DATABASE SYSTEMS

SQL practice

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ÉS GAZDASÁGTUDOMÁNYI EGYETEM
Építőmérnöki Kar - építőmérnöki képzés 1782 óta

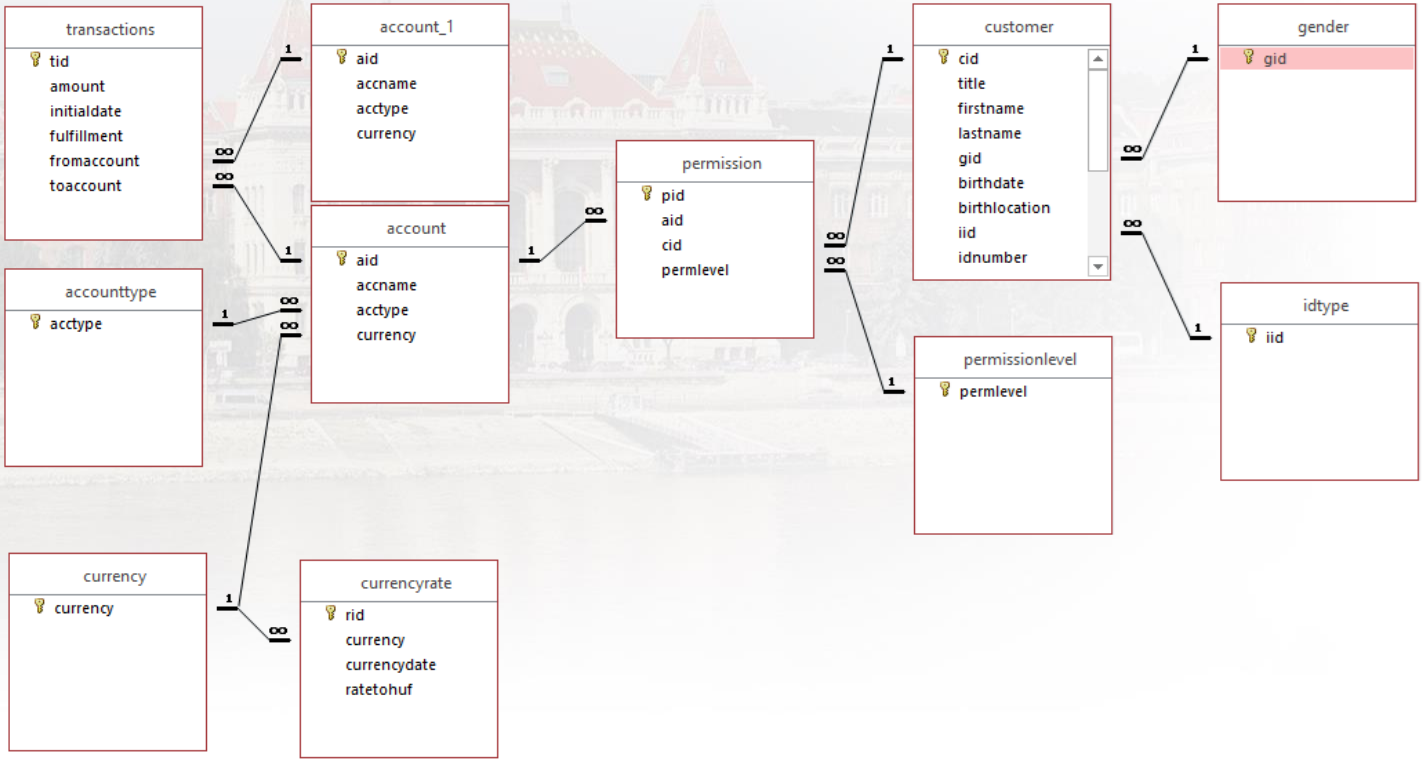
Fotogrammetria és Térinformatika Tanszék

