**Hibernate Lazy Collection**

**MySQL**

**CREATE DATABASE ecommerce**

**USE ecommerce**

**•**

**• DROP TABLE IF EXISTS `colors`;**

**• /\*!40101 SET @saved\_cs\_client = @@character\_set\_client \*/;**

**• /\*!40101 SET character\_set\_client = utf8 \*/;**

**• CREATE TABLE `colors` (**

**• `ID` bigint(20) NOT NULL AUTO\_INCREMENT,**

**• `color\_name` varchar(40) DEFAULT NULL,**

**• `idx` int(11) DEFAULT NULL,**

**• `product\_id` bigint(20) DEFAULT NULL,**

**• PRIMARY KEY (`ID`)**

**• ) ENGINE=InnoDB AUTO\_INCREMENT=6 DEFAULT CHARSET=latin1;**

**• /\*!40101 SET character\_set\_client = @saved\_cs\_client \*/;**

**•**

**• --**

**• -- Dumping data for table `colors`**

**• --**

**•**

**• LOCK TABLES `colors` WRITE;**

**• /\*!40000 ALTER TABLE `colors` DISABLE KEYS \*/;**

**• INSERT INTO `colors` VALUES (1,'Red',0,1),(2,'Silver',1,1),(3,'Gray',0,2),(4,'White',1,2),(5,'Maroon',0,3);**

**• /\*!40000 ALTER TABLE `colors` ENABLE KEYS \*/;**

**• UNLOCK TABLES;**

**•**

**• --**

**• -- Table structure for table `eproduct`**

**• --**

**•**

**• DROP TABLE IF EXISTS `eproduct`;**

**• /\*!40101 SET @saved\_cs\_client = @@character\_set\_client \*/;**

**• /\*!40101 SET character\_set\_client = utf8 \*/;**

**• CREATE TABLE `eproduct` (**

**• `ID` bigint(20) NOT NULL AUTO\_INCREMENT,**

**• `name` varchar(100) DEFAULT NULL,**

**• `price` decimal(10,2) DEFAULT NULL,**

**• `date\_added` timestamp NOT NULL DEFAULT CURRENT\_TIMESTAMP,**

**• PRIMARY KEY (`ID`)**

**• ) ENGINE=InnoDB AUTO\_INCREMENT=4 DEFAULT CHARSET=latin1;**

**• /\*!40101 SET character\_set\_client = @saved\_cs\_client \*/;**

**•**

**• --**

**• -- Dumping data for table `eproduct`**

**• --**

**•**

**• LOCK TABLES `eproduct` WRITE;**

**• /\*!40000 ALTER TABLE `eproduct` DISABLE KEYS \*/;**

**• INSERT INTO `eproduct` VALUES (1,'HP Laptop ABC',21900.00,'2019-06-04 07:18:57'),(2,'Acer Laptop ABC',23300.00,'2019-06-04 07:19:07'),(3,'Lenovo Laptop ABC',33322.00,'2019-06-04 07:19:19');**

**• /\*!40000 ALTER TABLE `eproduct` ENABLE KEYS \*/;**

**• UNLOCK TABLES;**

**•**

**• --**

**• -- Table structure for table `finance`**

**• --**

**•**

**• DROP TABLE IF EXISTS `finance`;**

**• /\*!40101 SET @saved\_cs\_client = @@character\_set\_client \*/;**

**• /\*!40101 SET character\_set\_client = utf8 \*/;**

**• CREATE TABLE `finance` (**

**• `ID` bigint(20) NOT NULL AUTO\_INCREMENT,**

**• `ftype` varchar(10) DEFAULT NULL,**

**• `name` varchar(30) DEFAULT NULL,**

**• `product\_id` bigint(20) DEFAULT NULL,**

**• PRIMARY KEY (`ID`)**

**• ) ENGINE=InnoDB AUTO\_INCREMENT=6 DEFAULT CHARSET=latin1;**

**• /\*!40101 SET character\_set\_client = @saved\_cs\_client \*/;**

**•**

**• --**

**• -- Dumping data for table `finance`**

**• --**

**•**

**• LOCK TABLES `finance` WRITE;**

**• /\*!40000 ALTER TABLE `finance` DISABLE KEYS \*/;**

**• INSERT INTO `finance` VALUES (1,'CREDITCARD','EMI on Citibank Card',1),(3,'BANK','40% finance from SBI',2),(4,'BANK','60% finance from ICICI',3),(5,'BANK','20% finance from ICICI',1);**

