**Color.java:**

**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;}

}

**EProduct.java:**

**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** **Collection**<ScreenSizes> screenSizes;

**private** **Set**<OS> os;

**private** **Map** finance;

**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** **Collection**<ScreenSizes> getScreensizes() { **return** **this**.screenSizes;}

**public** **Set**<OS> getOs() { **return** **this**.os;}

**public** **Map** getFinance() { **return** **this**.finance;}

**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 setScreensizes(**Collection**<ScreenSizes> sizes) { **this**.screenSizes = sizes;}

**public** void setOs(**Set**<OS> os) { **this**.os = os;}

**public** void setFinance(**Map** finance) { **this**.finance = finance;}

}

**Finance.java:**

**public** **class** Finance {

**private** long FINANCEID;

**private** **String** name;

**private** **String** ftype;

**public** Finance() {

}

**public** Finance(**String** name, **String** ftype) {

**this**.FINANCEID = 0;

**this**.name = name;

**this**.ftype = ftype;

}

**public** long getFINANCEID() {**return** **this**.FINANCEID; }

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

**public** **String** getFtype() { **return** **this**.ftype;}

**public** void setFINANCEID(long id) { **this**.FINANCEID = id;}

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

**public** void setFtype(**String** ftype) { **this**.ftype= ftype;}

}

**OS.java:**

**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;}

}

**ScreenSizes.java:**

**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.java:**

**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">

<key column="product\_id" />

<list-index column="idx" />

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

</list>

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

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

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

</bag>

<set name = "os" cascade="all">

<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>

**index.html:**

<!DOCTYPE html>

<**html**>

<**head**>

<**meta** charset="UTF-8">

<**title**>Hibernate Collection Mapping</**title**>

</**head**>

<**body**>

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

</**body**>

</**html**>

**ProductDetails.java:**

**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.OS;

**import** com.ecommerce.ScreenSizes;

/\*\*

**\*** 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>Product Listing</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("Colors: ");

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

out.print(c.getName() + "&nbsp;");

}

**Collection**<ScreenSizes> sizes= p.getScreensizes();

out.println(", Screen Sizes: ");

**for**(ScreenSizes s: sizes) {

out.print(s.getSize() + "&nbsp;");

}

**Set**<OS> os= p.getOs();

out.println(", OS : ");

**for**(OS o: os) {

out.print(o.getName() + "&nbsp;");

}

**Map** finances = p.getFinance();

out.println(", Finance Options: ");

**if** (finances.get("CREDITCARD") != **null**) {

Finance f = (Finance) finances.get("CREDITCARD");

out.println(f.getName() + " &nbsp;");

}

**if** (finances.get("BANK") != **null**) {

Finance f = (Finance) finances.get("BANK");

out.println(f.getName() + " &nbsp;");

}

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>HibernateListMapping</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>