Querydsl - ####

Timo Westkämper
Samppa Saarela
Vesa Marttila
Lassi Immonen
Ruben Dijkstra

Querydsl - ####

Timo Westkämper, Samppa Saarela, Vesa Marttila, Lassi Immonen, ### Ruben Dijkstra

3.6.3

Legal Notice

##

##

Querydsl ## ### #### SQL# ## ### ### # ### # ## ######. #### ##### XML ### ### #### ##, Querydsl # #### ####(Fluent) API# #### ### ### # ##.

Fluent API# ### ## ### ### ##.

1. IDE# ## ## ## ## ##
2. ##### ### ### #### ##
3. ### ### ##### #### ### # ##
4. ### ### ##### # # # # ##

1#. Introduction

1.1. Background

Querydsl# ### ### #### HQL ### #### ## #### #####. HQL ### ###### String ### #### ##, ## #### # ## ### ### ### ### ####. String# #### ### ### ##### ###### ## ### ### ### ## # # ###, ## String # #### HQL ### # #### # ## ###.

##. #### ### ##### ### ####, ## ## #### ## #### ### # ##### ### # ### #### ## # ## ##.

Querydsl# ## ## ## ### Hibernate# HQL####, ### JPA, JDO, JDBC, Lucene, Hibernate Search, MongoDB, ### ### RDFBean# ####.

1.2.

Querydsl# ## ### ## *###(Type safety)*##. ### ### ##### #### ### ## ### #### ### #### ##. ##, ### # ## ### #### ##/### ### #####.

###(consistency)##. ## ### #### ## ### ###### ## ####, Query ###### ### ## ###### ###.

####. ## ## ## ### #### #### ### ####.

Javadoc## com.mysema.query.Query, com.mysema.query.Projectable ### com.mysema.query.types.Expression# ### ## Querydsl ### ## ### #### #### ## # ###.

2#.

Querydsl# #### ## ### ### ## ## ### ####.

2.1. JPA

Querydsl# ## ### ### ## ### # ## #### ## ## ### #### ##. JDO# JPA# Querydsl# #### ## ####. # ## ##### JPA# ## Querydsl# #### ### ####.

Querydsl# JPQL# Criteria ### ## ### # ##. Querydsl# Criteria ### ### ### JPQL# #### ### ### #### ####.

##

####.

```
<dependency>
  <groupId>com.mysema.querydsl</groupId>
  <artifactId>querydsl-apt</artifactId>
  <version>${querydsl.version}</version>
  <scope>provided</scope>
</dependency>

<dependency>
  <groupId>com.mysema.querydsl</groupId>
  <artifactId>querydsl-jpa</artifactId>
  <version>${querydsl.version}</version>
</dependency>

<dependency>
  <groupId>org.slf4j</groupId>
  <artifactId>slf4j-log4j12</artifactId>
  <version>1.6.1</version>
</dependency>
```

APT ##### ####.

```
<project>
  <build>
  <plugins>
    ...
    <plugin>
      <groupId>com.mysema.maven</groupId>
      <artifactId>apt-maven-plugin</artifactId>
      <version>1.1.3</version>
      <executions>
        <execution>
          <goals>
            <goal>process</goal>
          </goals>
          <configuration>
            <outputDirectory>target/generated-sources/java</outputDirectory>
            <processor>com.mysema.query.apt.jpa.JPAAnnotationProcessor</processor>
          </configuration>
        </execution>
      </executions>
    </plugin>
    ...
  </plugins>
  </build>
</project>
```

JPAAnnotationProcessor# javax.persistence.Entity ###### ## ### ### ### ## ### ####.

Hibernate ###### ####, APT ##### `com.mysema.query.apt.hibernate.HibernateAnnotationProcessor`# #### ##.

mvn clean install # ####, target/generated-sources/java ##### Query ### ####.

##, mvn eclipse:eclipse # #### target/generated-sources/java ##### ## ### ####.

Query ### #### JPA ## ##### ## ### ## ##### ### # ##.

Ant

full-deps# ### jar #### #####, ## #### #### Querydsl ### ####.

```
    <!-- APT based code generation -->
    <javac srcdir="${src}" classpathref="cp">
      <compilerarg value="-proc:only"/>
      <compilerarg value="-processor"/>
      <compilerarg value="com.mysema.query.apt.jpa.JPAAnnotationProcessor"/>
      <compilerarg value="-s"/>
      <compilerarg value="${generated}"/>
    </javac>

    <!-- compilation -->
    <javac classpathref="cp" destdir="${build}">
      <src path="${src}"/>
      <src path="${generated}"/>
    </javac>
```

src# ## ## ### ####, generated# ### ### ## ### ####, build# ### ## ### ####.

Roo## Querydsl JPA

Roo## Querydsl JPA# #####, `com.mysema.query.apt.jpa.JPAAnnotationProcessor` ## `com.mysema.query.apt.roo.RooAnnotationProcessor#` ### # ##. RooAnnotationProcessor# `@Entity#` ### ### ## `@RooJpaEntity#` `@RooJpaActiveRecord` ### ### ### #### ####.

APT ### ## ## ### AspectJ IDT## # #### ###.

hbm.xml #### ## ##

######## XML ## ### #### ###, Querydsl ### #### ## XML ##### ### # ##.

`com.mysema.query.jpa.codegen.HibernateDomainExporter#` # ### ####.

```
HibernateDomainExporter exporter = new HibernateDomainExporter(
  "Q",                    // name prefix
  new File("target/gen3"), // target folder
  configuration);          // instance of org.hibernate.cfg.Configuration

exporter.export();
```

HibernateDomainExporter# ##### #### #### #### ### #### ###, HibernateDomainExporter# ##### ## #### ### ### #### ##.

JPA ###### #####, @QueryInit## @QueryType# ## Querydsl ###### ####.

####

Querydsl# #### ### #####, ### Query #### #### ##. ## #### #####.

####.

```
@Entity
public class Customer {
    private String firstName;
    private String lastName;

    public String getFirstName(){
        return firstName;
    }

    public String getLastName(){
        return lastName;
    }

    public void setFirstName(String fn){
        firstName = fn;
    }

    public void setLastName(String ln) {
        lastName = ln;
    }
}
```

Querydsl# Customer# ### #### QCustomer## ### ## ## ### ####. Querydsl #### Customer ### ## ## ## ### QCustomer# ####.

QCustomer# ## #### ### ## ###, ### ## ## ### ### # ##.

```
QCustomer customer = QCustomer.customer;
```

Customer ### ## ### ## ##.

```
QCustomer customer = new QCustomer("myCustomer");
```

##

Querdsl JPA ### JPA# Hibernate API# ## ####.

JPA API# ##### ### ## `JPAQuery` ##### #### ##.

```
// where entityManager is a JPA EntityManager
JPAQuery query = new JPAQuery(entityManager);
```

Hibernate# #####, `HibernateQuery`# #### ##.

```
// where session is a Hibernate session
HibernateQuery query = new HibernateQuery(session);
```

JPAQuery# HibernateQuery# # # JPQLQuery ###### #### ##.

firstName ##### Bob# Customer# #### ### ### ### #### ##.

```
QCustomer customer = QCustomer.customer;
JPAQuery query = new JPAQuery(entityManager);
Customer bob = query.from(customer)
  .where(customer.firstName.eq("Bob"))
  .uniqueResult(customer);
```

from #### ## ##(##)# ####, where ### ### ####, uniqueResult# ##### ####, 1# ### ##### ####.

####.

```
QCustomer customer = QCustomer.customer;
QCompany company = QCompany.company;
query.from(customer, company);
```

##.

```
query.from(customer)
    .where(customer.firstName.eq("Bob"), customer.lastName.eq("Wilson"));
```

##, ### ## ## ##.

```
query.from(customer)
    .where(customer.firstName.eq("Bob").and(customer.lastName.eq("Wilson")));
```

JPQL ### #### ### ## ###.

```
from Customer as customer
    where customer.firstName = "Bob" and customer.lastName = "Wilson"
```

or# #### ### ## ### ####.

```
query.from(customer)
    .where(customer.firstName.eq("Bob").or(customer.lastName.eq("Wilson")));
```

##

Querydsl# JPQL# ## ##, ##, ### ##, #### ####. ## ## ### #### ## ### ## ####.

```
QCat cat = QCat.cat;
QCat mate = new QCat("mate");
QCate kitten = new QCat("kitten");
query.from(cat)
    .innerJoin(cat.mate, mate)
    .leftJoin(cat.kittens, kitten)
    .list(cat);
```

JPQL# #### ### ##.

```
from Cat as cat
    inner join cat.mate as mate
    left outer join cat.kittens as kitten
```

##.

```
query.from(cat)
    .leftJoin(cat.kittens, kitten)
    .on(kitten.bodyWeight.gt(10.0))
    .list(cat);
```

JPQL ### ### ##.

```
from Cat as cat
    left join cat.kittens as kitten
    on kitten.bodyWeight > 10.0
```

##

JPQLQuery ###### cascading #### ### ##.

from: ## ### ####.

innerJoin, join, leftJoin, fullJoin, on: ## ### ####. ## ##### # ## ### ## ####, # ## ### ##(##)##.

where: ## ### ####. ##### and/or #### #### ### ####.

groupBy: #### ### ### #### ### ####.

having: Predicate #### #### "group by" #### ### ####.

orderBy: ## #### #### ## ### ####. ### #### #### asc()# desc()# ####, OrderSpecifier# #### ## ## # # #### ####.

limit, offset, restrict: ### #### ####. limit# ## ## ##, offset# ### ## #, restrict# limit# offset# ## ####.

##

##.

```
QCustomer customer = QCustomer.customer;
query.from(customer)
    .orderBy(customer.lastName.asc(), customer.firstName.desc())
    .list(customer);
```

JPQL# ####.

```
from Customer as customer
    order by customer.lastName asc, customer.firstName desc
```

###

####.

```
query.from(customer)
    .groupBy(customer.lastName)
    .list(customer.lastName);
```

JPQL# ### ##.

```
select customer.lastName
    from Customer as customer
    group by customer.lastName
```

DeleteClause

Querydsl JPA## DeleteClause# ### delete-where-execute ### ###. ### # ## ##.

```
QCustomer customer = QCustomer.customer;
// delete all customers
new JPADeleteClause(entityManager, customer).execute();
// delete all customers with a level less than 3
new JPADeleteClause(entityManager, customer).where(customer.level.lt(3)).execute();
```

JPADeleteClause #### # ## ##### ### ### ####. where# ### ## ### # ###, execute# #### ### #### # ## #### ### ####.

Hibernate ###, HibernateDeleteClause# #### ##.

JPA# DML ## JPA ### ### ## ### ### ##, 2# ## #### #### ###.

