

Many to many relationships need a proxy (intermediary) table to breakdown what is happening = the decomposition rule

MySQL Workbench

File Edit View Query Database Server Tools Scripting Help

Navigator

Schemas

- ims
 - Tables
 - Views
 - Stored Procedures
 - Functions
- movielens
- sakila
- school
- something
- sys
- world

Administration Schemas

Information

Schema: school

```

1 • INSERT INTO `ims`.`customers` ('first_name', 'surname') VALUES ('Bukayo', 'Saka');
2 • INSERT INTO `ims`.`customers` ('first_name', 'surname') VALUES ('Marcus', 'Rashford');
3 • INSERT INTO `ims`.`customers` ('first_name', 'surname') VALUES ('Jadon', 'Sancho');
4 • INSERT INTO `ims`.`customers` ('first_name', 'surname') VALUES ('Raheem', 'Sterling');
5 • INSERT INTO `ims`.`items` ('item_name', 'price') VALUES ('Orange', '0.19');
6 • INSERT INTO `ims`.`items` ('item_name', 'price') VALUES ('Apple', '0.15');
7 • INSERT INTO `ims`.`items` ('item_name', 'price') VALUES ('Water', '1.50');
8 • INSERT INTO `ims`.`items` ('item_name', 'price') VALUES ('Lucazade Sport', '1.69');
9 • INSERT INTO `ims`.`items` ('item_name', 'price') VALUES ('Football', '24.99');
10 • INSERT INTO `ims`.`items` ('item_name', 'price') VALUES ('Football Boots', '89.99');
11 • INSERT INTO `ims`.`items` ('item_name', 'price') VALUES ('Gym Socks', '15.99');
12 • INSERT INTO `ims`.`items` ('item_name', 'price') VALUES ('Protein Shake', '2.29');
13 • INSERT INTO `ims`.`orders` ('order_name', 'order_status', 'date_placed', 'price') VALUES ('BS7', 'Processed');
14 • INSERT INTO `ims`.`orders` ('order_name', 'order_status', 'date_placed', 'price') VALUES ('MR10', 'Dispatched');
15 • INSERT INTO `ims`.`orders` ('order_name', 'order_status', 'date_placed', 'price') VALUES ('JS17', 'Delivered');
16 • INSERT INTO `ims`.`orders` ('order_name', 'order_status', 'date_placed', 'price') VALUES ('RSS', 'Ordered');
17 • INSERT INTO `ims`.`orders_items` ('items_item_id', 'orders_order_id', 'orders_customers_id') VALUES (1,1,1);
18 • INSERT INTO `ims`.`orders_items` ('items_item_id', 'orders_order_id', 'orders_customers_id') VALUES (2,2,2);
19 • INSERT INTO `ims`.`orders_items` ('items_item_id', 'orders_order_id', 'orders_customers_id') VALUES (3,3,3);

```

Action Output

| # | Time | Action | Message | Duration / Fetch |
|---|-------------|--|--------------------|------------------|
| 1 | 74 10:25:26 | INSERT INTO `ims`.`customers` ('name', 'item_id', 'order_id', 'customers') | 1 message affected | 0ms |

SQL script saved to 'C:\Users\user\git\IMStarterjuneSDTgify\src\main\resources\sql\data.sql'

Type here to search

Training - IMStarterjuneSDTgify[src\main\java\com\qa\ims\controller\ItemController.java - Eclipse IDE

File Edit Source Refactor Navigate Search Project Run Window Help

Package Explorer JUnit

IMSjava

Runnerjava CustomerController.java Customer.java *ItemController.java Item.java Util.java

```

@Override
public Item create() {
    LOGGER.info("Please enter the name of the item");
    String itemName = utils.getString();
    LOGGER.info("Please enter the price of the item");
    float price = utils.getFloat();
    Item item = itemDAO.create(new Item(itemName, price));
    LOGGER.info("Item created");
    return item;
}

/**
 * Updates an existing customer by taking in user input
 */
@Override
Multiple markers at this line
- Customer cannot be resolved to a type
- implements com.qa.ims.controller.CrudController<com.qa.ims.persistence.domain.Item>.update
    LOGGER.info("Please enter the name of the item that you would like to update");
    String itemName = utils.getString();
    LOGGER.info("Please enter the price of the item that you would like to update");
    float price = utils.getFloat();
    Item item = itemDAO.update(new Item(itemID, itemName, price));
    LOGGER.info("Item Updated");
    return item;
}

/**
 * Deletes an existing customer by the id of the customer
 */

