

## CSE 412 - Assignment 2

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**P1:**












Relation Algebra:

$$\pi_{s\_name, s\_address, s\_phone} (\tau_{s\_acctbal} (\sigma_{s\_acctbal < 0} (Supplier)))$$

SQL Query:

```
SELECT s_name, s_address, s_phone FROM supplier
WHERE s_acctbal < 0
ORDER BY s_acctbal
LIMIT 10;
```

Result:

Data Output Messages Notifications			
        SQL			
	s_name character (25) 	s_address character varying (40) 	s_phone character (15) 
1	Supplier#000009795 ...	8OTciWrTnRVbFAUUrqEg	23-628-902-10...
2	Supplier#000007259 ...	S1U6lyVIF4HUUwbQyo5JzCxL7Y mcodVZXj ...	20-445-712-82...
3	Supplier#000008927 ...	LgwVct4dJnK59FBF50U4lvb6INGeO9ID9IHkz	10-485-509-98...
4	Supplier#000003934 ...	,KA9SfSroSuN5YMb46WxlzJQA	19-683-401-13...
5	Supplier#000007956 ...	vmAYh95Lr3f2kKHI6kRX2G7	16-947-231-89...
6	Supplier#000005298 ...	jtFU3iIMXr18ExQQAQRlyCt0OITSBf9eauEhK	12-327-575-43...
7	Supplier#000001764 ...	7nVLpQw9JWeN94kqw	27-200-805-41...
8	Supplier#000008224 ...	TWxt9f,LVER	13-845-388-70...
9	Supplier#000001870 ...	laa9 Fntbx4kHd	22-681-122-23...
10	Supplier#000001654 ...	5F6ZEzmh6PWDS	12-219-980-38...

**P2:**

Relation Algebra:

$$\pi_{s\_nationkey} (\sigma_{s\_acctbal > 5000} (Supplier))$$

SQL Query:

```
SELECT DISTINCT s_nationkey
```

```
FROM supplier
```

```
WHERE s_acctbal > 5000
```

```
LIMIT 10;
```

Result:

Data Output		Messages	Notifications
	s_nationkey integer		
1	23		
2	11		
3	8		
4	24		
5	19		
6	4		
7	21		
8	0		
9	14		
10	3		

**P3:**

SQL Query:

```
SELECT ps_supkey AS SupplierKey, COUNT(DISTINCT ps_partkey) AS NumParts  
FROM partsupp  
GROUP BY ps_supkey  
LIMIT 10;
```

Result:

Data Output Messages Notifications			
	supplierkey integer	numparts bigint	
1	1	80	
2	2	80	
3	3	80	
4	4	80	
5	5	80	
6	6	80	
7	7	80	
8	8	80	
9	9	80	
10	10	80	

**P4:**

SQL Query:

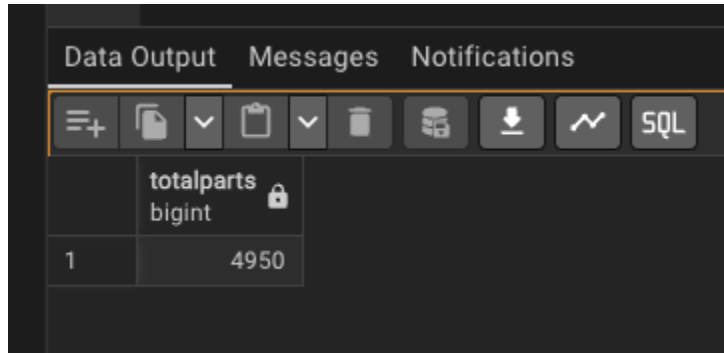
```
SELECT COUNT(*) AS TotalParts
```

```
FROM part
```

```
WHERE p_retailprice > 2000
```

```
LIMIT 10;
```

Result:



	totalparts bigint
1	4950

**P5:**

SQL Query:












```
SELECT p_name
```

```
FROM part
```

```
WHERE p_retailprice = (SELECT MAX(p_retailprice) FROM part)
```

```
LIMIT 10;
```

