

```

8  -- 1
9  -- Write a query that returns all orders placed on the last day of
10 -- activity that can be found in the Orders table
11 -- Tables involved: TSQLV4 database, Orders table
12
13 -- --Desired output
14 --orderid    orderdate    custid    empid
15 -- -----
16 -- 11077      2016-05-06    65        1
17 -- 11076      2016-05-06    9         4
18 -- 11075      2016-05-06    68        8
19 -- 11074      2016-05-06    73        7
20
21 -- (4 row(s) affected)
22
23 USE TSQLV4;
24
25 SELECT orderid, orderdate, custid, empid FROM Sales.Orders
26 WHERE orderdate =
27     (SELECT MAX(O.orderdate) FROM Sales.Orders AS O)
28 ORDER BY orderid DESC;
29
30
31 USE Northwinds2022TSQLV7;
32 Go
33 SELECT OrderId, OrderDate, CustomerId, EmployeeId FROM Sales.[Order]
34 WHERE orderdate =
35     (SELECT MAX(O.OrderDate) FROM Sales.[Order] AS O)
36 ORDER BY OrderId DESC;
37

```

Results Messages

	orderid	orderdate	custid	empid
1	11077	2016-05-06	65	1
2	11076	2016-05-06	9	4
3	11075	2016-05-06	68	8
4	11074	2016-05-06	73	7

	OrderId	OrderDate	CustomerId	EmployeeId
1	11077	2016-05-06	65	1
2	11076	2016-05-06	9	4
3	11075	2016-05-06	68	8
4	11074	2016-05-06	73	7

```

85  -- 2 (Optional, Advanced)
86  -- Write a query that returns all orders placed
87  -- by the customer(s) who placed the highest number of orders
88  -- * Note: there may be more than one customer
89  --   with the same number of orders
90  -- Tables involved: TSQLV4 database, Orders table
91
92  USE TSQLV4;
93
94  SELECT custid,orderid,orderdate,empid
95  FROM Sales.Orders
96  WHERE custid IN (SELECT TOP (1) WITH TIES O.custid
97  FROM Sales.Orders AS O
98  GROUP BY O.custid
99  ORDER BY COUNT(*) DESC);
100
101  USE Northwinds2022TSQLV7;
102  GO
103  SELECT CustomerId,orderid,orderdate,EmployeeId
104  FROM Sales.[Order]
105  WHERE CustomerId IN (SELECT TOP (1) WITH TIES O.CustomerId
106  FROM Sales.[Order] AS O
107  GROUP BY O.CustomerId
108  ORDER BY COUNT(*) DESC);

```

Results Messages

	custid	orderid	orderdate	empid
1	71	10324	2014-10-08	9
2	71	10393	2014-12-25	1
3	71	10398	2014-12-30	2
4	71	10440	2015-02-10	4
5	71	10452	2015-02-20	8
6	71	10510	2015-04-18	6
7	71	10555	2015-06-02	6
8	71	10603	2015-07-18	8
9	71	10607	2015-07-22	5
10	71	10612	2015-07-28	1

	CustomerId	orderid	orderdate	EmployeeId
1	71	10324	2014-10-08	9
2	71	10393	2014-12-25	1
3	71	10398	2014-12-30	2
4	71	10440	2015-02-10	4
5	71	10452	2015-02-20	8
6	71	10510	2015-04-18	6
7	71	10555	2015-06-02	6
8	71	10603	2015-07-18	8
9	71	10607	2015-07-22	5
10	71	10612	2015-07-28	1

```

111 -- 3
112 -- Write a query that returns employees
113 -- who did not place orders on or after May 1st, 2016
114 -- Tables involved: TSQLV4 database, Employees and Orders tables
115
116 -- -- Desired output:
117 -- empid      FirstName  lastname
118 -- -----
119 -- 3          Judy       Lew
120 -- 5          Sven       Mortensen
121 -- 6          Paul        Suurs
122 -- 9          Patricia    Doyle
123
124 -- (4 row(s) affected)
125
126 USE TSQLV4
127
128 SELECT empid, FirstName, lastname
129 FROM HR.Employees
130 WHERE empid NOT IN (SELECT O.empid
131 ... FROM Sales.Orders AS O
132 ... WHERE O.orderdate >= '20160501');
133
134 USE Northwinds2022TSQLV7
135 GO
136 SELECT EmployeeId, EmployeeFirstName, EmployeeLastName
137 FROM HumanResources.Employee
138 WHERE EmployeeId NOT IN (SELECT O.EmployeeId
139 ... FROM Sales.[Order] AS O
140 ... WHERE O.OrderDate >= '20160501');
141

