HQL AND JPQL QUERIES

By the expert: Eng. Ubaldo Acosta

EXERCISE OBJECTIVE

Create queries with HQL / JPQL. At the end we should see:

HqlJpqlQueries - NetBeans IDE

File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help

Search (Ctrl+I)

<default config>

Navigator

Projects | Files | Services

- HqlJpqlQueries
  - Source Packages
  - Test Packages
  - Other Sources
    - src/main/resources
      - <default package>
      - META-INF
        - persistence.xml
  - Dependencies
  - Java Dependencies
  - Project Files

JPQL Query0

Persistence Unit: HibernateJpaPU

Result SQL

Set Max. Row Count: 100

Hint: You need to build the project to get the correct results to your query.

ADD DATA TO THE DATABASE SMS_DB

We add some records to the database using the Web application that we created previously or directly in the mysql database of sms_db, the values may vary, but as an example are:

List of Students

localhost:8080/WebStudentsPersistence/ServletController

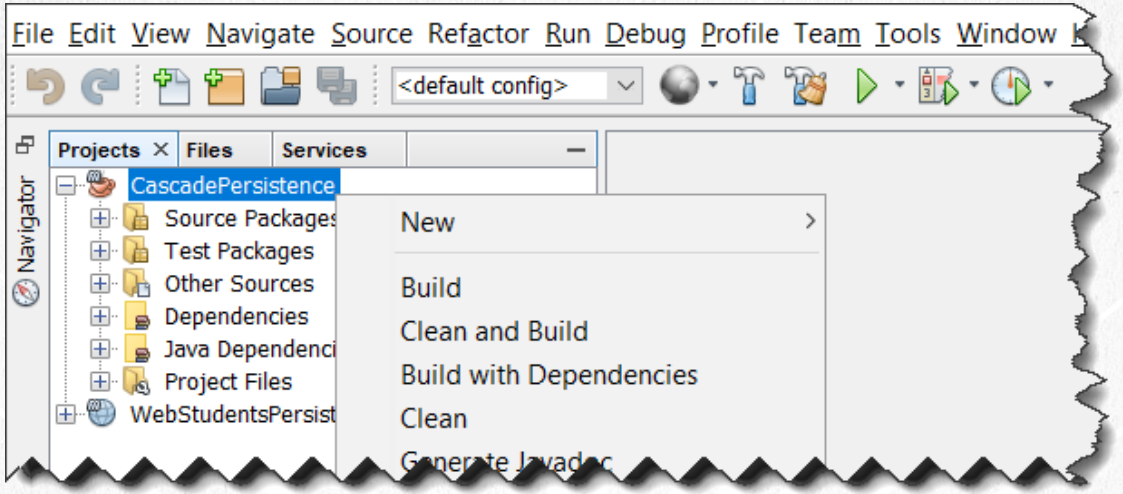
List of Students

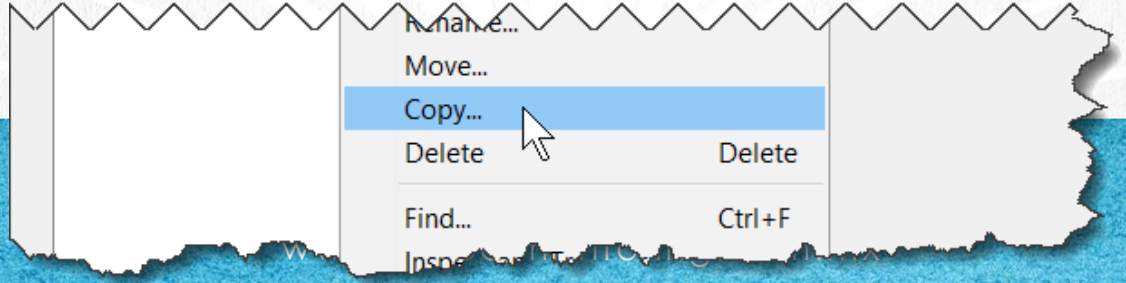
Add

Student ID	Name	Street name	Street number	Country
1	Juan	Reforma	555	Mexico
2	Charly	Merside	419	England
4	Sara	Macarena	208	Colombia
5	Elder	Piura	336	Peru
6	Oliver	High Street	10	Austrialia
7	Emma	King Street	280	U.S

1. COPY THE PROJECT

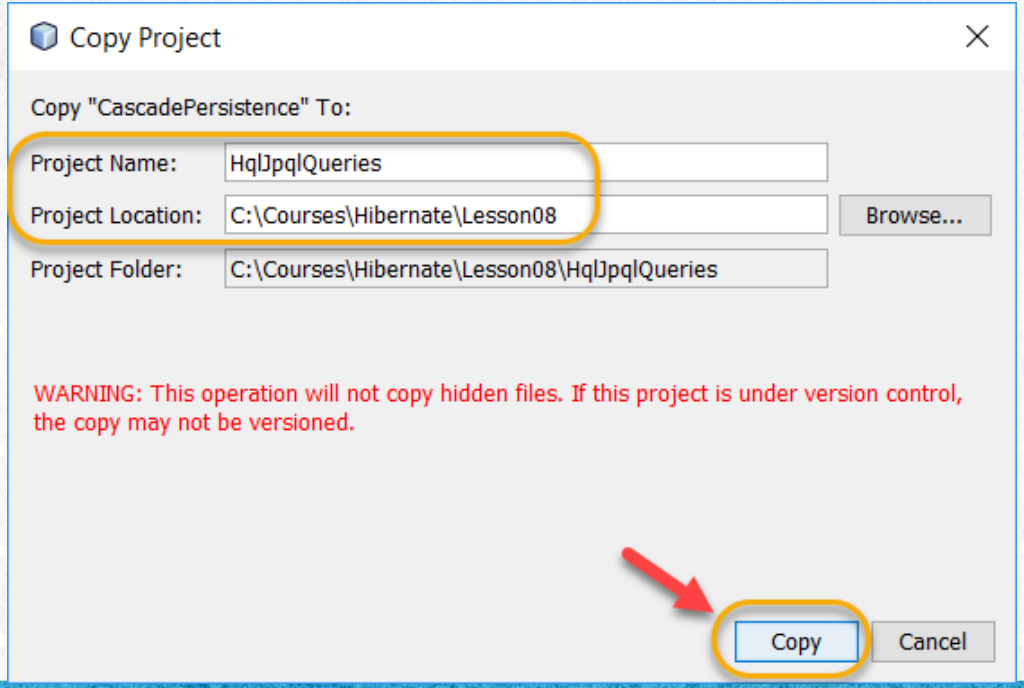
We copy the project CascadePersistence:





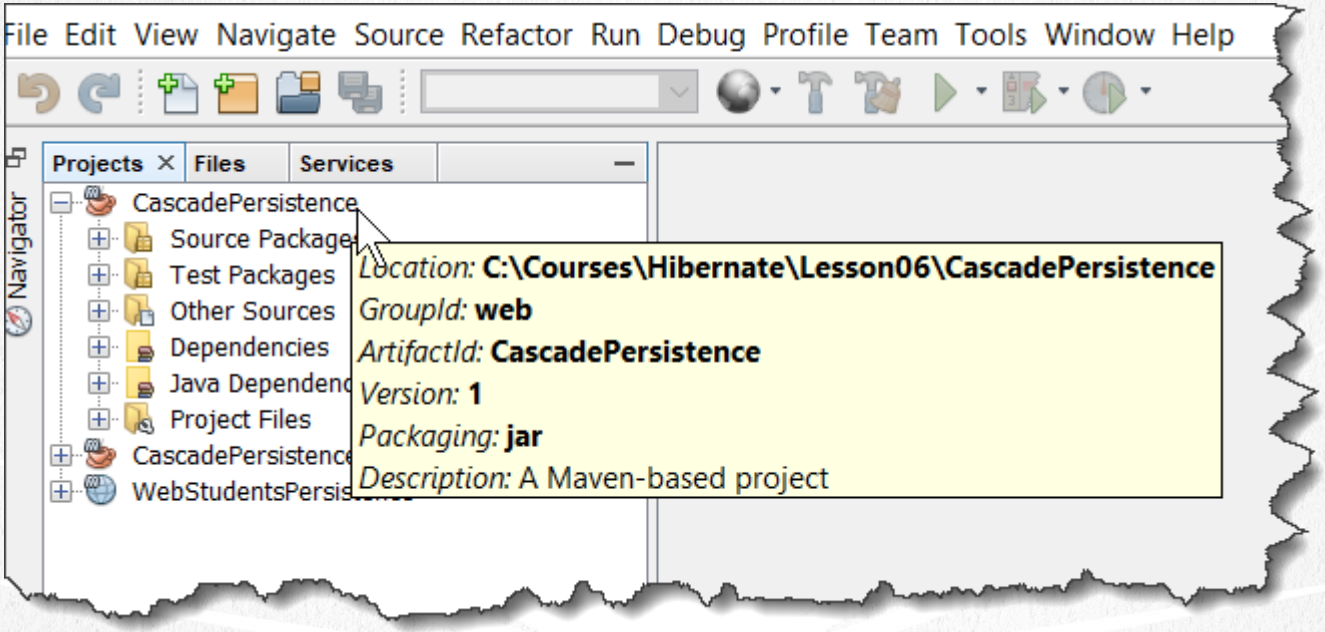
1. COPY THE PROJECT

We created the new project HqlJpqlQueries:



2. CLOSED THE PROJECT NOT USED ANYMORE

We close the project that we no longer use:



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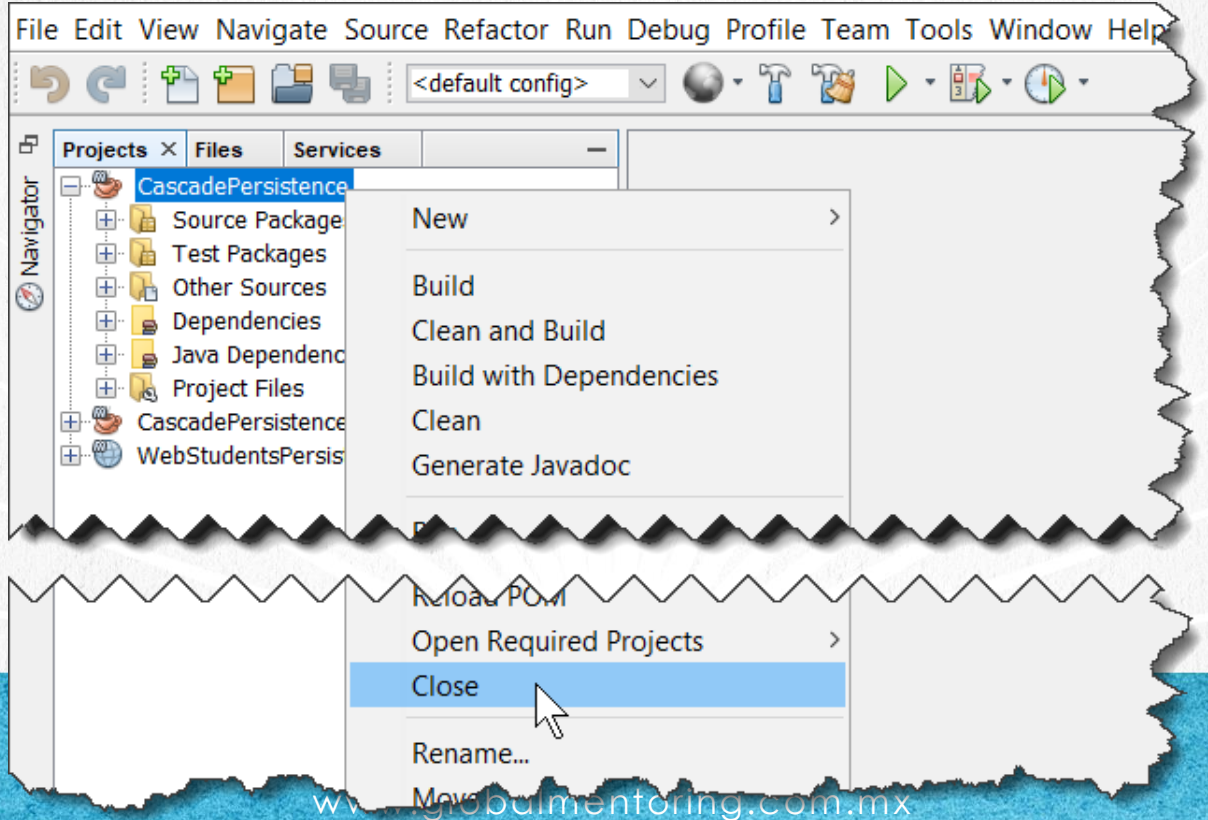
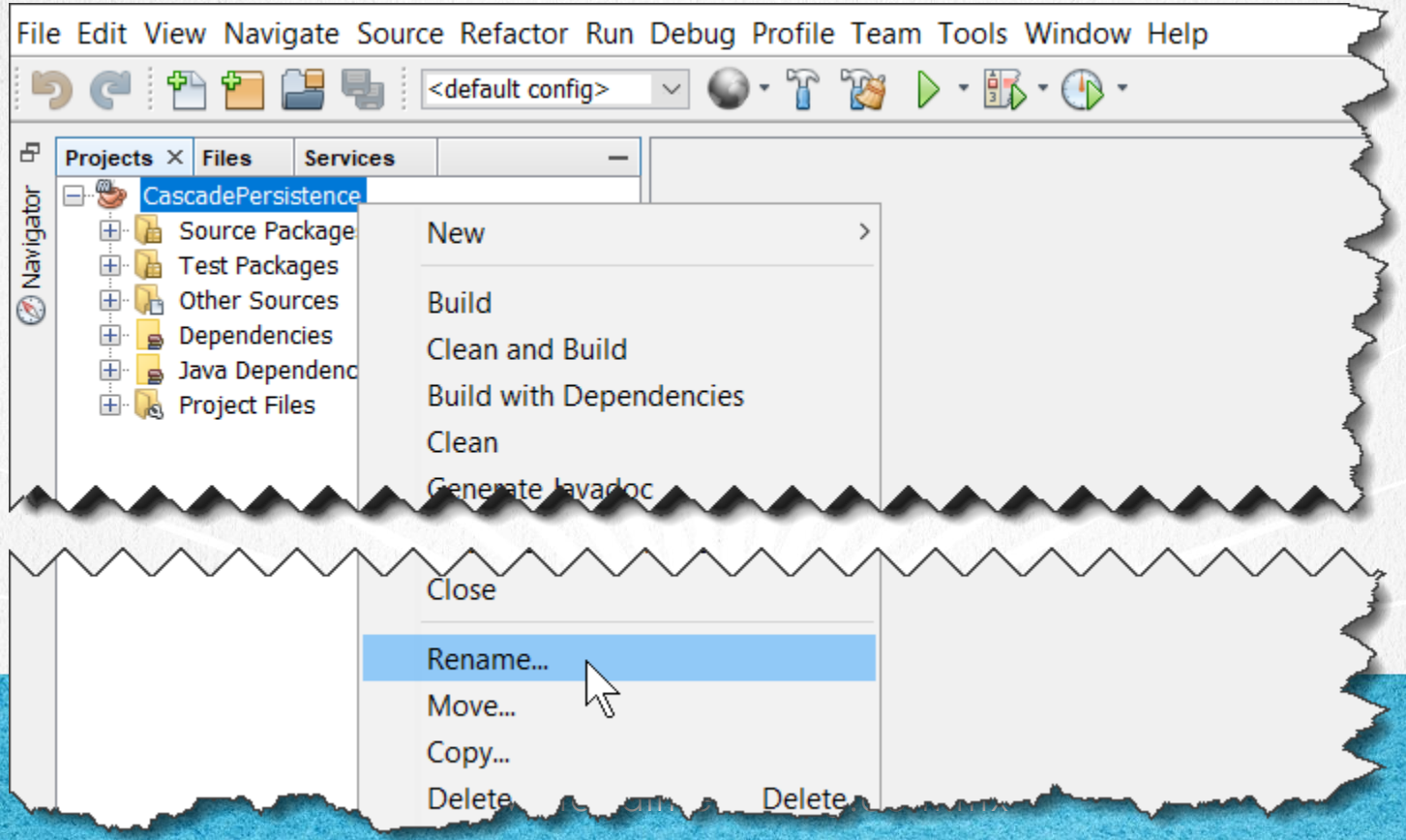