Agenda

Formulating queries in SQL

- Projection
- Join
- Filtering
- Grouping
- Sorting
- Limit rows

Relational schema diagram



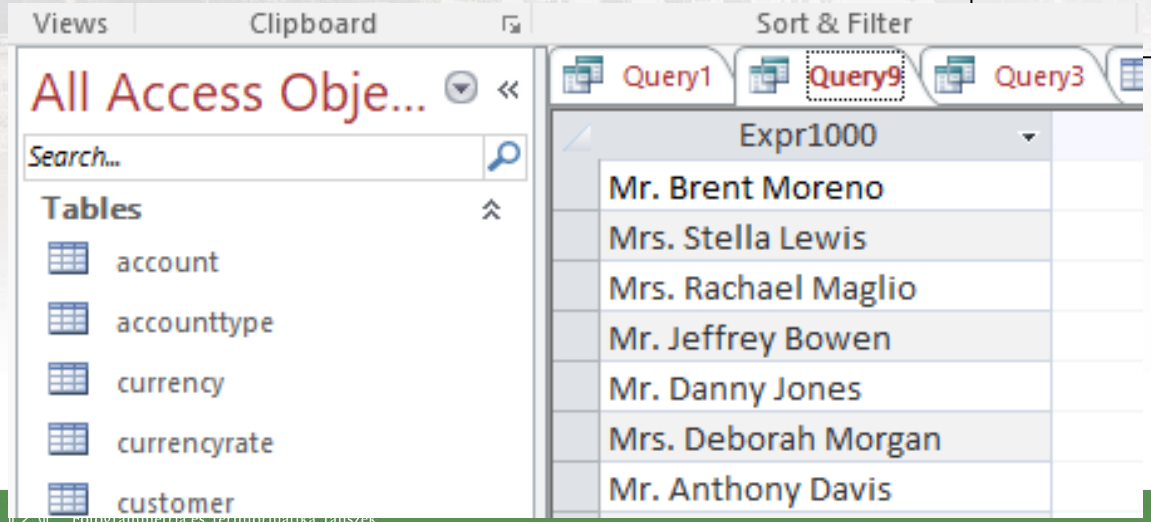
List all customers

Columns: title, firstname, lastname

Tables: customer

Joins: -

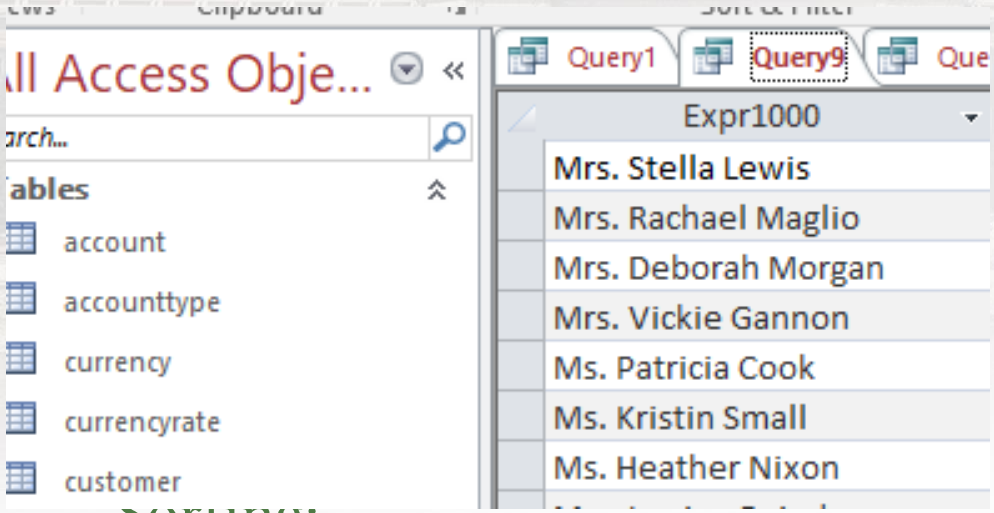
```
SELECT
        title&' '&firstname&' '&lastname
FROM
        customer;
```



Concatenate int a single cell!

List all customers, but exclude everybody with Mr. title.

Columns: title, firstname, lastname




```
SELECT
        title&' '&firstname&' '&lastname
FROM
        customer
WHERE
        title<>'Mr.';
```

Concatenate int a single cell!

Sorting: -

Rows num: -

List all customers and sort by name

Columns: title, firstname, lastname

Tables: customer

Joins: -

Filtering: title<>'Mr.'