Result:

Data Output		Messages	Notifications
         			
	<b>p_name</b> character varying (55) 		
1	goldenrod drab brown salmon mint		

### P6:












Relation Algebra:

$$\pi_{s\_address}(\sigma_{p\_name='goldenrod\,lavender\,spring\,chocolate\,lace'}(Part)) \bowtie_{p\_partkey=ps\_partkey} (PartSupp) \bowtie_{ps\_supplier=s\_suppkey} (Supplier)$$

SQL Query:

```
SELECT DISTINCT s.s_address
FROM supplier AS s
JOIN partsupp AS ps ON s.s_suppkey = ps.ps_suppkey
JOIN part AS p ON p.p_partkey = ps.ps_partkey
WHERE p.p_name = 'goldenrod lavender spring chocolate lace'
ORDER BY s.s_address
LIMIT 10;
```

Result:

Data Output		Messages	Notifications
<div></div>			
	<b>s_address</b> character varying (40)		
1	,rSo5R1i654jwDP8DIUT1W1YW1TJ3onUPaXa,2		
2	89eJ5ksX3ImxJQBvxObC,		
3	jJqsKkqMlf8nOaY5LYQvNGpGkj		
4	WwZj0jzQ5Znb6NJlxgPAqS,vZu6IX		

**P7:**

Relation Algebra:

$$\pi_{n\_name}((\sigma_{r\_name='ASIA'}(REGION)) \bowtie_{r\_regionkey=n\_regionkey} (NATION))$$

SQL Query:

```
SELECT n.n_name FROM nation AS n
JOIN region AS r ON n.n_regionkey = r.r_regionkey
WHERE r.r_name = 'ASIA'
ORDER BY n.n_name
LIMIT 10;
```

Result:

Data Output			Messages	Notifications
	n_name	character (25)		
1	CHINA			
2	INDIA			
3	INDONESIA	...		
4	JAPAN			
5	VIETNAM	...		

**P8:**

SQL Query:

```
SELECT s.s_name AS SupplierName, COUNT(DISTINCT ps.ps_partkey) AS NumParts
FROM supplier AS s
JOIN partsupp AS ps ON s.s_suppkey = ps.ps_suppkey
WHERE s.s_acctbal < 0
GROUP BY s.s_name
LIMIT 10;
```

Result:

Data Output			Messages	Notifications
	suppliername character (25)	numparts bigint		
1	Supplier#000000005	80		
2	Supplier#000000022	80		
3	Supplier#000000028	80		
4	Supplier#000000029	80		
5	Supplier#000000040	80		
6	Supplier#000000056	80		
7	Supplier#000000057	80		
8	Supplier#000000065	80		
9	Supplier#000000075	80		
10	Supplier#000000080	80		












**P9:**

SQL Query:

```
SELECT s.s_nationkey AS SupplierNationKey,  
COUNT(DISTINCT ps.ps_partkey) AS NumParts  
FROM supplier AS s  
JOIN partsupp AS ps ON s.s_suppkey = ps.ps_suppkey  
GROUP BY s.s_nationkey  
LIMIT 10;
```

Result:










Data Output Messages Notifications			
         SQL			
	suppliernationkey integer		numparts bigint
1		0	31585
2		1	31110
3		2	30064
4		3	30985
5		4	31097
6		5	28615
7		6	30247
8		7	29818
9		8	31082
10		9	30485

**P10:**

SQL Query:

```
SELECT s.s_nationkey AS SupplierNationKey, COUNT(DISTINCT ps.ps_partkey) AS  
NumParts  
FROM supplier AS s  
JOIN partsupp AS ps ON s.s_suppkey = ps.ps_suppkey  
WHERE s.s_acctbal < 0  
GROUP BY s.s_nationkey  
LIMIT 10;
```

Result:

Data Output Messages Notifications			
         SQL			
	suppliernationkey integer		numparts bigint
1		0	2786
2		1	3191
3		2	2709
4		3	1839
5		4	2468
6		5	2787
7		6	2869
8		7	3327
9		8	3180
10		9	2715