UpdateClause

Querydsl JPA# UpdateClause# ### update-set/where-execute ### ###. ### # ## ##.

```
QCustomer customer = QCustomer.customer;
// rename customers named Bob to Bobby
new JPAUpdateClause(session, customer).where(customer.name.eq("Bob"))
    .set(customer.name, "Bobby")
    .execute();
```

JPAUpdateClause #### # ## ##### ### ### ####. set# SQL# update #### #### ### ####, execute# ### # ### #### ### #### ### ####.

Hibernate ###, HibernateUpdateClause# ####.

JPA## DML ## JPA ### ### ## ### ### ##, 2# ## ### #### ###.

####

JPASubQuery# #### ##. ##### ### ## from #### ## ##### ####, unique# list# ####. unique # ## ### ## #### list# ### ### ## ####. ##### #### ### ### Querydsl #####.

```
QDepartment department = QDepartment.department;
QDepartment d = new QDepartment("d");
query.from(department)
    .where(department.employees.size().eq(
        new JPASubQuery().from(d).unique(d.employees.size().max())
     )).list(department);
```

##

```
QEmployee employee = QEmployee.employee;
QEmployee e = new QEmployee("e");
query.from(employee)
    .where(employee.weeklyhours.gt(
        new JPASubQuery().from(employee.department.employees, e)
        .where(e.manager.eq(employee.manager))
        .unique(e.weeklyhours.avg())
    )).list(employee);
```

Hibernate# ### ##, HibernateSubQuery# #### ##.

JPA Query

JPA Query# ### ###, ## ### ####.

```
JPAQuery query = new JPAQuery(entityManager);
Query jpaQuery = query.from(employee).createQuery(employee);
// ...
List results = jpaQuery.getResultList();
```

JPA #### #### SQL

JPASQLQuery #### #### JPA# #### SQL# Querydsl## ### # ##.

SQL #### ## Querydsl ## ### #### ##. ### ## ## Maven ## ## #### ##.

```
<project>
  <build>
    <plugins>
      ...
      <plugin>
        <groupId>com.mysema.querydsl</groupId>
        <artifactId>querydsl-maven-plugin</artifactId>
        <version>${querydsl.version}</version>
        <executions>
          <execution>
            <goals>
              <goal>export</goal>
            </goals>
          </execution>
        </executions>
        <configuration>
          <jdbcDriver>org.apache.derby.jdbc.EmbeddedDriver</jdbcDriver>
          <jdbcUrl>jdbc:derby:target/demoDB;create=true</jdbcUrl>
          <packageName>com.mycompany.mydomain</packageName>
          <targetFolder>${project.basedir}/target/generated-sources/java</targetFolder>
        </configuration>
        <dependencies>
          <dependency>
            <groupId>org.apache.derby</groupId>
            <artifactId>derby</artifactId>
            <version>${derby.version}</version>
          </dependency>
        </dependencies>
      </plugin>
      ...
    </plugins>
  </build>
</project>
```

#####, #### # ### ### # ##.

##:

```
// serialization templates
SQLTemplates templates = new DerbyTemplates();
// query types (S* for SQL, Q* for domain types)
SAnimal cat = new SAnimal("cat");
SAnimal mate = new SAnimal("mate");
QCat catEntity = QCat.cat;

JPASQLQuery query = new JPASQLQuery(entityManager, templates);
List<String> names = query.from(cat).list(cat.name);
```

###(#, QCat)# ###(#, SAnimal)# ## ### ## ## ###, ## #### ### ## ##. SAnimal.animal# "animal"# # #### #### ### #### (new SAnimal("cat"))# ## ####.

##.

```
QCat catEntity = QCat.cat;
SAnimal cat = new SAnimal(catEntity.getMetadata().getName());
```

##:

```
query = new JPASQLQuery(entityManager, templates);
List<Object[]> rows = query.from(cat).list(cat.id, cat.name);
```

##:

```
List<Object[]> rows = query.from(cat).list(cat.all());
```

SQL# ### ##, ### #### ###:

```
query = new JPASQLQuery(entityManager, templates);
List<Cat> cats = query.from(cat).orderBy(cat.name.asc()).list(catEntity);
```

##:

```
query = new JPASQLQuery(entityManager, templates);
cats = query.from(cat)
    .innerJoin(mate).on(cat.mateId.eq(mate.id))
    .where(cat.dtype.eq("Cat"), mate.dtype.eq("Cat"))
    .list(catEntity);
```

DTO# ###:

```
query = new JPASQLQuery(entityManager, templates);
List<CatDTO> catDTOs = query.from(cat)
    .orderBy(cat.name.asc())
    .list(ConstructorExpression.create(CatDTO.class, cat.id, cat.name));
```

JPA API ## ###### API# #####, HibernateSQLQuery# ####.

2.2. JDO

Querydsl# ## ### ### ## ### # ## #### ## ## ### #### ##. JDO# JPA# Querydsl# #### ## ####. # ## ##### JDO# ## Querydsl# #### ### ####.

###

####.

```
<dependency>
  <groupId>com.mysema.querydsl</groupId>
  <artifactId>querydsl-apt</artifactId>
  <version>${querydsl.version}</version>
  <scope>provided</scope>
</dependency>

<dependency>
  <groupId>com.mysema.querydsl</groupId>
  <artifactId>querydsl-jdo</artifactId>
  <version>${querydsl.version}</version>
</dependency>

<dependency>
  <groupId>org.slf4j</groupId>
  <artifactId>slf4j-log4j12</artifactId>
  <version>1.6.1</version>
</dependency>
```

Querydsl## ## ### #### ## #### ### APT ##### ####.

```
<project>
  <build>
    <plugins>
      ...
      <plugin>
        <groupId>com.mysema.maven</groupId>
        <artifactId>apt-maven-plugin</artifactId>
        <version>1.1.3</version>
        <executions>
          <execution>
            <goals>
              <goal>process</goal>
            </goals>
            <configuration>
              <outputDirectory>target/generated-sources/java</outputDirectory>
              <processor>com.mysema.query.apt.jdo.JDOAnnotationProcessor</processor>
            </configuration>
          </execution>
        </executions>
      </plugin>
    ...
    </plugins>
  </build>
</project>
```

JDOAnnotationProcessor# `javax.jdo.annotations.PersistenceCapable` ###### ### ### # ## # ### ## ## ### ####.

`mvn clean install`# ####, target/generated-sources/java ##### Query ### ####.

##, `mvn eclipse:eclipse`# #### target/generated-sources/java ##### ## ### ####.

Query ### #### JDO ## ##### ## ### ## ##### ### # ##.

Ant

full-deps# ### jar #### #####, ## #### #### Querydsl ### ####.

```
    <!-- APT based code generation -->
    <javac srcdir="${src}" classpathref="cp">
      <compilerarg value="-proc:only"/>
      <compilerarg value="-processor"/>
      <compilerarg value="com.mysema.query.apt.jdo.JDOAnnotationProcessor"/>
      <compilerarg value="-s"/>
      <compilerarg value="${generated}"/>
    </javac>

    <!-- compilation -->
    <javac classpathref="cp" destdir="${build}">
      <src path="${src}"/>
      <src path="${generated}"/>
    </javac>
```

src# ## ## ### ####, *generated# ### ### ## ### ####*, *build# ### ## ### ####*.

####

Querydsl# #### ### #####, ### Query #### #### ##. ## #### #####.

####.

```
@PersistenceCapable
public class Customer {
  private String firstName;
  private String lastName;

  public String getFirstName() {
    return firstName;
  }

  public String getLastName() {
    return lastName;
  }

  public void setFirstName(String fn) {
    firstName = fn;
  }

  public void setLastName(String ln) {
    lastName = ln;
  }
}
```

Querydsl# Customer# ### #### QCustomer## ### ## ## ### ####. Querydsl #### Customer ### ## ## ## ### QCustomer# ####.

QCustomer# ## #### ### ## ###, ### ## ## ### ### # ##.

```
QCustomer customer = QCustomer.customer;
```

Customer ### ## ### ## ##.

```
QCustomer customer = new QCustomer("myCustomer");
```

QCustomer# ## Customer ### ## ##### public ### ####. firstName ### ### ## ### # ##.

```
customer.firstName;
```

##

JDOQuery# JDO ### ## Query #####, ### ## ##### ####.

```
PersistenceManager pm = ...;
JDOQuery query = new JDOQuery (pm);
```

firstName ##### Bob# Customer# #### ### ### ### #### ##.

```
QCustomer customer = QCustomer.customer;
JDOQuery query = new JDOQuery (pm);
Customer bob = query.from(customer)
  .where(customer.firstName.eq("Bob"))
  .uniqueResult(customer);
query.close();
```

from #### ## ##(##)# ####, where ### ### ####, uniqueResult# ##### #### 1# ### ##### ####.

####.

```
QCustomer customer = QCustomer.customer;
QCompany company = QCompany.company;
query.from(customer, company);
```

##.

```
query.from(customer)
    .where(customer.firstName.eq("Bob"), customer.lastName.eq("Wilson"));
```

##, ### ## ## ##.

```
query.from(customer)
    .where(customer.firstName.eq("Bob").and(customer.lastName.eq("Wilson")));
```

or# #### ### ## ### ####.

```
query.from(customer)
    .where(customer.firstName.eq("Bob").or(customer.lastName.eq("Wilson")));
```

##

JDOQuery #### cascading #### ### ##.

from: ## ### ####. # ## ### ## ### ##, #### ### ####.

where: ## ### ####. ##### and/or #### #### ### ####.

groupBy: #### ### ### #### ### ####.

having: Predicate #### #### "group by" #### ### ####.

orderBy: ## #### #### ## ### ####. ### #### #### asc()# desc()# ####, OrderSpecifier# #### ## ## ## #### ####.

limit, offset, restrict: ### #### ####. limit# ## ## ##, offset# ### ## #, restrict# limit# offset# ## ####.

##

##.

```
QCustomer customer = QCustomer.customer;
query.from(customer)
    .orderBy(customer.lastName.asc(), customer.firstName.desc())
    .list(customer);
```

###

####.

```
query.from(customer)
    .groupBy(customer.lastName)
    .list(customer.lastName);
```

DeleteClause

Querydsl JDO## DeleteClause# ### delete-where-execute ### ###. ### # ## ##.

```
QCustomer customer = QCustomer.customer;
// delete all customers
new JDODeleteClause(pm, customer).execute();
// delete all customers with a level less than 3
new JDODeleteClause(pm, customer).where(customer.level.lt(3)).execute();
```

JDODeleteClause #### # ## ##### ### ### ####. where# ### ## ### # ###, execute# #### ### #### ## #### ### ####.

