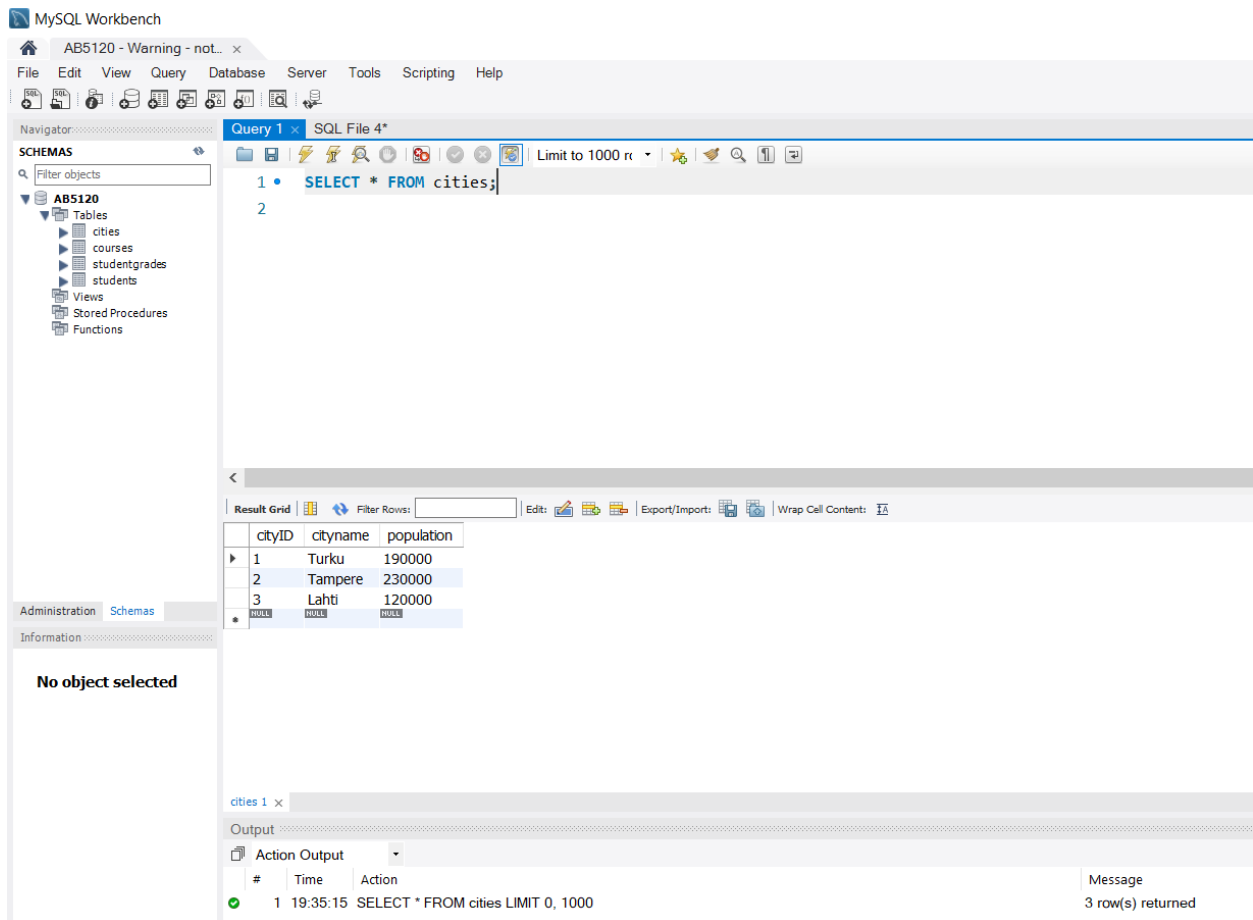


Tietokannat harjoitus 2

1.A. Hae kaikki kaupungit (cities); kaikki sarakkeet näkyviin



The screenshot shows the MySQL Workbench interface. The left sidebar displays the 'SCHEMAS' tree with the 'AB5120' database selected, showing tables like 'cities', 'courses', 'studentgrades', and 'students'. The main query editor contains the SQL statement: `SELECT * FROM cities;`. Below the editor, the 'Result Grid' shows the query results in a table format. The table has three columns: 'cityID', 'cityname', and 'population'. The results are as follows:

cityID	cityname	population
1	Turku	190000
2	Tampere	230000
3	Lahti	120000

At the bottom, the 'Output' tab shows the 'Action Output' for the query, indicating that 3 row(s) were returned.