```

Results Messages

	empid	FirstName	lastname
1	3	Judy	Lew
2	5	Sven	Mortensen
3	6	Paul	Suurs
4	9	Patricia	Doyle

	EmployeeId	EmployeeFirstName	EmployeeLastName
1	3	Judy	Lew
2	5	Sven	Mortensen
3	6	Paul	Suurs
4	9	Patricia	Doyle

```

143 -- 4
144 -- Write a query that returns
145 -- countries where there are customers but not employees
146 -- Tables involved: TSQLV4 database, Customers and Employees tables
147
148 -- -- Desired output:
149 -- country
150 -- -----
151 -- Argentina
152 -- Austria
153 -- Belgium
154 -- Brazil
155 -- Canada
156 -- Denmark
157 -- Finland
158 -- France
159 -- Germany
160 -- Ireland
161 -- Italy
162 -- Mexico
163 -- Norway
164 -- Poland
165 -- Portugal
166 -- Spain
167 -- Sweden
168 -- Switzerland
169 -- Venezuela
170
171 -- (19 row(s) affected)
172
173 USE TSQLV4;
174
175 SELECT DISTINCT country
176 FROM Sales.Customers
177 WHERE country NOT IN (SELECT E.country
178 ... FROM HR.Employees AS E);
179
180 USE Northwinds2022TSQLV7;
181 GO
182 SELECT DISTINCT CustomerCountry
183 FROM Sales.Customer
184 WHERE CustomerCountry NOT IN (SELECT E.EmployeeCountry
185 ... FROM HumanResources.Employee AS E);

```

Results Messages

	country ▾
1	Argentina
2	Austria
3	Belgium
4	Brazil
5	Canada
6	Denmark
7	Finland
8	France
9	Germany
10	Ireland
	CustomerCountry ▾
1	Argentina
2	Austria
3	Belgium
4	Brazil

```

188 -- 5
189 -- Write a query that returns for each customer
190 -- all orders placed on the customer's last day of activity
191 -- Tables involved: TSQLV4 database, Orders table
192
193 -- -- Desired output:
194 -- custid     orderid      orderdate  empid
195 -- -----
196 -- 1          11011        2016-04-09  3
197 -- 2          10926        2016-03-04  4
198 -- 3          10856        2016-01-28  3
199 -- 4          11016        2016-04-10  9
200 -- 5          10924        2016-03-04  3
201 -- ...
202 -- 87         11025        2016-04-15  6
203 -- 88         10935        2016-03-09  4
204 -- 89         11066        2016-05-01  7
205 -- 90         11005        2016-04-07  2
206 -- 91         11044        2016-04-23  4
207
208 -- (90 row(s) affected)
209
210 USE TSQLV4;
211
212 SELECT custid,orderid,orderdate,empid
213 FROM Sales.Orders AS 01
214 WHERE orderdate =(SELECT MAX(02.orderdate)
215 ... FROM Sales.Orders AS 02
216 ... WHERE 02.custid = 01.custid)
217 ORDER BY custid;
218
219 USE Northwinds2022TSQLV7;
220 GO
221 SELECT CustomerId,orderid,orderdate,EmployeeId
222 FROM Sales.[Order] AS 01
223 WHERE orderdate =(SELECT MAX(02.orderdate)
224 ... FROM Sales.[Order] AS 02
225 ... WHERE 02.CustomerId = 01.CustomerId)
226 ORDER BY CustomerId;
227

