SE3030 – Software Architecture – Assignment 01

Point of Sales System

Group ID: CSSE_WE_55

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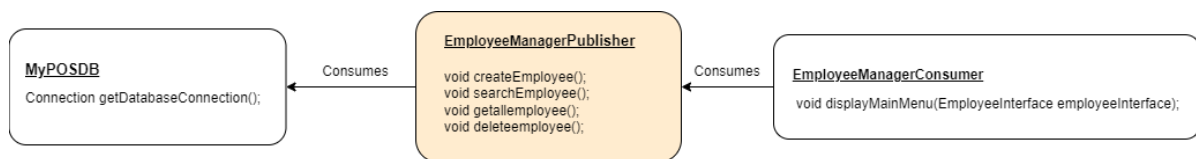Submitted On:

19th March 2023

Contributions

IT Number	Name	Contribution Part
IT20609658	Perera M.R.A.	Bill Management
IT20633790	Rupasinghe S.P	Wholesale Management
IT20625016	Nanayakkara H.M.S.Y	Item Management
IT20631192	Ekanayake E.M.S.D	Employee Management

Business Scenario

This project is a Point-Of-Sale(POS) system implemented in java using the OSGI framework. There are 4 primary functions in the scenario.
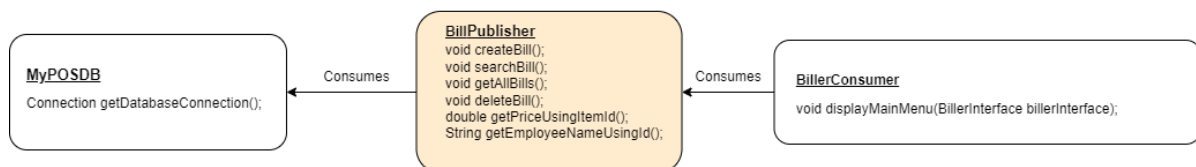
1. Employee management
2. Bill management
3. Item management
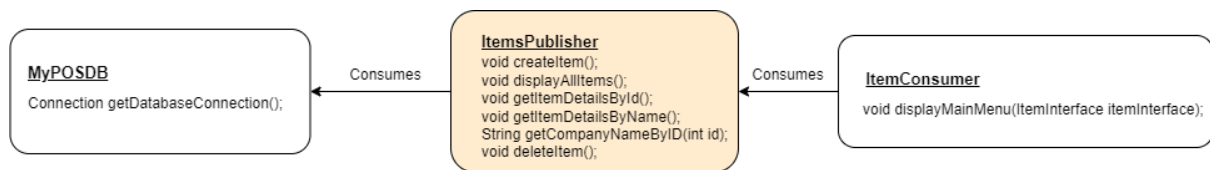4. Wholesaler management

Employee Management

The employee management function is focused on managing details about employees of the system. Using the function user can add new employees to the database, search for details of a specific employee, get details of all the employees added to the system, or remove a specific employee from the system. EmployeeManagerPublisher bundle implements these functions and EmployeeManagerConsumer consumes the bundle and displays the main menu for the user to interact with.