1.B

Hae kaikkien kaupunkien nimet ja asukasluvut. Lajittele asukasmäärän mukaan pienimmästä suurimpaan.

MySQL Workbench

AB5120 - Warning - not... x

File Edit View Query Database Server Tools Scripting Help

Navigator: SCHEMAS

Filter objects

AB5120

- Tables
 - cities
 - courses
 - studentgrades
 - students
- Views
- Stored Procedures
- Functions

Query 1 x SQL File 4*

Limit to 1000 rows

```
1 • SELECT cityname, population FROM cities
2 ORDER BY population ASC;
3
4
```

Result Grid

cityname	population
Lahti	120000
Turku	190000
Tampere	230000

Administration Schemas

Information

No object selected

cities 2 x

Output

Action Output

#	Time	Action	Message
1	19:35:15	SELECT * FROM cities LIMIT 0, 1000	3 row(s) returned
2	19:40:51	SELECT cityname, population FROM cities ORDER BY population ASC LIMIT 0, 1000	3 row(s) returned

1.C

Mitä eri silmien värejä opiskelijoilla on? Kukin väri saa tulostua vain kerran ja tulosjoukossa saa olla vain yksi sarake.

MySQL Workbench

AB5120 - Warning - not.. x

File Edit View Query Database Server Tools Scripting Help

Navigator: SCHEMAS

Filter objects

AB5120

- Tables
 - cities
 - courses
 - studentgrades
 - students
- Views
- Stored Procedures
- Functions

Query 1 x SQL File 4*

Limit to 1000 rows

```
1 • SELECT DISTINCT eyecolor FROM students;
```

2

3

Result Grid

eyecolor
Ruskea
Sininen
Harmaa
Muut

Administration Schemas

Information

No object selected

students 5 x

Output

1.D Hae opiskelijoiden suku- ja etunimet, silmien väri ja tulot (incomes): incomes-sarakkeen otsikoksi pitää tulla Vuosipalkka.

MySQL Workbench

AB5120 - Warning - not... x

File Edit View Query Database Server Tools Scripting Help

Navigator

SCHEMAS

Filter objects

AB5120

- Tables
 - cities
 - courses
 - studentgrades
 - students
- Views
- Stored Procedures
- Functions

Query 1 x SQL File 4*

Limit to 1000 rows

```
1 • SELECT lastname, firstname, eyecolor, incomes as Vuosipalkka FROM students;
2
3
```

Result Grid

Filter Rows: | Export: | Wrap Cell Content: |

	lastname	firstname	eyecolor	Vuosipalkka
▶	Guru	Ken	Ruskea	12010.12
	Saurus	Tino	Ruskea	14010.22
	Tiainen	Sini	Sininen	16010.32
	Vainio	Vilja	Sininen	0.00
	Vainio	Elo	Sininen	0.00
	Rahainen	Muu	Harmaa	13010.12
	Alainen	Kim	NULL	18010.12
	Ana	Ruut	NULL	20010.12

Administration Schemas

Information

No object selected

students 6 x

1.E Lajittele edellinen tehtävä ensijaisesti suku ja toissijaisesti etunimen mukaan kummatkin laskevassa järjestyksessä (käänteinen aakkosjärjestys).

MySQL Workbench

AB5120 - Warning - not... x

File Edit View Query Database Server Tools Scripting Help

Navigator

Filter objects

AB5120

- Tables
 - cities
 - courses
 - studentgrades
 - students
- Views
- Stored Procedures
- Functions

Query 1 x SQL File 4*

Limit to 1000 rows

```
1 • SELECT lastname, firstname, eyecolor, incomes as Vuosipalkka FROM students
2 ORDER BY lastname DESC, firstname DESC;
3
4
```

Result Grid

Filter Rows:

Export:

Wrap Cell Content:

lastname	firstname	eyecolor	Vuosipalkka
Vainio	Vilja	Sininen	0.00
Vainio	Elo	Sininen	0.00
Tiainen	Sini	Sininen	16010.32
Saurus	Tino	Ruskea	14010.22
Rahainen	Muu	Harmaa	13010.12
Guru	Ken	Ruskea	12010.12
Ana	Ruut	NULL	20010.12
Alainen	Kim	NULL	18010.12

No object selected

2.A Hae niiden opiskelijoiden suku- ja etunimet, joiden silmien väri on 'Sininen'.