```

Item com.qa.ims.controller.ItemController.update()

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The screenshot shows the Eclipse IDE interface with the following details:

- Project Explorer:** Shows the project structure under "src/main/java".
- Editor:** Displays the code for `ItemController.java`. The code implements methods for updating and deleting items.
- Bottom Bar:** Includes tabs for Javadoc, Declaration, Terminal, and Debug, along with the current package (`com.qa.ims.persistence.domain.Item`).
- Bottom Status Bar:** Shows the file name (`Writable`), line number (`76 : 43 : 2091`), and system status (e.g., battery level, network, time).

```
Training - IMSstarterjuneSDTEgify/src/main/java/com/qa/ims/controller/ItemController.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help
Package Explorer JUnit
CustomerDAO.java ItemDAO.java Customer.java IMS.java Runner.java ItemController.java Util.java
AnimalTask calculator ExampleFlow GarageTask HelloWorldExample
src/main/java com.qa.ims
    controller Action.java CrudController.java CustomerController.java ItemController.java OrderController.java
    exceptions
    persistence
        dao CustomerDAO.java Dao.java ItemDAO.java OrderDAO.java
    domain Customer.java Domain.java Item.java Order.java
    utils
    IMS.java
    Runner.java
53     /*
54     * @Override
55     public Item update() {
56         LOGGER.info("Please enter the id of the item that you would like to update");
57         Long itemID = utils.getLong();
58         LOGGER.info("Please enter the name of the item that you would like to update");
59         String itemName = utils.getString();
60         LOGGER.info("Please enter the price of the item that you would like to update");
61         Float price = utils.getFloat();
62         Item item = itemDAO.update(new Item(itemID, itemName, price));
63         LOGGER.info("Item Updated");
64         return item;
65     }
66
67     /**
68      * Deletes an existing customer by the id of the customer
69      *
70      * @return
71      */
72     @Override
73     public int delete() {
74         LOGGER.info("Please enter the id of the item that you would like to delete");
75         Long itemID = utils.getLong();
76         return itemDAO.delete(itemID);
77     }
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79 }
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```

Training - IMSstarterjuneSDETgify/src/main/java/com/qa/ims/IMS.java - Eclipse IDE

```

private void runDomainAction(Domain domain) {
    boolean changeDomain = false;
    do {
        CrudController<?> active = null;
        switch (domain) {
            case CUSTOMER:
                active = this.customers;
                break;
            case ITEM:
                active = this.items;
                break;
            case ORDER:
                active = this.orders;
                break;
            case STOP:
                //active = STOP
                //active = this.stop;
                return;
            default:
                break;
        }
        LOGGER.info(() -> "What would you like to do with " + domain.name().toLowerCase() + ":");
        Action.printActions();
    } while (!changeDomain);
}

public void stop() {
    stop();
}

```

Console [Problems [Debug Shell [Terminal]

Runner (6) [Java Application] C:\Users\user\p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_16.0.1.v20210528-1205\jre\bin\javaw.exe (13 Jul 2021, 15:41:55)

CREATE: To save a new entity into the database
READ: To read an entity from the database
UPDATE: To change an entity already in the database
DELETE: To remove an entity from the database
RETURN: To return to domain selection

Type here to search

Writable Smart Insert 64 : 38 : 1647 22°C Mostly sunny 16:31 13/07/2021

Training - IMSstarterjuneSDETgify/src/main/java/com/qa/ims/IMS.java - Eclipse IDE

```

private void runDomainAction(Domain domain) {
    boolean changeDomain = false;
    do {
        CrudController<?> active = null;
        switch (domain) {
            case CUSTOMER:
                active = this.customers;
                break;
            case ITEM:
                active = this.items;
                break;
            case ORDER:
                active = this.orders;
                break;
            case STOP:
                return;
            default:
                break;
        }
        LOGGER.info(() -> "What would you like to do with " + domain.name().toLowerCase() + ":");