**• /\*!40000 ALTER TABLE `finance` ENABLE KEYS \*/;**

**• UNLOCK TABLES;**

**•**

**• --**

**• -- Table structure for table `os`**

**• --**

**•**

**• DROP TABLE IF EXISTS `os`;**

**• /\*!40101 SET @saved\_cs\_client = @@character\_set\_client \*/;**

**• /\*!40101 SET character\_set\_client = utf8 \*/;**

**• CREATE TABLE `os` (**

**• `ID` bigint(20) NOT NULL AUTO\_INCREMENT,**

**• `name` varchar(30) DEFAULT NULL,**

**• `product\_id` bigint(20) DEFAULT NULL,**

**• PRIMARY KEY (`ID`)**

**• ) ENGINE=InnoDB AUTO\_INCREMENT=6 DEFAULT CHARSET=latin1;**

**• /\*!40101 SET character\_set\_client = @saved\_cs\_client \*/;**

**•**

**• --**

**• -- Dumping data for table `os`**

**• --**

**•**

**• LOCK TABLES `os` WRITE;**

**• /\*!40000 ALTER TABLE `os` DISABLE KEYS \*/;**

**• INSERT INTO `os` VALUES (1,'Windows 10',1),(2,'Windows 10',2),(3,'FreeDOS',2),(4,'RedHat Linux',2),(5,'Windows 10',3);**