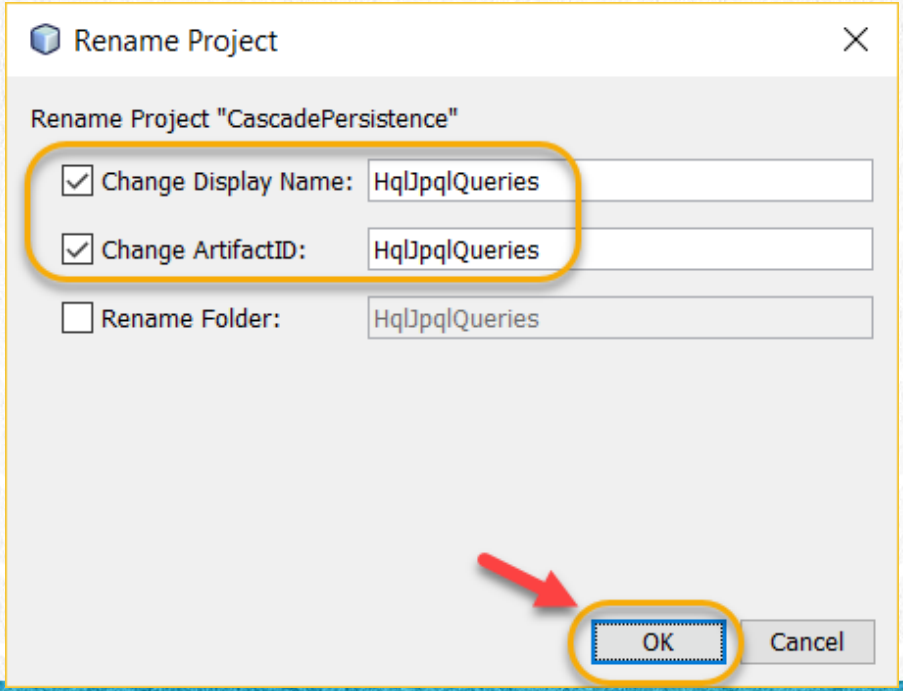
3. RENAME THE PROJECT

Rename the project:



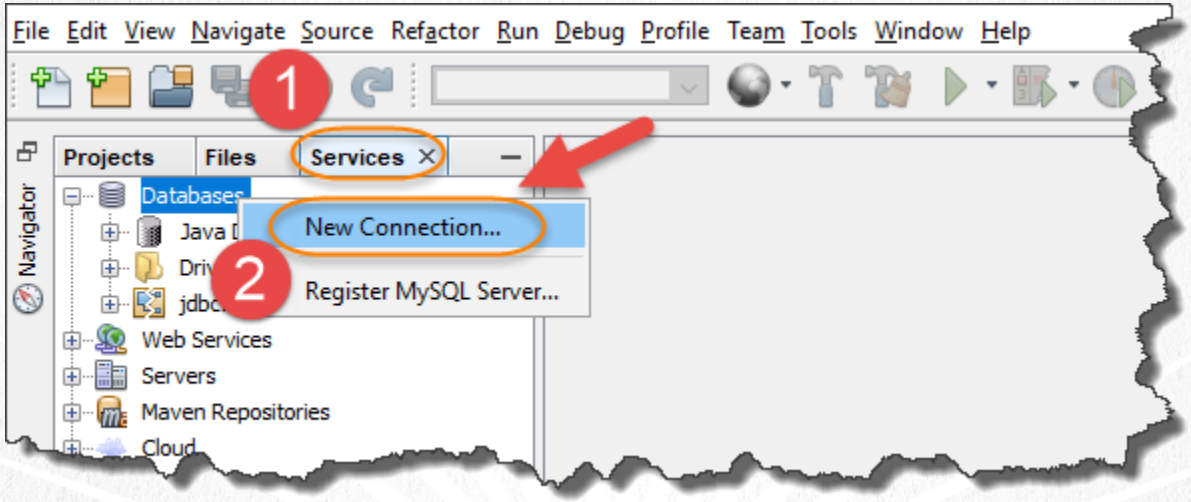
3. RENAME THE PROJECT

Rename the Project:



4. CREATE A MYSQL CONNECTION

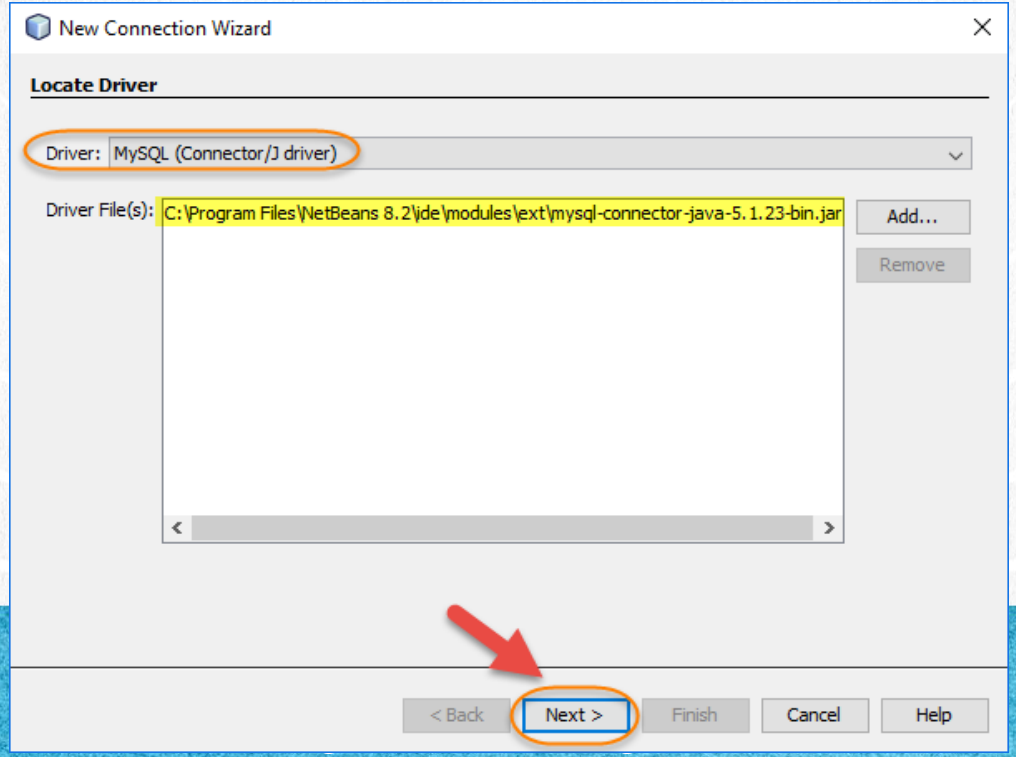
We created a connection to Mysql in the Services section:



4. CREATE A MYSQL CONNECTION

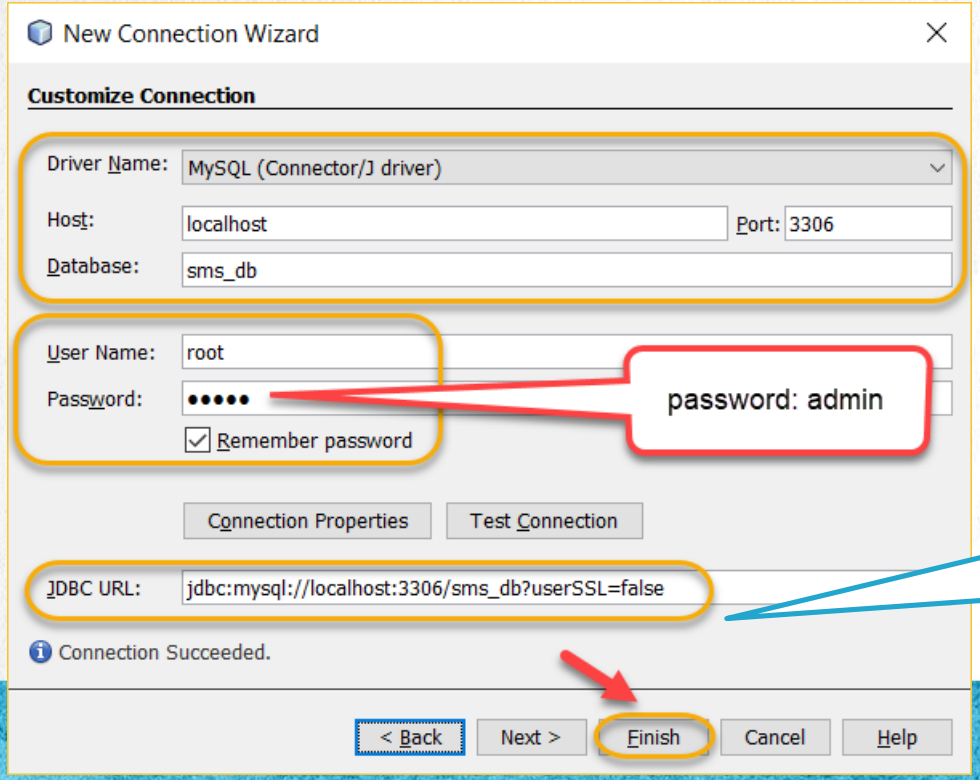
If you do not recognize the mysql .jar automatically, we add it from the following link:

http://icursos.net/cursos/JavaJDBC/drivers/mysql-driver.jar



4. CREATE A MYSQL CONNECTION

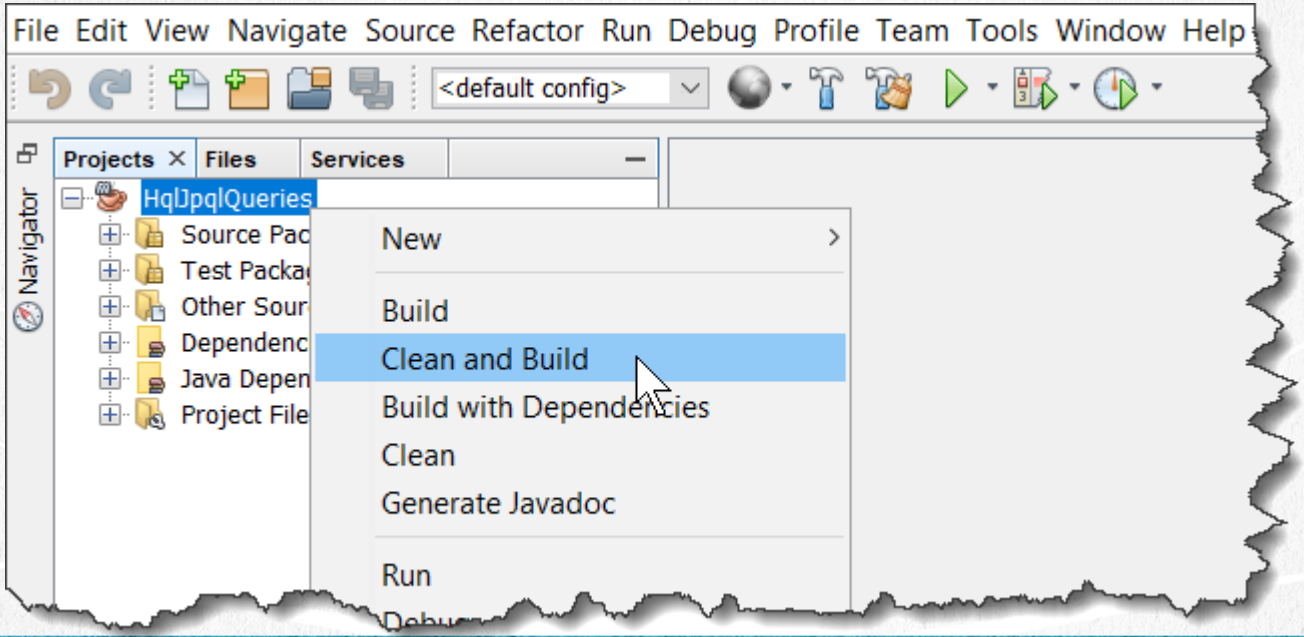
We add the values requested by the connection to the mysql sms_db database:



Very Important: All values must match the values contained in the **persistence.xml** file of the Java project

5. EXECUTE CLEAN & BUILD

We do a clean & build of the project, and we have to do it every time we open a JPQL console to ensure that we have the latest version in the Java and JPA code:



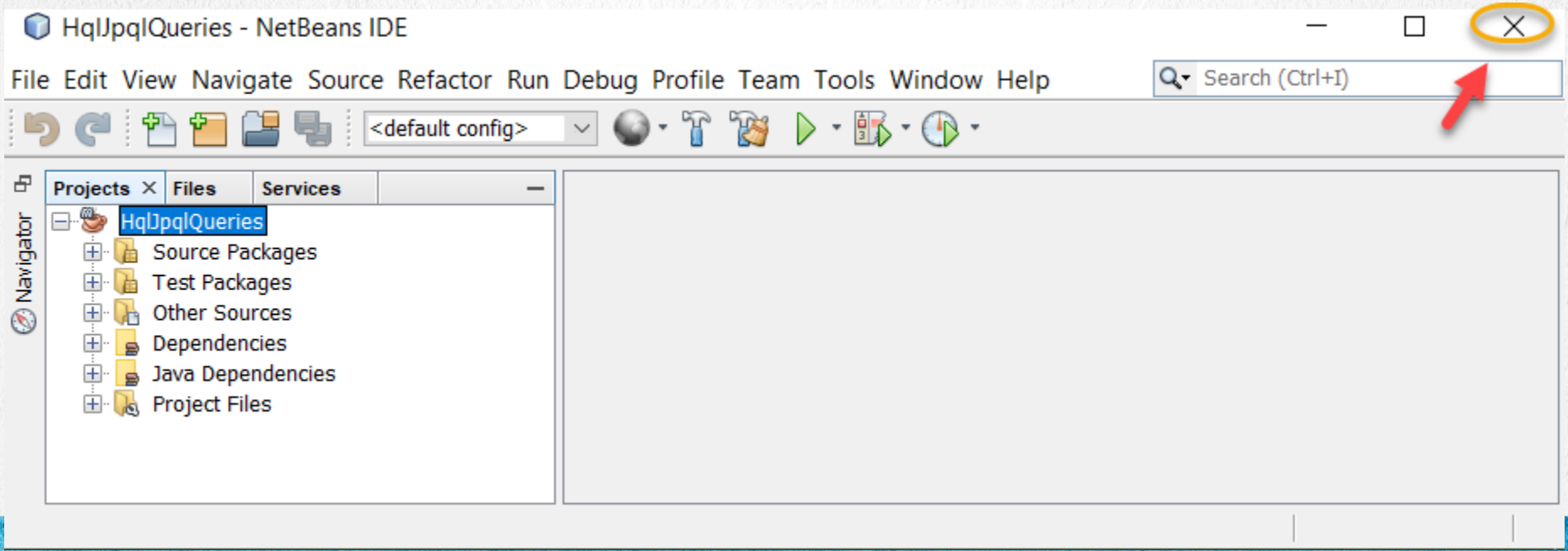
5. EXECUTE CLEAN & BUILD

We do a clean & build of the project, and we have to do it every time we open a JPQL console to ensure that we have the latest version in the Java and JPA code:

```
Output - Build (HqlJpqlQueries)

Results :

Tests run: 0, Failures: 0, Errors: 0, Skipped: 0


--- maven-jar-plugin:2.3.2:jar (default-jar) @ HqlJpqlQueries ---
Building jar: C:\Courses\Hibernate\Lesson08\HqlJpqlQueries\target\HqlJpqlQueries-1.jar

--- maven-install-plugin:2.3.1:install (default-install) @ HqlJpqlQueries ---
Installing C:\Courses\Hibernate\Lesson08\HqlJpqlQueries\target\HqlJpqlQueries-1.jar to C:\Users\user\.m2\repository\web\HqlJpqlQueries\1\HqlJpq
Installing C:\Courses\Hibernate\Lesson08\HqlJpqlQueries\pom.xml to C:\Users\user\.m2\repository\web\HqlJpqlQueries\1\HqlJpqlQueries-1.pom
------------------------------------------------------------------------
BUILD SUCCESS
------------------------------------------------------------------------
Total time: 3.251s
Finished at: Tue Sep 18 20:54:42
Final Memory: 16M/383M
------------------------------------------------------------------------
```

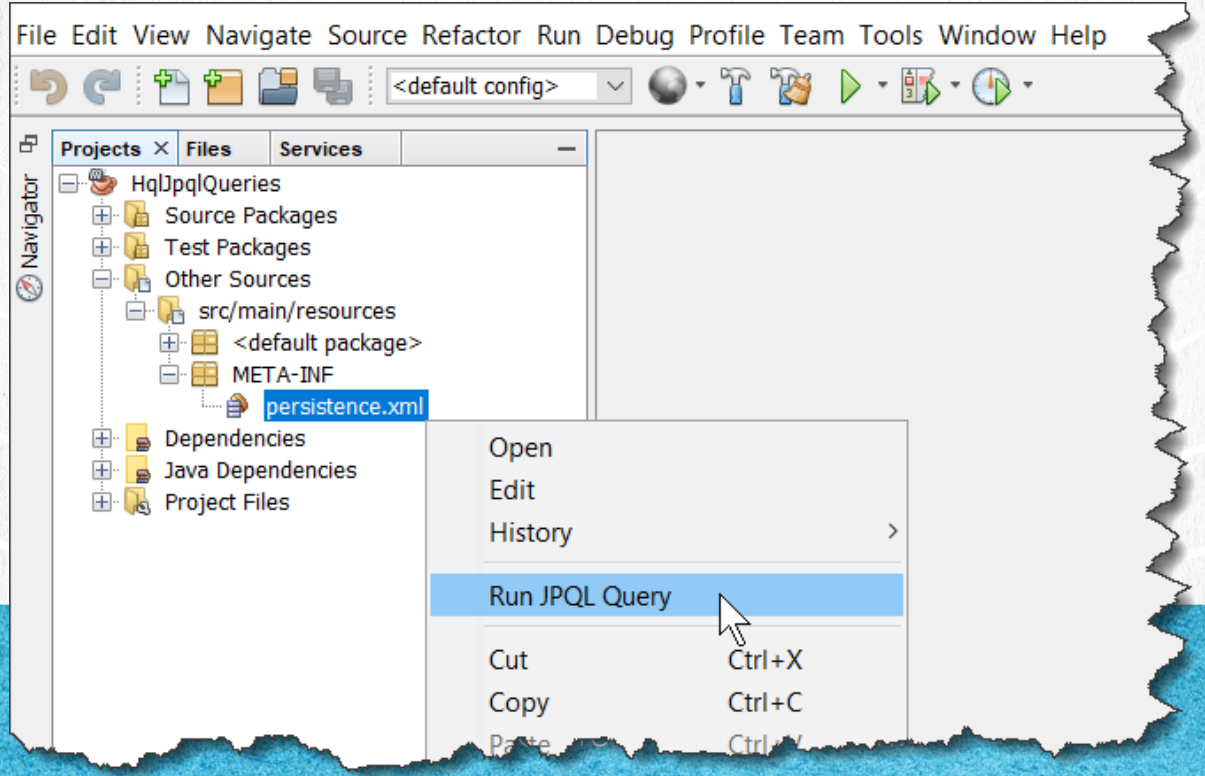
6. RESTART THE IDE

We close and reopen Netbeans so that it recognizes the persistence.xml file as a valid file to execute JPQL queries with the new changes:



7. OPEN THE JPQL CONSOLE

Once the IDE is opened again, we open the console to execute JPQL queries. If for some reason it fails, check that the connection string of the persistence.xml file is the same as the one created in Netbeans, according to the steps indicated above:



7. OPEN THE JPQL CONSOLE

We open the console to execute JPQL queries:

File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help

<default config>

Projects Files Services

ConsultasHQLyJPQL
- Source Packages
- Test Packages
- Other Sources
  - src/main/resources
    - <default package>
    - META-INF
      - persistence.xml
- Dependencies
- Java Dependencies
- Project Files

JPQL Query0

Persistence Unit: HibernateJpaPU

Result SQL

Hint: You need to build the project to get the correct results to your query.

7. WRITE THE JPQL QUERY

Write the query: `from Student`

And we run the query by pressing the Run JPQL Query button as shown:

File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help

Search (Ctrl+I)

<default config>

Projects Files Services

- HqlJpqlQueries
  - Source Packages
  - Test Packages
  - Other Sources
    - src/main/resources
      - <default package>
      - META-INF
        - persistence.xml
  - Dependencies
  - Java Dependencies
  - Project Files

JPQL Query0

Persistence Unit: HibernateJpaPU

```
from Student
```

Result SQL

Set Max. Row Count: 100

Hint: You need to build the project to get the correct results to your query.

8. RUN THE JPQL CONSOLE

We observe the result of executing the query. The data may vary according to the information in the database.

