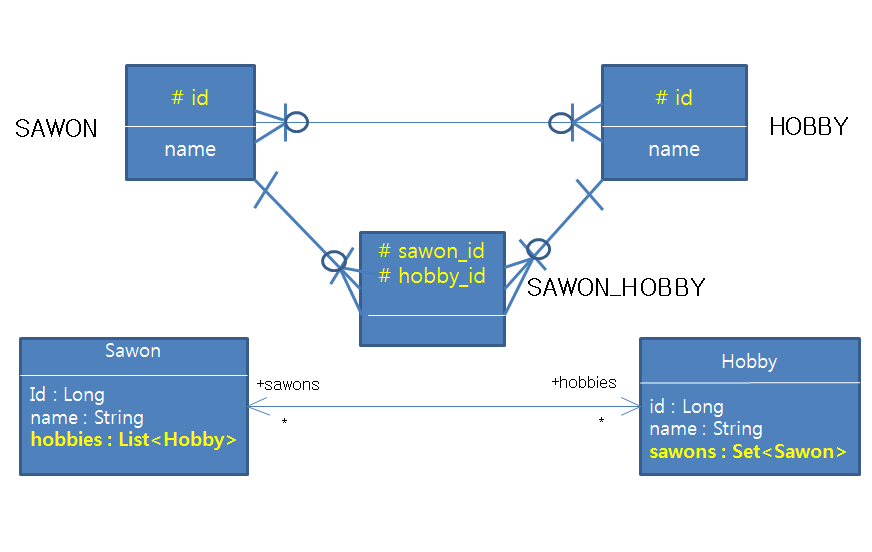
M : N 연관관계(다 : 다) 실습

* 사원(Sawon), 취미(Hobby)는 다 : 다 관계이다. 사원은 여러 취미를 가질 수 있고, 하나의 취미 역시 여러 사원에 할당 될 수 있기 때문이다. 보통 관계형 DB에서는 다 : 다 관계는 1 : 다, 다 : 1 로 나누어서 풀게 된다. 그러나 객체에서는 보통 2개의 객체로 다 : 다 관계를 만드는데, 사원에서 취미를 컬렉션에 넣어 접근 가능하고, 반대로 취미에서도 사원들을 컬렉션에 넣어 접근하면 양쪽에서 접근이 가능하다.
* 다 : 다 매핑을 위해 @ManyToMany 어노테이션을 사용한다.
* @ManyToMany 어노테이션에 mappedBy속성을 사용하여 연관관계의 주인을 지정한다. (mappedBy가 없는 곳이 Owning Side 이다)



**[예제]**

STS -> Spring Stater Project ,name : manytomany

다음화면에서 SQL -> JPA, MySQL 선택

<http://ojc.asia/bbs/board.php?bo_table=LecSpring&wr_id=524>

(마리아 DB 설치는 위 URL에서 참조)

**src/main/resources/application.properties**

spring.datasource.platform=mysql

spring.datasource.url=jdbc:mysql://localhost/manytomany?createDatabaseIfNotExist=true

spring.datasource.username=root

spring.datasource.password=1111

spring.datasource.driver-class-name=com.mysql.jdbc.Driver

spring.datasource.sql-script-encoding=UTF-8

spring.jpa.hibernate.ddl-auto=create

spring.jpa.show-sql=true

**demo.model.Sawon.java**

package demo.model;

import java.util.List;

import java.util.Set;

import javax.persistence.CascadeType;

import javax.persistence.Entity;

import javax.persistence.GeneratedValue;

import javax.persistence.Id;

import javax.persistence.JoinColumn;

import javax.persistence.JoinTable;

import javax.persistence.ManyToMany;

import javax.persistence.OrderColumn;

**@Entity**

public class Sawon {

private Long id;

private String name;

private List<Hobby> hobbies;

public Sawon(String name, List<Hobby> hobby) {

this.name = name;

this.hobbies = hobby;

}

public Sawon(Long id, String name, List<Hobby> hobbies) {

super();

this.id = id;

this.name = name;

this.hobbies = hobbies;

}

public Sawon() {

}

@Id

@GeneratedValue

public Long getId() {

return id;

}

public void setId(Long id) {

this.id = id;

}

public String getName() {

return name;

}

public void setName(String name) {

this.name = name;

}

**@ManyToMany(cascade = {CascadeType.MERGE, CascadeType.PERSIST, CascadeType.REFRESH}) @JoinTable(name = "sawon\_hobby",**