####

`JDOSubQuery`# #### ##. ##### ### ## from #### ## ##### ####, unique# list# ####. unique # ## ### ## #### list# ### ### ## ####. ##### #### ### ### Querydsl #####.

```
QDepartment department = QDepartment.department;
QDepartment d = new QDepartment("d");
query.from(department)
    .where(department.employees.size().eq(
        new JDOSubQuery().from(d).unique(AggregationFunctions.max(d.employees.size()))
     )).list(department);
```

JDO ### ####.

```
SELECT this FROM com.mysema.query.jdoql.models.company.Department
WHERE this.employees.size() ==
(SELECT max(d.employees.size()) FROM com.mysema.query.jdoql.models.company.Department d)
```

##

```
QEmployee employee = QEmployee.employee;
QEmployee e = new QEmployee("e");
query.from(employee)
    .where(employee.weeklyhours.gt(
        new JDOSubQuery().from(employee.department.employees, e)
        .where(e.manager.eq(employee.manager))
        .unique(AggregationFunctions.avg(e.weeklyhours))
    )).list(employee);
```

JDO ### ####.

```
SELECT this FROM com.mysema.query.jdoql.models.company.Employee
WHERE this.weeklyhours >
(SELECT avg(e.weeklyhours) FROM this.department.employees e WHERE e.manager == this.manager)
```

SQL

`JDOSQLQuery` #### #### JDO# #### SQL# Querydsl## ### # ##.

SQL #### ## Querydsl ## ### #### ##. ### ## ## Maven ## ## #### ##.

```
<project>
  <build>
    <plugins>
      ...
      <plugin>
        <groupId>com.mysema.querydsl</groupId>
        <artifactId>querydsl-maven-plugin</artifactId>
        <version>${querydsl.version}</version>
        <executions>
          <execution>
            <goals>
              <goal>export</goal>
            </goals>
          </execution>
        </executions>
        <configuration>
          <jdbcDriver>org.apache.derby.jdbc.EmbeddedDriver</jdbcDriver>
          <jdbcUrl>jdbc:derby:target/demoDB;create=true</jdbcUrl>
          <packageName>com.mycompany.mydomain</packageName>
          <targetFolder>${project.basedir}/target/generated-sources/java</targetFolder>
        </configuration>
        <dependencies>
          <dependency>
            <groupId>org.apache.derby</groupId>
            <artifactId>derby</artifactId>
            <version>${derby.version}</version>
          </dependency>
        </dependencies>
      </plugin>
      ...
    </plugins>
  </build>
</project>
```

#####, #### # ### ### # ##.

##:

```
// serialization templates
SQLTemplates templates = new DerbyTemplates();
// query types (S* for SQL, Q* for domain types)
SAnimal cat = new SAnimal("cat");
SAnimal mate = new SAnimal("mate");

JDOSQLQuery query = new JDOSQLQuery(pm, templates);
List<String> names = query.from(cat).list(cat.name);
```

##:

```
query = new JDOSQLQuery(pm, templates);
List<Object[]> rows = query.from(cat).list(cat.id, cat.name);
```

##:

```
List<Object[]> rows = query.from(cat).list(cat.all());
```

##:

```
query = new JDOSQLQuery(pm, templates);
cats = query.from(cat)
    .innerJoin(mate).on(cat.mateId.eq(mate.id))
    .where(cat.dtype.eq("Cat"), mate.dtype.eq("Cat"))
    .list(catEntity);
```

DTO# ###:

```
query = new JDOSQLQuery(pm, templates);
List<CatDTO> catDTOs = query.from(cat)
    .orderBy(cat.name.asc())
    .list(ConstructorExpression.create(CatDTO.class, cat.id, cat.name));
```

2.3. SQL

SQL ### ## ## ### ## ### ####.

##

####.

```
<dependency>
  <groupId>com.mysema.querydsl</groupId>
  <artifactId>querydsl-sql</artifactId>
  <version>${querydsl.version}</version>
</dependency>

<dependency>
  <groupId>com.mysema.querydsl</groupId>
  <artifactId>querydsl-sql-codegen</artifactId>
  <version>${querydsl.version}</version>
  <scope>provided</scope>
</dependency>

<dependency>
  <groupId>org.slf4j</groupId>
  <artifactId>slf4j-log4j12</artifactId>
  <version>1.6.1</version>
</dependency>
```

Ant## # ## querydsl-sql-codegen ### ### # ##.

##

####. ### ## ##.

```
<project>
  <build>
    <plugins>
      ...
      <plugin>
        <groupId>com.mysema.querydsl</groupId>
        <artifactId>querydsl-maven-plugin</artifactId>
        <version>${querydsl.version}</version>
        <executions>
          <execution>
            <goals>
              <goal>export</goal>
            </goals>
          </execution>
        </executions>
        <configuration>
          <jdbcDriver>org.apache.derby.jdbc.EmbeddedDriver</jdbcDriver>
          <jdbcUrl>jdbc:derby:target/demoDB;create=true</jdbcUrl>
          <packageName>com.myproject.domain</packageName>
          <targetFolder>${project.basedir}/target/generated-sources/java</targetFolder>
        </configuration>
        <dependencies>
          <dependency>
            <groupId>org.apache.derby</groupId>
            <artifactId>derby</artifactId>
            <version>${derby.version}</version>
          </dependency>
        </dependencies>
      </plugin>
      ...
    </plugins>
  </build>
</project>
```

targetFolder# ##### *test-export* ## #### ##.

 # 2.1. ####

##	##
jdbcDriver	JDBC #### ### ##
jdbcUrl	JDBC URL
jdbcUser	JDBC ###
jdbcPassword	JDBC ##
namePrefix	### ## #### ### (##: Q)

##	##
nameSuffix	### ## #### ### (##:)
beanPrefix	### #Bean #### ###
beanSuffix	### # #### ###
packageName	### ## ### ### ###
beanPackageName	# ### ### ### ## (##: packageName)
beanInterfaces	# #### ### ##### ## (##: ##)
beanAddToString	true# #### ## toString() ### ## (##: false)
beanAddFullConstructor	true# #### ## ### ## ### #### ## (##: false)
beanPrintSupertype	true# #### ## ### ## (##: false)
schemaPattern	### ## ##. ### ####### #### ### ### #### ##. (## #: null)
tableNamePattern	### ## ##. ### ####### #### ### ### #### ##, ## # #### # # ## ### # ##. (##: null)
targetFolder	## ### ### ### ##
namingStrategyClass	NamingStrategy# ### ### ### ## (##: DefaultNamingStrategy)
beanSerializerClass	BeanSerializer# ### ### ## (##: BeanSerializer)
serializerClass	Serializer# ### ### ## (##: MetaDataSerializer)
exportBeans	true# #### ## ## ##. 2.14.13 ##. (##: false)
innerClassesForKeys	true# #### ## ## #### ## (##: false)
validationAnnotations	true# #### Validation ###### #### #### # (##: false)
columnAnnotations	true# #### ## ###### ### (##: false)
createScalaSources	true# #### ## ## ## Scala ### ### (##: false)
schemaToPackage	true# #### ### ### #### ## (##: false)
lowerCase	true# #### ### #### ## (##: false)
exportTables	true# #### #### ## (##: true)
exportViews	true# ### ## ## (##: true)

##	##
exportPrimaryKeys	true# #### PK# ## (##: true)
exportForeignKeys	true# #### #### ## (##: true)
customTypes	### ### ## (##: ##)
typeMappings	###.#### ## #### ## (##: ##)
numericMappings	##/#### ## #### ## (##: ##)
imports	### ## #### ### ## import ##: #### ## (.* ##) ### ###(#, *com.bar*), #### ## ### ### ## (#, *com.bar.Foo*) ##. (##: ##)

customTypes# ####.

```
<customTypes>
  <customType>com.mysema.query.sql.types.InputStreamType</customType>
</customTypes>
```

###.### ## ## ### #### ## # typeMappings# ####.

```
<typeMappings>
  <typeMapping>
    <table>IMAGE</table>
    <column>CONTENTS</column>
    <type>java.io.InputStream</type>
  </typeMapping>
</typeMappings>
```

##.

 # 2.2. ## ##

##	**##(Digits)**	##
> 18	0	BigInteger
> 9	0	Long
> 4	0	Integer
> 2	0	Short
> 0	0	Byte
> 16	> 0	BigDecimal

##	**##(Digits)**	##
> 0	> 0	Double

##/### ## ### ### ### ## ####.

```
<numericMappings>
  <numericMapping>
    <size>1</size>
    <digits>0</digits>
    <javaType>java.lang.Byte</javaType>
  </numericMapping>
</numericMappings>
```

Import# #### ### ### ### ### ### # ##.

APT ## ## ### ### # ## ### ### # ##. (#, QueryDelegate ##### ##)

ANT# ## ##

Querydsl-sql ### #### `com.mysema.query.sql.ant.AntMetaDataExporter` ANT #### ANT ###(## ANT ###?)# ## ### ####. #### ## ###### ### ##### ####.

###

DB #### Querydsl# ## #### #### ### ## ## ##.

```
java.sql.Connection conn = ...;
MetaDataExporter exporter = new MetaDataExporter();
exporter.setPackageName("com.myproject.mydomain");
exporter.setTargetFolder(new File("target/generated-sources/java"));
exporter.export(conn.getMetaData());
```

##(com.myproject.mydomain #### ##)# target/generated-sources/java ##### ###.

##, ## ## #### ### ### ### ## ### ##.

###, ### ## ### ## PK# FK# ## ### ####.

##

com.mysema.query.sql.Configuration #### #### ####, Configuration #### ### ### Querydsl SQL Dialect # ###. ## ##, H2 DB ### ### ## ####.

```
SQLTemplates templates = new H2Templates();
Configuration configuration = new Configuration(templates);
```

Querydsl# ## ## RDBMS# ## SQL #### ######## ## SQL Dialect# ####. ##### Dialect# ### ##.

- CUBRIDTemplates (tested with CUBRID 8.4)
- DB2Templates (tested with DB2 10.1.2)
- DerbyTemplates (tested with Derby 10.8.2.2)
- FirebirdTemplates (tested with Firebird 2.5)
- HSQLDBTemplates (tested with HSQLDB 2.2.4)
- H2Templates (tested with H2 1.3.164)
- MySQLTemplates (tested with MySQL 5.5)
- OracleTemplates (test with Oracle 10 and 11)
- PostgresTemplates (tested with PostgreSQL 9.1)
- SQLiteTemplates (tested with xerial JDBC 3.7.2)
- SQLServerTemplates (tested with SQL Server)
- SQLServer2005Templates (for SQL Server 2005)
- SQLServer2008Templates (for SQL Server 2008)
- SQLServer2012Templates (for SQL Server 2012 and later)
- TeradataTemplates (tested with Teradata 14)

SQLTemplate ### ### ##### ### ## ## ### ### # ##.

```
H2Templates.builder()
   .printSchema() // to include the schema in the output
   .quote()       // to quote names
   .newLineToSingleSpace() // to replace new lines with single space in the output
   .escape(ch)    // to set the escape char
   .build();      // to get the customized SQLTemplates instance
```

Configuration #### #### setUseLiterals(true)# ## #### ## ### ##, #### ### ###, ### ### ### # ##. ### ### javadoc# Configuration# ####.