Grouping: -

Group filtering: -

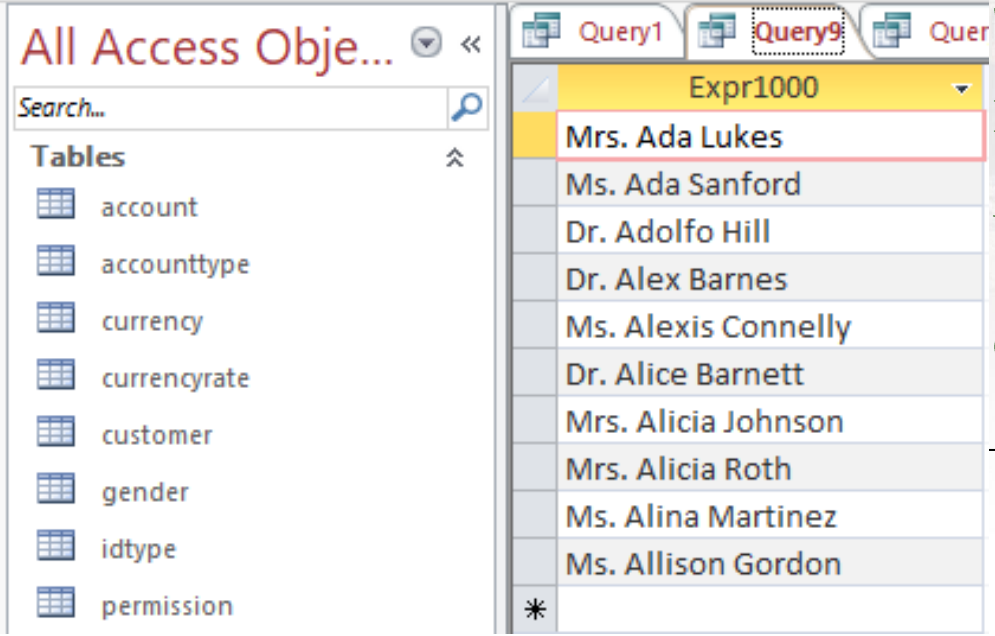
Sorting: firstname, lastname

Num rows: -

```
SELECT
        title&' '&firstname&' '&lastname
FROM
        customer
WHERE
        title<>'Mr.'
ORDER BY
        firstname, lastname;
```

List all customers, order by name, but display only the first 10 items

Columns: title, firstname, lastname

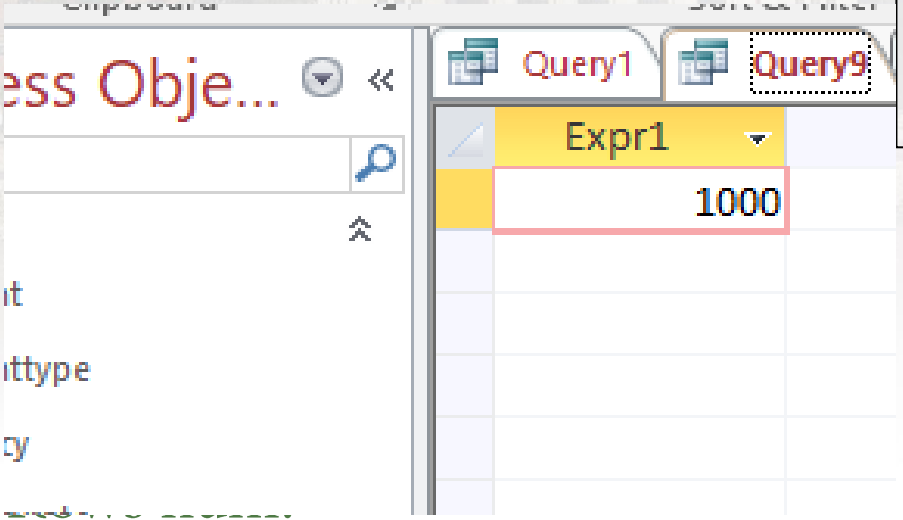



```
SELECT TOP 10
        title&' '&firstname&' '&lastname
FROM
        customer
WHERE
        title<>'Mr.'
ORDER BY
        firstname, lastname;
```

NUMBER OF CUSTOMERS

Columns: COUNT(*)

Tables: customer




```
SELECT
        COUNT(*)
FROM
        customer;
```

Number of non-male customers

Columns: COUNT(*)

