

Querydsl - ##### ##

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4.0.0

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##

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

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

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

2#.

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

2.1. JPA

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

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

##

#####.

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

<dependency>
  <groupId>com.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.querydsl.apl.jpa.JPAAnnotationProcessor</processor>
            </configuration>
          </execution>
        </executions>
      </plugin>
      ...
    </plugins>
  </build>
</project>

```

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

Hibernate ##### ####, APT #####
 com.querydsl.apl.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="${src}" classpathref="cp">
  <compilerarg value="-proc:only"/>
  <compilerarg value="-processor"/>
  <compilerarg value="com.querydsl.apr.jpa.JPAAnnotationProcessor"/>
  <compilerarg value="-s"/>
  <compilerarg value="${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.querydsl.apr.jpa.JPAAnnotationProcessor #
 # com.querydsl.apr.roo.RooAnnotationProcessor# ### # ##. RooAnnotationProcessor#
 @Entity# ### ## ## @RooJpaEntity# @RooJpaActiveRecord ##### ## ## ## ##.

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

hbm.xml ##### ## ##

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

com.querydsl.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");
QCat 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, rightJoin, 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

JPA SQLQuery ##### JPA# ##### SQL# Querydsl## ### # ##.

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

```
<project>
  <build>
    <plugins>
      ...
      <plugin>
        <groupId>com.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(Projections.constructor(CatDTO.class, cat.id, cat.name));

```

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

2.2. JDO

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

##

#####.

```

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

<dependency>
  <groupId>com.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.querydsl.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="${src}" classpathref="cp">
  <compilerarg value="-proc:only"/>
  <compilerarg value="-processor"/>
  <compilerarg value="com.querydsl.apt.jdo.JDOAnnotationProcessor"/>
  <compilerarg value="-s"/>
  <compilerarg value="${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.querydsl.jdo.models.company.Department
WHERE this.employees.size() ==
(SELECT max(d.employees.size()) FROM com.querydsl.jdo.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.querydsl.jdo.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.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(Projections.constructor(CatDTO.class, cat.id, cat.name));
```

2.3. SQL

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

##

##.

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

<dependency>
  <groupId>com.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.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.querydsl.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 |
| > 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.querydsl.sql.codegen.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.querydsl.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)
- PostgreSQLTemplates (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, rightJoin, 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.querydsl.core.types.dsl.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.querydsl.core.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(11, 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(11, 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.querydsl.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.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.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.querydsl.lucene3.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.querydsl</groupId>
  <artifactId>querydsl-apt</artifactId>
  <version>${querydsl.version}</version>
  <scope>provided</scope>
</dependency>

<dependency>
  <groupId>com.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.querydsl.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.querydsl.collections.CollQueryFactory.*;
// needed, if you use the $-invocations
import static com.querydsl.core.alias.Alias.*;
```

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

\$ ##### Cat ##### ## ## ## ## ## ## ## ## ## ##. ## ##, 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.querydsl</groupId>
  <artifactId>querydsl-apt</artifactId>
  <version>${querydsl.version}</version>
  <scope>provided</scope>
</dependency>

<dependency>
  <groupId>com.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.querydsl.core.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.querydsl.apt.QuerydslAnnotationProcessor</processor>
            </configuration>
          </execution>
        </executions>
      </plugin>
      ...
    </plugins>
  </build>
</project>
```

Ant

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

```
<!-- APT based code generation -->
<javac srcdir="${src}" classpathref="cp">
  <compilerarg value="-proc:only"/>
  <compilerarg value="-processor"/>
  <compilerarg value="com.querydsl.appt.QuerydslAnnotationProcessor"/>
  <compilerarg value="-s"/>
  <compilerarg value="${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.querydsl.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.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.querydsl.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.querydsl.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.querydsl")
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.querydsl")
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.querydsl.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.querydsl.scala.sql.RichSimpleQuery# ##### ##### ##.

##

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

```

<project>
  <build>
    <plugins>
      ...
      <plugin>
        <groupId>com.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.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 ##### ## ## ## ## ##### ##, #
##.

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

##(complex predicates)

com.querydsl.core.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.querydsl.core.types.dsl.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.querydsl.core.types.dsl.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.querydsl.core.types.dsl.EntityPathBase#
com.querydsl.core.types.dsl.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.querydsl.core.types.FactoryExpression##### # ##,### ## ### # ### ##### ## #
###. com.querydsl.core.types.Projections ##### ##### FactoryExpression ### ## ## # ##.

com.querydsl.core.ResultTransformer ##### ## ##### GroupBy #####.

##

Querydsl 3.0 ## ## ## ### ## ## ### com.querydsl.core.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(Projections.constructor(Customer.class, customer.id, customer.name));
```

##(aggregation)

```
com.querydsl.core.group.GroupBy ##### ## ## ## ## ## ## ## ## ##. ## ## ##.
```

```
## ## ## ## ## ##
```

```
import static com.querydsl.core.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, Mongoddb ##### ## ## ## ##6# APT ##### ## ## ## ##. # ##### ## ## ## ## #
# ### APT# ## ## ## #####.
```

###

```
##### Querydsl# ## 2### ##### #####. # ## ## ##### ##,
com.querydsl.core.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.querydsl.core.domain.rel;

import com.querydsl.core.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.querydsl.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 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.querydsl.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.querydslapt.QuerydslAnnotationProcessor</processor>
            </configuration>
          </execution>
        </executions>
      </plugin>
      ...
    </plugins>
  </build>
</project>
```

##

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

```
GenericExporter# ##### querydsl-codegen ### ### ##### ##. (##### com.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.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.querydsl</groupId>
        <artifactId>querydsl-maven-plugin</artifactId>
        <version>${querydsl.version}</version>
        <dependencies>
          <dependency>
            <groupId>com.querydsl</groupId>
            <artifactId>querydsl-scala</artifactId>
            <version>${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.querydsl.core.alias.Alias.$;
import static com.querydsl.core.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.querydsl.jdo.testdomain.Store#products
    at com.querydsl.apt.Processor$2.visitType(Processor.java:117)
    at com.querydsl.apt.Processor$2.visitType(Processor.java:80)
    at com.sun.tools.javac.code.Symbol$ClassSymbol.accept(Symbol.java:827)
    at com.querydsl.apt.Processor.getClassModel(Processor.java:154)
    at com.querydsl.apt.Processor.process(Processor.java:191)
    ...
Caused by: java.lang.IllegalArgumentException: Insufficient type arguments for List
    at com.querydsl.apt.APTTypeModel.visitDeclared(APTTypeModel.java:112)
    at com.querydsl.apt.APTTypeModel.visitDeclared(APTTypeModel.java:40)
    at com.sun.tools.javac.code.Type$ClassType.accept(Type.java:696)
    at com.querydsl.apt.APTTypeModel.<init>(APTTypeModel.java
    at com.querydsl.apt.APTTypeModel.get(APTTypeModel:48)
    at com.querydsl.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.querydsl.codegen.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 ### ## ##### ##.