File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help

Projects | Files | Services

- HqlJpqlQueries
  - Source Packages
  - Test Packages
  - Other Sources
    - src/main/resources
      - <default package>
      - META-INF
        - persistence.xml
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  - Java Dependencies
  - Project Files

JPQL Query0

Persistence Unit: HibernateJpaPU

```
from Student
```

Result | SQL

0 row(s) updated.; 6 row(s) selected.

idStudent	name	address	assignationList	deleted	user	version
1	Juan	Address{idAddress=1, streetName=Reforma, streetNumber=555, country=Mexico, version=0, deleted=0}	[Assignation{idAssi...	0	User{idUser=1, use...	0
2	Charly	Address{idAddress=3, streetName=Merside, streetNumber=419, country=England, version=0, deleted=0}	[]	0	<NULL>	0
4	Sara	Address{idAddress=5, streetName=Macarena, streetNumber=208, country=Colombia, version=0, deleted=0}	[]	0	<NULL>	0
5	Elder	Address{idAddress=6, streetName=Piura, streetNumber=336, country=Peru, version=0, deleted=0}	[]	0	<NULL>	0
6	Oliver	Address{idAddress=7, streetName=High Street, streetNumber=10, country=Austrialia, version=0, deleted=0}	[]	0	<NULL>	0
7	Emma	Address{idAddress=8, streetName=King Street, streetNumber=280, country=U.S, version=0, deleted=0}	[]	0	<NULL>	0

9. EXECUTE THE JPQL QUERY

Based on the previous steps, we execute the following queries. You may have to modify the values as they exist in your database, so the values may vary:

```
from Student s where s.idStudent = 1
```

JPQL Query0

Persistence Unit: HibernateJpaPU

```
from Student s where s.idStudent = 1
```

Result SQL

0 row(s) updated.; 1 row(s) selected.

idStudent	name	address	assignati...	deleted	user	version
1	Juan	Address{idAddress=1, streetName=Reforma, streetNumber=555, country=Mexico, version=0, deleted=0}	[Assignati...	0	User{idUs...	0

10. EXECUTE THE JPQL QUERY

We execute the following query:

```
from Student s where s.name = 'Charly'
```

JPQL Query0

Persistence Unit: HibernateJpaPU

```
from Student s where s.name = 'Charly'
```

Result SQL

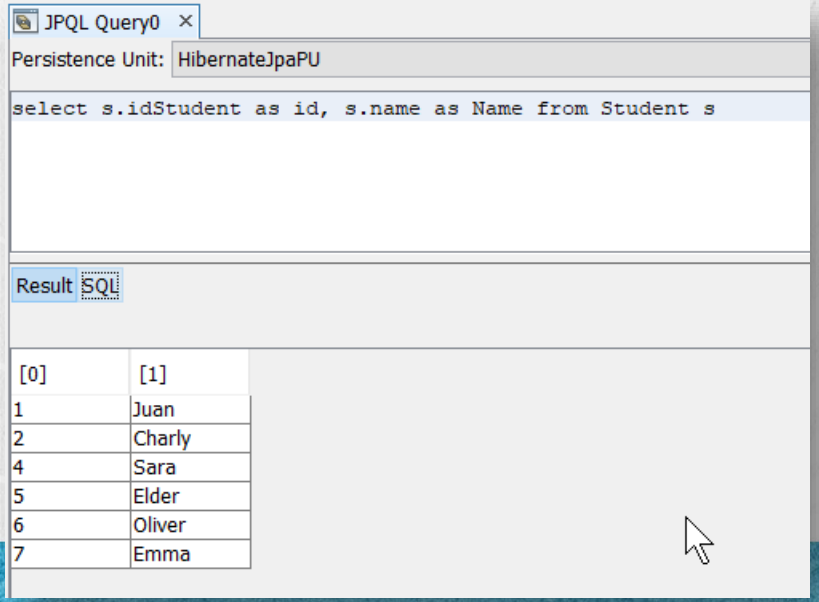
0 row(s) updated.; 1 row(s) selected.

idStudent	name	address	assignati...	deleted	user	version
2	Charly	Address{idAddress=3, streetName=Merside,...	[]	0	<NULL>	0

11. EXECUTE THE JPQL QUERY

We execute the following query:

```
select s.idStudent as id, s.name as Name from Student s
```



An array of Object type of 2-column is created

12. EXECUTE THE JPQL QUERY

We execute the following query:

```
select s, s.idStudent from Student s
```

JPQL Query0

Persistence Unit: HibernateJpaPU

```
select s, s.idStudent from Student s
```

An array of Object type of 2-column is created

Result SQL

1st Col

2nd Col

[0].idStu...	[0].name	[0].addr...	[0].assig...	[0].deleted	[0].user	[0].version	[1]
1	Juan	Address{i...	[Assignati...	0	User{idUs...	0	1
2	Charly	Address{i...	[]	0	<NULL>	0	2
4	Sara	Address{i...	[]	0	<NULL>	0	4
5	Elder	Address{i...	[]	0	<NULL>	0	5
6	Oliver	Address{...	[]	0	<NULL>	0	6
7	Emma	Address{i...	[]	0	<NULL>	0	7

13. EXECUTE THE JPQL QUERY

We execute the following query:

```
select new Student(s.idStudent) from Student s
```

We use the idStudent constructor

JPQL Query0

Persistence Unit: HibernateJpaPU

```
select new Student(s.idStudent) from Student s
```

Result SQL

idStudent	address	assignati...	deleted	name	user	version
1	<NULL>	<NULL>	0	<NULL>	<NULL>	0
2	<NULL>	<NULL>	0	<NULL>	<NULL>	0
4	<NULL>	<NULL>	0	<NULL>	<NULL>	0
5	<NULL>	<NULL>	0	<NULL>	<NULL>	0
6	<NULL>	<NULL>	0	<NULL>	<NULL>	0
7	<NULL>	<NULL>	0	<NULL>	<NULL>	0

14. EXECUTE THE JPQL QUERY

We execute the following query:

```
select min(s.idStudent) as MinId, max(s.idStudent) as MaxId,
count(s.idStudent) as Count from Student s
```

JPQL Query0

Persistence Unit: HibernateJpaPU

```
select min(s.idStudent) as MinId, max(s.idStudent) as MaxId,
count(s.idStudent) as Count from Student s
```

Result SQL

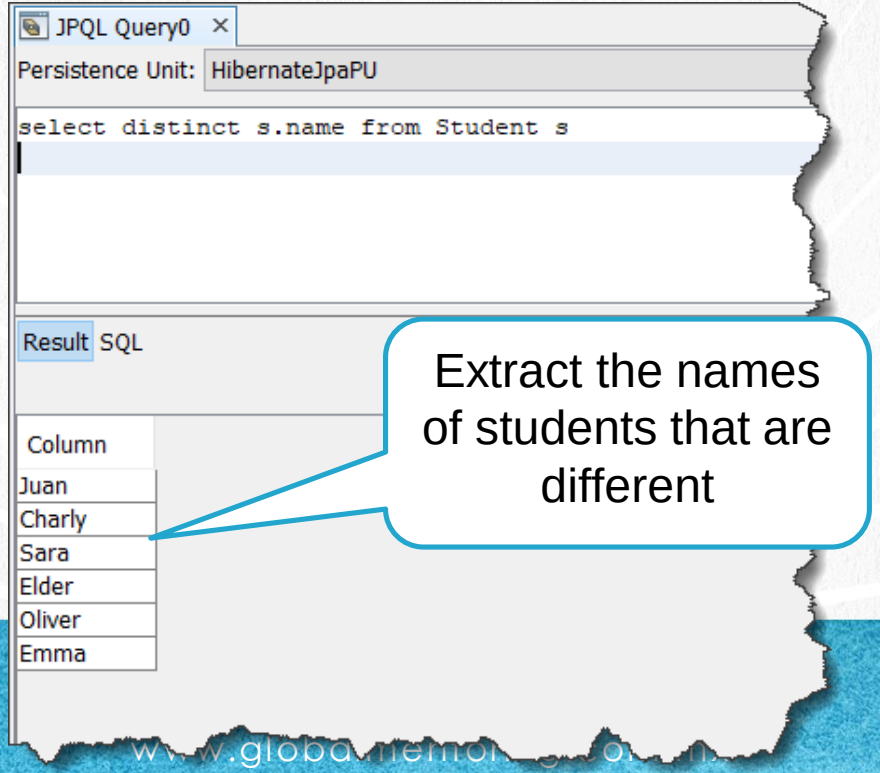
[0]	[1]	[2]
1	7	6

Returns the minimum and maximum value of the idAlumno (Scalar results)