```

Results Messages

	custid	orderid	orderdate	empid
1	1	11011	2016-04-09	3
2	2	10926	2016-03-04	4
3	3	10856	2016-01-28	3
4	4	11016	2016-04-10	9
5	5	10924	2016-03-04	3
6	6	11058	2016-04-29	9
7	7	10826	2016-01-12	6
8	8	10970	2016-03-24	9
9	9	11076	2016-05-06	4
10	10	11048	2016-04-24	7

	CustomerId	orderid	orderdate	EmployeeId
1	1	11011	2016-04-09	3
2	2	10926	2016-03-04	4
3	3	10856	2016-01-28	3
4	4	11016	2016-04-10	9
5	5	10924	2016-03-04	3
6	6	11058	2016-04-29	9

```

229 -- -- 6
230 -- -- Write a query that returns customers
231 -- -- who placed orders in 2015 but not in 2016
232 -- -- Tables involved: TSQLV4 database, Customers and Orders tables
233
234 -- -- Desired output:
235 -- custid      companyname
236 -----
237 -- 21          Customer KIDPX
238 -- 23          Customer WVFAF
239 -- 33          Customer FVXPQ
240 -- 36          Customer LVJSO
241 -- 43          Customer UISOJ
242 -- 51          Customer PVDZC
243 -- 85          Customer ENQZT
244
245 -- (7 row(s) affected)
246
247 USE TSQLV4;
248
249 SELECT custid, companyname
250 FROM Sales.Customers AS C
251 WHERE EXISTS
252 (SELECT *
253  FROM Sales.Orders AS O
254  WHERE O.custid = C.custid
255  AND O.orderdate >= '20150101'
256  AND O.orderdate < '20160101') AND NOT EXISTS
257 (SELECT *
258  FROM Sales.Orders AS O
259  WHERE O.custid = C.custid
260  AND O.orderdate >= '20160101' AND O.orderdate < '20170101');
261
262
263 USE Northwinds2022TSQLV7;
264
265 GO
266 SELECT CustomerId, CustomerCompanyName
267 FROM Sales.Customer AS C
268 WHERE EXISTS
269 (SELECT *
270  FROM Sales.[Order] AS O
271  WHERE O.CustomerId = C.CustomerId
272  AND O.orderdate >= '20150101'
273  AND O.orderdate < '20160101') AND NOT EXISTS
274 (SELECT *
275  FROM Sales.[Order] AS O
276  WHERE O.CustomerId = C.CustomerId
277  AND O.orderdate >= '20160101' AND O.orderdate < '20170101');

```

Results Messages

	custid	companyname
1	21	Customer KIDPX
2	23	Customer WVFAF
3	33	Customer FVXPQ
4	36	Customer LVJSO
5	43	Customer UISOJ
6	51	Customer PVDZC
7	85	Customer ENQZT

	CustomerId	CustomerCompanyName
1	21	Customer KIDPX
2	23	Customer WVFAF

```

280 -- 7 (Optional, Advanced)
281 -- Write a query that returns customers
282 -- who ordered product 12
283 -- Tables involved: TSQLV4 database,
284 -- Customers, Orders and OrderDetails tables
285
286 -- -- Desired output:
287 -- custid      companyname
288 -- -----
289 -- 48          Customer DVFMB
290 -- 39          Customer GLLAG
291 -- 71          Customer LCOUJ
292 -- 65          Customer NYUHS
293 -- 44          Customer OXFRU
294 -- 51          Customer PVDZC
295 -- 86          Customer SNX0J
296 -- 20          Customer THHDP
297 -- 90          Customer XBBVR
298 -- 46          Customer XPNIK
299 -- 31          Customer YJCBX
300 -- 87          Customer ZHYOS
301
302 -- (12 row(s) affected)
303
304 USE TSQLV4;
305
306 SELECT custid, companyname
307 FROM Sales.Customers AS C
308 WHERE EXISTS
309 (SELECT *
310  FROM Sales.Orders AS O
311  WHERE O.custid = C.custid AND EXISTS
312  (SELECT *
313   FROM Sales.OrderDetails AS OD
314   WHERE OD.orderid = O.orderid
315   AND OD.ProductID = 12))
316 ORDER BY companyname ASC;
317
318 USE Northwinds2022TSQLV7;
319 GO
320 SELECT CustomerId, CustomerCompanyName
321 FROM Sales.Customer AS C
322 WHERE EXISTS
323 (SELECT *
324  FROM Sales.[Order] AS O
325  WHERE O.CustomerId = C.CustomerId AND EXISTS
326  (SELECT *
327   FROM Sales.OrderDetail AS OD
328   WHERE OD.orderid = O.orderid
329   AND OD.ProductID = 12))
330 ORDER BY CustomerCompanyName ASC;
331
332

