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DBTechNet Tutorial on

ORM – Object Relational Mapping

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Disclaimers

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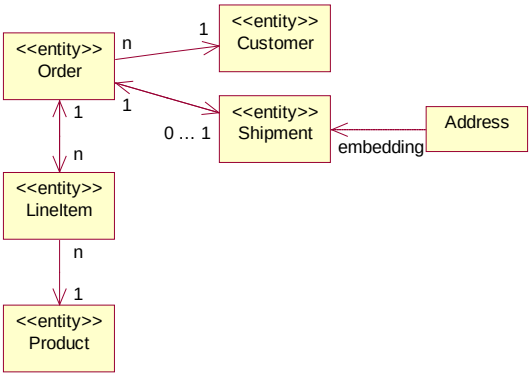
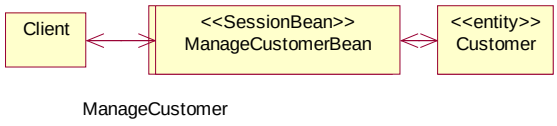
Workshop practice

Order application is in `/home/dbtech/ORM/order` directory. Open editor and see the files.

The figure below describes the object model of the order application. An order has a customer and can have many lineitems. The lineitem can belong only to one order and the lineitem has a product. In addition, the order can have a shipment and the shipment can belong only to an order. A normal class, `Address`, is embedded into the `Shipment` entity.

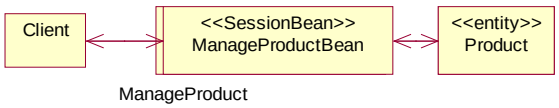


The `Customer` and `Product` entities are managed through `ManageCustomer` and `ManageProduct` session beans, respectively.



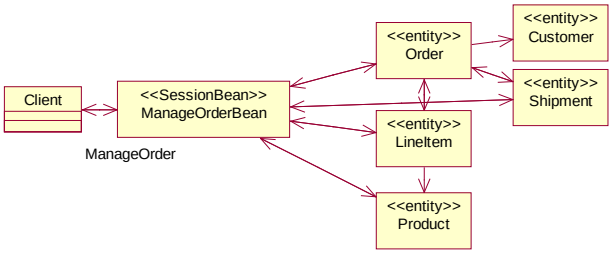

```
public interface ManageCustomer {
     public void createCustomer(Customer customer);
```

```
      public Customer findCustomer(int customerId);
      public void updateCustomer(Customer customer);
      public List<Customer> listAllCustomers();
      public List<Customer> getCustomersByType(String type);
}
```




```
public interface ManageProduct {
      public String createProduct(Product product);
      public Product getProduct(String code);
      public boolean deleteProduct(String code);
      public List<Product> listProducts();
      public List<Product> listProductsOfProductGroup(String productGroup);
      public List<Product> listProductsWithPriceRange(double fromPrice, double toPrice);
}
```

The `Order` entities with `LineItem` and `Shipment` entities are managed with `ManageOrder` interface.



See the Java program code.

```
public interface ManageOrder {
      public int createOrder(int CustomerId);
      public boolean createLineItem(int orderId,Product product,double amount, double price);
      public boolean createLineItem(int orderId,String productCode,double amount,double price);
      public Order getOrder(int orderId);
      public List<Order> listAllOrders();
      public List<Order> listOrdersByCustomerId(int customerId);
      public List<Order> listOrdersByCustomerName(String name);
      public int createShipmentForOrder(int orderId, String destination, Address address);
      public List<Shipment> listAllShipments();
      public List listOrderedProductNameOfCustomer(String name);
      public List<Order> listOrdersOfProduct(String productCode);
}
```

Exercises

1. Create two new customers and four products. Add the program code into `Client.java` program and test the program.

2. Programmer has forgotten to write the methods stated below. Please, help the programmer and write the methods to the applicable interface and session beans:

```
interface ManageCustomer: public boolean deleteCustomer(int customerId);
interface ManageCustomer: public Customer getCustomerByName(String CustomerName);
interface ManageProduct: public void updateProduct(Product product);
interface ManageProduct: public Product getProductByName(String productName);

interface ManageOrder: public List<Order> listOrdersByProductName(String
                                                                productName);
interface ManageOrder: public List<Order> listOrdersByCustomerNameAndProductName
                              (String customerName, String productName);
```

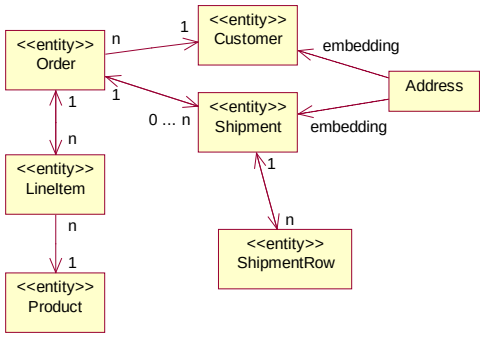
   Test new methods .

3. Write a method, which returns a list of product shipped to a country, which is given as input parameter:

```
public List<Product> listProductsShippedToCountry(String country);
```

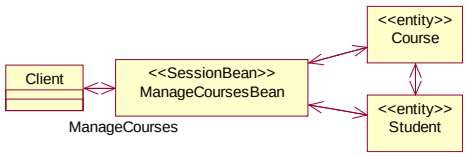
4. The Customer class has the String type `address` field. Change it's type to the embedded `Address` class. See the figure below.

5. Change the relationship between `Order` and `Shipment` from the one-to-one relationship to the one-to-many relationship. An order can accordingly have many shipments and an `Shipment` entity can have many relationship. An order can accordingly have many shipments and an `Shipment` entity can have many `ShipmentRows`. See the figure below.



6. Course program contains a many-to-many relationship. A course has many students and a student can take part in many courses. The `course` program is in `/home/dbtech/ORM/course` directory.

   The courses and students are managed through `ManageCourses` interface.



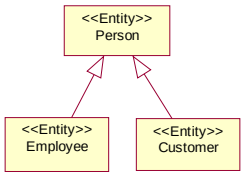

```
public interface ManageCourses {
   public String createStudent(Student student);
   public String createCourse(Course course);
   public boolean setStudentToCourse(String studentId, String courseCode);
   public boolean dropStudentFromCourse(String studentId, String courseCode);
   public List<Course> getCourseList();
   public List<Student> listStudents();
}
```

The interface is not complete. The following methods is needed. Could you, please, write and test them.

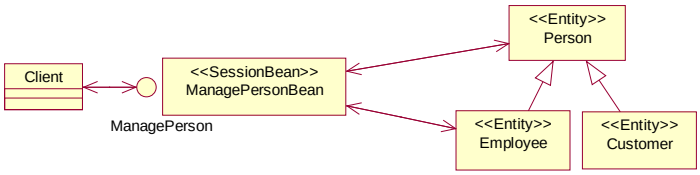
```
   public List<Course> getCoursesOfStudent(String studentId);
   public List<Student> getStudentsOfCourse(String courseCode);
```

7. Entity inheritance mapping to database.

The domain model of a `person` application consists of a root class `Person` and its two subclasses `Employee` and `Customer`.



The entities are managed through `ManagePerson` interface.



The person application is in the `/home/dbtech/ORM/person` directory.

Do the following:

See the mapping strategy in the root class `Person`, run the program and see, how the class hierarchy is mapped to the database. See the polymorphic query in the `Client` program.

Change the mapping strategy into `JOINED` and test.
Change the mapping strategy into `TABLE_PER_CLASS` and test.

Sources

http://www.jboss.org/