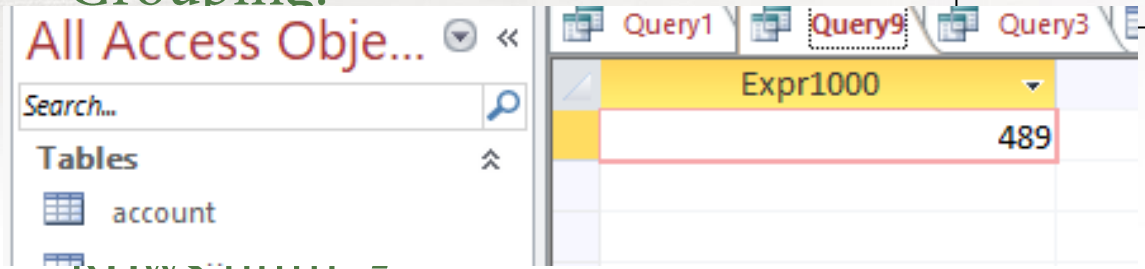
Tables: customer

Joins: -

Filtering: gid<>'male'

Grouping: -

```
SELECT
        COUNT(*)
FROM
        customer
WHERE
        gid<>'male';
```



Total cache flow

Columns: SUM(amount)

Tables: transaction

Joins: -

Filtering: -

Grouping: -

Group filtering: -

Sorting: -

Rows num: -

```
SELECT
        SUM(amount)
FROM
        transaction;
```

Maximum of HUF-EUR exchange rate

Columns: MAX(ratetohuf)

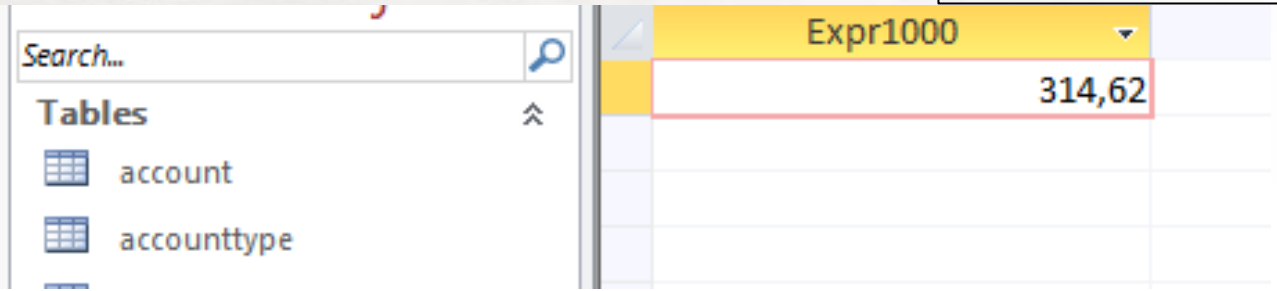
Tables: currencyrate

Joins: -

Filtering: currency='EUR'

Grouping: -

```
SELECT
        MAX(ratetohuf)
FROM
        currencyrate
WHERE
        currency='EUR';
```

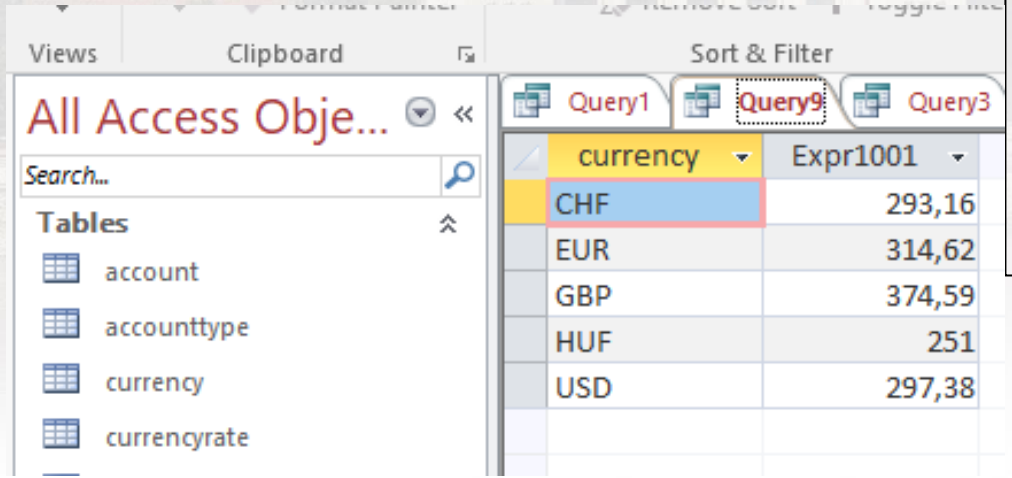


Maximum of each currencies

Columns: currency, MAX(ratetohuf)

Tables: currencyrate

```
SELECT
        currency, MAX(ratetohuf)
FROM
        currencyrate
GROUP BY
        currency;
```



Rows num: -

We will put the date next to it soon!