```

Results **Messages**

	custid ▾	companyname ▾
1	48	Customer DVFMB
2	39	Customer GLLAG
3	71	Customer LCOUJ
4	65	Customer NYUHS
5	44	Customer OXFRU
6	51	Customer PVDZC
7	86	Customer SNX0J
8	20	Customer THHDP
9	90	Customer XBBVR
10	46	Customer XPNIK
11	31	Customer YJCBX
12	87	Customer ZHYOS

	CustomerId ▾	CustomerCompanyName ▾
1	48	Customer DVFMB
2	39	Customer GLLAG
3	71	Customer LCOUJ
4	65	Customer NYUHS
5	44	Customer OXFRU
6	51	Customer PVDZC
7	86	Customer SNX0J
8	20	Customer THHDP
9	90	Customer XBBVR
10	46	Customer XPNIK
11	31	Customer YJCBX
12	87	Customer ZHYOS


```

333 -- 8 (Optional, Advanced)
334 -- Write a query that calculates a running total qty
335 -- for each customer and month using subqueries
336 -- Tables involved: TSQLV4 database, Sales.CustOrders view
337
338 -- -- Desired output:
339 -- custid      ordermonth      qty      runqty
340 -----
341 -- 1           2015-08-01 00:00:00.000 38      38
342 -- 1           2015-10-01 00:00:00.000 41      79
343 -- 1           2016-01-01 00:00:00.000 17      96
344 -- 1           2016-03-01 00:00:00.000 18      114
345 -- 1           2016-04-01 00:00:00.000 60      174
346 -- 2           2014-09-01 00:00:00.000 6       6
347 -- 2           2015-08-01 00:00:00.000 18      24
348 -- 2           2015-11-01 00:00:00.000 10      34
349 -- 2           2016-03-01 00:00:00.000 29      63
350 -- 3           2014-11-01 00:00:00.000 24      24
351 -- 3           2015-04-01 00:00:00.000 30      54
352 -- 3           2015-05-01 00:00:00.000 80      134
353 -- 3           2015-06-01 00:00:00.000 83      217
354 -- 3           2015-09-01 00:00:00.000 102     319
355 -- 3           2016-01-01 00:00:00.000 40      359
356 -- ...
357
358 -- (636 row(s) affected)
359
360 USE TSQLV4;
361
362 SELECT custid, ordermonth, qty, (SELECT SUM(O2.qty)
363 FROM Sales.CustOrders AS O2
364 WHERE O2.custid = O1.custid
365 AND O2.ordermonth <= O1.ordermonth) AS runqty
366 FROM Sales.CustOrders AS O1
367 ORDER BY custid, ordermonth;
368
369 -- I couldn't figure out how to create the view for this exercise to work
370 -- with Northwinds and Northwinds did not have the view already made,
371 -- but this is what I tried to create the view :
372
373 -- error message is:
374
375 -- Started executing query at Line 370
376 -- Msg 1088, Level 16, State 18, Procedure CustOrder, Line 5
377 -- Cannot find the object "Order" because it does not exist or you do not have permissions.
378
379 -- USE Northwinds2022TSQLV7;
380 -- GO
381 -- SET ANSI_NULLS ON
382 -- GO
383 -- SET QUOTED_IDENTIFIER ON
384 -- GO
385
386 -- CREATE VIEW [Sales].[CustOrder]
387 -- WITH SCHEMABINDING
388 -- AS
389
390 -- SELECT
391 -- O.CustomerId,
392 -- DATEADD(month, DATEDIFF(month, CAST('19000101' AS DATE), O.OrderDate), CAST('19000101' AS DATE)) AS OrderMonth,
393 -- SUM(OD.Quantity) AS qty
394 -- FROM Sales.[Order] AS O
395 -- JOIN Sales.OrderDetail AS OD
396 -- ON OD.OrderId = O.OrderId
397 -- GROUP BY CustomerId, DATEADD(month, DATEDIFF(month, CAST('19000101' AS DATE), O.OrderDate), CAST('19000101' AS DATE));
398 -- GO