**• /\*!40000 ALTER TABLE `os` ENABLE KEYS \*/;**

**• UNLOCK TABLES;**

**•**

**• --**

**• -- Table structure for table `screensizes`**

**• --**

**•**

**• DROP TABLE IF EXISTS `screensizes`;**

**• /\*!40101 SET @saved\_cs\_client = @@character\_set\_client \*/;**

**• /\*!40101 SET character\_set\_client = utf8 \*/;**

**• CREATE TABLE `screensizes` (**

**• `ID` bigint(20) NOT NULL AUTO\_INCREMENT,**

**• `size` varchar(10) DEFAULT NULL,**

**• `product\_id` bigint(20) DEFAULT NULL,**

**• PRIMARY KEY (`ID`)**

**• ) ENGINE=InnoDB AUTO\_INCREMENT=5 DEFAULT CHARSET=latin1;**

**• /\*!40101 SET character\_set\_client = @saved\_cs\_client \*/;**

**•**

**• --**

**• -- Dumping data for table `screensizes`**

**• --**

**•**

**• LOCK TABLES `screensizes` WRITE;**

**• /\*!40000 ALTER TABLE `screensizes` DISABLE KEYS \*/;**

**• INSERT INTO `screensizes` VALUES (1,'12 in',1),(2,'14.5 in',2),(3,'14.9 in',2),(4,'15.5 in',3);**

**• /\*!40000 ALTER TABLE `screensizes` ENABLE KEYS \*/;**

**• UNLOCK TABLES;**

**Creating a class Color**

**package** com.ecommerce;

**public** **class** Color {

**private** **long** COLORID;

**private** String name;

**public** Color() {

}

**public** Color(String name) {

**this**.COLORID = 0;

**this**.name = name;

}

**public** **long** getCOLORID() {**return** **this**.COLORID; }

**public** String getName() { **return** **this**.name;}

**public** **void** setCOLORID(**long** id) { **this**.COLORID = id;}

**public** **void** setName(String name) { **this**.name = name;}

}

**class EProduct**

**package** com.ecommerce;

**import** java.math.BigDecimal;

**import** java.util.Collection;

**import** java.util.Date;

**import** java.util.List;

**import** java.util.Set;

**import** java.util.Map;

**public** **class** EProduct {

**private** **long** ID;

**private** String name;

**private** BigDecimal price;

**private** Date dateAdded;

**private** List<Color> colors;

**private** Set<Finance> finance;

**private** PDescription pdescrip;

**public** EProduct() {

}

**public** **long** getID() {**return** **this**.ID; }

**public** String getName() { **return** **this**.name;}

**public** BigDecimal getPrice() { **return** **this**.price;}

**public** Date getDateAdded() { **return** **this**.dateAdded;}

**public** List<Color> getColors() { **return** **this**.colors;}

**public** Set<Finance> getFinance() { **return** **this**.finance;}

**public** PDescription getPdescrip() { **return** **this**.pdescrip;}

**public** **void** setID(**long** id) { **this**.ID = id;}

**public** **void** setName(String name) { **this**.name = name;}

**public** **void** setPrice(BigDecimal price) { **this**.price = price;}

**public** **void** setDateAdded(Date date) { **this**.dateAdded = date;}

**public** **void** setColors(List<Color> colors) { **this**.colors = colors;}

**public** **void** setFinance(Set<Finance> finance) { **this**.finance = finance;}

**public** **void** setPdescrip(PDescription pdescrip) { **this**.pdescrip = pdescrip;}

}

**class Finance**

**package** com.ecommerce;

**public** **class** OS {

**private** **long** OSID;

**private** String name;

**public** OS() {

}

**public** OS(String name) {

**this**.OSID = 0;

**this**.name = name;

}

**public** **long** getOSID() {**return** **this**.OSID; }

**public** String getName() { **return** **this**.name;}

**public** **void** setOSID(**long** id) { **this**.OSID = id;}

**public** **void** setName(String name) { **this**.name= name;}

}

**class OS**

**package** com.ecommerce;

**public** **class** OS {

**private** **long** OSID;

**private** String name;

**public** OS() {

}

**public** OS(String name) {

**this**.OSID = 0;

**this**.name = name;

}

**public** **long** getOSID() {**return** **this**.OSID; }

**public** String getName() { **return** **this**.name;}

**public** **void** setOSID(**long** id) { **this**.OSID = id;}

**public** **void** setName(String name) { **this**.name= name;}

}

**class ScreenSizes**

**package** com.ecommerce;

**public** **class** ScreenSizes {

**private** **long** SCREENID;

**private** String size;

**public** ScreenSizes() {

}

**public** ScreenSizes(String size) {

**this**.SCREENID = 0;

**this**.size = size;

}

**public** **long** getSCREENID() {**return** **this**.SCREENID; }

**public** String getSize() { **return** **this**.size;}

**public** **void** setSCREENID(**long** id) { **this**.SCREENID = id;}

**public** **void** setSize(String size) { **this**.size = size;}

}

**HibernateUtil class**

**package** com.ecommerce;

**import** org.hibernate.SessionFactory;

**import** org.hibernate.boot.Metadata;

**import** org.hibernate.boot.MetadataSources;

**import** org.hibernate.boot.registry.StandardServiceRegistry;

**import** org.hibernate.boot.registry.StandardServiceRegistryBuilder;

**public** **class** HibernateUtil {

**private** **static** **final** SessionFactory ***sessionFactory***;

**static** {

**try** {

StandardServiceRegistry standardRegistry = **new** StandardServiceRegistryBuilder()

.configure("hibernate.cfg.xml").build();

Metadata metaData = **new** MetadataSources(standardRegistry).getMetadataBuilder().build();

***sessionFactory*** = metaData.getSessionFactoryBuilder().build();

} **catch** (Throwable th) {

**throw** **new** ExceptionInInitializerError(th);

}

}

**public** **static** SessionFactory getSessionFactory() {

**return** ***sessionFactory***;

}

}

**Color.hbm.xml**

<?xml version="1.0"?>

<!DOCTYPE hibernate-mapping PUBLIC

"-//Hibernate/Hibernate Mapping DTD 3.0//EN"

"http://www.hibernate.org/dtd/hibernate-mapping-3.0.dtd">

<hibernate-mapping package="com.ecommerce">

<class name="Color" table="colors">

<id name="COLORID" type="long" column="ID">

<generator class="identity"/>

</id>

<property name="name" type="string" column="COLOR\_NAME"/>

</class>

</hibernate-mapping>

**EProduct.hbm.xml**

<?xml version="1.0"?>

<!DOCTYPE hibernate-mapping PUBLIC

"-//Hibernate/Hibernate Mapping DTD 3.0//EN"