Which account is accessible by most person?

Please see structure of the permissions table

Columns: aid, COUNT(*)

Tables: permission

Joins: -

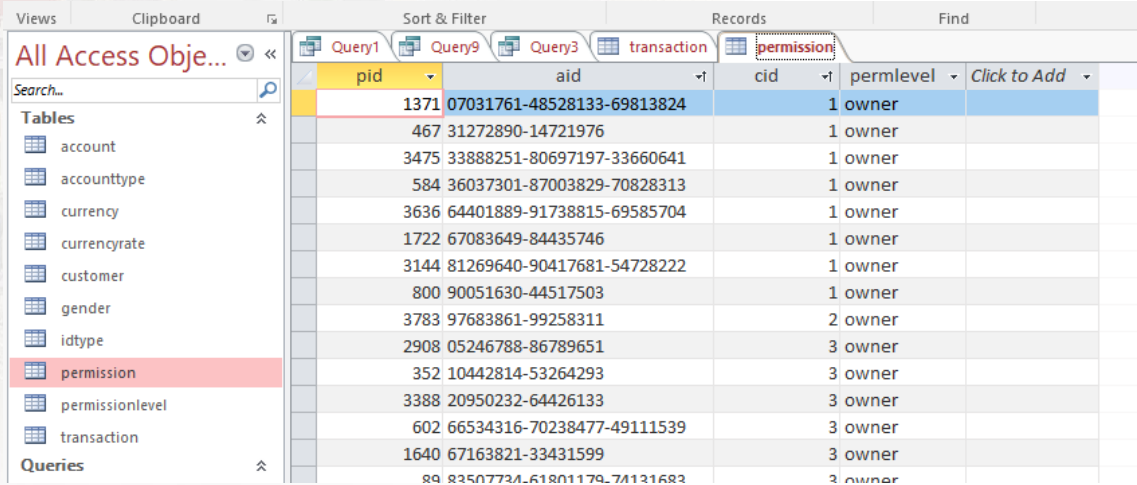
Filtering: -

Grouping: aid

Group filtering: -

Sorting: COUNT(*)

Rows num: -



pid	aid	cid	permlevel	Click to Add
1371	07031761-48528133-69813824	1	owner	
467	31272890-14721976	1	owner	
3475	33888251-80697197-33660641	1	owner	
584	36037301-87003829-70828313	1	owner	
3636	64401889-91738815-69585704	1	owner	
1722	67083649-84435746	1	owner	
3144	81269640-90417681-54728222	1	owner	
800	90051630-44517503	1	owner	
3783	97683861-99258311	2	owner	
2908	05246788-86789651	3	owner	
352	10442814-53264293	3	owner	
3388	20950232-64426133	3	owner	
602	66534316-70238477-49111539	3	owner	
1640	67163821-33431599	3	owner	
89	83507734-61801179-74131683	3	owner	

Which account is accessible by most person?

Sort & Filter

Query1 | Query9 | Query3 | transaction

aid	Expr1001
78171884-91227545	10
06684326-26300089	10
99758242-76257656-19141475	9
19726924-29805121	9
29427998-90346996	9
82351621-04186569	9
93807336-38250753-10254098	9
06781933-91757694	9
74640375-80815842	8
37291243-18615380	8
71285733-64801647-47652007	8
50275028-98726239	8

```
SELECT
        aid, COUNT(*)
FROM
        permission
GROUP BY
        aid
ORDER BY
        COUNT(*) DESC;
```

Which account is accessible by most person?