Bill Management

The bill management function is focused on managing details about bills or invoices generated by the system. Using this function, the user can add new bills to the database, search for details of a specific bill, get details of all the bills added to the system, or remove a specific bill from the system. The BillPublisher bundle implements these functions and the BillConsumer consumes the bundle and displays the main menu for the user to interact with. This function is crucial for businesses and organizations that need to track their financial transactions and maintain accurate records of their bills or invoices.
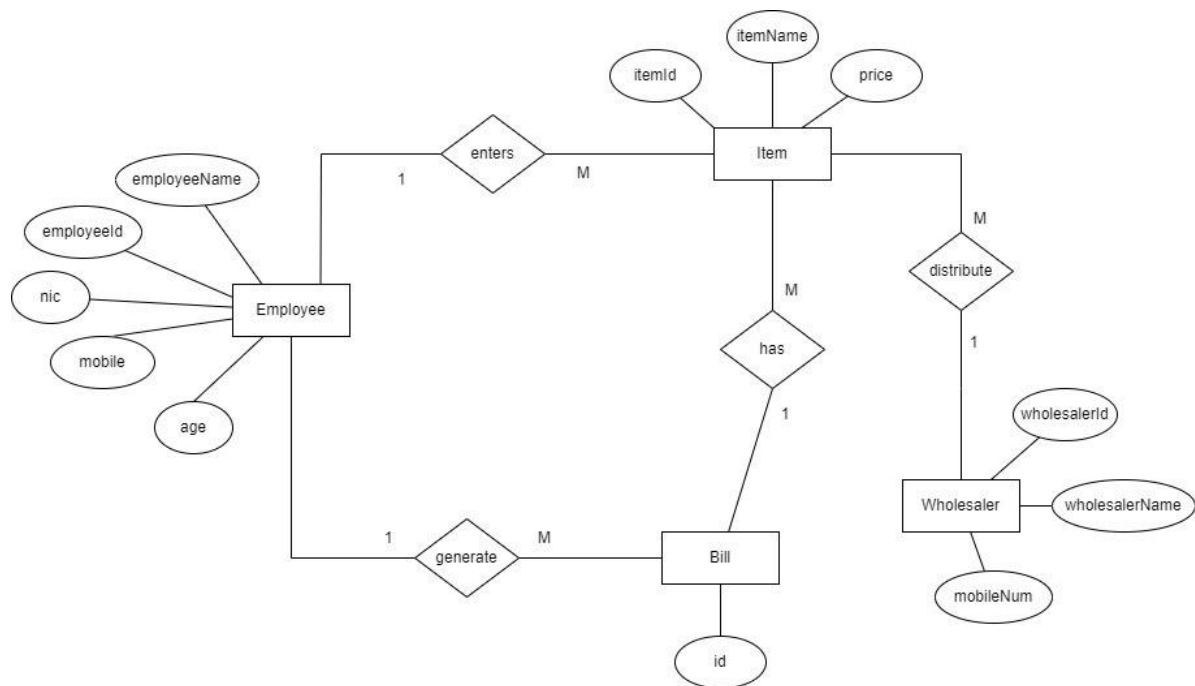
Item management

The item management function is focused on managing details about the items or products that are being sold or managed by the system. Using this function, the user can add new items to the database, search for details of a specific item, get details of all the items added to the system, or remove a specific item from the system. When adding an item to the system user needs to input the id of the company and the function will add company details to the item. The ItemsPublisher bundle implements these functions and the ItemConsumer consumes the bundle and displays the main menu for the user to interact with. The item management function provides a streamlined and efficient way to manage items and ensures that businesses have accurate and up-to-date information about their stock levels and inventory.

Wholesale Management

The wholesaler function is focused on managing details about the wholesale suppliers that the system interacts with. Using this function, the user can add new wholesale suppliers to the database, search for details of a specific supplier, get details of all the suppliers added to the system, or remove a specific supplier from the system. The WholesalerPublisher bundle implements these functions and the WholesalerConsumer consumes the bundle and displays the main menu for the user to interact with. With this function, businesses can easily track their suppliers, maintain accurate records of their interactions, and make informed decisions about which suppliers to work with in the future.

Database

Data related to the POS service is stored in the local MySQL database. Connection to the database is implemented in posdb bundle and it is consumed by the services that need to connect to the database. The design of the database is shown in the above diagram

Instructions to implement the database:

Before running the application please execute the schema named posdb provided in the submission in your local MySQL instance. Since MySQL version 8, MYSQL has changed its default pluggable authentication method to "caching_sha2_password". Previously it was "mysql_native_password" which let us authenticate directly via MySQL drivers. When running the project there might be SQL errors due to this default pluggable authentication method depending on your MySQL version. So, in case you got an error like this "Error: ER_NOT_SUPPORTED_AUTH_MODE: Client does not support authentication protocol requested by server; considerupgrading MySQL client". Please execute the following query in your database instance in order to make your default authentication method "mysql_native_password".

ALTER USER '<YOUR_SQL_USERNAME>'@'localhost' IDENTIFIED WITH mysql_native_password BY '<USER_PASSWORD';

flush privileges;

Biller

Manifest Implementation of Employee Management

1.OSGI.employeeManagerConsumer

```
 1 Manifest-Version: 1.0
 2 Bundle-ManifestVersion: 2
 3 Bundle-Name: EmployeeManagerConsumer
 4 Bundle-SymbolicName: employeeManagerConsumer
 5 Bundle-Version: 1.0.0.qualifier
 6 Bundle-Activator: employeemanagerconsumer.Activator
 7 Bundle-RequiredExecutionEnvironment: JavaSE-15
 8 Automatic-Module-Name: employeeManagerConsumer
 9 Import-Package: employeemanagerpublisher,
10  org.osgi.framework;version="1.3.0"
11 Bundle-ActivationPolicy: lazy
12
```