```

```
414
415
416 -- 9
417 -- Explain the difference between IN and EXISTS
418
419 -- The IN predicate uses three-valued logic, the EXISTS predicate uses two-valued logic, meaning
420 -- EXISTS does not recognize the 'unknown' category which is important when your data has Null values.
421 -- In the absense of a value, ie a null value, NOT IN, the negation of IN, returns unknown,
422 -- where NOT EXISTS returns TRUE.
423
424
425
426 -- 10 (Optional - Advanced)
```

```

426 -- 10 (Optional, Advanced)
427 -- Write a query that returns for each order the number of days that past
428 -- since the same customer's previous order. To determine recency among orders,
429 -- use orderdate as the primary sort element and orderid as the tiebreaker.
430 -- Tables involved: TSQLV4 database, Sales.Orders table
431
432 -- Desired output:
433 -- --custid      orderdate  orderid    diff
434 -- -----
435 -- 1            2015-08-25  10643      NULL
436 -- 1            2015-10-03  10692      39
437 -- 1            2015-10-13  10702      10
438 -- 1            2016-01-15  10835      94
439 -- 1            2016-03-16  10952      61
440 -- 1            2016-04-09  11011      24
441 -- 2            2014-09-18  10308      NULL
442 -- 2            2015-08-08  10625      324
443 -- 2            2015-11-28  10759      112
444 -- 2            2016-03-04  10926      97
445 -- ...
446
447 -- (830 row(s) affected)
448
449 USE TSQLV4;
450
451 SELECT custid, orderdate, orderid,
452        DATEDIFF(day,
453 (SELECT TOP (1) O2.orderdate
454 FROM Sales.Orders AS O2
455 WHERE O2.custid = O1.custid
456 AND ( O2.orderdate = O1.orderdate AND O2.orderid < O1.orderid OR O2.orderdate < O1.orderdate )
457 ORDER BY O2.orderdate DESC, O2.orderid DESC), orderdate) AS diff
458 FROM Sales.Orders AS O1
459 ORDER BY custid, orderdate, orderid;
460
461 USE Northwinds2022TSQLV7;
462 GO
463 SELECT CustomerId, orderdate, orderid,
464        DATEDIFF(day,
465 (SELECT TOP (1) O2.orderdate
466 FROM Sales.[Order] AS O2
467 WHERE O2.CustomerId = O1.CustomerId
468 AND ( O2.orderdate = O1.orderdate AND O2.orderid < O1.orderid OR O2.orderdate < O1.orderdate )
469 ORDER BY O2.orderdate DESC, O2.orderid DESC), orderdate) AS diff
470 FROM Sales.[Order] AS O1
471 ORDER BY CustomerId, orderdate, orderid;

```

Results Messages

	custid	orderdate	orderid	diff
1	1	2015-08-25	10643	NULL
2	1	2015-10-03	10692	39
3	1	2015-10-13	10702	10
4	1	2016-01-15	10835	94
5	1	2016-03-16	10952	61
6	1	2016-04-09	11011	24
7	2	2014-09-18	10308	NULL
8	2	2015-08-08	10625	324
9	2	2015-11-28	10759	112
10	2	2016-03-04	10926	97

	CustomerId	orderdate	orderid	diff
1	1	2015-08-25	10643	NULL
2	1	2015-10-03	10692	39