15. EXECUTE THE JPQL QUERY

We execute the following query:

```
select distinct s.name from Student s
```



16. EXECUTE THE JPQL QUERY

We execute the following query:

```
select upper (a.streetName) || ' - ' || upper (a.country) from Address a
```

JPQL Query0

Persistence Unit: HibernateJpaPU

```
select upper (a.streetName) || ' - ' || upper (a.country) from Address a
```

Result SQL

Column
REFORMA - MEXICO
STAR AVENUE - USA
MERSIDE - ENGLAND
BOLIVIA - COLOMBIA
MACARENA - COLOMBIA
PIURA - PERU
HIGH STREET - AUSTRIALIA
KING STREET - U.S

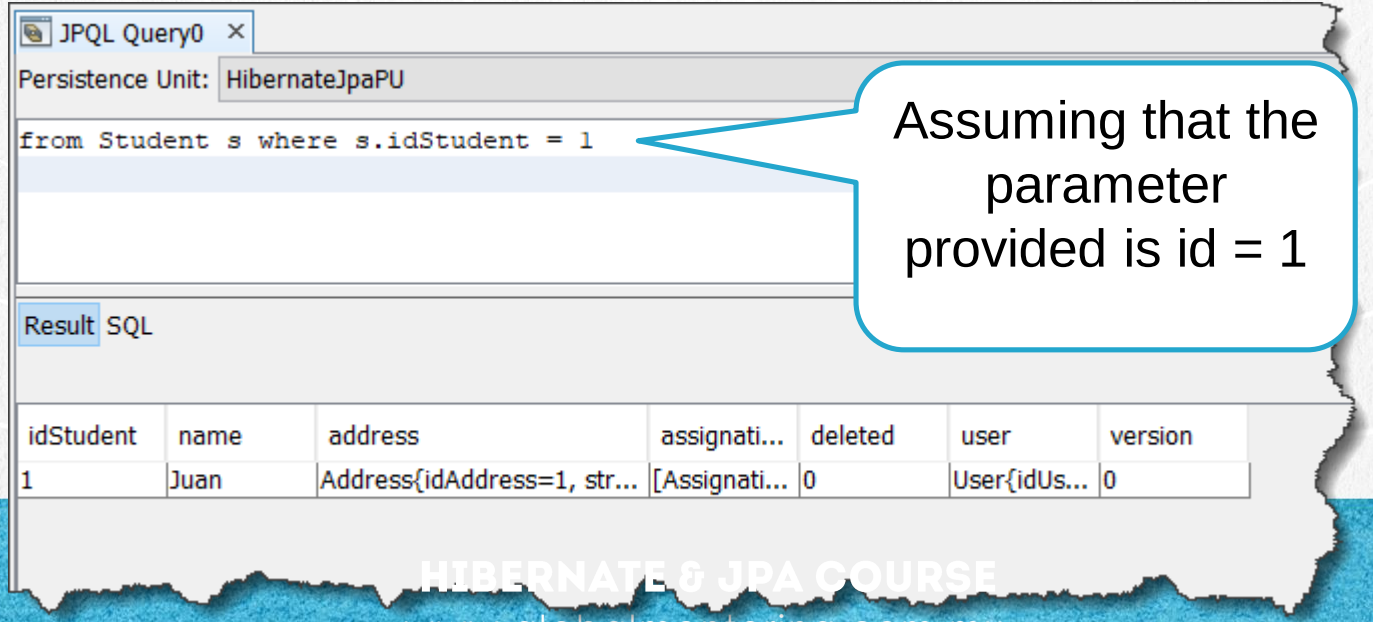
Concatenates and capitalizes the streetName and Country

17. EXECUTE THE JPQL QUERY

The query with parameters can not be executed in the Netbeans console, but we will execute it with Java code.

```
from Student s where s.idStudent = :id
```

Result: Get the student object with id equal to the given parameter



18. EXECUTE THE JPQL QUERY

The query with parameters can not be executed in the Netbeans console, since a list of data must be provided. We will do this from Java code.

```
from Student s where s.idStudent in (:list)
```

Result: Get students in a range of ids (can not run in the console)

JPQL Query0

Persistence Unit: HibernateJpaPU

```
from Student s where s.idStudent in (1,2,7)
```

Assuming that the parameters provided are 1,2,7

Result SQL

0 row(s) updated.; 3 row(s) selected.

idStudent	name	address	assignati...	deleted	user	version
1	Juan	Address{idAddress=1, streetName=Reforma, streetNumber=555, country=Mexico, versio...	[Assignati...	0	User{idUs...	0
2	Charly	Address{idAddress=3, streetName=Merside, streetNumber=419, country=England, versio...	[]	0	<NULL>	0
7	Emma	Address{idAddress=8, streetName=King Street, streetNumber=280, country=U.S, version...	[]	0	<NULL>	0

19. EXECUTE THE JPQL QUERY

The query with parameters can not be executed in the Netbeans console, but we will execute it with Java code.

```
from Student s where upper(s.name) like upper(:param1)
```

Result: Get students that contain a letter A, regardless of uppercase / lowercase.

JPQL Query0

Persistence Unit: HibernateJpaPU

```
from Student s where upper(s.name) like upper('%A%')
```

Result SQL

address	assignati...	deleted	idStudent	name	user	version
Address{i...	[Assignati...	0	1	Juan	User{idUs...	0
Address{i...	[]	0	2	Charly	<NULL>	0
Address{i...	[]	0	4	Sara	<NULL>	0
Address{i...	[]	0	7	Emma	<NULL>	0

Assuming that the parameter provided is %A%

20. EXECUTE THE JPQL QUERY

We execute the following query:

```
select a, now() from Address a where a.country is not null
```

Result: Return the now date of mysql, similar to Date in Java.

JPQL Query0

Persistence Unit: HibernateJpaPU

```
select a, now() from Address a where a.country is not null
```

Result SQL

0 row(s) updated.; 8 row(s) selected.

