Toys (Batson, TX)	
16	Tailspin Toys (Coney Island, MO)	
17	Tailspin Toys (East Fultonham, OH)	
18	Tailspin Toys (Goffstown, NH)	
19	Tailspin Toys (Lemeta, AK)	
20	Tailspin Toys (College Place, WA)	
21	Tailspin Toys (Tresckow, PA)	

3. (0 rows affected)



4.(219 rows affected)

Results Messages

	StockItemID	StockItemName	quantity_...
1	1	USB missile launcher (Green)	88
2	2	USB rocket launcher (Gray)	83
3	3	Office cube periscope (Black)	150
4	4	USB food flash drive - sushi roll	104
5	5	USB food flash drive - hamburger	99
6	6	USB food flash drive - hot dog	98
7	7	USB food flash drive - pizza slice	102
8	8	USB food flash drive - dim sum 10 drive variety pack	204
9	9	USB food flash drive - banana	96
10	10	USB food flash drive - chocolate bar	111
11	11	USB food flash drive - cookie	102
12	12	USB food flash drive - donut	101
13	13	USB food flash drive - shrimp cocktail	99
14	14	USB food flash drive - fortune cookie	97
15	15	USB food flash drive - dessert 10 drive variety pack	196
16	16	DBA joke mug - mind if I join you? (White)	28
17	17	DBA joke mug - mind if I join you? (Black)	33
18	18	DBA joke mug - daaaaaa-ta (White)	46
19	19	DBA joke mug - daaaaaa-ta (Black)	36
20	20	DBA joke mug - you might be a DBA if (White)	35
21	21	DBA joke mug - you might be a DBA if (Black)	36
22	22	DBA joke mug - it depends (White)	38
23	23	DBA joke mug - it depends (Black)	30
24	24	DBA joke mug - I will get you in order (White)	31

5.(227 rows affected)

	StockItemID	▼
1	1	
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9	9	
1...	10	
1...	11	
1...	12	
1...	13	
1...	14	
1...	15	
1...	16	
1...	17	
1...	18	
1...	19	
2...	20	

6. (219 rows affected)

	StockItemID ▼
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27

7. (53 rows affected)

	StateProvinceID	avg_processing_days
1	1	5
2	2	5
3	3	6
4	4	4
5	5	5
6	6	4
7	7	4
8	8	NULL
9	9	NULL
1...	10	4
1...	11	3
1...	12	4
1...	13	5
1...	14	4
1...	15	7
1...	16	4
1...	17	4
1...	18	3
1...	19	5
2...	20	4

8. (592 rows affected)

	StateProvinceID ▾	month ▾	avg_processing_days ▾
1	1	1	10
2	1	2	2
3	1	3	3
4	1	4	4
5	1	5	3
6	1	6	2
7	1	7	11
8	1	8	1
9	1	9	3
10	1	10	5
11	1	11	11
12	1	12	5
13	2	1	1
14	2	2	1
15	2	3	1
16	2	4	2
17	2	5	5
18	2	6	4
19	2	7	4
20	2	8	8
21	2	9	13
22	2	10	5
23	2	11	13

9.(9 rows affected)

Results Messages

	StockItemID	▼
1	77	
2	78	
3	80	
4	86	
5	95	
6	98	
7	184	
8	193	
9	204	

10. (6 rows affected)

	CustomerID	▼	Phon...	▼	PrimaryContactName	▼
1	107		(209) 5...		Karie Mercier	
2	171		(201) 5...		Raymond Levesque	
3	194		(239) 5...		Thomas Fischer	
4	412		(406) 5...		Chati Ornlamai	
5	902		(210) 5...		Kamila Michnova	
6	947		(206) 5...		Svetlana Todorovic	

11. (13 rows affected)

	CityID	CityName
1	164	Adrian
2	5368	Carlton
3	9908	East Smithfield
4	11095	Fairfax
5	18834	Laupahoehoe
6	21614	McWhorter
7	24452	Norborne
8	24608	North Granby
9	27500	Pondosa
10	28862	Richvale
11	32517	Springville
12	33997	Throop
13	34934	Urbancrest

12.(367 rows affected)