Windows PowerShell

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\jeand> cd C:\XAMPP\mysql\bin\
PS C:\XAMPP\mysql\bin> .\mysql.exe -u root -p student_db
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 11
Server version: 10.4.19-MariaDB mariadb.org binary distribution


Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [student_db]> SELECT lastname, firstname, eyecolor FROM students WHERE eyecolor='Sininen';
+-----+-----+-----+
| lastname | firstname | eyecolor |
+-----+-----+-----+
| Tiainen  | Sini      | Sininen  |
| Vainio   | Vilja     | Sininen  |
| Vainio   | Elo       | Sininen  |
+-----+-----+-----+
3 rows in set (0.017 sec)

MariaDB [student_db]> █
```

2.B Listaa ne opiskelijat, joilla on **pienemmät** tulot kuin 14010.22? Hae nimet ja tulot.

 Windows PowerShell

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\jeand> cd C:\XAMPP\mysql\bin\
PS C:\XAMPP\mysql\bin> .\mysql.exe -u root -p student_db
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 12
Server version: 10.4.19-MariaDB mariadb.org binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [student_db]> SELECT lastname, firstname, incomes FROM students WHERE incomes < 14010.2
+-----+-----+-----+
| lastname | firstname | incomes |
+-----+-----+-----+
| Guru     | Ken       | 12010.12 |
| Vainio   | Vilja    | 0.00     |
| Vainio   | Elo      | 0.00     |
| Rahainen | Muu       | 13010.12 |
+-----+-----+-----+
4 rows in set (0.007 sec)

MariaDB [student_db]>
```

2.C Listaa ne opiskelijat, joilla on **pienemmät** tai **yhtäsuuret** tulot kuin 14010.22?
Hae nimet ja tulot. Lajittele palkan mukaan laskevasti.

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\jeand> cd C:\XAMPP\mysql\bin\
PS C:\XAMPP\mysql\bin> .\mysql.exe -u root -p student_db
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 13
Server version: 10.4.19-MariaDB mariadb.org binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [student_db]> SELECT lastname, firstname, incomes FROM students WHERE incomes <= 14010.22 ORDER BY incomes DESC;
+-----+-----+-----+
| lastname | firstname | incomes |
+-----+-----+-----+
| Saurus   | Tino      | 14010.22 |
| Rahainen | Muu       | 13010.12 |
| Guru     | Ken       | 12010.12 |
| Vainio   | Vilja     | 0.00     |
| Vainio   | Elo       | 0.00     |
+-----+-----+-----+
5 rows in set (0.007 sec)

MariaDB [student_db]>
```

2.D Hae ne turkulaiset (hometown = 1) opiskelijat, joiden silmien väri on 'Sininen'.
Tulostasarakkeet studentID, lastname, firstname, eyecolor ja hometown (kokonaisluku).

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\jeand> cd C:\XAMPP\mysql\bin\
PS C:\XAMPP\mysql\bin> .\mysql.exe -u root -p student_db
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 14
Server version: 10.4.19-MariaDB mariadb.org binary distribution


Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [student_db]> SELECT studentID, lastname, firstname, eyecolor, hometown FROM students WHERE hometown= 1 AND eyecolor='Sininen';
+-----+-----+-----+-----+-----+
| studentID | lastname | firstname | eyecolor | hometown |
+-----+-----+-----+-----+-----+
| 2003      | Tiainen  | Sini     | Sininen  | 1         |
+-----+-----+-----+-----+-----+
1 row in set (0.008 sec)

MariaDB [student_db]>
```


2.E Listaa kaikki turkulaiset opiskelijat ja heidän **lisäksi** kaikki silmien väriltään harmaat. Tulosta kaikki sarakkeet.