**joinColumns = @JoinColumn(name = "sawon\_id", referencedColumnName = "id") ,**

**inverseJoinColumns = @JoinColumn(name = "hobby\_id", referencedColumnName = "id") )**

**@OrderColumn(name="hobby\_order") //Sawon\_Hobby에 hobby\_order칼럼 생성**

public List<Hobby> getHobbies() {

return hobbies;

}

public void setHobbies(List<Hobby> hobbies) {

this.hobbies = hobbies;

}

@Override

public String toString() {

String result = String.format("Sawon [id=%d, name='%s']%n", id, name);

if (hobbies != null) {

for (Hobby hobby : hobbies) {

result += String.format("Hobby[id=%d, name='%s']%n", hobby.getId(), hobby.getName());

}

}

return result;

}

}

**demo.model.Hobby.java**

@Entity

public class Hobby {

private Long id;

private String name;

private Set<Sawon> sawons;

public Hobby() {}

public Hobby(String name) {

this.name = name;

}

public Hobby(Long id, String name) {

this.id = id; this.name = name;

}

public Hobby(Long id, String name, Set<Sawon> sawons) {

this.id = id;

this.name = name;

this.sawons = sawons;

}

@Id @GeneratedValue

public Long getId() { return id; }

public void setId(Long id) { this.id = id; }

public String getName() { return name; }

public void setName(String name)

{

this.name = name;

}

**@ManyToMany(mappedBy = "hobbies")**

public Set<Sawon> getSawons() {

return sawons;

}

public void setSawons(Set<Sawon> sawons) {

this.sawons = sawons;

}

}

**demo.repository.SawonRepository.java**

package demo.repository;

import org.springframework.data.jpa.repository.JpaRepository;

import demo.model.Sawon;

public interface SawonRepository extends JpaRepository<Sawon, Long>{

}

**demo.repository.HobbyRepository.java**

package demo.repository;

import org.springframework.data.jpa.repository.JpaRepository;

import demo.model.Hobby;

public interface HobbyRepository extends JpaRepository<Hobby, Long>{

}

**demo.ManytomanyApplication.java**

package demo;

import java.util.ArrayList;

import java.util.HashSet;

import java.util.List;

import javax.persistence.EntityManager;

import javax.persistence.PersistenceContext;

import org.slf4j.Logger;

import org.slf4j.LoggerFactory;

import org.springframework.beans.factory.annotation.Autowired;

import org.springframework.boot.CommandLineRunner;

import org.springframework.boot.SpringApplication;

import org.springframework.boot.autoconfigure.SpringBootApplication;

import org.springframework.transaction.annotation.Transactional;

import demo.model.Hobby;

import demo.model.Sawon;

import demo.repository.HobbyRepository;

import demo.repository.SawonRepository;

**@SpringBootApplication**

public class ManytomanyApplication implements CommandLineRunner {

private static final Logger logger =

LoggerFactory.getLogger(ManytomanyApplication.class);

public static void main(String[] args) {

SpringApplication.run(ManytomanyApplication.class, args);

}

@Autowired

SawonRepository sawonRepository;

@Autowired

HobbyRepository hobbyRepository;

@Transactional

**public void run(String...args) {**

**save();** **//저장**

sawonRepository.flush();

**deleteSawon();**  **//삭제**

sawonRepository.flush();

**updateSawon();** **//수정**

sawonRepository.flush();

**deleteSawonHobby();** **//삭제**

}

**void save() {**

Sawon s1 = new Sawon("1길동", new ArrayList() {

{

add(new Hobby("취미1"));

add(new Hobby("취미2"));

}

});

Sawon s2 = new Sawon("2길동", new ArrayList() {

{

add(new Hobby("취미3"));

}

});

**//-------------------------------------------------------------**

**// Sawon 테이블에는 [1, 1길동],[2, 2길동] 이 있고**

**// Hobby 테이블에는 [1, 취미1],[2, 취미2],[3, 취미3]**

**// Sawon\_Hobbby 테이블에는 트랜잭션 종료시점(커밋)시점에**

**// [1, 1], [1, 2], [2, 3] 형태로 데이터가 삽입된다. 로그를 확인하자.**

**// 만약 트랜잭션 도중에 Sawon 데이터가 삭제된다면 트랜잭션 커밋시점에**

**// Sawon\_Hobby 테이블에 insert 하므로 SQL로그는 확인되지 않는다.**

**// 다른 트랜잭션이라면 insert 로그가 남는다.**

**// insert into sawon (name) values (?)**

**// insert into hobby (name) values (?)**

**// insert into hobby (name) values (?)**

**// insert into sawon (name) values (?)**

**// insert into hobby (name) values (?)**

**//-------------------------------------------------------------**

sawonRepository.save(new HashSet<Sawon>() {

{

add(s1);

add(s2);