	StockItemName	delivery_address	delivery_country	delivery_state	delivery_city	CustomerN.	customer_contact_name	customer_phone	Quantity
1	DBA joke mug - tw.	Unit 193, 583 Aluri Road, 98726	United States	Puerto Rico (US Terr...	Rosa Sánchez	Wingtip Toys ..	Selma Seppanen	(787) 555-0100	7
2	Developer joke mu.	Suite 255, 299 Gill Boulevard, 98567	United States	Louisiana	Donner	Tailspin Toys..	Kurt Lukes	(225) 555-0100	7
3	Developer joke mu.	Unit 61, 474 Tran Lane, 98124	United States	New York	Arietta	Tailspin Toys..	Chandrakanta Raut	(212) 555-0100	7
4	DBA joke mug - SE.	Suite 14, 731 Szolosy Crescent, 98468	United States	Washington	Venersborg	Svetlana Todo..	Svetlana Todorovic	(206) 555-0100	1
5	IT joke mug - tha.	Suite 183, 796 Zvaigzne Boulevard, 98683	United States	Alaska	Haycock	Wingtip Toys ..	Bhaamini Kanaparthi	(907) 555-0100	1
6	Developer joke mu.	Unit 32, 917 Morgan Boulevard, 98782	United States	California	Glen Avon	Tailspin Toys..	Karie Mercier	(209) 555-0100	1
7	DBA joke mug - tw.	Unit 148, 1161 Chang Lane, 98548	United States	New Jersey	Absecon	Tailspin Toys..	Sang Tran	(201) 555-0100	2
8	DBA joke mug - tw.	Unit 15, 685 Pavel Road, 98812	United States	Alabama	Southside	Manca Hrastov..	Manca Hrastovsek	(205) 555-0100	2
9	DBA joke mug - yo.	Unit 13, 1331 Sen Street, 98665	United States	Kansas	Coffeyville	Dena Glissen	Dena Glissen	(316) 555-0100	2
1.	Developer joke mu.	Suite 4, 438 Desforges Road, 98686	United States	Maine	Edgecomb	Dhaatri Chavva	Dhaatri Chavva	(207) 555-0100	2
1.	IT joke mug - har.	Shop 11, 965 Horackova Lane, 98718	United States	New York	Greig	Kertu Sökk	Kertu Sökk	(212) 555-0100	9
1.	DBA joke mug - yo.	Shop 28, 1846 Saucier Road, 98832	United States	Ohio	East Fultonham	Wingtip Toys ..	Masa Buecek	(216) 555-0100	8
1.	DBA joke mug - tw.	Unit 206, 1898 Kasesalu Boulevard, 98579	United States	Maine	Wallagrass	Tailspin Toys..	Laboni Deb	(207) 555-0100	4
1.	Developer joke mu.	Suite 4, 438 Desforges Road, 98686	United States	Maine	Edgecomb	Dhaatri Chavva	Dhaatri Chavva	(207) 555-0100	4
1.	Developer joke mu.	Unit 90, 1648 Mitra Lane, 98388	United States	Texas	Oak Point	Wingtip Toys ..	Duangrat Atitarn	(210) 555-0100	4
1.	DBA joke mug - it.	Suite 243, 328 Bhat Street, 98213	United States	Puerto Rico (US Terr...	Aceitunas	Tailspin Toys..	Eekalabya Bose	(787) 555-0100	4
1.	Developer joke mu.	Unit 61, 474 Tran Lane, 98124	United States	New York	Arietta	Tailspin Toys..	Chandrakanta Raut	(212) 555-0100	3
1.	Developer joke mu.	Suite 191, 1924 Spousta Lane, 98498	United States	Puerto Rico (US Terr...	Corcovado	Wingtip Toys ..	Harri Kask	(787) 555-0100	3

13. (9 rows affected)

	StockGroupID	purchased_quantity	sold_quantity	remaining_stock_quantity
1	1	10992	1168276	-1157284
2	2	90923747	2842918	88080829
3	3	1442	244010	-242568
4	4	90920724	1800072	89120652
5	6	90923896	2181299	88742597
6	7	1580	81057	-79477
7	8	1390	395849	-394459
8	9	1313	121360	-120047
9	10	48485018	5838043	42646975

14. (2952 rows affected)