        Action.printActions();
    } while (!changeDomain);
}

public void stop() {
    stop();
}

```

Console [Problems [Debug Shell [Terminal]

Runner (6) [Java Application] C:\Users\user\p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_16.0.1.v20210528-1205\jre\bin\javaw.exe (13 Jul 2021, 15:41:55)

stop
Invalid selection please try again
item
Invalid selection please try again

Type here to search

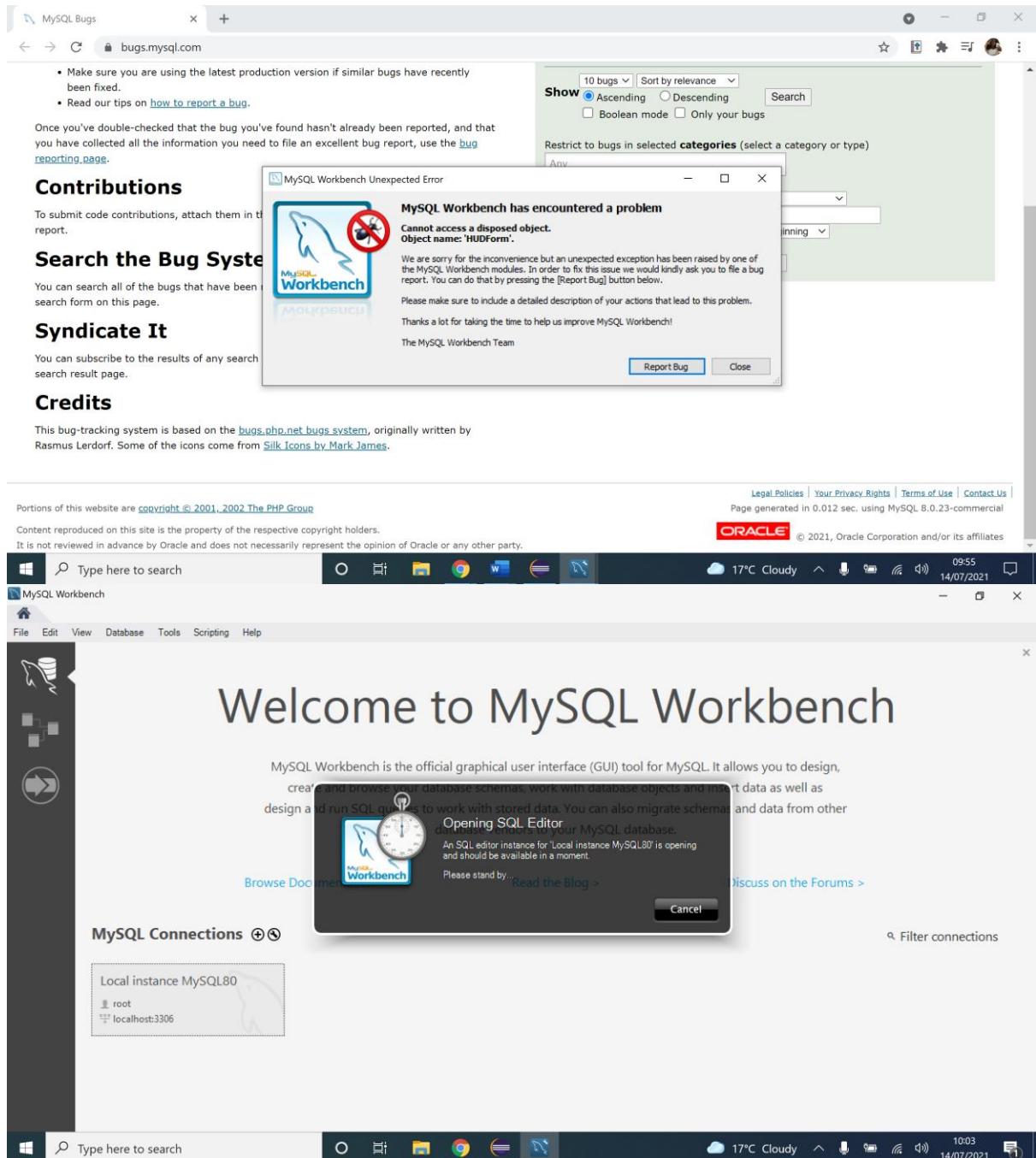
Writable Smart Insert 64 : 38 : 1643 22°C Mostly sunny 16:43 13/07/2021

The screenshot shows the Eclipse IDE interface with the following details:

- Title Bar:** Training - IMSstarterjuneSDTEgify/src/main/java/com/qa/ims/persistence/domain/Item.java - Eclipse IDE
- Menu Bar:** File Edit Source Refactor Navigate Search Project Run Window Help
- Toolbars:** Standard toolbar with icons for file operations.
- Project Explorer:** Shows the project structure with packages like com.qa.ims, com.qa.ims.persistence.domain, and com.qa.ims.utils.
- Code Editors:** Two code editors are open:
 - Left Editor:** Displays ItemController.java and Item.java. Item.java contains code for a domain entity Item with fields itemID, itemName, and price, and constructors for both String and Long parameters.
 - Right Editor:** Displays Customer.java and OrderController.java. Order.java is partially visible, showing a constructor for Order with parameters itemID and itemName.
- Terminal:** A terminal window at the bottom shows a database interaction:

```
Runner (6) [Java Application] C:\Users\user>p2\pool\plugins\org.eclipse.jst\openjdk\hotspot\jre\full\win32\x86_64_16.0.1.v20210528-1205\jre\bin\javaw.exe (13 Jul 2021, 17:23:39)
DELETE: To remove an entity from the database
RETURN: To return to domain selection
CREATE: To save a new entity into the database
read
Column 'itemID' not found.
What would you like to do with item:

```



The screenshot shows the Eclipse IDE interface with the following details:

- Title Bar:** Training - IMSstarterjuneSDETgify/src/main/java/com/qa/ims/persistence/dao/ItemDAO.java - Eclipse IDE
- Menu Bar:** File Edit Source Refactor Navigate Search Project Run Window Help
- Toolbars:** Standard toolbar with icons for file operations.
- Project Explorer:** Shows the project structure:
 - src/main/java
 - com.qa.ims
 - com.qa.ims.controller
 - Action.java
 - CrudController.java
 - CustomerController.java
 - ItemController.java
 - OrderController.java
 - com.qa.ims.exceptions
 - com.qa.ims.persistence
 - CustomerDAO.java
 - Dao.java
 - ItemDAO.java
 - OrderDAO.java
 - com.qa.ims.persistence.domain
 - com.qa.ims.utils
 - src/main/resources
 - db.properties
 - log4j2.xml
 - sql-data.sql
 - sql-schema.sql
 - src/test/java
 - src/test/resources
- Code Editor:** Displays the `ItemDAO.java` file content:

```
1 package com.qa.ims.persistence.dao;
2
3 import java.sql.Connection;
4
5 public class ItemDAO implements Dao<Item> {
6
7     public static final Logger LOGGER = LogManager.getLogger();
8
9     @Override
10    public Item modelFromResultSet(ResultSet resultSet) throws SQLException {
11        Long item_id = resultSet.getLong("item_id");
12        String item_name = resultSet.getString("item_name");
13        Float price = resultSet.getFloat("price");
14        ...
15    }
16}
```
- Console:** Shows the following output:

```
Runner (6) [Java Application]
UPDATE: To change an entity already in the database
DELETE: To remove an entity from the database
RETURN: To return to domain selection
read
Item [item_id=1, item_name=Apple, price=0.15]
Item [item_id=2, item_name=Water, price=1.5]
Item [item_id=3, item_name=Protein Shake, price=2.29]
What would you like to do with item:
CREATE: To save a new entity into the database
READ: To read an entity from the database
UPDATE: To change an entity already in the database
DELETE: To remove an entity from the database
RETURN: To return to domain selection
```

The screenshot shows the Eclipse IDE interface with the following details:

- Title Bar:** Type here to search, Training - IMSstarterjuneSDETgify/src/main/java/com/qa/ims/IMS.java - Eclipse IDE, 11:05, 14/07/2021.
- Toolbar:** Standard Eclipse icons for File, Edit, Source, Refactor, Navigate, Search, Project, Run, Window, Help.
- Project Explorer:** Shows multiple Runner Java files (6 instances) located at C:\Users\user\IdeaProjects\IMS\src\main\java\com\qa\ims. Other files like ItemController.java, OrderController.java, IMS.java, Item.java, ItemDAO.java, Order.java, and OrderDAO.java are also listed.
- Code Editor:** Displays the Runner.java code. The code implements a system that connects to a database and allows users to choose between different entity domains. It includes methods for connecting to the database, printing domain names, and performing actions on selected domains.
- Console:** Shows the terminal output of the application. It starts by connecting to the database and then enters a loop where it prints domain names and performs actions on them. An exception is thrown when trying to invoke a method on a null object reference.

```
Runner.java
public void imsSystem() {
    LOGGER.info("Welcome to the Inventory Management System!");
    DBUtils.connect();

    Domain domain = null;
    do {
        LOGGER.info("Which entity would you like to use?");
        Domain.printDomains();

        domain = Domain.getDomain(utils);

        domainAction(domain);

    } while (domain != Domain.STOP);
}

private void domainAction(Domain domain) {
    boolean changeDomain = false;
```

```
<terminated> Runner (6) [Java Application] C:\Users\user\p2\pool\plugins\org.eclipse.jdt.openjdk.hotspot.jre.full.win32.x86_64_16.0.1.v20210528-1205\jre\bin\javaw.exe (14 Jul 2021, 12:14:06 - 12:14:18)
read
Exception in thread "main" java.lang.NullPointerException: Cannot invoke "com.qa.ims.controller.CrudController.readAll()" because "crudController" is null
at com.qa.ims.IMS.doAction(IMS.java:87)
at com.qa.ims.IMS.domainAction(IMS.java:76)
at com.qa.ims.IMS.imsSystem(IMS.java:43)
at com.qa.ims.Runner.main(Runner.java:12)
```

Database Access Object – allows controller to access the database information in sql

Training - IMSstarterjuneSDTgify/src/main/java/com/qa/ims/controller/OrderController.java - Eclipse IDE

```

    /**
     * Deletes an existing order by the id of the order
     *
     * @return
     */
    @Override
    public int delete() {
        LOGGER.info("Please enter the id of the order th");
        Long order_id = utils.getLong();
        return orderDAO.delete(order_id);
    }

    /**
     * Adds an existing item to an order by the id of th
     *
     * @return
     */
    public Order addItem() {
        LOGGER.info("Please enter the item id that you w");
        Long order_id = utils.getLong();
        LOGGER.info("Please enter the order id that you u");
        Long item_id = utils.getLong();
        return orderDAO.addItem(order_id, item_id);
    }
}

The method additem(Order) in the type OrderDAO is not applicable for the arguments (Long, Long)
1 quick fix available:
  ● Create method 'additem(Long, Long)' in type 'OrderDAO'

```

Console

No consoles to display at this time.

Writable Smart Insert 96 : 32 : 2988

21°C Sunny 10:14 15/07/2021

Type here to search

Training - IMSstarterjuneSDTgify/src/main/java/com/qa/ims/persistence/dao/OrderDAO.java - Eclipse IDE

```

    /**
     * Adds an item into an order
     *
     * @param id - id of the item
     */
    public Order addItem(Order order, Long order_id, Long item_id) {
        try (Connection connection = DBUtils.getInstance().getConnec
            PreparedStatement statement = connection.prepareStatement("INSERT INTO orders_items(item_id,
                statement.setLong(1, order.getOrder_id());
                statement.setLong(2, order.getItem_id());
                statement.executeUpdate();
                return readLatest();
            } catch (Exception e) {
                LOGGER.debug(e);
                LOGGER.error(e.getMessage());
            }
        return null;
    }
}