 Windows PowerShell

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\jeand> cd C:\XAMPP\mysql\bin\
PS C:\XAMPP\mysql\bin> .\mysql.exe -u root -p student_db
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 15
Server version: 10.4.19-MariaDB mariadb.org binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [student_db]> SELECT * FROM students WHERE hometown=1 OR eyecolor='Harmaa';
+-----+-----+-----+-----+-----+-----+-----+-----+
| studentID | lastname | firstname | birthdate | eyecolor | incomes | taxrate | hometown |
+-----+-----+-----+-----+-----+-----+-----+
| 2001 | Guru | Ken | 2001-11-11 | Ruskea | 12010.12 | 5.10 | 1 |
| 2002 | Saurus | Tino | 2002-11-11 | Ruskea | 14010.22 | 6.20 | 1 |
| 2003 | Tiainen | Sini | 2003-11-11 | Sininen | 16010.32 | 7.30 | 1 |
| 2006 | Rahainen | Muu | 2006-11-11 | Harmaa | 13010.12 | 5.80 | 2 |
+-----+-----+-----+-----+-----+-----+-----+
4 rows in set (0.001 sec)

MariaDB [student_db]> █
```

3.A Hae kaikki sarakkeet opiskelijoista, joiden veroprosentti (taxrate) ei ole 0.00

mariadb.labranet.jamk.fi\AB5120\ - HeidiSQL 11.2.0.6213

File Edit Search Query Tools Go to Help

Database filter Table filter Host: mariadb.labranet.jamk.fi Database: AB5120 Query Query #2*

mariadb.labranet.jamk.fi

- AB5120** 112,0 KiB
 - cities 16,0 KiB
 - courses 16,0 KiB
 - studentgrad... 48,0 KiB
 - students 32,0 KiB
 - information_s...

```
1 SELECT * FROM students
2 WHERE taxrate != 0.00;
```

students (6r x 8c)

studentID	lastname	firstname	birthdate	eyecolor	incomes	taxrate	hometown
2 001	Guru	Ken	2001-11-11	Ruskea	12 010,12	5,10	1
2 002	Saurus	Tino	2002-11-11	Ruskea	14 010,22	6,20	1
2 003	Tiainen	Sini	2003-11-11	Sininen	16 010,32	7,30	1
2 006	Rahainen	Muu	2006-11-11	Harmaa	13 010,12	5,80	2
2 007	Alainen	Kim	2007-11-11	(NULL)	18 010,12	8,80	2
2 008	Ana	Ruut	2008-11-11	(NULL)	20 010,12	9,90	(NULL)

3.B Hae turkulaisista tai tamperelaisista opiskelijoista ne, joiden tulot ovat yli 14000.

mariadb.labranet.jamk.fi\AB5120\studentgrades\ - HeidiSQL 11.2.0.6213

File Edit Search Query Tools Go to Help

Database filter Table filter Host: mariadb.labranet.jamk.fi Database: AB5120 Table: studentgrades Data Query Query #2* X

▼ mariadb.labranet.jamk.fi
▼ AB5120 112,0 KiB
cities 16,0 KiB
courses 16,0 KiB
studentgrades 48,0 KiB
students 32,0 KiB
information_schema

```
1 SELECT * FROM students
2 WHERE (hometown= 1 OR hometown=2) AND incomes > 14000;
```

students (3r x 8c)

studentID	lastname	firstname	birthdate	eyecolor	incomes	taxrate	hometown
2 002	Saurus	Tino	2002-11-11	Ruskea	14 010,22	6,20	1
2 003	Tiainen	Sini	2003-11-11	Sininen	16 010,32	7,30	1
2 007	Alainen	Kim	2007-11-11	(NULL)	18 010,12	8,80	2

3.C Hae turkulaisista tai tamperelaisista opiskelijoista ne, joiden tulot ovat joko 12010.12 tai 18010.12

mariadb.labranet.jamk.fi\AB5120\studentgrades\ - HeidiSQL 11.2.0.6213

File Edit Search Query Tools Go to Help

Database filter Table filter Host: mariadb.labranet.jamk.fi Database: AB5120 Table: studentgrades Data Query Query #2* X

▼ mariadb.labranet.jamk.fi
▼ AB5120 112,0 KiB
cities 16,0 KiB
courses 16,0 KiB
studentgrades 48,0 KiB
students 32,0 KiB
information_schema