	CityID	StockitemID	deliveries
1	15	72	2
2	15	20	2
3	15	117	2
4	15	123	2
5	15	162	2
6	15	9	2
7	15	156	2
8	49	107	2
9	49	57	2
10	49	72	2
11	54	35	3
12	58	1	3
13	232	173	2
14	232	171	2
15	232	79	2
16	242	183	3
17	242	1	3
18	242	199	3
19	242	114	3
20	242	47	3
21	242	220	3
22	242	2	3
23	357	27	2
24	357	132	2
25	357	172	2
26	372	201	2
27	372	145	2
28	372	59	2

15.(0 rows affected)

OrderID

16. (207 rows affected)

	StockItemID
1	1
2	2
3	3
4	16
5	17
6	18
7	19
8	20
9	21
10	22
11	23
12	24
13	25
14	26
15	27
16	28

17.(2 rows affected)

	CountryOfManuf... ▾	stockitem... ▾
1	China	2850885
2	Japan	22365

18.(9 rows affected)

	StockGroupName ▾	2013 ▾	2014 ▾	2015 ▾	2016 ▾	2017 ▾
1	Clothing	767341	831573	889178	354826	NULL
2	Computing Novelties	588555	639315	677480	275949	NULL
3	Furry Footwear	107839	112845	125924	49241	NULL
4	Mugs	65713	70384	77268	30645	NULL
5	Novelty Items	276609	306077	328677	256913	NULL
6	Packaging Materials	1572415	1694778	1826433	744417	NULL
7	Toys	32266	35403	38303	15388	NULL
8	T-Shirts	486924	528096	558144	226908	NULL
9	USB Novelties	21328	23685	26048	9996	NULL

19. (2 rows affected)

	year_ ▾	Clothing ▾	Computing Novelties ▾	Furry Footwear ▾	Mugs ▾	Novelty Items ▾	Packaging Materials ▾	Toys ▾	T-Shirts ▾	USB Novelties ▾
1	2013	767341	588555	107839	65713	276609	1572415	32266	486924	21328
2	2014	831573	639315	112845	70384	306077	1694778	35403	528096	23685
3	2015	889178	677480	125924	77268	328677	1826433	38303	558144	26048
4	2016	354826	275949	49241	30645	256913	744417	15388	226908	9996

20.(70510 rows affected)