CUSTOMER: Information about customers

```

Project Explorer

src/main/java

- com.qa.ims
- com.qa.ims.controller
- Action.java
- CrudController.java
- CustomerController.java
- ItemController.java
- OrderController.java
- com.qa.ims.exceptions
- com.qa.ims.persistence.dao
- com.qa.ims.persistence.domain
- com.qa.ims.utils
- src/main/resources
- src/test/java
- src/test/resources
- JRE System Library [JavaSE-1.8]
- Maven Dependencies
- bin
- src
- target
- errors.log
- LICENSE.md
- nom.xml

Console

Runner (6) [Java Application] C:\Users\user\p2\pool\plugins\org.eclipse.jdt.openjdk.hotspot.jre.full.win32.x86_64-16.0.1.v20210528-1205\jre\bin\javaw.exe (15 Jul 2021, 10:23:40)

21°C Mostly cloudy 11:10 15/07/2021

Type here to search

Training - IMStarterjuneSDETgify/src/main/java/com/qa/ims/controller/OrderController.java - Eclipse IDE

```

    /**
     * Deletes an existing order by the id of the order
     *
     * @return
     */
    @Override
    public int delete() {
        LOGGER.info("Please enter the id of the order that you would like to delete");
        Long order_id = utils.getLong();
        return orderDAO.delete(order_id);
    }

    /**
     * Adds an existing item to an order by the id of the order and id of item
     *
     * @return
     */
    public Order addItem() {
        LOGGER.info("Please enter the item id that you would like to add to the order");
        Long order_id = utils.getLong();
        LOGGER.info("Please enter the order id that you would like to add to the item to");
        Long item_id = utils.getLong();
        return orderDAO.addItem(null, order_id, item_id);
    }
}

```

Runner (6) Java Application] C:\Users\user\p2\pool\plugins\org.eclipse.jdt.openjdk.hotspot.jre.full.win32.x86_64_16.0.1.v20210528-1205\jre\bin\javaw.exe (15 Jul 2021, 10:23:40)
CUSTOMER: Information about customers

Training - IMStarterjuneSDETgify/src/main/java/com/qa/ims/controller/OrderController.java - Eclipse IDE

```

    /**
     * Updates an existing order by the id of the order
     *
     * @param order
     * @return
     */
    @Override
    public Order update() {
        LOGGER.info("Please enter the id of the order that you would like to update");
        Long order_id = utils.getLong();
        LOGGER.info("Please enter the name of the order that you would like to update");
        String order_name = utils.getString();
        LOGGER.info("Please enter the status of the order that you would like to update");
        String order_status = utils.getString();
        LOGGER.info("Please enter the updated date that the order was placed");
        String date_placed = utils.getString();
        LOGGER.info("Please enter the price of the order that you would like to update");
        Float price = utils.getDouble().floatValue();
        Order order = orderDAO.update(new Order(order_name, date_placed, order_status, price, order_id));
        LOGGER.info("Order Updated");
        return order;
    }
}

```

Runner (6) Java Application] C:\Users\user\p2\pool\plugins\org.eclipse.jdt.openjdk.hotspot.jre.full.win32.x86_64_16.0.1.v20210528-1205\jre\bin\javaw.exe (15 Jul 2021, 10:23:40)
DELETE: To remove an entity from the database
RETURN: To return to domain selection
read
Column 'item_id' not found.
What would you like to do with order:
CREATE: To save a new entity into the database
READ: To read an entity from the database
UPDATE: To change an entity already in the database
DELETE: To remove an entity from the database
RETURN: To return to domain selection

Training - IMSstarterjuneSDETgify/src/main/java/com/qa/ims/controller/OrderController.java - Eclipse IDE

```

1
2
3@import java.util.List;
4
5
6public class OrderController implements CrudController<Order> {
7
8    public static final Logger LOGGER = LogManager.getLogger();
9
10   private OrderDAO orderDAO;
11   private Utils utils;
12
13   public OrderController(OrderDAO orderDAO, Utils utils) {
14       super();
15       this.orderDAO = orderDAO;
16       this.utils = utils;
17   }
18
19   /**
20
21
22
23
24
25

```

Console