##

Querydsl SQL# #### #### ### #### ####.

```
QCustomer customer = new QCustomer("c");

SQLQuery query = new SQLQuery(connection, configuration);
List<String> lastNames = query.from(customer)
    .where(customer.firstName.eq("Bob"))
    .list(customer.lastName);
```

SQL# #### ####. (### ### *customer*, ## ### *first_name*, *last_name*### ##)

```
SELECT c.last_name
FROM customer c
WHERE c.first_name = 'Bob'
```

##

SQLQuery #### cascading #### ### ##.

from: ## ### ####.

innerJoin, join, leftJoin, fullJoin, on: ## ### ####. ## ##### # ## ### ## ####, # ## ### ##(##)##.

where: ## ### ####. ##### and/or #### #### ### ####.

groupBy: #### ### ### #### ### ####.

having: Predicate #### #### "group by" #### ### ####.

orderBy: ## #### #### ## ### ####. ### #### #### asc()# desc()# ####, OrderSpecifier# #### ## ## # # #### ####.

limit, offset, restrict: ### #### ####. limit# ## ## ##, offset# ### ## #, restrict# limit# offset# ## ####.

##

##.

```
QCustomer customer = QCustomer.customer;
QCompany company = QCompany.company;
query.from(customer)
    .innerJoin(customer.company, company)
    .list(customer.firstName, customer.lastName, company.name);
```

##.

```
query.from(customer)
    .leftJoin(customer.company, company)
    .list(customer.firstName, customer.lastName, company.name);
```

##.

```
query.from(customer)
    .leftJoin(company).on(customer.company.eq(company.id))
    .list(customer.firstName, customer.lastName, company.name);
```

##

####.

```
query.from(customer)
    .orderBy(customer.lastName.asc(), customer.firstName.asc())
    .list(customer.firstName, customer.lastName);
```

SQL ### ####.

```
SELECT c.first_name, c.last_name
FROM customer c
ORDER BY c.last_name ASC, c.first_name ASC
```

###

##.

```
query.from(customer)
    .groupBy(customer.lastName)
    .list(customer.lastName);
```

SQL ###.

```
SELECT c.last_name
FROM customer c
GROUP BY c.last_name
```

####

SQLSubQuery# #### ##. ##### ### ## from #### ## ##### ####, unique# list# ####. unique # ## ### ## #### list# ### ### ## ####. ##### #### ### ### Querydsl #####.

```
QCustomer customer = QCustomer.customer;
QCustomer customer2 = new QCustomer("customer2");
query.from(customer).where(
  customer.status.eq(new SQLSubQuery().from(customer2).unique(customer2.status.max()))
  .list(customer.all())
```

##

```
QStatus status = QStatus.status;
query.from(customer).where(
  customer.status.in(new SQLSubQuery().from(status).where(status.level.lt(3)).list(status.id))
  .list(customer.all())
```

##

#####, ### ## constant ##### ##### ##.

```
query.list(Expressions.constant(1),
           Expressions.constant("abc"));
```

`com.mysema.query.support.Expressions` #### ####, #####, ### ### ## ### ## #### ####.

##

####. ### ## ### AbstractSQLQuery# #### ### # ##. ### MySQLQuery ##### #### #### ## #### ##.

```
public class MySQLQuery extends AbstractSQLQuery<MySQLQuery> {

    public MySQLQuery(Connection conn) {
        this(conn, new MySQLTemplates(), new DefaultQueryMetadata());
    }

    public MySQLQuery(Connection conn, SQLTemplates templates) {
        this(conn, templates, new DefaultQueryMetadata());
    }

    protected MySQLQuery(Connection conn, SQLTemplates templates, QueryMetadata metadata) {
        super(conn, new Configuration(templates), metadata);
    }

    public MySQLQuery bigResult() {
        return addFlag(Position.AFTER_SELECT, "SQL_BIG_RESULT ");
    }

    public MySQLQuery bufferResult() {
        return addFlag(Position.AFTER_SELECT, "SQL_BUFFER_RESULT ");
    }


    // ...
}
```

SQL ## ###. `com.mysema.query.QueryFlag.Position` # # ### #### ### #### ##.

##

Querydsl# `SQLExpressions` #### ### ### ### ####.

##.

```
query.from(employee)
    .list(SQLExpressions.rowNumber()
        .over()
        .partitionBy(employee.name)
        .orderBy(employee.id));
```

SQL

`SQLExpressions` #### ## #### #### ## SQL #### ### # ##.

DML ##

Querydsl SQL ### ## DMLClause #### Connection, ### ### SQLTemplate, DMLClause# ## ## #### # # ##### ### ##.

##

##

```
QSurvey survey = QSurvey.survey;

new SQLInsertClause(conn, configuration, survey)
    .columns(survey.id, survey.name)
    .values(3, "Hello").execute();
```

##

```
new SQLInsertClause(conn, configuration, survey)
    .values(4, "Hello").execute();
```

##

```
new SQLInsertClause(conn, configuration, survey)
    .columns(survey.id, survey.name)
    .select(new SQLSubQuery().from(survey2).list(survey2.id.add(1), survey2.name))
    .execute();
```

##, ##

```
new SQLInsertClause(conn, configuration, survey)
    .select(new SQLSubQuery().from(survey2).list(survey2.id.add(10), survey2.name))
    .execute();
```

columns/values# #### ##, set #### ##

```
QSurvey survey = QSurvey.survey;

new SQLInsertClause(conn, configuration, survey)
    .set(survey.id, 3)
    .set(survey.name, "Hello").execute();
```

####. set #### #### ##### columns/values# ####.

####.

```
columns(...).select(...)
```

executeWithKey/s #### ####.

```
set(...)
```

####. ## ## ### ### null# ####.

clause ##### ##### ### ### ####.

```
new SQLInsertClause(conn, configuration, survey)
    .populate(surveyBean).execute();
```

null# ####. null# ##### ### ## ### ####.

```
new SQLInsertClause(conn, configuration, survey)
    .populate(surveyBean, DefaultMapper.WITH_NULL_BINDINGS).execute();
```

##

where # ##

```
QSurvey survey = QSurvey.survey;

new SQLUpdateClause(conn, configuration, survey)
    .where(survey.name.eq("XXX"))
    .set(survey.name, "S")
    .execute();
```

where # ##

```
new SQLUpdateClause(conn, configuration, survey)
    .set(survey.name, "S")
    .execute();
```

##

```
new SQLUpdateClause(conn, configuration, survey)
    .populate(surveyBean)
    .execute();
```

##

where # ##

```
QSurvey survey = QSurvey.survey;

new SQLDeleteClause(conn, configuration, survey)
    .where(survey.name.eq("XXX"))
    .execute();
```

where ##

```
new SQLDeleteClause(conn, configuration, survey)
    .execute()
```

DMLClause# ##

Querydsl SQL# DML API# ### JDBC ## ##### ####. ## ### ## DML# #### ### ##, addBatch() #### # ### # DMLClause# ## # ##. UPDATE, DELETE, INSERT# ## ### ##### ### ####.

##:

```
QSurvey survey = QSurvey.survey;

insert(survey).values(2, "A").execute();
insert(survey).values(3, "B").execute();

SQLUpdateClause update = update(survey);
update.set(survey.name, "AA").where(survey.name.eq("A")).addBatch();
update.set(survey.name, "BB").where(survey.name.eq("B")).addBatch();
```

##:

```
insert(survey).values(2, "A").execute();
insert(survey).values(3, "B").execute();

SQLDeleteClause delete = delete(survey);
delete.where(survey.name.eq("A")).addBatch();
delete.where(survey.name.eq("B")).addBatch();
assertEquals(2, delete.execute());
```

##:

```
SQLInsertClause insert = insert(survey);
insert.set(survey.id, 5).set(survey.name, "5").addBatch();
insert.set(survey.id, 6).set(survey.name, "6").addBatch();
assertEquals(2, insert.execute());
```

##

MetaDataExporter# #### #### ## ### DTO ### ####.

```
java.sql.Connection conn = ...;
MetaDataExporter exporter = new MetaDataExporter();
exporter.setPackageName("com.myproject.mydomain");
exporter.setTargetFolder(new File("src/main/java"));
exporter.setBeanSerializer(new BeanSerializer());
exporter.export(conn.getMetaData());
```

DMLClause# populate #### ### # ### ### # ###, #### # ### ## ### # ##. ### JUnit## ### ### ###.

```
QEmployee e = new QEmployee("e");

// Insert
Employee employee = new Employee();
employee.setFirstname("John");
Integer id = insert(e).populate(employee).executeWithKey(e.id);
employee.setId(id);

// Update
employee.setLastname("Smith");
assertEquals(1l, update(e).populate(employee).where(e.id.eq(employee.getId())).execute());

// Query
Employee smith = query().from(e).where(e.lastname.eq("Smith")).uniqueResult(e);
assertEquals("John", smith.getFirstname());

// Delete
assertEquals(1l, delete(e).where(e.id.eq(employee.getId())).execute());
```

##.

```
protected SQLUpdateClause update(RelationalPath<?> e) {
    return new SQLUpdateClause(Connections.getConnection(), templates, e);
}

protected SQLInsertClause insert(RelationalPath<?> e) {
    return new SQLInsertClause(Connections.getConnection(), templates, e);
}

protected SQLDeleteClause delete(RelationalPath<?> e) {
    return new SQLDeleteClause(Connections.getConnection(), templates, e);
}

protected SQLMergeClause merge(RelationalPath<?> e) {
    return new SQLMergeClause(Connections.getConnection(), templates, e);
}

protected SQLQuery query() {
    return new SQLQuery(Connections.getConnection(), templates);
}
```

SQL ### ###

getSQL #### ### SQL ### ### ## ## # ##.

```
SQLBindings bindings = query.getSQL(customer.id, customer.firstname, customer.lastname);
System.out.println(bindings.getSQL());
```

SQL #### ### ## #### #####, setUseLiterals(true)# #### ### ### #### ##### ##.

