



CS544 EA

Hibernate

Optimization: FetchMode.SUBSELECT

FetchMode.SUBSELECT

- Hibernate Extension commonly used for N+1
 - Turns N + 1 into 1 + 1
 - Can load too much data

```
import org.hibernate.annotations.Fetch;
import org.hibernate.annotations.FetchMode;

@Entity
public class SalesRep {
    @Id
    @GeneratedValue
    private Long id;
    private String name;
    @OneToMany(mappedBy = "salesRep", cascade=CascadeType.ALL)
    @Fetch(FetchMode.SUBSELECT)
    private List<Customer> customers = new ArrayList<>();
}
```

@Fetch

1 select

Select * from Salesrep

Salesrep #1

Salesrep #2

Salesrep #3

Salesrep #4

Salesrep #5

1 select

**Select * from Customer
where salesrep_id in
(Select id from Salesrep)**

Uses a sub-select
to specify IDs

Select returns
all Customers related to
our SalesReps

Customer #1

Customer #2

Customer #3

Customer #4

Customer #5

Customer #6

Customer #7

Customer #8

Customer #9

Customer #10

Customer #11

Customer #12

Customer #13

Customer #14

Customer #15

Code

```
em.getTransaction().begin();

SalesRep sr1 = new SalesRep("John Willis");
SalesRep sr2 = new SalesRep("Mary Long");

sr1.addCustomer(new Customer("Frank", "Brown"));
sr1.addCustomer(new Customer("Jane", "Terrien"));
sr2.addCustomer(new Customer("John", "Doe"));
sr2.addCustomer(new Customer("Carol", "Reno"));

em.persist(sr1);
em.persist(sr2);
em.getTransaction().commit();
```

```
System.out.println("Before query");
TypedQuery<SalesRep> query =
    em.createQuery("from SalesRep where id < 1000",
        SalesRep.class);
List<SalesRep> salesReps = query.getResultList();
System.out.println("After query");
for (SalesRep s : salesReps) {
    s.getCustomers().get(0).getFirstName();
}
System.out.println("After loop");
```

Before query

Hibernate:

```
select
    salesrep0_.id as id1_3_,
    salesrep0_.name as name2_3_
from
    SalesRep salesrep0_
where
    salesrep0_.id<1000
```

After query

Hibernate:

```
select
    customers0_.salesRep_id as salesRep4_1_1_,
    customers0_.id as id1_1_1_,
    customers0_.id as id1_1_0_,
    customers0_.firstName as firstNam2_1_0_,
    customers0_.lastName as lastName3_1_0_,
    customers0_.salesRep_id as salesRep4_1_0_
from
    Customer customers0_
where
    customers0_.salesRep_id in (
        select
            salesrep0_.id
        from
            SalesRep salesrep0_
        where
            salesrep0_.id<1000
```

SubSelect Query
executes when
first customer needed

Includes
where

)
After loop

SubSelect and N+1

- SUBSELECT is like a **supercharged BatchSize**
 - Works on same principle but goes all the way
 - Turns $N + 1$ into $1 + 1$
- Potential problem:
 - Static, always on, no way to not use it
 - May load everything even if we only needed 1