2.OSGI.employeeManagerPublisher

```
 1 Manifest-Version: 1.0
 2 Bundle-ManifestVersion: 2
 3 Bundle-Name: EmployeeManagerPublisher
 4 Bundle-SymbolicName: employeeManagerPublisher
 5 Bundle-Version: 1.0.0.qualifier
 6 Bundle-Activator: employeemanagerpublisher.Activator
 7 Bundle-RequiredExecutionEnvironment: JavaSE-15
 8 Automatic-Module-Name: employeeManagerPublisher
 9 Import-Package: myposdb,
10  org.osgi.framework;version="1.3.0"
11 Bundle-ActivationPolicy: lazy
12 Export-Package: employeemanagerpublisher
13
```

Manifest Implementation of Bill Management

1.OSGI.billConsumer


```
1 Manifest-Version: 1.0
2 Bundle-ManifestVersion: 2
3 Bundle-Name: BillerConsumer
4 Bundle-SymbolicName: billConsumer
5 Bundle-Version: 1.0.0.qualifier
6 Bundle-Activator: billerconsumer.Activator
7 Bundle-RequiredExecutionEnvironment: JavaSE-15
8 Automatic-Module-Name: billerConsumer
9 Import-Package: billpublisher,
10  org.osgi.framework;version="1.3.0"
11 Bundle-ActivationPolicy: lazy
```

2.OSGI.billPublisher


```
1 Manifest-Version: 1.0
2 Bundle-ManifestVersion: 2
3 Bundle-Name: BillerPublisher
4 Bundle-SymbolicName: billPublisher
5 Bundle-Version: 1.0.0.qualifier
6 Bundle-Activator: billpublisher.Activator
7 Bundle-RequiredExecutionEnvironment: JavaSE-15
8 Automatic-Module-Name: billerPublisher
9 Import-Package: myposdb,
10  org.osgi.framework;version="1.3.0"
11 Bundle-ActivationPolicy: lazy
12 Export-Package: billpublisher
13
```

Manifest Implementation of Item

1.OSGI.itemConsumer


```
ItemsConsumer ×
 1 Manifest-Version: 1.0
 2 Bundle-ManifestVersion: 2
 3 Bundle-Name: ItemsConsumer
 4 Bundle-SymbolicName: itemsConsumer
 5 Bundle-Version: 1.0.0.qualifier
 6 Bundle-Activator: itemsconsumer.Activator
 7 Bundle-RequiredExecutionEnvironment: JavaSE-15
 8 Automatic-Module-Name: itemsConsumer
 9 Import-Package: itemspublisher,
10  org.osgi.framework;version="1.3.0"
11 Bundle-ActivationPolicy: lazy
12
```

2.OSGI.itemPublisher


```
ItemsConsumer      ItemsPublisher ×
 1 Manifest-Version: 1.0
 2 Bundle-ManifestVersion: 2
 3 Bundle-Name: ItemsPublisher
 4 Bundle-SymbolicName: itemsPublisher
 5 Bundle-Version: 1.0.0.qualifier
 6 Bundle-Activator: itemspublisher.Activator
 7 Bundle-RequiredExecutionEnvironment: JavaSE-15
 8 Automatic-Module-Name: itemsPublisher
 9 Import-Package: myposdb,
10  org.osgi.framework;version="1.3.0"
11 Bundle-ActivationPolicy: lazy
12 Export-Package: itemspublisher
13
```

Manifest Implementation of Whole Sale

1.OSGI.wholesaleConsumer

```
1 Manifest-Version: 1.0
2 Bundle-ManifestVersion: 2
3 Bundle-Name: WholesalerConsumer
4 Bundle-SymbolicName: wholesaleConsumer
5 Bundle-Version: 1.0.0.qualifier
6 Bundle-Activator: wholesaleconsumer.Activator
7 Bundle-RequiredExecutionEnvironment: JavaSE-15
8 Automatic-Module-Name: wholesalerConsumer
9 Import-Package: org.osgi.framework;version="1.3.0",
10  wholesalepublisher
11 Bundle-ActivationPolicy: lazy
12
```

2.OSGI.wholesalePublisher

```
1 Manifest-Version: 1.0
2 Bundle-ManifestVersion: 2
3 Bundle-Name: WholesalePublisher
4 Bundle-SymbolicName: wholesalePublisher
5 Bundle-Version: 1.0.0.qualifier
6 Bundle-Activator: wholesalepublisher.Activator
7 Bundle-RequiredExecutionEnvironment: JavaSE-15
8 Automatic-Module-Name: wholesalePublisher
9 Import-Package: myposdb,
10  org.osgi.framework;version="1.3.0"
11 Bundle-ActivationPolicy: lazy
12 Export-Package: wholesalepublisher
13
```