##

Querydsl SQL# ResultSet/Statement## ### ## ### ####. com.mysema.query.sql.Configuration ### #### ### ## ### ####. Configuration ### ## ### ### ### ####.

```
Configuration configuration = new Configuration(new H2Templates());
// overrides the mapping for Types.DATE
configuration.register(new UtilDateType());
```

##

```
Configuration configuration = new Configuration(new H2Templates());
// declares a mapping for the gender column in the person table
configuration.register("person", "gender",  new EnumByNameType<Gender>(Gender.class));
```

registerNumeric #### ####.

```
configuration.registerNumeric(5,2,Float.class);
```

Float ### NUMERIC(5,2) #### ####.

Query# Clause

SQLListener# ### DMLClause# ### # # #### ### #######. Configuration## Query, Clause# addListener #### ### SQLListener ### ### # ##.

###, ##, ##, ### ##.

2.4. ##

####.

Maven integration

Querydsl ### ##### ## 3# querydsl-lucene3 ### ### ## 4# querydsl-lucene4 ### ####.

3:

```
<dependency>
  <groupId>com.mysema.querydsl</groupId>
  <artifactId>querydsl-lucene3</artifactId>
  <version>${querydsl.version}</version>
</dependency>

<dependency>
  <groupId>org.slf4j</groupId>
  <artifactId>slf4j-log4j12</artifactId>
  <version>1.6.1</version>
</dependency>
```

4:

```
<dependency>
  <groupId>com.mysema.querydsl</groupId>
  <artifactId>querydsl-lucene4</artifactId>
  <version>${querydsl.version}</version>
</dependency>

<dependency>
  <groupId>org.slf4j</groupId>
  <artifactId>slf4j-log4j12</artifactId>
  <version>1.6.1</version>
</dependency>
```

##

year# title ### ## ## ### ## ### # ##.

```
public class QDocument extends EntityPathBase<Document> {
    private static final long serialVersionUID = -4872833626508344081L;

    public QDocument(String var) {
        super(Document.class, PathMetadataFactory.forVariable(var));
    }

    public final StringPath year = createString("year");

    public final StringPath title = createString("title");
}
```

QDocument# year# title ### ## ## Document# ####.

##.

##

Querydsl #### #### ## ####.

```
QDocument doc = new QDocument("doc");

IndexSearcher searcher = new IndexSearcher(index);
LuceneQuery query = new LuceneQuery(true, searcher);
List<Document> documents = query
    .where(doc.year.between("1800", "2000").and(doc.title.startsWith("Huckle"))
    .list();
```

###.

```
+year:[1800 TO 2000] +title:huckle*
```

##

LuceneQuery #### cascading #### ### ##.

where: ## ### ####. ##### and/or #### #### ### ####. PStrings# #### ###### ####. (*matches*, *indexOf*, *charAt*# ##). ## *in*# #### ###, ## ### ####.

orderBy: ## #### #### ## ### ####. ### #### #### asc()# desc()# ####, OrderSpecifier# #### ## ## # # #### ####.

limit, offset, restrict: ### #### ####. limit# ## ## ##, offset# ### ## #, restrict# limit# offset# ## ####.

##

##.

```
query
    .where(doc.title.like("*"))
    .orderBy(doc.title.asc(), doc.year.desc())
    .list();
```

####.

```
title:*
```

title# year# ###### ### ####.

sort #### Sort ##### #### ### ### # ##.

```
Sort sort = ...;
query
    .where(doc.title.like("*"))
    .sort(sort)
    .list();
```

##

##.

```
query
    .where(doc.title.like("*"))
    .limit(10)
    .list();
```


####.

```
query
    .where(doc.title.like("*"))
    .offset(3)
    .list();
```

##(fuzzy)

`com.mysema.query.lucene.LuceneExpressions` ##### ### fuzzyLike #### #### ## ### # # ##.

```
query
    .where(LuceneExpressions.fuzzyLike(doc.title, "Hello"))
    .list();
```

####

##.

```
query
    .where(doc.title.like("*"))
    .filter(filter)
    .list();
```

distinct #### ## distinct(Path) #### ####.

```
query
    .where(doc.title.like("*"))
    .distinct(doc.title)
    .list();
```

2.5. Hibernate Search

Hibernate Search ### ## ### ####.

Querydsl ## ##

JPA ## ### ####.

##

Querydsl Hibernate Search# ### ### ### ## ####.

```
QUser user = QUser.user;
SearchQuery<User> query = new SearchQuery<User>(session, user);
List<User> list = query
    .where(user.firstName.eq("Bob"))
    .list();
```

##

Querying Lucene# ## ##### ####.

Querydsl Lucene module## ### #### ### ### ##### ###. `org.hibernate.search.annotations.Field` ###### ### ##### ##, ## ### ## ## #### name ### ## ####.

2.6. Mongodb

Mongodb ### ## ### ####.

##

####.

```
<dependency>
  <groupId>com.mysema.querydsl</groupId>
  <artifactId>querydsl-apt</artifactId>
  <version>${querydsl.version}</version>
  <scope>provided</scope>
</dependency>

<dependency>
  <groupId>com.mysema.querydsl</groupId>
  <artifactId>querydsl-mongodb</artifactId>
  <version>${querydsl.version}</version>
</dependency>

<dependency>
  <groupId>org.slf4j</groupId>
  <artifactId>slf4j-log4j12</artifactId>
  <version>1.6.1</version>
</dependency>
```

Querydsl# #### ## ### #### ## ### APT ##### ####.

```
<project>
  <build>
    <plugins>
      ...
      <plugin>
        <groupId>com.mysema.maven</groupId>
        <artifactId>apt-maven-plugin</artifactId>
        <version>1.1.3</version>
        <executions>
          <execution>
            <goals>
              <goal>process</goal>
            </goals>
            <configuration>
              <outputDirectory>target/generated-sources/java</outputDirectory>
              <processor>com.mysema.query.apt.morphia.MorphiaAnnotationProcessor</processor>
            </configuration>
          </execution>
        </executions>
      </plugin>
    ...
    </plugins>
  </build>
</project>
```

MorphiaAnnotationProcessor# `com.google.code.morphia.annotations.Entity` ###### ## # ### ### ## Querydsl ## ### ####.

mvn clean install # #### target/generated-sources/java ### ## ## ### ####.

#####, mvn eclipse:eclipse # #### target/generated-sources/java# #### ##### ## ### #####.

Mongodb# ### # ##.

##

Querydsl Mongodb# #### ### ## #### ### # ##.

```
Morphia morphia;
Datastore datastore;
// ...
QUser user = new QUser("user");
MorphiaQuery<User> query = new MorphiaQuery<User>(morphia, datastore, user);
List<User> list = query
    .where(user.firstName.eq("Bob"))
    .list();
```

##

MongodbQuery #### cascading #### ### ##.

where: ## ### ####. ##### and/or #### #### ### ####. PStrings# #### ###### ####. (*matches*, *indexOf*, *charAt*# ##). ## *in*# #### ###, ## ### ####.

orderBy: ## #### #### ## ### ####. ### #### #### asc()# desc()# ####, OrderSpecifier# #### ## ## # # #### ####.

limit, *offset*, *restrict:* ### #### ####. limit# ## ## ##, offset# ### ## #, restrict# limit# offset# ## ####.

##

##.

```
query
    .where(doc.title.like("*"))
    .orderBy(doc.title.asc(), doc.year.desc())
    .list();
```

title# year# ###### ### ####.

##

####.

```
query
    .where(doc.title.like("*"))
    .limit(10)
    .list();
```

###

####.

```
query
    .where(doc.title.like("*"))
    .offset(3)
    .list();
```

##(Geospatial)

near(Double[]) #### #### ## ### # # ##.

```
query
    .where(geoEntity.location.near(50.0, 50.0))
    .list();
```

####

###, ## ## ### ## list, iterate, uniqueResult, singleResult #### #### ##.

```
query
    .where(doc.title.like("*"))
    .list(doc.title, doc.path);
```

title# path ### ####.

2.7. ###

querydsl-collections ### ### # ##. # ## #### ### ## ## ## #### ### ####.

####

querydsl-collections ### #####, Querydsl ## ### #### ##. ### # ## ##.

####.

```
// needed for access of the Querydsl Collections API
import static com.mysema.query.collections.CollQueryFactory.*;
// needed, if you use the $-invocations
import static com.mysema.query.alias.Alias.*;
```

Cat #### ## ## ##### #####. ## #### ## non-final #### #### Alias ##### ### ##.

$ #### ### #### Cat ### ## #### # ### getter ### ### ### ###. ## ##, `c.getKittens()`# ## ### $ #### ## c.kittends ### ###.

```
Cat c = alias(Cat.class, "cat");
for (String name : from($(c),cats)
  .where($(c.getKittens()).size().gt(0))
  .list($(c.getName()))) {
    System.out.println(name);
}
```

###. ## ### List# size() #### $ #### ###.

```
Cat c = alias(Cat.class, "cat");
for (String name : from($(c),cats)
  .where($(c.getKittens().size()).gt(0))
  .list($(c.getName()))) {
    System.out.println(name);
}
```

#-##### non-final ## ##### ## # ####. ###, $ ### ##### ## #### non-final ## (#, java.lang.String) # ## # ## ### ### ### ####.

##,

```
$(c.getMate().getName())
```

c.mate.name## ###. ###, ## ### #### ### ###.

```
$(c.getMate().getName().toLowerCase())
```

toLowerCase() ### #### ## ####.

getter, size(), contains(Object), get(int) # ### # ##. ### ## #### ## ### #### #####.

####

##.

```
QCat cat = new QCat("cat");
for (String name : from(cat,cats)
  .where(cat.kittens.size().gt(0))
  .list(cat.name)) {
    System.out.println(name);
}
```

####, ## #### ## #### ### # ## $ #### ### ## ## #### ### ## ### # ##.

##

####.

```
<dependency>
  <groupId>com.mysema.querydsl</groupId>
  <artifactId>querydsl-apt</artifactId>
  <version>${querydsl.version}</version>
  <scope>provided</scope>
</dependency>

<dependency>
  <groupId>com.mysema.querydsl</groupId>
  <artifactId>querydsl-collections</artifactId>
  <version>${querydsl.version}</version>
</dependency>

<dependency>
  <groupId>org.slf4j</groupId>
  <artifactId>slf4j-log4j12</artifactId>
  <version>1.6.1</version>
</dependency>
```

JPA# JDO# #### ####, ### ### `com.mysema.query.annotations.QueryEntity` ###### ### # ### ##(pom.xml)# ## #### ### ###### ### ### ### # ##.

```
<project>
  <build>
  <plugins>
    ...
    <plugin>
      <groupId>com.mysema.maven</groupId>
      <artifactId>apt-maven-plugin</artifactId>
      <version>1.1.3</version>
      <executions>
        <execution>
          <goals>
            <goal>process</goal>
          </goals>
          <configuration>
            <outputDirectory>target/generated-sources/java</outputDirectory>
            <processor>com.mysema.query.apt.QuerydslAnnotationProcessor</processor>
          </configuration>
        </execution>
      </executions>
    </plugin>
    ...
  </plugins>
  </build>
</project>
```

Ant

full-deps# ### jar #### #####, ## #### #### Querydsl ### ####.

```
<!-- APT based code generation -->
<javac srcdir="${src}" classpathref="cp">
  <compilerarg value="-proc:only"/>
  <compilerarg value="-processor"/>
  <compilerarg value="com.mysema.query.apt.QuerydslAnnotationProcessor"/>
  <compilerarg value="-s"/>
  <compilerarg value="${generated}"/>
</javac>

<!-- compilation -->
<javac classpathref="cp" destdir="${build}">
  <src path="${src}"/>
  <src path="${generated}"/>
</javac>
```

src# ## ## ### ####, generated# ### ### ## ### ####, build# ### ## ### ####.