CreditNot...	Comments	DeliveryL...	InternalC...	TotalDryL...	TotalChil...	DeliveryR...	RunPositi...	ReturnedD...	Confirmed...	Confirmed...	LastEdite...	LastEdite...	OrderID	OrderTotal
NULL	NULL	Suite 24, 134...	NULL	1	0			{ "Events": [{	2013-01-02 07...	Aakriti Byrra...	15	2013-01-02 07...	1	2300.00
NULL	NULL	Unit 7, 844 H...	NULL	2	0			{ "Events": [{	2013-01-02 07...	Bala Dixit	15	2013-01-02 07...	2	405.00
NULL	NULL	Unit 60, 1150...	NULL	1	0			{ "Events": [{	2013-01-02 07...	Sung-Hwan Hwa...	15	2013-01-02 07...	3	90.00
NULL	NULL	Unit 136, 133...	NULL	3	0			{ "Events": [{	2013-01-02 07...	Aile Mae	15	2013-01-02 07...	4	445.20
NULL	NULL	Shop 30, 1476...	NULL	3	0			{ "Events": [{	2013-01-02 07...	Sara Huiting	15	2013-01-02 07...	5	704.00
NULL	NULL	Suite 6, 244 ...	NULL	3	0			{ "Events": [{	2013-01-02 07...	Alinne Matos	15	2013-01-02 07...	6	430.00
NULL	NULL	Shop 227, 178...	NULL	4	0			{ "Events": [{	2013-01-02 07...	Dattaatraeya ...	15	2013-01-02 07...	7	603.50
NULL	NULL	Suite 24, 130...	NULL	3	0			{ "Events": [{	2013-01-02 07...	Ingrida Zelti...	15	2013-01-02 07...	8	250.00
NULL	NULL	Unit 176, 167...	NULL	2	0			{ "Events": [{	2013-01-02 07...	Airi Vassiljev	15	2013-01-02 07...	9	170.00
NULL	NULL	Suite 169, 94...	NULL	2	0			{ "Events": [{	2013-01-02 07...	Ester Ahmadian	15	2013-01-02 07...	10	104.00
NULL	NULL	Shop 204, 167...	NULL	1	0			{ "Events": [{	2013-01-02 07...	Anete Kundzina	15	2013-01-02 07...	11	13.00
NULL	NULL	Suite 270, 12...	NULL	2	0			{ "Events": [{	2013-01-02 08...	Seo-yeon Rim	15	2013-01-02 07...	12	229.00
NULL	NULL	Suite 203, 22...	NULL	2	0			{ "Events": [{	2013-01-02 08...	Doru Munteanu	15	2013-01-02 07...	13	2430.00
NULL	NULL	Shop 10, 353 ...	NULL	3	0			{ "Events": [{	2013-01-02 08...	In-Su Bae	15	2013-01-02 07...	14	650.00
NULL	NULL	Suite 10, 120...	NULL	2	0			{ "Events": [{	2013-01-02 08...	Valter Viiding	15	2013-01-02 07...	15	174.00
NULL	NULL	Unit 212, 183...	NULL	1	0			{ "Events": [{	2013-01-02 08...	Lan Chu	15	2013-01-02 07...	16	60.00
NULL	NULL	Unit 18, 469 ...	NULL	2	0			{ "Events": [{	2013-01-02 08...	Elina Kaleja	15	2013-01-02 07...	17	424.00
NULL	NULL	Suite 7, 493 ...	NULL	1	0			{ "Events": [{	2013-01-02 08...	Seo-yun Paik	15	2013-01-02 07...	19	91.00
NULL	NULL	Suite 25, 174...	NULL	3	0			{ "Events": [{	2013-01-02 08...	Kumar Kamei	15	2013-01-02 07...	20	3185.00
NULL	NULL	Unit 17, 1957...	NULL	1	0			{ "Events": [{	2013-01-02 08...	Anindya Ghatak	15	2013-01-02 07...	22	240.00
NULL	NULL	Unit 235, 822...	NULL	3	0			{ "Events": [{	2013-01-02 08...	Raju Atluri	15	2013-01-02 07...	23	535.00

21. (394 rows affected)

	OrderID ▾	OrderDate ▾	OrderTotal ▾	CustomerID ▾
1	18	2013-01-01	2534.00	423
2	68	2013-01-01	864.00	972
3	43	2013-01-01	648.00	1000
4	33	2013-01-01	100.00	567
5	19	2013-01-01	91.00	949
6	53	2013-01-01	11988.00	586
7	73	2013-01-01	1420.00	431
8	36	2013-01-01	32.40	10
9	66	2013-01-01	1850.00	89
10	65	2013-01-01	1908.00	484
11	38	2013-01-01	200.00	431
12	72	2013-01-01	463.20	10
13	13	2013-01-01	2430.00	473
14	32	2013-01-01	373.00	972
15	15	2013-01-01	174.00	991
16	47	2013-01-01	11020.00	105
17	79	2013-01-01	420.00	415
18	45	2013-01-01	5600.00	832
19	51	2013-01-01	432.00	77
20	24	2013-01-01	3182.00	890
21	44	2013-01-01	270.00	415
...	22	76	6420.00	910

22. (227 rows affected)

[illegible][illegible]

	OrderID ▾	OrderDate ▾	OrderTotal ▾	CustomerID ▾
1	26240	2014-05-02	600.00	807
2	26344	2014-05-05	2822.00	48
3	26317	2014-05-03	11551.50	975
4	26555	2014-05-07	1648.00	194
5	26260	2014-05-02	2880.00	181
6	26478	2014-05-07	781.50	97
7	26190	2014-05-02	3988.00	24
8	26294	2014-05-03	91.75	18
9	26377	2014-05-05	3749.00	490
10	26243	2014-05-02	6878.00	26
11	26235	2014-05-02	372.00	44
12	26430	2014-05-06	2763.00	857
13	26209	2014-05-02	2118.00	180
14	26396	2014-05-05	3461.00	163
15	26481	2014-05-07	104.00	839
16	26471	2014-05-07	2291.40	32
17	26303	2014-05-03	3150.00	432
18	26403	2014-05-05	1167.00	65
19	26337	2014-05-05	552.00	464
20	26413	2014-05-05	511.50	64
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24. (didn't complete this one)

25.