Output of Employee Management

1.Start

```
■ Console ×
Employee [OSGi Framework] C:\Users\Shavidini Ekanayake\.p2\pool\plugins\org.eclipse.just
Employee Management Publisher service up and running
MyPos Publisher service started
DB Connection Successfull
Start Employee Management Service



---------- Point Of Sale System - Employee Manager----------
1  - Create Employee
2  - Get all Employees
3  - Search Employee using employee Id
4  - Delete Employee using employee Id
Select an option : |
```

2.Create Employee

```
---------- Point Of Sale System - Employee Manager----------
1  - Create Employee
2  - Get all Employees
3  - Search Employee using employee Id
4  - Delete Employee using employee Id
Select an option : 1
Enter Employee Name:
D.M.P.K.Dissanayake
Enter Employee Phone Number:
0766521788
Enter Employee Age:
34
Enter Employee NIC :
893898400V
Employee created successfully...


Do you want to Add Another Employee (y/n)
y
Enter Employee Name:
```

3.Get All Employee

```
---------- Point Of Sale System - Employee Manager----------
1  - Create Employee
2  - Get all Employees
3  - Search Employee using employee Id
4  - Delete Employee using employee Id
Select an option : 2
            Employee ID          Employee Name      Phone Number          Age
              1    E.M.S.D.Ekanayake        703009914              24        996729388V
              2        S.P.Rupasighe        766529400              45        899039499V
              3   S.M.N.D.Samarakoon        710943163              23        990054020V
              4        S.A.Jayaweera        748990034              54        873789200V
              5  D.M.P.K.Dissanayake        766521788              34        893898400V


---------- Point Of Sale System - Employee Manager----------
1  - Create Employee
2  - Get all Employees
3  - Search Employee using employee Id
4  - Delete Employee using employee Id
Select an option :
```

4.Search Employee

```
---------- Point Of Sale System - Employee Manager----------
1  - Create Employee
2  - Get all Employees
3  - Search Employee using employee Id
4  - Delete Employee using employee Id
Select an option : 3
Enter Id :
1
            Employee ID          Employee Name      Phone Number          Age
              1    E.M.S.D.Ekanayake        703009914              24


---------- Point Of Sale System - Employee Manager----------
1  - Create Employee
2  - Get all Employees
3  - Search Employee using employee Id
4  - Delete Employee using employee Id
Select an option :
```

5.Delete Employee

```
---------- Point Of Sale System - Employee Manager----------
1  - Create Employee
2  - Get all Employees
3  - Search Employee using employee Id
4  - Delete Employee using employee Id
Select an option : 4
Enter Id:
3
Employee Deleted Successfully!


---------- Point Of Sale System - Employee Manager----------
1  - Create Employee
2  - Get all Employees
3  - Search Employee using employee Id
4  - Delete Employee using employee Id
Select an option : 2
          Employee ID          Employee Name          Phone Number          Age
               1     E.M.S.D.Ekanayake          703009914          24          996729388V
               2          S.P.Rupasighe          766529400          45          899039499V
               4          S.A.Jayaweera          748990034          54          873789200V
               5  D.M.P.K.Dissanayake          766521788          34          893898400V


---------- Point Of Sale System - Employee Manager----------
1  - Create Employee
2  - Get all Employees
3  - Search Employee using employee Id
4  - Delete Employee using employee Id
Select an option :
```

Output of Bill Management

1.Start

```
Console ×
bill [OSGi Framework] C:\Users\Shavidini Ekanayake\.p2\pool\plugins\org.eclipse.justj.openj
Start Bill consumer Service
Bill Publisher service started
MyPos Publisher service started
DB Connection Successfull



----------Point of Sale System - Billing Management ----------
1  - create Bill
2  - Display all Bills
3  - Search for Bill by using bill Id
4  - Remove  a Bill from the system using bill id
Choose your option : |
```

2.Create Employee

```
----------Point of Sale System - Billing Management ----------
1  - create Bill
2  - Display all Bills
3  - Search for Bill by using bill Id
4  - Remove  a Bill from the system using bill id
Choose your option : 1
Enter Employee Id :
1
Enter Item Id :
1
Enter Quantity :
10
Do you want to add more item? (Y/N):
y
Enter Item Id :
2
Enter Quantity :
5
Do you want to add more item? (Y/N):
n
Do you want to add a discount? (y/n)
y
Enter Discount Amount
10
Bill successfully inserted ...


Do you want to Create Another Bill (y/n)
```