```

Runner (6) [Java Application] C:\Users\user\p2\pool\plugins\org.eclipse.jdt.openjdk.hotspot.jre.full.win32.x86_64_16.0.1.v20210528-1205\jre\bin\javaw.exe (15 Jul 2021, 15:20:47)
Please enter the updated date that the order was placed
2021-07-18
Please enter the price of the order that you would like to update
3.79
Data truncation: Truncated incorrect DOUBLE value: 'Delivered'
Order Updated
What would you like to do with order:
CREATE: To save a new entity into the database
READ: To read an entity from the database
UPDATE: To change an entity already in the database
DELETE: To remove an entity from the database

```

Type here to search

20°C Cloudy 15:35 15/07/2021

Training - IMSstarterjuneSDETgify/src/test/java/com/qa/ims/persistence/dao/CustomerDAOTest.java - Eclipse IDE

```

File Edit Source Refactor Navigate Search Project Run Window Help
Project Explorer JUnit
Finished after 3.562 seconds
Runs: 6/6 Errors: 0 Failures: 0
com.qa.ims.persistence.dao.CustomerDAOTest [ ]
  testReadLatest (2.246 s)
  testRead (0.237 s)
  testReadAll (0.219 s)
  testCreate (0.332 s)
  testDelete (0.201 s)
  testUpdate (0.167 s)

Failure Trace

OrderController... OrderDAO.java Order.java CustomerDAOT... IMStarterju... ItemDAO.java
32     List<Customer> expected = new ArrayList<>();
33     expected.add(new Customer(1L, "jordan", "harrison"));
34     assertEquals(expected, DAO.readAll());
35 }
36
37 @Test
38 public void testReadLatest() {
39     assertEquals(new Customer(1L, "jordan", "harrison"), DAO.readLatest());
40 }
41
42 @Test
43 public void testRead() {
44     final long ID = 1L;
45     assertEquals(new Customer(ID, "jordan", "harrison"), DAO.read(ID));
46 }
47
48 @Test
49 public void testUpdate() {
50     final Customer updated = new Customer(1L, "chris", "perrins");
51     assertEquals(updated, DAO.update(updated));
52 }
53
54
55 @Test
56 public void testDelete() {
57     assertEquals(1, DAO.delete(1));
58 }
59 }

```

Console

```

<terminated> CustomerDAOTest [JUnit] C:\Users\user\p2\pool\plugins\org.eclipse.jdt.openjdk.hotspot.jre.full.win32.x86_64_16.0.1.v20210528-1205\jre\bin\javaw.exe (16 Jul 2021, 09:36:59 - 09:37:04)

```

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16°C 09:37 16/07/2021

Meeting in "Team 2" | Untitled Diagram - diagram | gantwi16/IMSSDETJune | Email - Antwi, Gifty - Out! | IMSSDET board - Agile bo...

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TO DO 3 ISSUES

- Add an item to an order
BUILD AN APPLICATION THAT AN ...
IMSSDET-14 GA
- Calculate a cost for an order
BUILD AN APPLICATION THAT AN ...
IMSSDET-15 GA
- Delete an item in an order
BUILD AN APPLICATION THAT AN ...
IMSSDET-16 GA

+ Create issue

IN PROGRESS 3 ISSUES

- Risk Assessment
BUILD AN APPLICATION THAT AN ...
IMSSDET-24 GA
- Update an order in the system
BUILD AN APPLICATION THAT AN ...
IMSSDET-26 GA
- Regular testing
BUILD AN APPLICATION THAT AN ...
IMSSDET-23 GA

DONE 18 ISSUES

- Delete an order in the system
BUILD AN APPLICATION THAT AN ...
IMSSDET-13 GA
- UML Diagram
BUILD AN APPLICATION THAT AN ...
IMSSDET-20 GA
- Presentation
BUILD AN APPLICATION THAT AN ...
IMSSDET-25 GA
- ERD Diagram
BUILD AN APPLICATION THAT AN ...
IMSSDET-19 GA

GITHUB 1 ISSUE

- GitHub link
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Consider the entities in this domain

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