	JSON_F52E2B61-18A1-11d1-B105-00805F499168 ▾
1	{"Year StockGroup JSON": [{"Year": 2013, "Clothing": 767341, "Computing Novelties": 588555, "Furry Footwear": 107839, "Mugs": 65713, "Novelty Items": 276609, "Packagin...


```

"Year_StockGroup_JSON": [
  {
    "year_": 2013,
    "Clothing": 767341,
    "Computing Novelties": 588555,
    "Furry Footwear": 107839,
    "Mugs": 65713,
    "Novelty Items": 276609,
    "Packaging Materials": 1572415,
    "Toys": 32266,
    "T-Shirts": 486924,
    "USB Novelties": 21328
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    "Furry Footwear": 112845,
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    "Novelty Items": 306077,
    "Packaging Materials": 1694778,
    "Toys": 35403,
    "T-Shirts": 528096,
    "USB Novelties": 23685
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    "Toys": 38303,
    "T-Shirts": 558144,
    "USB Novelties": 26048
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    "Computing Novelties": 275949,
    "Furry Footwear": 49241,
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    </T-Shirts>
    <USB_Novelties>
      | 23685

```

27. (didn't complete this one)

28. Write a short essay talking about your understanding of transactions, locks and isolation levels.

A transaction is the logical work unit that performs a single activity or multiple activities in a database to read, write, update or delete data. Most Transactions happen in OLTP database and are normally not the responsibilities or in the workload for Data Engineers unless you want to use some DML to change the data, but it's better to know how it works.

Transactions have two outcomes, either all statements made in the transaction get committed or all rolled back. Transactions must obey ACID principles to successfully commit, which are atomicity, consistency, isolation and durability. Atomicity means all or nothing. If your request or command wrapped inside of the transaction to be executed by the relational database engine,, the execution would be either all or nothing. If two select statements wrapped in a single transaction, either they all go through or none of them go through. Atomicity prevent data loss or corruption from occurring. Consistency means transactions do not violate data integrity and constraints. Transactions only make changes to tables in predefined, predictable ways. Primary key/foreign key, not null, unique constraints, etc must be kept in a consistent state during and at the end of the transactions. Isolation means different transactions are isolated, independent of each other. Even though they may be occurring simultaneously, concurrent transactions must not interfere with or affect one another. Durability means any changes made by transactions should be permanently saved in some physical hard drive, not matter what happens. Either it's system failure, power shortage, network issue or else, the results should be permanently saved.

It's usually the case that transactional database system need to run different transactions at the same time, and this is where concurrency issues and concurrency controls come into play. Concurrency issues are potential problems that may occur from multiple transactions running simultaneously in an uncontrolled manner. To prevent concurrency issue from occurring, we have concurrency controls, including pessimistic concurrency control and optimistic

concurrency control. Optimistic concurrency control tries to avoid locks and pessimistic concurrency control uses locks. Locks prevent concurrency issues though locking certain sources. Simply put, I can lock the table when using it so that no one else can access/read/edit the table until I finished. Locks allows low risks of rolling back transactions or incorrect data. There's usually waiting time associated with it so it may slow down the process. Locks are systematic. Isolation levels act like the rules/settings for locks to get acquired and released, and how intense that process is.

29. Write a short essay, plus screenshots talking about performance tuning in SQL Server. Must include Tuning Advisor, Extended Events, DMV, Logs and Execution Plan.

(I don't have a windows computer right now and due to Mac M1 chip limitation, I can only be using Docker virtual sql server image along with Azure Data Studio, which is limited in some functionalities, but I'm considering getting a windows laptop soon.)

DMV is a bunch of views you can query, info stored are usually for diagnostic and administrative purposes.

Extended Events is a performance monitoring system in the sql server. It has 'watch live data' function which shows operations made in the database with timestamps.

Execution Plan displays the steps/operations in your query in execution order and returned the stats/details of it, such as how long it takes to run, CPU cost, etc. You can know which operations of your query are more expensive

30. Write a short essay talking about a scenario: Good news everyone! We (Wide World Importers) just brought out a small company called "Adventure works"! Now that bike shop is our sub-company. The first thing of all works pending would be to merge the user logon information, person information (including emails, phone numbers) and products (of course, add category, colors) to WWI database. Include screenshot, mapping and query.