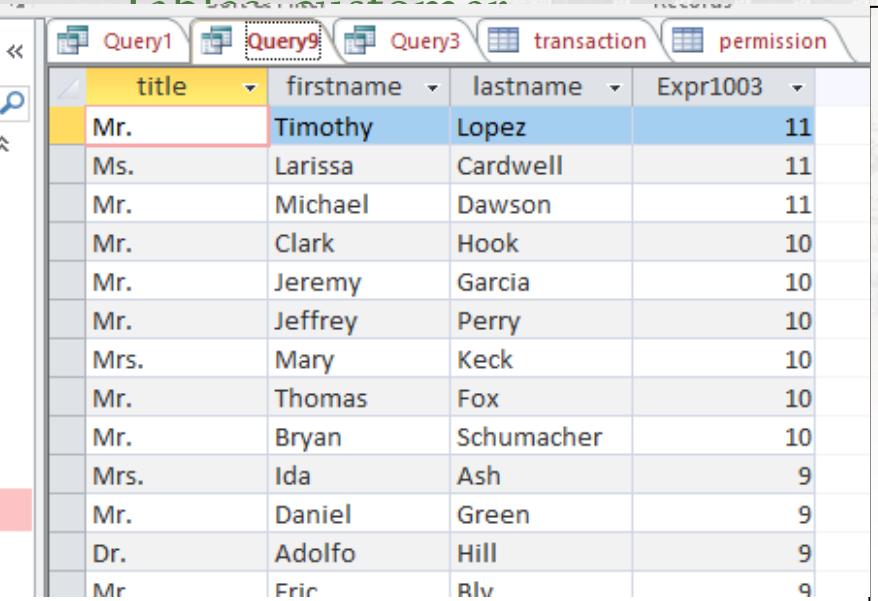
Columns: aid, COUNT(*)
Tables: permission
Joins: -
Filtering:
permlevel =’owner’ OR
Permlevel=’partner’
Grouping: aid
Group filtering: -
Sorting: COUNT(*)
Rows num: -

```
SELECT
        aid, COUNT(*)
FROM
        permission
WHERE
        permlevel='owner' OR
        permlevel='partner'
GROUP BY
        aid
ORDER BY
         COUNT(*) DESC;
```

Customer with the most bank accounts

Columns: title, firstname, lastname, COUNT(*)

Tables: customer



title	firstname	lastname	Expr1003
Mr.	Timothy	Lopez	11
Ms.	Larissa	Cardwell	11
Mr.	Michael	Dawson	11
Mr.	Clark	Hook	10
Mr.	Jeremy	Garcia	10
Mr.	Jeffrey	Perry	10
Mrs.	Mary	Keck	10
Mr.	Thomas	Fox	10
Mr.	Bryan	Schumacher	10
Mrs.	Ida	Ash	9
Mr.	Daniel	Green	9
Dr.	Adolfo	Hill	9
Mr.	Eric	Bly	9

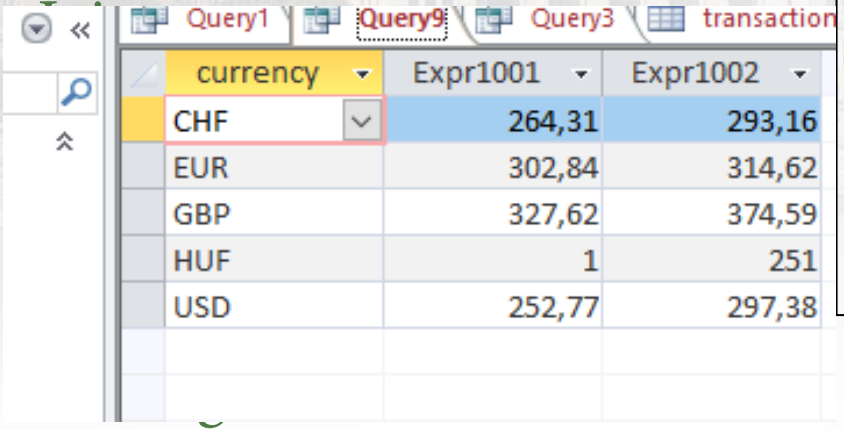
```
SELECT
        title, firstname, lastname, COUNT(*)
FROM
        customer
INNER JOIN
        permission
ON
        customer.cid=permission.cid
GROUP BY
        title, firstname, lastname
ORDER BY
        COUNT(*) DESC;
```

MIN & MAX CURRENCY RATES

Although the maximum value is present, the line has not been identified!