"http://www.hibernate.org/dtd/hibernate-mapping-3.0.dtd">

<hibernate-mapping package="com.ecommerce">

<class name="EProduct" table="eproduct">

<id name="ID" type="long" column="ID">

<generator class="identity"/>

</id>

<property name="name" type="string" column="NAME"/>

<property name="price" type="big\_decimal" column="PRICE"/>

<property name="dateAdded" type="timestamp" column="DATE\_ADDED"/>

<list name="colors" cascade="all" lazy="true">

<key column="product\_id" />

<list-index column="idx" />

<one-to-many class="com.ecommerce.Color" />

</list>

<bag name="screensizes" cascade="all" lazy="true">

<key column="product\_id"></key>

<one-to-many class="com.ecommerce.ScreenSizes"/>

</bag>

<set name = "os" cascade="all" lazy=”true”>

<key column = "product\_id"/>

<one-to-many class="OS"/>

</set>

<map name = "finance" cascade="all">

<key column = "product\_id"/>

<index column = "ftype" type = "string"/>

<one-to-many class="com.ecommerce.Finance"/>

</map>

</class>

</hibernate-mapping>

**Finance.hbm.xml**

<?xml version="1.0"?>

<!DOCTYPE hibernate-mapping PUBLIC

"-//Hibernate/Hibernate Mapping DTD 3.0//EN"

"http://www.hibernate.org/dtd/hibernate-mapping-3.0.dtd">

<hibernate-mapping package="com.ecommerce">

<class name="Finance" table="finance">

<id name="FINANCEID" type="long" column="ID">

<generator class="identity"/>

</id>

<property name="name" type="string" column="NAME"/>

<property name="ftype" type="string" column="FTYPE"/>

</class>

</hibernate-mapping>

**Os.hbm.xml**

<?xml version="1.0"?>

<!DOCTYPE hibernate-mapping PUBLIC

"-//Hibernate/Hibernate Mapping DTD 3.0//EN"

"http://www.hibernate.org/dtd/hibernate-mapping-3.0.dtd">

<hibernate-mapping package="com.ecommerce">

<class name="OS" table="os">

<id name="OSID" type="long" column="ID">

<generator class="identity"/>

</id>

<property name="name" type="string" column="NAME"/>

</class>

</hibernate-mapping>

**ScreenSizes.hbm.xml**

<?xml version="1.0"?>

<!DOCTYPE hibernate-mapping PUBLIC

"-//Hibernate/Hibernate Mapping DTD 3.0//EN"

"http://www.hibernate.org/dtd/hibernate-mapping-3.0.dtd">

<hibernate-mapping package="com.ecommerce">

<class name="ScreenSizes" table="screensizes">

<id name="SCREENID" type="long" column="ID">

<generator class="identity"/>

</id>

<property name="size" type="string" column="SIZE"/>

</class>

</hibernate-mapping>

**hibernate.cfg.xml**

<?xml version='1.0' encoding='utf-8'?>

<!DOCTYPE hibernate-configuration PUBLIC

"-//Hibernate/Hibernate Configuration DTD 3.0//EN"

"http://www.hibernate.org/dtd/hibernate-configuration-3.0.dtd">

<hibernate-configuration>

<session-factory>

<!-- Database connection settings -->

<property name="connection.driver\_class">com.mysql.jdbc.Driver</property>

<property name="connection.url">jdbc:mysql://localhost:3306/ecommerce</property>

<property name="connection.username">root</property>

<property name="connection.password">master</property>

<mapping resource="com/ecommerce/EProduct.hbm.xml"/>

<mapping resource="com/ecommerce/Color.hbm.xml"/>

<mapping resource="com/ecommerce/ScreenSizes.hbm.xml"/>

<mapping resource="com/ecommerce/Os.hbm.xml"/>

<mapping resource="com/ecommerce/Finance.hbm.xml"/>

</session-factory>

</hibernate-configuration>

**HTML page**

<!DOCTYPE html>

<html>

<head>

<meta charset="UTF-8">

<title>Hibernate Collection Mapping With XML</title>

</head>

<body>

<a href="details">Product Details</a><br>

</body>

</html>

**ProductDetails servlet**

**import** java.io.IOException;

**import** java.io.PrintWriter;

**import** javax.servlet.ServletConfig;

**import** javax.servlet.ServletException;

**import** javax.servlet.annotation.WebServlet;

**import** javax.servlet.http.HttpServlet;

**import** javax.servlet.http.HttpServletRequest;

**import** javax.servlet.http.HttpServletResponse;

**import** javax.transaction.\*;

**import** javax.xml.bind.\*;

**import** java.io.Serializable;

**import** java.math.BigDecimal;

**import** java.util.ArrayList;

**import** java.util.Calendar;

**import** java.util.Collection;

**import** java.util.List;

**import** java.util.Map;

**import** java.util.Set;

**import** org.hibernate.Session;

**import** org.hibernate.SessionFactory;

**import** org.hibernate.Transaction;

**import** org.hibernate.cfg.Configuration;

**import** com.ecommerce.Color;

**import** com.ecommerce.EProduct;

**import** com.ecommerce.Finance;

**import** com.ecommerce.HibernateUtil;

**import** com.ecommerce.PDescription;

/\*\*

\* Servlet implementation class ProductDetails

\*/

@WebServlet("/ProductDetails")