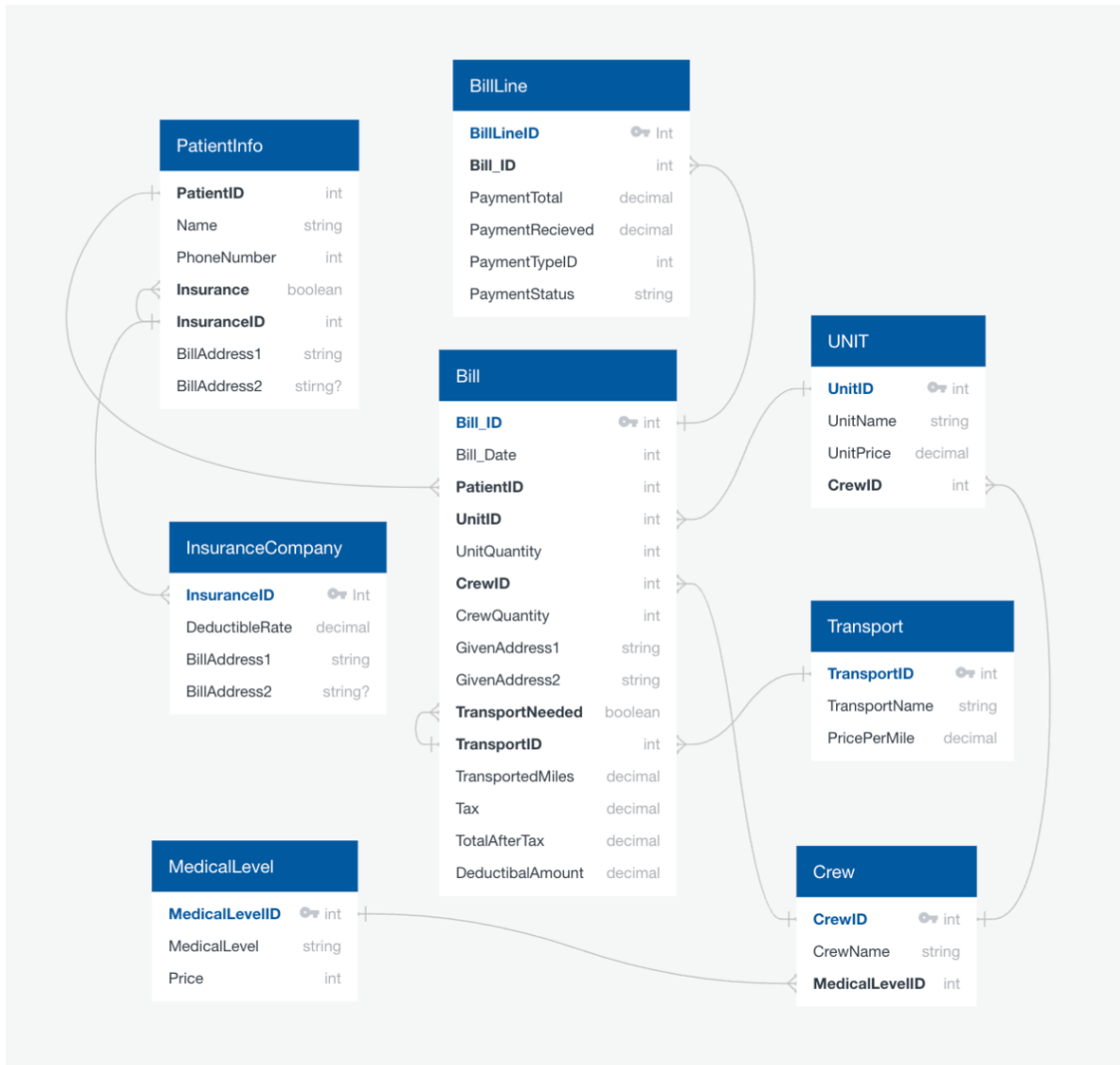
We have three fields in AdventureWorks data that can match to the fields in WWI data, which are **FullName** (need some concatenation), **EmailAddress**, and **PhoneNumber**. For all the other missing fields, we create the corresponding columns in AdventureWorks. In order to match the data type, and especially to meet the NOT NULL constraints, we manually set some default values based on our business sense. We then created **PersonID** with identity property starting from 3262 to avoid conflicts with the corresponding column in WWI. We wanted to change the datatype of **PersonID** from identity to primary key so that we can match it to the corresponding PersonID in WWI and be able to insert data, and this is where we stuck.

```

3 GO
4 CREATE TABLE AdventureWorks2019.dbo.person(
5 BusinessEntityID int not null,
6 FullName nvarchar (50) Not null,
7 PreferredName nvarchar (50) NOT NULL DEFAULT 'None',
8 SearchName nvarchar (101) NOT NULL DEFAULT 'None',
9 IsPermittedToLogon bit not null DEFAULT 0,
10 LogonName nvarchar (50),
11 IsExternalLogonProvider bit not null DEFAULT 0,
12 Hashedassword varbinary(max),
13 IsSystemUser bit not null DEFAULT 0,
14 IsEmployee bit not null DEFAULT 0,
15 IsSalesperson bit not null DEFAULT 0,
16 UserPreferences nvarchar(max),
17 PhoneNumber nvarchar (20),
18 FaxNumber nvarchar(20),
19 EmailAddress nvarchar(256),
20 Photo varbinary(max),
21 CustomFields nvarchar(max),
22 OtherLanguages nvarchar (max),
23 LastEditedby INT NOT NULL DEFAULT 0,
24 ValidFrom datetime2(7) NOT NULL DEFAULT GETDATE(),
25 ValidTo datetime2(7) NOT NULL DEFAULT '9999-12-31 23:59:59.9999999'
26 )
27 GO
28 --check table
29 select * from AdventureWorks2019.dbo.person
30 GO
31 --insert value
32 INSERT INTO AdventureWorks2019.dbo.person (BusinessEntityID,FullName,EmailAddress,PhoneNumber)
33 SELECT p1.BusinessEntityID, CONCAT(p1.FirstName, ' ', p1.LastName) as FullName, p2.EmailAddress, p3.PhoneNumber
