

Data Engineer Take Home Assessment – Part 2

Guidelines:

- ❖ The answers provided can be adapted to any database system, but it is essential that they adhere to Core ANSI SQL standards.
- ❖ The primary focus of this assessment is on the logic and reasoning applied in solving the given problems.
- ❖ Database-specific syntax or features are not required; only fundamental SQL concepts should be used.
- ❖ Candidates are encouraged to focus on accuracy, optimization, and clarity in their solutions.
- ❖ Please write a descriptive answer as an explanation in sentence for each query wherever possible.
- ❖ Note – Feel free to insert records-based on input datasets screenshots and name the tables by your naming conventions.

Question 1: In the data set mentioned subject name below, a list of countries is provided for cricket matches. We need to create all combinations. Like India match with Pakistan, but we need to restrict adjacent repetitive pairing like Pakistan match with India as above highlighted combination is them.

Input Table:

	title
1	India
2	Sri Lanka
3	Australia
4	Pakistan

Output table:

	title	title
1	India	Sri Lanka
2	India	Australia
3	India	Pakistan
4	Sri Lanka	Australia
5	Sri Lanka	Pakistan
6	Australia	Pakistan

Question 2: Mentioned data set contains result of students, we want to find result of each student in each subject, if student has not attended the exam, we want to see null in marks. Kindly refer output dataset for more information:

Input table:

	id	studentname	subjectname	marks
	1	Jyoti	Maths	90
	2	Hritik	Maths	85
	3	Arun	Maths	90
	4	Jyoti	Jyoti	70
	5	Arun	English	85
	6	Jyoti	Science	70

Output table:

	studentname	subjectname	marks
1	Arun	English	85
2	Arun	Maths	90
3	Arun	Science	NULL
4	Hritik	English	NULL
5	Hritik	Maths	85
6	Hritik	Science	NULL
7	Jyoti	English	70
8	Jyoti	Maths	90
9	Jyoti	Science	70

Question 3: Using the 2 tables, we need to find custom information with only the most recent order. Note: only 1 order will come for each customer, which is the latest order only. You cannot use multiple correlated subqueries.

Input tables:

Customers

Results Messages						
	CustomerID	CompanyName	ContactName	ContactTitle	Address	City
4	AROUT	Around the Horn	Thomas Hardy	Sales Representative	120 Hanover Sq.	London
5	BERGS	Berglunds snabbköp	Christina Berglund	Order Administrator	Berguvsvägen 8	Luleå
6	BLAUS	Blauer See Delikatessen	Hanna Moos	Sales Representative	Forsterstr. 57	Mannheim
7	BLONP	Blondesddsl père et fils	Frédérique Citeaux	Marketing Manager	24, place Kléber	Strasbourg
8	BOLID	Bólido Comidas preparadas	Martín Sommer	Owner	C/ Araquil, 67	Madrid
9	BONAP	Bon app'	Laurence Lebihan	Owner	12, rue des Bouchers	Marseille
10	BOTTM	Bottom-Dollar Markets	Elizabeth Lincoln	Accounting Manager	23 Tsawassen Blvd.	Tsawassen
11	BSBEV	B's Beverages	Victoria Ashworth	Sales Representative	Fauntleroy Circus	London
12	CACTU	Cactus Comidas para llevar	Patricio Simpson	Sales Agent	Cerrito 333	Buenos A...
13	CENTC	Centro comercial Moctezuma	Francisco Chang	Marketing Manager	Sierras de Granada 9993	México D.F.
14	CHOPS	Chop-suey Chinese	Yang Wang	Owner	Hauptstr. 29	Bern
15	COMMI	Comércio Mineiro	Pedro Afonso	Sales Associate	Av. dos Lusíadas, 23	São Paulo

Orders:

	OrderID	CustomerID	EmployeeID	OrderDate	ShipVia	Freight	ShipName	ShipAddress	ShipCity
1	10643	ALFKI	6	1997-08-25 00:00:00.000	1	29.46	Alfreds Futterkiste	Obere Str. 57	Berlin
2	10692	ALFKI	4	1997-10-03 00:00:00.000	2	61.02	Alfred's Futterkiste	Obere Str. 57	Berlin
3	10702	ALFKI	4	1997-10-13 00:00:00.000	1	23.94	Alfred's Futterkiste	Obere Str. 57	Berlin
4	10835	ALFKI	1	1998-01-15 00:00:00.000	3	69.53	Alfred's Futterkiste	Obere Str. 57	Berlin
5	10952	ALFKI	1	1998-03-16 00:00:00.000	1	40.42	Alfred's Futterkiste	Obere Str. 57	Berlin
6	11011	ALFKI	3	1998-04-09 00:00:00.000	1	1.21	Alfred's Futterkiste	Obere Str. 57	Berlin
7	10926	ANATR	4	1998-03-04 00:00:00.000	3	39.92	Ana Trujillo Emparedados y helados	Avda. de la Constitución 2222	México D.F.
8	10759	ANATR	3	1997-11-28 00:00:00.000	3	11.99	Ana Trujillo Emparedados y helados	Avda. de la Constitución 2222	México D.F.
9	10625	ANATR	3	1997-08-08 00:00:00.000	1	43.90	Ana Trujillo Emparedados y helados	Avda. de la Constitución 2222	México D.F.
10	10308	ANATR	7	1996-09-18 00:00:00.000	3	1.61	Ana Trujillo Emparedados y helados	Avda. de la Constitución 2222	México D.F.
11	10365	ANTON	3	1996-11-27 00:00:00.000	2	22.00	Antonio Moreno Taquería	Mataderos 2312	México D.F.
12	10507	ANTON	7	1997-04-15 00:00:00.000	1	47.45	Antonio Moreno Taquería	Mataderos 2312	México D.F.

Output:

	CustomerID	CompanyName	ContactName	ContactTitle	OrderID	CustomerID	EmployeeID	OrderDate	ShipVia	Freight	ShipName	ShipAddress
1	ALFKI	Alfreds Futterkiste	Maria Anders	Sales Representative	11011	ALFKI	3	1998-04-09 00:00:00.000	1	1.21	Alfred's Futterkiste	Obere Str. 57
2	ANATR	Ana Trujillo Emparedados y helados	Ana Trujillo	Owner	10926	ANATR	4	1998-03-04 00:00:00.000	3	39.92	Ana Trujillo Emparedados y helados	Avda. de la Constitu
3	ANTON	Antonio Moreno Taqueria	Antonio Moreno	Owner	10856	ANTON	3	1998-01-28 00:00:00.000	2	58.43	Antonio Moreno Taqueria	Mataderos 2312
4	AROUT	Around the Horn	Thomas Hardy	Sales Representative	11016	AROUT	9	1998-04-10 00:00:00.000	2	33.80	Around the Horn	Brook Farm Stratfor
5	BERGS	Berglunds snabbköp	Christina Berglund	Order Administrator	10924	BERGS	3	1998-03-04 00:00:00.000	2	151.52	Berglunds snabbköp	Berguvsvägen 8
6	BLAUS	Blauer See Delikatessen	Hanna Moos	Sales Representative	11058	BLAUS	9	1998-04-29 00:00:00.000	3	31.14	Blauer See Delikatessen	Forsterstr. 57
7	BLONP	Blondesdls père et fils	Frédérique Citeaux	Marketing Manager	10826	BLONP	6	1998-01-12 00:00:00.000	1	7.09	Blondel père et fils	24, place Kléber
8	BOLID	Bólido Comidas preparadas	Martín Sommer	Owner	10970	BOLID	9	1998-03-24 00:00:00.000	1	16.16	Bólido Comidas preparadas	C/ Araquil, 67
9	BONAP	Bon app'	Laurence Lehiban	Owner	11076	BONAP	4	1998-05-06 00:00:00.000	2	38.28	Bon app'	12, rue des Boucher
10	BOTTM	Bottom-Dollar Markets	Elizabeth Lincoln	Accounting Manager	11048	BOTTM	7	1998-04-24 00:00:00.000	3	24.12	Bottom-Dollar Markets	23 Tsawassen Blvd.
11	BSBEV	B's Beverages	Victoria Ashworth	Sales Representative	11023	BSBEV	1	1998-04-14 00:00:00.000	2	123.83	B's Beverages	Fauntleroy Circus
12	CACTU	Cactus Comidas para llevar	Patricio Simpson	Sales Agent	11054	CACTU	8	1998-04-28 00:00:00.000	1	0.33	Cactus Comidas para llevar	Cerrito 333
13	CENTC	Centro comercial Moctezuma	Francisco Chang	Marketing Manager	10259	CENTC	4	1998-07-18 00:00:00.000	3	3.25	Centro comercial Moctezuma	Sierras de Granada
14	CHOPS	Chop-suey Chinese	Yang Wang	Owner	11041	CHOPS	3	1998-04-22 00:00:00.000	2	48.22	Chop-suey Chinese	Hauptstr. 31
15	COMMI	Comércio Mineiro	Pedro Afonso	Sales Associate	11042	COMMI	2	1998-04-22 00:00:00.000	1	29.99	Comércio Mineiro	Av dos Lusíadas, 23
16	CONSH	Consolidated Holdings	Elizabeth Brown	Sales Representative	10848	CONSH	7	1998-01-23 00:00:00.000	2	38.24	Consolidated Holdings	Berkeley Gardens 1
17	DRACD	Drachenblut Delikatessen	Sven Ottlieb	Order Administrator	11067	DRACD	1	1998-05-04 00:00:00.000	2	7.98	Drachenblut Delikatessen	Walsenweg 21
18	DUMON	Du monde entier	Janine Labruno	Owner	10890	DUMON	7	1998-02-16 00:00:00.000	1	32.76	Du monde entier	67, rue des Cinquan
19	EASTC	Eastern Connection	Anni Devon	Sales Agent	11056	EASTC	8	1998-04-28 00:00:00.000	2	278.96	Eastern Connection	35 King George