```
1 SELECT * FROM students
2 WHERE (hometown= 1 OR hometown=2) AND (incomes=12010.12 OR incomes=18010.12);
```

students (2r x 8c)

studentID	lastname	firstname	birthdate	eyecolor	incomes	taxrate	hometown
2 001	Guru	Ken	2001-11-11	Ruskea	12 010,12	5,10	1
2 007	Alainen	Kim	2007-11-11	(NULL)	18 010,12	8,80	2

3.D Hae opiskelijat, joiden kunta sukunimi alkaa A-kirjaimella.

File Edit Search Query Tools Go to Help

Database filter Table filter Host: mariadb.labranet.jamk.fi Database: AB5120 Query*

▼ mariadb.labranet...
▼ AB5120 112,0 KiB
cities 16,0 KiB
courses 16,0 KiB
studentgrades 48,0 KiB
students 32,0 KiB
information_sch...

```
1 SELECT * FROM students
2 WHERE lastname LIKE 'A%';
3
4
5
6
7
8
9
10
11
12
13
14
15
```

students (2r x 8c)

studentID	lastname	firstname	birthdate	eyecolor	incomes	taxrate	hometown
2 007	Alainen	Kim	2007-11-11	(NULL)	18 010,12	8,80	2
2 008	Ana	Ruut	2008-11-11	(NULL)	20 010,12	9,90	(NULL)

3.E Hae opiskelijat, joiden sukunimessä esiintyy merkkijono 'ai'

mariadb.labranet.jamk.fi\AB5120\studentgrades - HeidiSQL 11.2.0.6213

File Edit Search Query Tools Go to Help

Database filter Table filter Host: mariadb.labranet.jamk.fi Database: AB5120 Table: studentgrades Data Query Query #2*

▼ mariadb.labranet...
▼ AB5120 112,0 KiB
cities 16,0 KiB
courses 16,0 KiB
studentgra... 48,0 KiB
students 32,0 KiB
information_s...

```
1 SELECT * FROM students
2 WHERE lastname LIKE '%ai%';
3
4
5
6
7
8
9
10
11
12
13
14
15
```

students (5r x 8c)

studentID	lastname	firstname	birthdate	eyecolor	incomes	taxrate	hometown
2 003	Tiainen	Sini	2003-11-11	Sininen	16 010,32	7,30	1
2 004	Vainio	Vilja	2004-11-11	Sininen	0,00	0,00	3
2 005	Vainio	Elo	2005-11-11	Sininen	0,00	0,00	3
2 006	Rahainen	Muu	2006-11-11	Harmaa	13 010,12	5,80	2
2 007	Alainen	Kim	2007-11-11	(NULL)	18 010,12	8,80	2

4.A Hae opiskelijat, joiden sukunimen toinen merkki ei ole a.

mariadb.labranet.jamk.fi\AB5120\ - HeidiSQL 11.2.0.6213

File Edit Search Query Tools Go to Help

Database filter Table filter Host: mariadb.labranet.jamk.fi Database: AB5120 Query*

▼ mariadb.labranet...
▼ AB5120 112,0 ...
cities 16,0 KiB
courses 16,0 KiB
studentgrades 48,0 KiB
students 32,0 KiB
information_sch...

```
1 SELECT * FROM students
2 WHERE lastname NOT LIKE '_a%'
3 ;
```

students (4r x 8c)

studentID	lastname	firstname	birthdate	eyecolor	incomes	taxrate	hometown
2 001	Guru	Ken	2001-11-11	Ruskea	12 010,12	5,10	1
2 003	Tiainen	Sini	2003-11-11	Sininen	16 010,32	7,30	1
2 007	Alainen	Kim	2007-11-11	(NULL)	18 010,12	8,80	2
2 008	Ana	Ruut	2008-11-11	(NULL)	20 010,12	9,90	(NULL)

4.B Hae opiskelijat, joiden veroprosentti on välillä 0.00 - 5.10 Lajittele veroprosentin mukaan. (Käytä BETWEEN-määrettä)

mariadb.labranet.jamk.fi\AB5120\ - HeidiSQL 11.2.0.6213

File Edit Search Query Tools Go to Help

Database filter Table filter Host: mariadb.labranet.jamk.fi Database: AB5120 Query*

▼ mariadb.labranet...
▼ AB5120 112,0 ...
cities 16,0 KiB
courses 16,0 KiB
studentgrades 48,0 KiB
students 32,0 KiB
information_sch...