34 FROM Person.Person p1 JOIN Person.EmailAddress p2 ON p1.BusinessEntityID = p2.BusinessEntityID
35 JOIN Person.PersonPhone p3 ON p1.BusinessEntityID = p3.BusinessEntityID
36 order by p1.BusinessEntityID
37 GO
38 --check table
39 select * from AdventureWorks2019.dbo.person
40 GO
41 --add personID to match with WWI
42 ALTER TABLE AdventureWorks2019.dbo.person
43 ADD PersonID int IDENTITY(3262,1)
44 GO
45 select * from AdventureWorks2019.dbo.person
46 GO
47 --alter personID datatype to match with WWI
48 ALTER TABLE AdventureWorks2019.dbo.person
49 ALTER COLUMN PersonID PRIMARY KEY
50 GO
51 --
52 INSERT INTO WidedworldImporters.Application.People
53 select PersonID, FullName, PreferredName, SearchName, IsPermittedToLogon, LogonName, IsExternalLogonProvider, Hashedassword, IsSystemUser, IsEmployee, IsSalesperson,
54 UserPreferences, PhoneNumber, FaxNumber, EmailAddress, Photo, CustomFields, OtherLanguages, LastEditedby, ValidFrom, ValidTo
55 from AdventureWorks2019.dbo.person

```

31. Database Design: OLTP db design request for EMS business: when people call 911 for medical emergency, 911 will dispatch UNITS to the given address. A UNIT means a crew on an apparatus (Fire Engine, Ambulance, Medic Ambulance, Helicopter, EMS supervisor). A crew member would have a medical level (EMR, EMT, A-EMT, Medic). All the treatments provided on scene are free. If the patient needs to be transported, that's where the bill comes in. A bill consists of Units dispatched (Fire Engine and EMS Supervisor are free), crew members provided care (EMRs and EMTs are free), Transported miles from the scene to the hospital (Helicopters have a much higher rate, as you can image) and tax (Tax rate is 6%). Bill should be sent to the patient insurance company first. If there is a deductible, we send the unpaid bill to the patient only. Don't forget about patient information, medical nature and bill paying status.



32. didn't get to do it