Hamcrest matchers

Querydsl Collections ### Hamcrest matchers# ####. ### import# ## #### ##.

```
import static org.hamcrest.core.IsEqual.equalTo;
import static com.mysema.query.collections.PathMatcher.hasValue;
import static org.junit.Assert.assertEquals;
import static org.junit.Assert.assertThat;
```

##.

```
Car car = new Car();
car.setHorsePower(123);

assertThat(car, hasValue($.horsePower));
assertThat(car, hasValue($.horsePower, equalTo(123)));
```

Jeroen van Schagen# Hamcrest matchers# ####.

2.8. Scala##

querydsl-scala ### ## Scala## Querydsl# ### # ##. # ### ##### ### ### ### ### ####.

```
<dependency>
  <groupId>com.mysema.querydsl</groupId>
  <artifactId>querydsl-scala</artifactId>
  <version>${querydsl.version}</version>
</dependency>
```

Scala# ## DSL

Scala # Querydsl# ### ### ## ## DSL# ####. Scala DSL# #### #### ##### ## ### ####, ## ###, ## # ## # ### ### ####.

DSL# ### ##.

```
//Standard              Alternative

expr isNotNull          expr is not(null)
expr isNull             expr is null
expr eq "Ben"           expr === "Ben"
expr ne "Ben"           expr !== "Ben"
expr append "X"         expr + "X"
expr isEmpty            expr is empty
expr isNotEmpty         expr not empty

// boolean
left and right          left && right
left or right           left || right
expr not                !expr

// comparison
expr lt 5               expr < 5
expr loe 5              expr <= 5
expr gt 5               expr > 5
expr goe 5              expr >= 5
expr notBetween(2,6)    expr not between (2,6)
expr negate             -expr

// numeric
expr add 3              expr + 3
expr subtract 3         expr - 3
expr divide 3           expr / 3
expr multiply 3         expr * 3
expr mod 5              expr % 5

// collection
list.get(0)             list(0)
map.get("X")            map("X")
```

####

Querydsl Scala ### Querydsl# ## ##### Scala# ## ### ### ## ## ## ### ####.

Querydsl #### Scala ##### ###### `RichProjectable`# `RichSimpleProjectable` ### #### ##. `com.mysema.query.scala.Helpers`# ### #### ### ## ### #####.

##, ## API# ### ## ### `Object[]` ### `java.util.List`# ####.

```
query.from(person).list(person.firstName, person.lastName, person.age)
```

######, list### select# #### Scala List ## ### ### # ##. ##, uniqueResult# singleResult ### unique # single# #### Option #### ### ### # ##.

##.

```
import com.mysema.query.scala.Helpers._

query.from(person).select(person.firstName, person.lastName, person.age)
```

List[(String,String,Integer)] #, Tuple3[String,String,Integer]# List# ##.

SQL# ###

Querydsl SQL# #####, ### #### ## ### #### ##. ### ## ## ### ## ## ###.

####:

```
val directory = new java.io.File("target/jdbcgen1")
val namingStrategy = new DefaultNamingStrategy()
val exporter = new MetaDataExporter()
exporter.setNamePrefix("Q")
exporter.setPackageName("com.mysema")
exporter.setSchemaPattern("PUBLIC")
exporter.setTargetFolder(directory)
exporter.setSerializerClass(classOf[ScalaMetaDataSerializer])
exporter.setCreateScalaSources(true)
exporter.setTypeMappings(ScalaTypeMappings.create)
exporter.export(connection.getMetaData)
```

####:

```
val directory = new java.io.File("target/jdbcgen2")
val namingStrategy = new DefaultNamingStrategy()
val exporter = new MetaDataExporter()
exporter.setNamePrefix("Q")
exporter.setPackageName("com.mysema")
exporter.setSchemaPattern("PUBLIC")
exporter.setTargetFolder(directory)
exporter.setSerializerClass(classOf[ScalaMetaDataSerializer])
exporter.setBeanSerializerClass(classOf[ScalaBeanSerializer])
exporter.setCreateScalaSources(true)
exporter.setTypeMappings(ScalaTypeMappings.create)
exporter.export(connection.getMetaData)
```

##

Querydsl Scala# Querydls SQL# ## ### ### ####. # ### Rogue ###### ### ## ## #### ### ###.

`RelationalPath` ##### ### ## #### ### ## ### ####. #### DAO #### `com.mysema.query.scala.sql.SQLHelpers` #### #### # ### ### # ##.

####, ### ## #### ## ## #### ### # ##.

###

```
query().from(employee).select(employee.firstName, employee.lastName)
```

Employee ## QEmployee# companion ### ### # ##.

```
Employee.select(_.firstName, _.lastName)
```

orderBy, where, select, single, unique# #### ##, ### ## #### ##### ## ## #### #### ### ### # # #. ### # ### ### ####.

```
Employee.select({ e => e.firstName }, { e => e.lastName })
```

`com.mysema.query.scala.sql.RichSimpleQuery`# ##### #### ###.

##

querydsl-maven-plugin# #### SQL ##### ##### ## Scala ### ####. ### ## ##.

```
<project>
  <build>
    <plugins>
      ...
      <plugin>
        <groupId>com.mysema.querydsl</groupId>
        <artifactId>querydsl-maven-plugin</artifactId>
        <version>${querydsl.version}</version>
        <configuration>
          <jdbcDriver>com.mysql.jdbc.Driver</jdbcDriver>
          <jdbcUrl>jdbc:mysql://localhost:3306/test</jdbcUrl>
          <jdbcUser>matko</jdbcUser>
          <jdbcPassword>matko</jdbcPassword>
          <packageName>com.example.schema</packageName>
          <targetFolder>${project.basedir}/src/main/scala</targetFolder>
          <exportBeans>true</exportBeans>
          <createScalaSources>true</createScalaSources>
        </configuration>
        <dependencies>
          <dependency>
            <groupId>mysql</groupId>
            <artifactId>mysql-connector-java</artifactId>
            <version>5.1.16</version>
          </dependency>
          <dependency>
            <groupId>com.mysema.querydsl</groupId>
            <artifactId>querydsl-scala</artifactId>
            <version>${querydsl.version}</version>
          </dependency>
          <dependency>
            <groupId>org.scala-lang</groupId>
            <artifactId>scala-library</artifactId>
            <version>${scala.version}</version>
          </dependency>
        </dependencies>
      </plugin>
      ...
    </plugins>
  </build>
</project>
```

querydsl:export ### ## ####.

##

###, Expression ### #### #### ## ### #### ##.

JPA# ### ## ###.

```
@Entity
class User {
  @BeanProperty
  @Id
  var id: Integer = _;
  @BeanProperty
  var userName: String = _;
  @BeanProperty
  @ManyToOne
  var department: Department = _;
}

@Entity
class Department {
  @BeanProperty
  @Id
  var id: Integer = _;
  @BeanProperty
  var name: String = _;
}
```

###.

List

```
val person = Person as "person"

query.from(person).where(person.firstName like "Rob%").list(person)
```

Unique result

```
query.from(person).where(person.firstName like "Rob%").unique(person)
```

Long where

```
query.from(person)
  .where(person.firstName like "Rob%", person.lastName like "An%")
  .list(person)
```

Order

```
query.from(person).orderBy(person.firstName asc).list(person)
```

Not null

```
query.from(person)
  .where(person.firstName isEmpty, person.lastName isNotNull)
  .list(person)
```

###

```
def query() = new JPAQuery(entityManager)
```

##.

```
val person = Person as "person"
```

######## XML ## ### ### ##, ## Scala ### ### # ##. HibernateDomainExporter# ## ## ## ## ### ####.

3#. ##

####.

3.1. ##

Querydsl## Query# ##### ### ### #### query #### ####. query #### ### ## ### ## ###### ######, # #### #### ### ## ###.

####. ## ### # ## ##, #### #### ## ## ### #### ##.

##(complext predicates)

`com.mysema.query.BooleanBuilder` #### ####. # #### Predicate# #### # # ### ## #### ### # ##.

```
public List<Customer> getCustomer(String... names) {
    QCustomer customer = QCustomer.customer;
    JPAQuery query = new JPAQuery(entityManager).from(customer);
    BooleanBuilder builder = new BooleanBuilder();
    for (String name : names) {
        builder.or(customer.name.eq(name));
    }
    query.where(builder); // customer.name eq name1 OR customer.name eq name2 OR ...
    return query.list(customer);
}
```

`BooleanBuilder`# ##### ##(mutable) #### null#, # `and` ## `or` ## ### ###### ### ####.

###

`com.mysema.query.support.Expressions` #### ### ### ### ## ## ### ####. ### #### ## ## # ## ### ##### ## ### # ##.

##, ### #### ### ###### ## Fluent DSL ### ### # ## ### ## `Expressions` #### ####.

##.

```
QPerson person = QPerson.person;
person.firstName.startsWith("P");
```

Q## ### #### ### ### ## ## ### #### ## # ##.

```
Path<Person> person = Expressions.path(Person.class, "person");
Path<String> personFirstName = Expressions.path(String.class, person, "firstName");
Constant<String> constant = Expressions.constant("P");
Expressions.predicate(Ops.STARTS_WITH, personFirstName, constant);
```

Path ##### ### ##### ####, Constant# ###, Operation# ###### ####, TemplateExpression ##### #### String ##### #### ### # ##.

##

`Expressions` ### ### ## ## Querydsl# ## ## ### ## # #### ## API# ####.

`com.mysema.query.types.path.PathBuilder` #### ### # ##. # #### `EntityPathBase` #### #### ## ## ### ## ### ### ## ## ### ######.

Expressions API# #### PathBuilder ### #### unknown ###### ## #### ###, ### ## DSL# # ###.