}

});

**// select sawon0\_.id as id1\_1\_, sawon0\_.name as name2\_1\_ from sawon sawon0\_**

**//Sawon[id=1,name='1길동']Hobby[id=1,name='취미1']Hobby[id=2,name='취미2']**

**// Sawon [id=2, name='2길동'] Hobby[id=3, name='취미3']**

for(Sawon s : sawonRepository.findAll()) {

logger.info(s.toString());

}

**// insert into sawon\_hobby (sawon\_id, hobby\_order, hobby\_id) values (?, ?, ?)**

**// insert into sawon\_hobby (sawon\_id, hobby\_order, hobby\_id) values (?, ?, ?)**

**// insert into sawon\_hobby (sawon\_id, hobby\_order, hobby\_id) values (?, ?, ?)**

}

**void deleteSawon() {**

**//---------------------------------------------------------------------**

**// 2번사원 검색 후 삭제**

**// Sawon 및 Sawon\_Hobby에서 2번 사원의 데이터가 삭제되고**

**// 만약 CascadeType.DELETE라면 Hobby 테이블에서도 2번사원 취미[3, 취미3]은**

**// 1번사원에 없으므로 삭제된다. (다른 사원이 사용하는 취미라면 삭제안됨)**

**// 현재 CascadeType.DELETE는 빠져있다. 그러므로 Hobby에서 “취미3”은 삭제안됨**

**// delete from sawon\_hobby where sawon\_id=?**

**// delete from sawon where id=?**

**//---------------------------------------------------------------------**

Sawon s2 = sawonRepository.findOne(2L);

logger.info("삭제될 사원 => " + s2.toString());

sawonRepository.delete(s2);

}

**void updateSawon() {**

**//-----------------------------------------------------**

**// 1번 사원 검색 후 수정,먼저 영속성컨텍스트에서 1번사원을 로딩**

**// "취미4"는 Hobby 테이블에 [4, 취미4]로 저장되고**

**// 1번사원의 이름을 "11길동"으로 수정 후**

**// Sawon\_Hobby 테이블에 [1, 1, 4]가 insert 된다.**

**// insert into hobby (name) values (?)**

**// update sawon set name=? where id=?**

**// insert into sawon\_hobby (sawon\_id, hobby\_order, hobby\_id) values (?, ?, ?)**

**//-----------------------------------------------------**

Sawon s1 = sawonRepository.findOne(1L);

logger.info("수정될 사원 => " +s1.toString());

s1.getHobbies().add(new Hobby("취미4"));

s1.setName("11길동");

sawonRepository.save(s1);

}

**void deleteSawonHobby() {**

**//--------------------------------------------------------------**

**// Hobby에서 [1, 취미1]을 검색 후 로딩**

**// 아래처럼 삭제하는 경우 Sawon\_Hobby에서 “1번사원”의 "취미1"만 삭제된다.**

**// Hobby 테이블에서는 "취미1"이 삭제되지 않난다.**

**// delete from sawon\_hobby where sawon\_id=? and hobby\_order=?**

**// update sawon\_hobby set hobby\_id=? where sawon\_id=? and hobby\_order=?**

**// update sawon\_hobby set hobby\_id=? where sawon\_id=? and hobby\_order=?**

**//--------------------------------------------------------------**

Sawon s1 = sawonRepository.findOne(1L);

Hobby h1 = hobbyRepository.findOne(1L);

if (s1.getHobbies().contains(h1))