```
1 SELECT * FROM students
2 WHERE taxrate BETWEEN 0.00 AND 5.10
3 ORDER BY taxrate;
```

students (3r x 8c)

studentID	lastname	firstname	birthdate	eyecolor	incomes	taxrate	hometown
2 004	Vainio	Vilja	2004-11-11	Sininen	0,00	0,00	3
2 005	Vainio	Elo	2005-11-11	Sininen	0,00	0,00	3
2 001	Guru	Ken	2001-11-11	Ruskea	12 010,12	5,10	1

4.C Hae opiskelijat, joiden veroprosentti on 0.00, 6.20 tai 7.30 (käytä IN-määrettä)

mariadb.labranet.jamk.fi\AB5120\ - HeidiSQL 11.2.0.6213

File Edit Search Query Tools Go to Help

Database filter Table filter Host: mariadb.labranet.jamk.fi Database: AB5120 Query*

▼ mariadb.labranet...
▼ AB5120 112,0 ...
cities 16,0 KiB
courses 16,0 KiB
studentgrades 48,0 KiB
students 32,0 KiB
information_sch...

```
1 SELECT * FROM students
2 WHERE taxrate IN (0.00, 6.20, 7.30);
3
4
5
6
7
8
9
10
11
12
13
14
15
```

students (4r x 8c)

studentID	lastname	firstname	birthdate	eyecolor	incomes	taxrate	hometown
2 002	Saurus	Tino	2002-11-11	Ruskea	14 010,22	6,20	1
2 003	Tiainen	Sini	2003-11-11	Sininen	16 010,32	7,30	1
2 004	Vainio	Vilja	2004-11-11	Sininen	0,00	0,00	3
2 005	Vainio	Elo	2005-11-11	Sininen	0,00	0,00	3

4.D Hae opiskelijat, joiden kotikunta ei ole tiedossa (on NULL)

mariadb.labranet.jamk.fi\AB5120\ - HeidiSQL 11.2.0.6213

File Edit Search Query Tools Go to Help

Database filter Table filter Host: mariadb.labranet.jamk.fi Database: AB5120 Query*

▼ mariadb.labranet...
▼ AB5120 112,0 ...
cities 16,0 KiB
courses 16,0 KiB
studentgrades 48,0 KiB
students 32,0 KiB
information_sch...

```
1 SELECT * FROM students
2 WHERE hometown IS NULL;
3
4
5
6
7
8
9
10
11
12
13
14
15
```

students (1r x 8c)

studentID	lastname	firstname	birthdate	eyecolor	incomes	taxrate	hometown
2 008	Ana	Ruut	2008-11-11	(NULL)	20 010,12	9,90	(NULL)

4.E Hae opiskelijat, joiden silmien värin EI tiedetä olevan 'Sininen'.

The screenshot shows the HeidiSQL interface connected to a MariaDB database. The left sidebar displays the database structure for 'AB5120', including tables like 'cities', 'courses', 'studentgrades', and 'students'. The main window shows a SQL query: `SELECT * FROM students WHERE eyecolor != 'Blue';`. Below the query, the results are displayed in a table format, showing 6 rows of student data.

studentID	lastname	firstname	birthdate	eyecolor	incomes	taxrate	hometown
2 001	Guru	Ken	2001-11-11	Ruskea	12 010,12	5,10	1
2 002	Saurus	Tino	2002-11-11	Ruskea	14 010,22	6,20	1
2 003	Tiainen	Sini	2003-11-11	Sininen	16 010,32	7,30	1
2 004	Vainio	Vilja	2004-11-11	Sininen	0,00	0,00	3
2 005	Vainio	Elo	2005-11-11	Sininen	0,00	0,00	3
2 006	Rahainen	Muu	2006-11-11	Harmaa	13 010,12	5,80	2

5.

So far, my experience working mysql, MySQL Workbench and HeidiSQL has been great. The working environments are not that much different, so can't really tell the difference for now.

All can be used from home, for example if you set up a local server using tools like XAMPP.

You can also use JAMK server provided that you are connected through a VPN.