Strign ####:

```
PathBuilder<User> entityPath = new
PathBuilder<User>(User.class, "entity");
// fully generic access
entityPath.get("userName");
// .. or with supplied type
entityPath.get("userName", String.class);
// .. and correct signature
entityPath.getString("userName").lower();
```

List ####:

```
entityPath.getList("list", String.class).get(0);
```

##:

```
entityPath.getList("list", String.class, StringPath.class).get(0).lower();
```

####:

```
entityPath.getMap("map", String.class, String.class).get("key");
```

##:

```
entityPath.getMap("map", String.class, String.class, StringPath.class).get("key").lower();
```

Case

case-when-then-else #### ## #, ### ## `CaseBuilder` #### ####.

```
QCustomer customer = QCustomer.customer;
Expression<String> cases = new CaseBuilder()
    .when(customer.annualSpending.gt(10000)).then("Premier")
    .when(customer.annualSpending.gt(5000)).then("Gold")
    .when(customer.annualSpending.gt(2000)).then("Silver")
    .otherwise("Bronze");
// The cases expression can now be used in a projection or condition
```

equals-operations# ## case #### ### ## ### ### #### ##.

```
QCustomer customer = QCustomer.customer;
Expression<String> cases = customer.annualSpending
    .when(10000).then("Premier")
    .when(5000).then("Gold")
    .when(2000).then("Silver")
    .otherwise("Bronze");
// The cases expression can now be used in a projection or condition
```

JDOQL### ## Case #### #### ###.

Casting

##, ## ### ######. # ## # ## ### ## ### `com.mysema.query.types.path.EntityPathBase`# `com.mysema.query.types.path.BeanPath`# ## #####, #### ## #### ## ### # ##.

##, `_super` ### ### ## ### ## ##### ### # ##. ### ## ### # # ## ### ## ##, _super ### ### # ##.

```
// from Account
QAccount extends EntityPathBase<Account> {
    // ...
}

// from BankAccount extends Account
QBankAccount extends EntityPathBase<BankAccount> {

    public final QAccount _super = new QAccount(this);

    // ...
}
```

EntityPathBase #### as #### #### ##.

```
QAccount account = new QAccount("account");
QBankAccount bankAccount = account.as(QBankAccount.class);
```

##

Constant #### ## #### ### # ##. ### ### ##.

```
query.list(Expressions.constant(1),
           Expressions.constant("abc"));
```

Constant #### ## ####.

3.2. ##

Querydsl# ## ### ###### ## ## # ## ### ## FactoryExpressions# ### ## ResultTransformer# #### ##.

`com.mysema.query.types.FactoryExpression` ###### # ##, ### ## ### # ### ### #### ## # ###. `com.mysema.query.types.Projections` #### #### FactoryExpression ### ### ### # ##.

`com.mysema.query.ResultTransformer` ###### ## #### `GroupBy` #####.

##

Querydsl 3.0 ## ## ## ### ## ## ### `com.mysema.query.Tuple` ##. Tuple# ### ### Map# ####, # # ## Tuple # ##### ## #### ### # ##.

```
List<Tuple> result = query.from(employee).list(employee.firstName, employee.lastName);
for (Tuple row : result) {
     System.out.println("firstName " + row.get(employee.firstName));
     System.out.println("lastName " + row.get(employee.lastName));
}}
```

QTuple #### #### ### ## ### # ##.

```
List<Tuple> result = query.from(employee).list(new QTuple(employee.firstName, employee.lastName));
for (Tuple row : result) {
     System.out.println("firstName " + row.get(employee.firstName));
     System.out.println("lastName " + row.get(employee.lastName));
}}
```

##(population)

###, Bean ##### #### ##.

```
List<UserDTO> dtos = query.list(
    Projections.bean(UserDTO.class, user.firstName, user.lastName));
```

setter ### ## ### ## #### ### ## ### #### ##.

```
List<UserDTO> dtos = query.list(
    Projections.fields(UserDTO.class, user.firstName, user.lastName));
```


##.

```
List<UserDTO> dtos = query.list(
    Projections.bean(UserDTO.class, user.firstName, user.lastName));
```

##, `QueryProjection` ###### ### #### ### ## ##.

```
class CustomerDTO {

  @QueryProjection
  public CustomerDTO(long id, String name) {
     ...
  }

}
```

###, # #### ### ## #### ## ####.

```
QCustomer customer = QCustomer.customer;
JPQLQuery query = new HibernateQuery(session);
List<CustomerDTO> dtos = query.from(customer).list(new QCustomerDTO(customer.id, customer.name));
```

Hibernate# #### ###, ## ## ##### # ### ### # ##.

QueryProjection ###### ### ### ###(@Entity) ### ####, #### ### ##### ### # ##. ###, ###### ### ### ###(@Entity) ##### ## ### ## create #### #### ### ##### ## ### ##.

```
@Entity
class Customer {

  @QueryProjection
  public Customer(long id, String name) {
     ...
  }

}
```

```
QCustomer customer = QCustomer.customer;
JPQLQuery query = new HibernateQuery(session);
List<Customer> dtos = query.from(customer).list(QCustomer.create(customer.id, customer.name));
```

###, ### ## ### ##### ### # ##.

```
List<Customer> dtos = query.from(customer)
    .list(ConstructorExpression.create(Customer.class, customer.id, customer.name));
```

##(aggregation)

com.mysema.query.group.GroupBy #### ##### ## ### ## ## ### #### ## ### ####. ### ## ###.

##

```
import static com.mysema.query.group.GroupBy.*;

Map<Integer, List<Comment>> results = query.from(post, comment)
    .where(comment.post.id.eq(post.id))
    .transform(groupBy(post.id).as(list(comment)));
```

post id# ### #### ####.

##

```
Map<Integer, Group> results = query.from(post, comment)
    .where(comment.post.id.eq(post.id))
    .transform(groupBy(post.id).as(post.name, set(comment.id)));
```

post id# Group# ####. Group# post name# comment id# ###.

Group# GroupBy# ## Tuple ###### ## ### ##.

####.

3.3. ##

Querydsl# JPA, JDO, Mongodb #### ## ### ## ##6# APT ##### ## ### ####. # #### ## ### ## ### # # ### APT# ## ### ####.

###

Querydsl# ## 2### #### ##### #####. # ## ### ##### ###, com.mysema.query.annotations.QueryInit ###### ### ### #### ##. # ## ### #### ### ## ### QueryInit ###### ####. ### ## ## #### ##.

```
@Entity
class Event {
    @QueryInit("customer.address")
    Account account;
}

@Entity
class Account {
    Customer customer;
}

@Entity
class Customer {
    String name;
    Address address;
    // ...
}
```

Event ### ## ### /# #### #, account.customer ### #### ####. ## ### ### ##### ##(customer.* # # ## * #)# ####.

####, ### ### final### # ##. ### ### ## ### ## ### ## ##### ### # ## final ### # ## ### #### ### ### ##.

#####, ### ### Config ###### #### ## #### ##### # ##.

######

Config ###### #### Querydsl# #### ####### # ##. Querydsl# ###### ### #### ### ### ## # ####.

##.

 # 3.1. Config ##

##	##
entityAccessors	public final ## ## ### ### ### ## ### (###: false)
listAccessors	listProperty(int index) ### ### (###: false)
mapAccessors	mapProperty(Key key) ### ## ### (###: false)
createDefaultVariable	## ## ## (###: true)
defaultVariableName	## ### ##

###.

######::

```
@Config(entityAccessors=true)
@Entity
public class User {
    //...
}
```

######::

```
@Config(listAccessors=true)
package com.mysema.query.domain.rel;

import com.mysema.query.annotations.Config;
```

###, ### APT ### #### ##.

 # 3.2. APT ##

##	##
querydsl.entityAccessors	#### ## ## ###
querydsl.listAccessors	### ### ### ## ## ###
querydsl.mapAccessors	# ## # ## ## ###
querydsl.prefix	## ### ## ### (###: Q)
querydsl.suffix	## ### ## ###
querydsl.packageSuffix	## ## #### ## ###
querydsl.createDefaultVariable	## ## ### ##
querydsl.unknownAsEmbeddable	##### ### #### embeddable# #### ## (###: false)
querydsl.includedPackages	## ### ### ### ## (### ##) (default: all)
querydsl.includedClasses	## ### ### ### ## ## (### ##) (default: all)
querydsl.excludedPackages	## #### ### ### ## (### ##) (default: none)
querydsl.excludedClasses	## #### ### ### ## (### ##) (default: none)

APT #### ## ## ##.

```
<project>
  <build>
  <plugins>
    ...
    <plugin>
      <groupId>com.mysema.maven</groupId>
      <artifactId>apt-maven-plugin</artifactId>
      <version>1.1.3</version>
      <executions>
        <execution>
          <goals>
            <goal>process</goal>
          </goals>
          <configuration>
            <outputDirectory>target/generated-sources/java</outputDirectory>
            <processor>com.mysema.query.apt.jpa.JPAAnnotationProcessor</processor>
            <options>
              <querydsl.entityAccessors>true</querydsl.entityAccessors>
            </options>
          </configuration>
        </execution>
      </executions>
    </plugin>
    ...
  </plugins>
  </build>
</project>
```

##

##. ## String ### ## ### String ### ### ### ### ### ## Date/Time ## # ##### ## ### ### ## ### #### ### # ##. Joda time API# JDK(java.util.Date, Calendar ### ## ##)# ## ### #### ####, ## API# ### ## # ### #### ##.

###.

```
@Entity
public class MyEntity {
    @QueryType(PropertyType.SIMPLE)
    public String stringAsSimple;

    @QueryType(PropertyType.COMPARABLE)
    public String stringAsComparable;

    @QueryType(PropertyType.NONE)
    public String stringNotInQuerydsl;
}
```

`PropertyType.NONE`# ## ## ### ##### ### # ####. @Transient# @QueryTransient ###### ### ### ## ## #### ### ## ### ##. PropertyType.NONE# ## Querydsl ## #### ## ##### ####.

###(Delegate methods)

#####, #### ### ### ### ## QueryDelegate ###### ## #### ####, ## #### # ## #### # #### Querydsl ## ### ####.