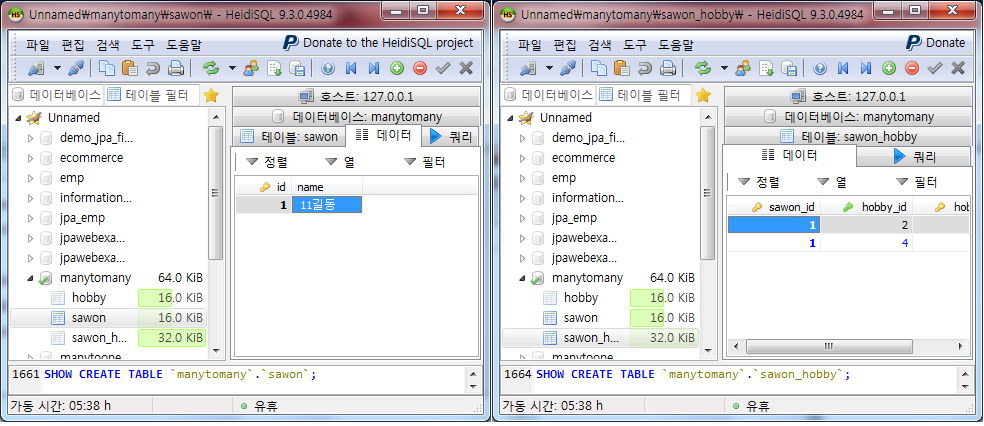
s1.getHobbies().remove(h1);

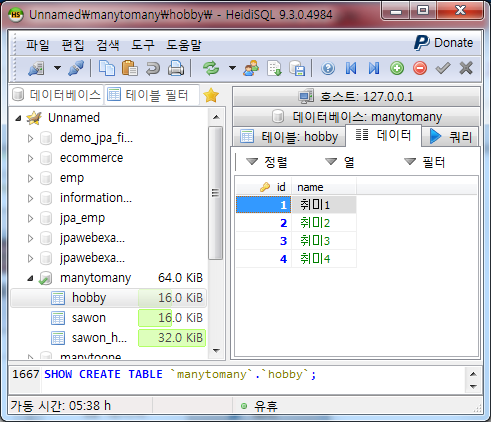
sawonRepository.save(s1);

}

}

**데이터 확인하기**





**[실행 결과]**

alter table sawon\_hobby drop foreign key FK\_p9uwrr1nddt9pgue7xqmey4cr

alter table sawon\_hobby drop foreign key FK\_qqk3c8ippcim47nrhxyislbtl

drop table if exists hobby

drop table if exists sawon

drop table if exists sawon\_hobby

create table hobby (id bigint not null auto\_increment, name varchar(255), primary key (id))

create table sawon (id bigint not null auto\_increment, name varchar(255), primary key (id))

create table sawon\_hobby (sawon\_id bigint not null, hobby\_id bigint not null, **hobby\_order** integer not null, primary key (sawon\_id, hobby\_order))

alter table sawon\_hobby add constraint FK\_p9uwrr1nddt9pgue7xqmey4cr foreign key (hobby\_id) references hobby (id)

alter table sawon\_hobby add constraint FK\_qqk3c8ippcim47nrhxyislbtl foreign key (sawon\_id) references sawon (id)

insert into sawon (name) values (?)

insert into hobby (name) values (?)

insert into hobby (name) values (?)

insert into sawon (name) values (?)

insert into hobby (name) values (?)

select sawon0\_.id as id1\_1\_, sawon0\_.name as name2\_1\_ from sawon sawon0\_

Sawon [id=1, name='1길동'] Hobby[id=1, name='취미1'] Hobby[id=2, name='취미2']

Sawon [id=2, name='2길동'] Hobby[id=3, name='취미3']

insert into sawon\_hobby (sawon\_id, hobby\_order, hobby\_id) values (?, ?, ?)

insert into sawon\_hobby (sawon\_id, hobby\_order, hobby\_id) values (?, ?, ?)

insert into sawon\_hobby (sawon\_id, hobby\_order, hobby\_id) values (?, ?, ?)

삭제될 사원 => Sawon [id=2, name='2길동']

Hobby[id=3, name='취미3']

delete from sawon\_hobby where sawon\_id=?

delete from sawon where id=?

수정될 사원 => Sawon [id=1, name='1길동']

Hobby[id=1, name='취미1']

Hobby[id=2, name='취미2']

insert into hobby (name) values (?)

update sawon set name=? where id=?

insert into sawon\_hobby (sawon\_id, hobby\_order, hobby\_id) values (?, ?, ?)

delete from sawon\_hobby where sawon\_id=? and hobby\_order=?

update sawon\_hobby set hobby\_id=? where sawon\_id=? and hobby\_order=?

update sawon\_hobby set hobby\_id=? where sawon\_id=? and hobby\_order=?