Question 4: Declare a variable which will be of type int, assign any number, e.g. 20. And generate output range starting from 1 to number assigned. You cannot use loops for this.

Output:

```
66 declare @num int =10
```

Results Messages

number
1
2
3
4
5
6
7
8
9
10

Question 5: Below is the table with hierarchical data, I want to generate level and breadcrumb output.

Input:

	Id	EmplID	ParentID	Description
1	1	1	0	Main Parent Yogi
2	2	2	0	Main Parent Ron
3	3	3	0	Main Parent Don
4	4	4	2	Child Jaz
5	5	5	2	Child Rat
6	6	6	1	Child Tom
7	7	7	2	Child Jerry
8	8	8	3	Child Din
9	9	9	1	Child Minny
10	10	10	3	Child Micky
11	11	11	3	Child Goofy
12	12	12	3	Child Daisy
13	13	13	6	Sub Child Popey
14	14	14	6	Sub Child Zen
15	15	15	9	Sub Child Shin Chan
16	16	16	10	Sub Child Doremon
17	17	17	9	Sub Child Pikachu
18	18	18	8	Sub Child Tweety

Output:

	EmplID	ParentID	Self Description	LevelID
1	1	0	Main Parent Yogi	1
2	6	1	Child Tom	1>6
3	13	6	Sub Child Popey	1>6>13
4	14	6	Sub Child Zen	1>6>14
5	9	1	Child Minny	1>9
6	15	9	Sub Child Shin Chan	1>9>15
7	17	9	Sub Child Pikachu	1>9>17
8	2	0	Main Parent Ron	2
9	4	2	Child Jaz	2>4
10	5	2	Child Rat	2>5
11	7	2	Child Jerry	2>7
12	3	0	Main Parent Don	3
13	8	3	Child Din	3>8
14	18	8	Sub Child Tweety	3>8>18
15	10	3	Child Micky	3>10
16	16	10	Sub Child Doremon	3>10>16
17	11	3	Child Goofy	3>11
18	12	3	Child Daisy	3>12