Columns: currency, MAX(ratetohuf), MIN(ratetohuf)

Tables: currencyrate



currency	Expr1001	Expr1002
CHF	264,31	293,16
EUR	302,84	314,62
GBP	327,62	374,59
HUF	1	251
USD	252,77	297,38

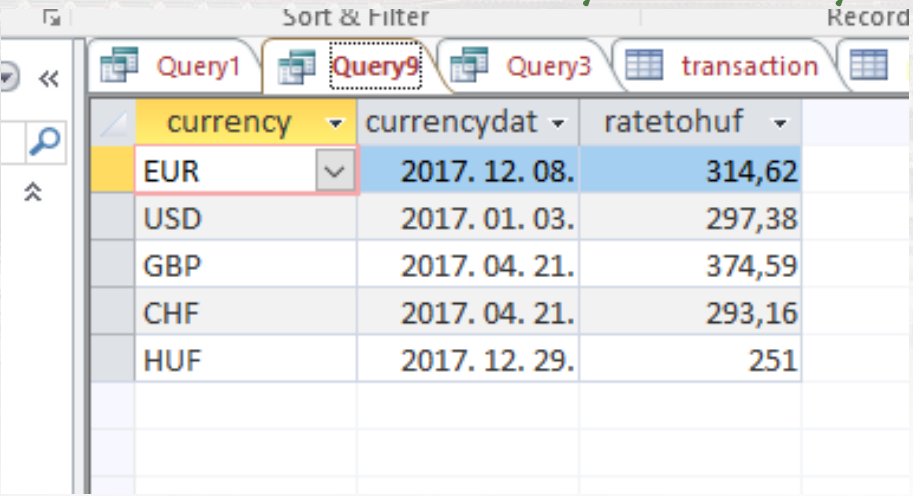
```
SELECT
        currency,
        MIN(ratetohuf),
        MAX(ratetohuf)
FROM
        currencyrate
GROUP BY
        currency;
```

Rows num: -

MAX CURRENCY RATES INCLUDING DATES

Although the maximum value is present, the line has not been identified!

Columns: currency, currencydate, ratetohuf



currency	currencydat	ratetohuf
EUR	2017. 12. 08.	314,62
USD	2017. 01. 03.	297,38
GBP	2017. 04. 21.	374,59
CHF	2017. 04. 21.	293,16
HUF	2017. 12. 29.	251

Sorting: -

Rows num: -

```
SELECT
        currencyrate.currency,
        currencyrate.currencydate,
        currencyrate.ratetohuf
FROM
        currencyrate
INNER JOIN
        (SELECT currency, MAX(ratetohuf) AS m
FROM currencyrate GROUP BY currency) AS maxs
ON
        currencyrate.currency=maxs.currency
AND currencyrate.ratetohuf=maxs.m;
```

Max currency rates including dates, In case of multiple peaks, only show last one

Columns: currency, LAST(currencydate), ratetohuf

Tables: currencyrate

Joins: (Previous query)

Filtering: -

Grouping: currency, ratetohuf

Group filtering: -

Sorting: -

Rows num: -

```
SELECT
currencyrate.currency,
LAST(currencyrate.currencydate),
currencyrate.ratetohuf
FROM
currencyrate
INNER JOIN
(SELECT currency, MAX(ratetohuf) AS m FROM
currencyrate GROUP BY currency) AS maxs
ON
currencyrate.currency=maxs.currency AND
currencyrate.ratetohuf=maxs.m
GROUP BY
currencyrate.currency, currencyrate.ratetohuf;
```