**P11:**

Relation Algebra:

SQL Query:

```
SELECT s.s_name
FROM supplier AS s
JOIN partsupp AS ps ON s.s_suppkey = ps.ps_suppkey
GROUP BY s.s_name
HAVING COUNT(DISTINCT ps.ps_partkey) >= 2
LIMIT 10;
```

Result:

Data Output		Messages	Notifications
	<b>s_name</b> character (25)		
1	Supplier#000000001		
2	Supplier#000000002		
3	Supplier#000000003		
4	Supplier#000000004		
5	Supplier#000000005		
6	Supplier#000000006		
7	Supplier#000000007		
8	Supplier#000000008		
9	Supplier#000000009		
10	Supplier#000000010		












## P12:

Relation Algebra:

SQL Query:

```
SELECT p.p_name
FROM part AS p
JOIN partsupp AS ps ON ps.ps_partkey = p.p_partkey
JOIN supplier AS s ON s.s_suppkey = ps.ps_suppkey
JOIN nation AS n ON n.n_nationkey = s.s_nationkey
GROUP BY p.p_name
HAVING COUNT(DISTINCT n.n_nationkey) >= 2
LIMIT 10;
```












Result:

Data Output		Messages	Notifications
         			
	<b>p_name</b> character varying (55) 		
1	almond antique blue royal burnished		
2	almond antique cornsilk midnight medium		
3	almond antique cyan lawn pale		
4	almond antique dodger blanded burnished		
5	almond antique dodger royal pale		
6	almond antique khaki frosted deep		
7	almond antique lavender dark navajo		
8	almond antique lawn lime misty		
9	almond antique linen floral lace		
10	almond antique magenta deep blush		

**P13:**

```
SELECT s_name
FROM supplier
JOIN partsupp ON s_suppkey = ps_suppkey
GROUP BY s_suppkey, s_name
HAVING COUNT(ps_partkey) >= ALL (
    SELECT COUNT(ps_partkey)
    FROM partsupp
    GROUP BY ps_suppkey
)
LIMIT 10;
```

Result:












Data Output		Messages	Notifications
<div></div>			
	<b>s_name</b> character (25) 		
1	Supplier#000006114		
2	Supplier#000004790		
3	Supplier#000000273		
4	Supplier#000003936		
5	Supplier#000005761		
6	Supplier#000005468		
7	Supplier#000007662		
8	Supplier#000004326		
9	Supplier#000002520		
10	Supplier#000002466		

**P14:**

SQL Query:

```
SELECT s.s_nationkey
FROM part AS p
JOIN partsupp AS ps ON p.p_partkey = ps.ps_partkey
JOIN supplier AS s ON ps.ps_suppkey = s.s_suppkey
WHERE p.p_name = 'blush thistle blue yellow saddle'
GROUP BY s.s_nationkey
ORDER BY SUM(ps.ps_availqty) DESC
LIMIT 1;
```

Result:












Data Output		Messages	Notifications
<div></div>			
	s_nationkey integer 		
1		1	

**P15:**

SQL Query:

```
SELECT p.p_name
FROM part AS p
JOIN partsupp AS ps ON p.p_partkey = ps.ps_partkey
JOIN supplier AS s ON ps.ps_suppkey = s.s_suppkey
WHERE s.s_nationkey IN (6, 12)
GROUP BY p.p_name
HAVING COUNT(DISTINCT s.s_nationkey) = 2
LIMIT 10;
```

Result:

Data Output		Messages	Notifications
         			
	<b>p_name</b> character varying (55) 		
1	almond aquamarine lawn honeydew frosted		
2	almond black azure powder ivory		
3	almond blue sandy slate burlywood		
4	almond blush snow salmon midnight		
5	almond burnished hot seashell dodger		
6	almond chartreuse metallic hot bisque		
7	almond coral gainsboro sandy olive		
8	almond cornsilk purple green moccasin		
9	almond cyan grey firebrick orchid		
10	almond dark khaki magenta dim		