###.

```
@QueryEntity
public static class User {

    String name;

    User manager;

}
```

```
@QueryDelegate(User.class)
public static BooleanPath isManagedBy(QUser user, User other) {
    return user.manager.eq(other);
}
```

QUser ## ### ### #### ### ##.

```
public BooleanPath isManagedBy(QUser other) {
    return com.mysema.query.domain.DelegateTest.isManagedBy(this, other);
}
```

##. ### # ## ###.

```
public class QueryExtensions {

    @QueryDelegate(Date.class)
    public static BooleanExpression inPeriod(DatePath<Date> date, Pair<Date,Date> period) {
        return date.goe(period.getFirst()).and(date.loe(period.getSecond()));
    }

    @QueryDelegate(Timestamp.class)
    public static BooleanExpression inDatePeriod(DateTimePath<Timestamp> timestamp, Pair<Date,Date> period) {
        Timestamp first = new Timestamp(DateUtils.truncate(period.getFirst(), Calendar.DAY_OF_MONTH).getTime())
        Calendar second = Calendar.getInstance();
        second.setTime(DateUtils.truncate(period.getSecond(), Calendar.DAY_OF_MONTH));
        second.add(1, Calendar.DAY_OF_MONTH);
        return timestamp.goe(first).and(timestamp.lt(new Timestamp(second.getTimeInMillis())));
    }

}
```

####, ## #### ### #### ## #### #####.

```
public class QDate extends DatePath<java.sql.Date> {

    public QDate(BeanPath<? extends java.sql.Date> entity) {
        super(entity.getType(), entity.getMetadata());
    }

    public QDate(PathMetadata<?> metadata) {
        super(java.sql.Date.class, metadata);
    }

    public BooleanExpression inPeriod(com.mysema.commons.lang.Pair<java.sql.Date, java.sql.Date> period) {
        return QueryExtensions.inPeriod(this, period);
    }

}

public class QTimestamp extends DateTimePath<java.sql.Timestamp> {

    public QTimestamp(BeanPath<? extends java.sql.Timestamp> entity) {
        super(entity.getType(), entity.getMetadata());
    }

    public QTimestamp(PathMetadata<?> metadata) {
        super(java.sql.Timestamp.class, metadata);
    }

    public BooleanExpression inDatePeriod(com.mysema.commons.lang.Pair<java.sql.Date, java.sql.Date> period) {
        return QueryExtensions.inDatePeriod(this, period);
    }

}
```

##

@QueryEntities ###### ###, ###### #### ## ### #### Querydsl ## ### #### ## ####. QueryEntities # ##### ### #### ##, value ### ### #### ### ####.

`com.mysema.query.apt.QuerydslAnnotationProcessor`# ####. ### ## ## # ### ##.

```
<project>
  <build>
  <plugins>
    ...
    <plugin>
      <groupId>com.mysema.maven</groupId>
      <artifactId>apt-maven-plugin</artifactId>
      <version>1.1.3</version>
      <executions>
        <execution>
          <goals>
            <goal>process</goal>
          </goals>
          <configuration>
            <outputDirectory>target/generated-sources/java</outputDirectory>
            <processor>com.mysema.query.apt.QuerydslAnnotationProcessor</processor>
          </configuration>
        </execution>
      </executions>
    </plugin>
    ...
  </plugins>
  </build>
</project>
```

##

##(## ##, Scala# Groovy# ## ## JVM ### #####, ##### ### #### ###### # ## ## #), `GenericExporter` #### #### ####### ###### ### #### #### ### #### ## ## ### ### # ##.

GenericExporter# ##### querydsl-codegen ### ### ###### ##. (# ##### `com.mysema.querydsl:querydsl-codegen:${querydsl.version}` ##)

JPA# ## ###.

```
GenericExporter exporter = new GenericExporter();
exporter.setKeywords(Keywords.JPA);
exporter.setEntityAnnotation(Entity.class);
exporter.setEmbeddableAnnotation(Embeddable.class);
exporter.setEmbeddedAnnotation(Embedded.class);
exporter.setSupertypeAnnotation(MappedSuperclass.class);
exporter.setSkipAnnotation(Transient.class);
exporter.setTargetFolder(new File("target/generated-sources/java"));
exporter.export(DomainClass.class.getPackage());
```

DomainClass# ### # # ###### ### ## JPA ##### ## #### ## target/generated-sources/java #### # ## ### ####.

###

querydsl-maven-plugin# generic-export, jpa-export#jdo-export ## ## GenericExporter# ### # ##.

Querydsl, JPA, JDO ###### ####.

##.

 # 3.3. ### ##

##	####	##
File	targetFolder	### ### ### ## ##
boolean	scala	Scala ### ##### true (###: false)
String[]	packages	### #### ### ###
boolean	handleFields	### ##### ### ## true (###: true)
boolean	handleMethods	getter# ##### ### ## true (###: true)
String	sourceEncoding	### ## ### ### ###
boolean	testClasspath	### ###### ##### true

JPA ###### ### #### ## ##.

```
<project>
  <build>
    <plugins>
      ...
      <plugin>
        <groupId>com.mysema.querydsl</groupId>
        <artifactId>querydsl-maven-plugin</artifactId>
        <version>${querydsl.version}</version>
        <executions>
          <execution>
            <phase>process-classes</phase>
            <goals>
              <goal>jpa-export</goal>
            </goals>
            <configuration>
              <targetFolder>target/generated-sources/java</targetFolder>
              <packages>
                <package>com.example.domain</package>
              </packages>
            </configuration>
          </execution>
        </executions>
      </plugin>
      ...
    </plugins>
  </build>
</project>
```

`com.example.domain` # # ## #### JPA ##### ## #### ## target/generated-sources/java # #### ### ####.

##, ## ### ### ###### # ## ### ## `compile` ## #### ##.

```
<execution>
  <goals>
    <goal>compile</goal>
  </goals>
  <configuration>
    <sourceFolder>target/generated-sources/scala</targetFolder>
  </configuration>
</execution>
```

`compile` ## ## ## ##### ###.

 # 3.4. ### ##

##	####	##
File	sourceFolder	### ### ## ##
String	sourceEncoding	### ### ###
String	source	##### -source ##
String	target	##### -target ##
boolean	testClasspath	### ###### ### ## true
Map	compilerOptions	#### ##

`sourceFolder`# ### ## ### ######.

Scala

Scala ### ###, ## ### ####.

```
<project>
  <build>
    <plugins>
      ...
      <plugin>
        <groupId>com.mysema.querydsl</groupId>
        <artifactId>querydsl-maven-plugin</artifactId>
        <version>${querydsl.version}</version>
        <dependencies>
          <dependency>
            <groupId>com.mysema.querydsl</groupId>
            <artifactId>querydsl-scala</artifactId>
            <version>${querydsl.version}</version>
          </dependency>
          <dependency>
            <groupId>org.scala-lang</groupId>
            <artifactId>scala-library</artifactId>
            <version>${scala.version}</version>
          </dependency>
        </dependencies>
        <executions>
          <execution>
            <goals>
              <goal>jpa-export</goal>
            </goals>
            <configuration>
              <targetFolder>target/generated-sources/scala</targetFolder>
              <scala>true</scala>
              <packages>
                <package>com.example.domain</package>
              </packages>
            </configuration>
          </execution>
        </executions>
      </plugin>
      ...
    </plugins>
  </build>
</project>
```

3.4. ##

##, ### ### ## ## ## #### ## ### ### # ##. ### ### #### #### ### ### getter #### ## # ### # ##.

####.

APT# ### ### ### #### ### #### ### ##.

```
QCat cat = new QCat("cat");
for (String name : query.from(cat,cats)
    .where(cat.kittens.size().gt(0))
    .list(cat.name)) {
    System.out.println(name);
}
```

###, ### Cal #### #### ## ##### #### ###. $ ### ##### `c.getKittens()`# ##### #### ## `c.kittens`# ####.

```
Cat c = alias(Cat.class, "cat");
for (String name : query.from($(c),cats)
    .where($(c.getKittens()).size().gt(0))
    .list($(c.getName()))) {
    System.out.println(name);
}
```

import# #### ##.

```
import static com.mysema.query.alias.Alias.$;
import static com.mysema.query.alias.Alias.alias;
```

####. $ ### ### #### size()# #### ##.

```
Cat c = alias(Cat.class, "cat");
for (String name : query.from($(c),cats)
    .where($(c.getKittens().size()).gt(0))
    .list($(c.getName()))) {
    System.out.println(name);
}
```

final# ## ## ## ##### ## ####. ###, $ ### ### ## ### #### final ### ### ### #### ## # ### # ##. ### ###.

```
$(c.getMate().getName())
```

is transformed into *c.mate.name* internally, but

```
$(c.getMate().getName().toLowerCase())
```

`toLowerCase()`## ####.

getters, size(), contains(Object), get(int)# ### # ### ####. ## ## ### ### #### #####.

4#.

4.1. #### ##

Querydsl# ## ### ### List, Set, Collection, Map ##### #### ### ## ### ##.

getter# ### ##, ### ## ### ####.

```
java.lang.RuntimeException: Caught exception for field com.mysema.query.jdoql.testdomain.Store#products
  at com.mysema.query.apt.Processor$2.visitType(Processor.java:117)
  at com.mysema.query.apt.Processor$2.visitType(Processor.java:80)
  at com.sun.tools.javac.code.Symbol$ClassSymbol.accept(Symbol.java:827)
  at com.mysema.query.apt.Processor.getClassModel(Processor.java:154)
  at com.mysema.query.apt.Processor.process(Processor.java:191)
  ...
Caused by: java.lang.IllegalArgumentException: Insufficient type arguments for List
  at com.mysema.query.apt.APTTypeModel.visitDeclared(APTTypeModel.java:112)
  at com.mysema.query.apt.APTTypeModel.visitDeclared(APTTypeModel.java:40)
  at com.sun.tools.javac.code.Type$ClassType.accept(Type.java:696)
  at com.mysema.query.apt.APTTypeModel.<init>(APTTypeModel.java:55)
  at com.mysema.query.apt.APTTypeModel.get(APTTypeModel.java:48)
  at com.mysema.query.apt.Processor$2.visitType(Processor.java:114)
  ... 35 more
```

##.

```
    private Collection names; // WRONG

    private Collection<String> names; // RIGHT

    private Map employeesByName; // WRONG

    private Map<String,Employee> employeesByName; // RIGHT
```

4.2. ##### #### Querydsl Q###

Q### ## ### ## ##, ## ### #### Q### ##### #### ### # ##.

###.

com.mysema.util.ClassPathUtils #### ### # ##.

```
    ClassPathUtils.scanPackage(Thread.currentThread().getContextClassLoader(), packageToLoad);
```

packageToLoad# ## ##### ### #### #### ### ##.

4.3. JDK5

JDK 5# ##### #### #, ### ## #### ### # ##.

```
[INFO] ------------------------------------------------------------------------
[ERROR] BUILD FAILURE
[INFO] ------------------------------------------------------------------------
[INFO] Compilation failure
...
class file has wrong version 50.0, should be 49.0
```

##6## #### ### ## ### 50.0## ##5# 49.0##.

JDK 6.0 ## #### ##### APT# ##### #### ## ###, Querydsl# JDK 6.0### ### ##.

JDK 5.0## Querydsl# #### #### Querydsl ### ## ##### ##.