[0].country	[0].deleted	[0].idAdd...	[0].stree...	[0].stree...	[0].stude...	[0].version	[1].date	[1].day	[1].hours	[1].minut...	[1].month	[1].nanos	[1].seco...
Mexico	0	1	Reforma	555	[Student{i...	0	19	3	18	5	8	55674000	9
USA	0	2	Star Avenue	51	[]	0	19	3	18	5	8	55674000	9
England	0	3	Merside	419	[Student{i...	0	19	3	18	5	8	55674000	9
Colombia	0	4	Bolivia	56	[]	0	19	3	18	5	8	55674000	9
Colombia	0	5	Macarena	208	[Student{i...	0	19	3	18	5	8	55674000	9
Peru	0	6	Piura	336	[Student{i...	0	19	3	18	5	8	55674000	9
Austrialia	0	7	High Street	10	[Student{i...	0	19	3	18	5	8	55674000	9
U.S	0	8	King Street	280	[Student{i...	0	19	3	18	5	8	55674000	9

Use functions of the Dialect, in this case of mysql (function now)

21. EXECUTE THE JPQL QUERY

We execute the following query:

```
from Student s where s.idStudent not between 2 and 5
```

Result: Return students whose id is NOT between 2 and 7

JPQL Query0

Persistence Unit: HibernateJpaPU

```
from Student s where s.idStudent not between 2 and 5
```

Use of between

Result SQL

idStudent	name	address	assignati...	deleted	user	version
1	Juan	Address{i...	[Assignati...	0	User{idUs...	0
6	Oliver	Address{i...	[]	0	<NULL>	0
7	Emma	Address{i...	[]	0	<NULL>	0

22. EXECUTE THE JPQL QUERY

We execute the following query:

```
select a from Address a where a.idAddress > 3 order by a.streetName desc,
a.country desc
```

Result: Return the addresses whose idAddress is greater than 3 and sorted by streetName and country in descending order

JPQL Query0

Persistence Unit: HibernateJpaPU

```
select a from Address a where a.idAddress > 3 order by a.streetName desc, a.country desc
```

Result SQL

idAddress	streetNa...	country	streetNumber	deleted	studentList	version
6	Piura	Peru	336	0	[Student{i...	0
5	Macarena	Colombia	208	0	[Student{i...	0
8	King Street	U.S	280	0	[Student{i...	0
7	High Street	Austrialia	10	0	[Student{i...	0
4	Bolivia	Colombia	56	0	[]	0

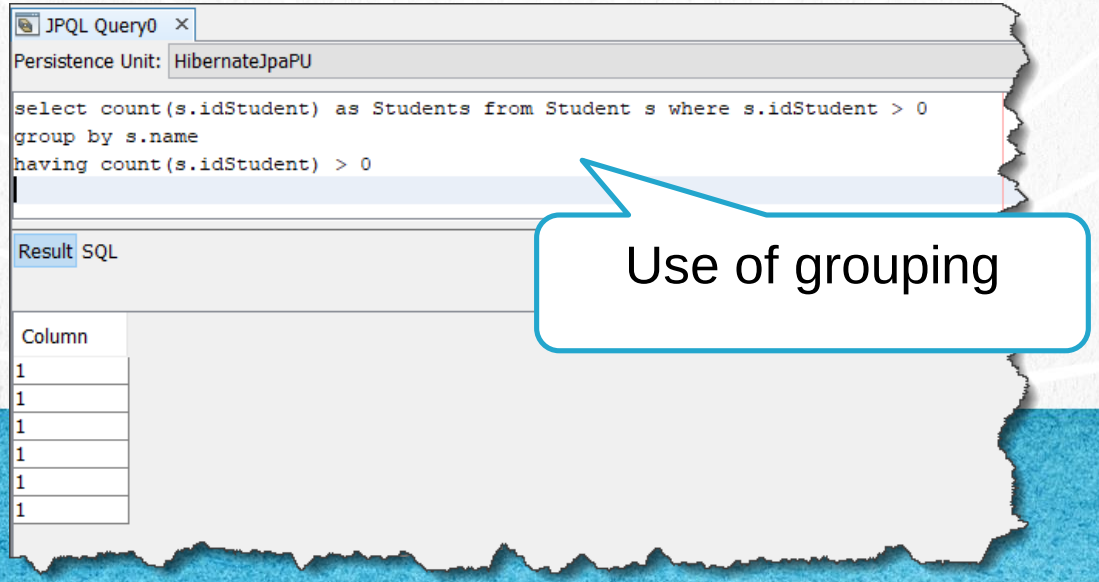
Use of > operator and ordering with order by

23. EXECUTE THE JPQL QUERY

We execute the following query:

```
select count(s.idStudent) as Students from Student s where s.idStudent > 0
group by s.name
having count(s.idStudent) > 0
```

Result: Return the student count, grouping by name, where the student ID is greater than zero and the group count contains at least 1 item.



24. EXECUTE THE JPQL QUERY

We execute the following query:

```
select s from Student s
where s.idStudent in ( select min(s1.idStudent) from Student s1 )
```

Result: Return the student whose id is the smallest of the idAlumno. the support of this functionality depends on the database used.

JPQL Query0

Persistence Unit: HibernateJpaPU

```
select s from Student s
where s.idStudent in ( select min(s1.idStudent) from Student s1 )
```

Use of subquery

Result SQL

0 row(s) updated.; 1 row(s) selected.

idStudent	name	address	assignati...	deleted	user	version
1	Juan	Address{idAddress=1, streetName=Reforma...	[Assignati...	0	User{idUs...	0

25. EXECUTE THE JPQL QUERY

We execute the following query :

```
from Student s join s.address a
```

Result: Return the students without returning their relationships as is their address or contact.

JPQL Query0

Persistence Unit: HibernateJpaPU

```
from Student s
join s.address a
```

Using join with lazy loading

Result SQL

0 row(s) updated.; 6 row(s) selected.

[0].idStu...	[0].name	[0].addr...	[0].assig...	[0].deleted	[0].user	[0].version	[1].idAdd...	[1].stree...	[1].country	[1].stree...	[1].studentList	[1].version	[1].deleted
1	Juan	Address{i...	[Assignati...	0	User{idUs...	0	1	Reforma	Mexico	555	[Student{idStud...	0	0
2	Charly	Address{i...	[]	0	<NULL>	0	3	Merside	England	419	[Student{idStud...	0	0
4	Sara	Address{i...	[]	0	<NULL>	0	5	Macarena	Colombia	208	[Student{idStud...	0	0
5	Elder	Address{i...	[]	0	<NULL>	0	6	Piura	Peru	336	[Student{idStud...	0	0
6	Oliver	Address{i...	[]	0	<NULL>	0	7	High Street	Austrialia	10	[Student{idStud...	0	0
7	Emma	Address{i...	[]	0	<NULL>	0	8	King Street	U.S	280	[Student{idStud...	0	0

26. EXECUTE THE JPQL QUERY

We execute the following query :

```
from Student s left join fetch s.address a
```

Result: Return the students also loading the relationships as address.

JPQL Query0

Persistence Unit: HibernateJpaPU

```
from Student s
left join fetch s.address a
```

Using left join with eager loading

Result SQL

0 row(s) updated.; 6 row(s) selected.

idStudent	name	address	assignati...	deleted	user	version
1	Juan	Address{idAddress=1, streetName=Reforma, streetN...	[Assignati...	0	User{idUs...	0
2	Charly	Address{idAddress=3, streetName=Merside, streetNu...	[]	0	<NULL>	0
4	Sara	Address{idAddress=5, streetName=Macarena, street...	[]	0	<NULL>	0
5	Elder	Address{idAddress=6, streetName=Piura, streetNumb...	[]	0	<NULL>	0
6	Oliver	Address{idAddress=7, streetName=High Street, stree...	[]	0	<NULL>	0
7	Emma	Address{idAddress=8, streetName=King Street, stree...	[]	0	<NULL>	0

EXERCISE CONCLUSION

With this exercise we have reviewed several of the queries that we can execute with HQL / JPQL.

From simple queries, with parameters, ordering, groupings, lazy loading and eager loading, among several other examples.

Then we will execute these queries but from Java code.

ONLINE COURSE

HIBERNATE & JPA

By: Eng. Ubaldo Acosta