**public** **class** ProductDetails **extends** HttpServlet {

**private** **static** **final** **long** ***serialVersionUID*** = 1L;

/\*\*

\* **@see** HttpServlet#HttpServlet()

\*/

**public** ProductDetails() {

**super**();

// **TODO** Auto-generated constructor stub

}

/\*\*

\* **@see** HttpServlet#doGet(HttpServletRequest request, HttpServletResponse response)

\*/

**protected** **void** doGet(HttpServletRequest request, HttpServletResponse response) **throws** ServletException, IOException {

// **TODO** Auto-generated method stub

**try** {

SessionFactory factory = HibernateUtil.*getSessionFactory*();

Session session = factory.openSession();

List<EProduct> list = session.createQuery("from EProduct").list();

PrintWriter out = response.getWriter();

out.println("<html><body>");

out.println("<b>One to One Mapping</b><br>");

**for**(EProduct p: list) {

out.println("ID: " + String.*valueOf*(p.getID()) + ", Name: " + p.getName() +

", Price: " + String.*valueOf*(p.getPrice()) + ", Date Added: " + p.getDateAdded().toString());

PDescription descrip = p.getPdescrip();

out.println("<br>Description:" + descrip.getDescrip());

out.println("<hr>");

}

out.println("<b>One to Many and Many to One Mapping</b><br>");

**for**(EProduct p: list) {

out.println("ID: " + String.*valueOf*(p.getID()) + ", Name: " + p.getName() +

", Price: " + String.*valueOf*(p.getPrice()) + ", Date Added: " + p.getDateAdded().toString());

List<Color> colors = p.getColors();

out.println("<br>Colors: <ul>");

**for**(Color c: colors) {

out.print("<li>" + c.getName() + "</li>");

}

out.println("</ul>");

out.println("<hr>");

}

out.println("<b>Many to Many Mapping</b><br>");

**for**(EProduct p: list) {

out.println("ID: " + String.*valueOf*(p.getID()) + ", Name: " + p.getName() +

", Price: " + String.*valueOf*(p.getPrice()) + ", Date Added: " + p.getDateAdded().toString());

Set<Finance> finances= p.getFinance();

out.println("<br>Finance Options : <ul>");

**for**(Finance f: finances) {

out.print("<li>" + f.getFtype() + "</li>");

}

out.println("</ul>");

out.println("<hr>");

}

session.close();

out.println("</body></html>");

} **catch** (Exception ex) {

**throw** ex;

}

}

/\*\*

\* **@see** HttpServlet#doPost(HttpServletRequest request, HttpServletResponse response)

\*/

**protected** **void** doPost(HttpServletRequest request, HttpServletResponse response) **throws** ServletException, IOException {

// **TODO** Auto-generated method stub

doGet(request, response);

}

}

**web.xml**

<?xml version="1.0" encoding="UTF-8"?>

<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://xmlns.jcp.org/xml/ns/javaee" xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee http://xmlns.jcp.org/xml/ns/javaee/web-app\_4\_0.xsd" id="WebApp\_ID" version="4.0">

<display-name>HibernateLazyCollections</display-name>

<welcome-file-list>

<welcome-file>index.html</welcome-file>

<welcome-file>index.htm</welcome-file>

<welcome-file>index.jsp</welcome-file>

<welcome-file>default.html</welcome-file>

<welcome-file>default.htm</welcome-file>

<welcome-file>default.jsp</welcome-file>

</welcome-file-list>

<servlet>

<servlet-name>ProductDetails</servlet-name>

<servlet-class>ProductDetails</servlet-class>

</servlet>

<servlet-mapping>

<servlet-name>ProductDetails</servlet-name>

<url-pattern>/details</url-pattern>

</servlet-mapping>

</web-app>