Complex SQL query in the homework system

```
SELECT users.fullname, users.username, users.mail, gname, users.crid, SUBSTR(u6.fullname, 5, 1), DATE_FORMAT(users.last, '%m/%d %k:%i:%s'),
users.p1, DATE_FORMAT(p1.date,'%m/%d %k:%i:%s'), DATE_FORMAT(p1_d.date,'%m/%d %k:%i:%s'), users.p1_fee, users.p1_spec, users.p1_cor<p1.date, mn1,
users.p2, DATE_FORMAT(p2.date,'%m/%d %k:%i:%s'), DATE_FORMAT(p2_d.date,'%m/%d %k:%i:%s'), users.p2_fee, users.p2_spec, users.p2_cor<p2.date, mn2,
users.p3, DATE_FORMAT(p3.date,'%m/%d %k:%i:%s'), DATE_FORMAT(p3_d.date,'%m/%d %k:%i:%s'), users.p3_fee, users.p3_spec, users.p3_cor<p3.date, mn3,
users.t1, users.t1_group, users.t2, users.t3, grade, u1.p3 u1, u2.p3 u2, u4.p3 u4, u5.p3 u5
FROM users
JOIN groups USING(gid)
JOIN users_grade USING (uid)
LEFT JOIN (SELECT uid, MAX(date) AS date FROM part1 GROUP BY uid) AS p1 USING(uid)
LEFT JOIN (SELECT uid, MAX(date) AS date FROM part1 WHERE date <= '2021-10-01 11:59:59' GROUP BY uid) AS p1_d USING(uid)
LEFT JOIN chain AS c1 ON c1.uid1=uid
LEFT JOIN (SELECT cid AS cid1, COUNT(1) AS mn1 FROM msg AS m1 GROUP BY cid1) AS msg1 ON c1.cid=cid1
LEFT JOIN (SELECT uid, MAX(date) AS date FROM part2 GROUP BY uid) AS p2 USING(uid)
LEFT JOIN (SELECT uid, MAX(date) AS date FROM part2 WHERE date <= '2021-11-05 11:59:59' GROUP BY uid) AS p2_d USING(uid)
LEFT JOIN chain AS c2 ON c2.uid2=uid
LEFT JOIN (SELECT cid AS cid2, COUNT(1) AS mn2 FROM msg AS m2 GROUP BY cid2) AS msg2 ON c2.cid=cid2
LEFT JOIN (SELECT uid, MAX(date) AS date FROM part3 GROUP BY uid) AS p3 USING(uid)
LEFT JOIN (SELECT uid, MAX(date) AS date FROM part3 WHERE date <= '2021-12-10 11:59:59' GROUP BY uid) AS p3_d USING(uid)
LEFT JOIN chain AS c3 ON c3.uid3=uid
LEFT JOIN (SELECT cid AS cid3, COUNT(1) AS mn3 FROM msg AS m3 GROUP BY cid3) AS msg3 ON c3.cid=cid3
LEFT JOIN users u1 ON c3.uid1=u1.uid
LEFT JOIN users u2 ON c3.uid2=u2.uid
LEFT JOIN users u4 ON c1.uid3=u4.uid
LEFT JOIN users u5 ON c2.uid3=u5.uid
LEFT JOIN course ON users.crid=course.crid
LEFT JOIN users u6 ON course.uid=u6.uid
WHERE users.permission=2
ORDER BY users.fullname;
```

Complex SQL query in Neptun

```
SELECT DISTINCT
  t100.C_CODE AS "F0",
  t100.C_DESCRIPTION AS "F1",
  t120.C_CODE AS "F2",
  t120.C_NAME AS "F3",
  t120.C_NAME_1 AS "F4",
  t131.C_NEPTUNCODE AS "F5",
  t130.C_TITLE AS "F6",
  t130.C_LASTNAME AS "F7",
  t130.C_FIRSTNAME AS "F8"
FROM
  T_SUBJECT t120,
 T_ORGANIZATION t100, T_INTERIORORGANIZATION t101,
 T_ORGANIZATION t110, T_INTERIORORGANIZATION t111,
  T_COURSE t140
   RIGHT JOIN T_CourseTutor t18 ON t140.ID=t18.C_COURSEID
    RIGHT JOIN  T_Employee t132 ON t18.C_EMPLOYEEID=t132.ID
     RIGHT JOIN T_PARTNER t130 ON t132.ID = t130.ID
     RIGHT JOIN T_USER t131 ON t132.ID = t131.ID
 WHERE t100.ID=t101.ID   AND
 t100.C_BOSSID = t110.ID  AND
 t110.ID=t111.ID   AND
 t120.ID = t140.C_SUBJECTID  AND
 t120.C_INTERIORORGANIZATIONID = t101.ID  AND
 (t100.C_CODE LIKE 'EO%')
  AND
 (t140.C_TERM = 70610) AND
  (t140.C_LANGUAGE = 137001) AND
  (t140.C_CODE <> 'VK')

 ORDER BY
  3,
  9,
  8,
  6
```

Conclusion

Formulating queries in SQL

- Projection
- Join
- Filtering
- Grouping
- Sorting
- Limit rows

Thank you for your attention!

Questions?

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