3.Display All Bill

```
----------Point of Sale System - Billing Management ----------
1  - create Bill
2  - Display all Bills
3  - Search for Bill by using bill Id
4  - Remove  a Bill from the system using bill id
Choose your option : 2
              bill id           Total Price                employee
                 1              55250.00     E.M.S.D.Ekanayake
                 2                150.00          S.P.Rupasighe
                 3              45000.00     S.M.N.D.Samarakoon
                 4             652500.00     E.M.S.D.Ekanayake



----------Point of Sale System - Billing Management ----------
1  - create Bill
2  - Display all Bills
3  - Search for Bill by using bill Id
4  - Remove  a Bill from the system using bill id
Choose your option :
```

4.Search Bill

```
----------Point of Sale System - Billing Management ----------
1  - create Bill
2  - Display all Bills
3  - Search for Bill by using bill Id
4  - Remove  a Bill from the system using bill id
Choose your option : 3
Input Bill Id :
1
              bill id           Total Price                employee
                 1              55250.00     E.M.S.D.Ekanayake



----------Point of Sale System - Billing Management ----------
1  - create Bill
2  - Display all Bills
3  - Search for Bill by using bill Id
4  - Remove  a Bill from the system using bill id
Choose your option :
```

5.Remove Bill

```
----------Point of Sale System - Billing Management ----------
1  - create Bill
2  - Display all Bills
3  - Search for Bill by using bill Id
4  - Remove  a Bill from the system using bill id
Choose your option : 4
Enter Id:
1
Successfully Deleted!


----------Point of Sale System - Billing Management ----------
1  - create Bill
2  - Display all Bills
3  - Search for Bill by using bill Id
4  - Remove  a Bill from the system using bill id
Choose your option : 2
              bill id        Total Price            employee
                    2             150.00        S.P.Rupasighe
                    3           45000.00    S.M.N.D.Samarakoon
                    4          652500.00      E.M.S.D.Ekanayake
```

Output of Item Management

1.Start

```
■ Console ✕
Employee [OSGi Framework] C:\Users\Shavidini Ekanayake\.p2\pool\plugins\org.eclip
Start Item Consumer
Item Publisher up and running
MyPos Publisher service started
DB Connection Successfull



---------- Point of Sale System - Item Manager ----------
1  - Create Items
2  - Get all Items
3  - Search Item using Item ID
4  - Search Item using Item name
5  - Delete Item from the System
Select an option :
```

1.Create Item

```
---------- Point of Sale System - Item Manager ----------
1  - Create Items
2  - Get all Items
3  - Search Item using Item ID
4  - Search Item using Item name
5  - Delete Item from the System
Select an option : 1
Enter Item Name :
iphone 14 Pro Max
Enter Item Company ID :
2
Enter Item Price :
400000
Item saved Successfully ...


Do you want to Add Another item (y/n) ?
```

2.Get All Items

```
---------- Point of Sale System - Item Manager ----------
1  - Create Items
2  - Get all Items
3  - Search Item using Item ID
4  - Search Item using Item name
5  - Delete Item from the System
Select an option : 2


            ------- All Items -------

        ItemID          Item Name              Company Name            Price
           1          Samsung A10S             Phone Max           45000.00
           2           Samsung M2              Phone Max           55000.00
           3          Cassava Chips          Shelower pvt            250.00
           4            Hot milo             Shelower pvt            150.00
           5             Bucket              Anohana pvt             450.00
           6              Bag                Anohana pvt            1200.00
           7      iphone 14 Pro Max            Phone Max          400000.00



---------- Point of Sale System - Item Manager ----------
1  - Create Items
2  - Get all Items
3  - Search Item using Item ID
4  - Search Item using Item name
5  - Delete Item from the System
Select an option :
```

3.Search Item by Id

```
---------- Point of Sale System - Item Manager ----------
1  - Create Items
2  - Get all Items
3  - Search Item using Item ID
4  - Search Item using Item name
5  - Delete Item from the System
Select an option : 3
Enter Item ID : 3
            ItemID          Item Name              Company Name              Price

                3         Cassava Chips          Shelower pvt              250.00


---------- Point of Sale System - Item Manager ----------
1  - Create Items
2  - Get all Items
3  - Search Item using Item ID
4  - Search Item using Item name
5  - Delete Item from the System
Select an option :
```

4.Search Item by Name

```
---------- Point of Sale System - Item Manager ----------
1  - Create Items
2  - Get all Items
3  - Search Item using Item ID
4  - Search Item using Item name
5  - Delete Item from the System
Select an option : 4
Enter Item Name : 4
            ItemID          Item Name              Company Name


---------- Point of Sale System - Item Manager ----------
1  - Create Items
2  - Get all Items
3  - Search Item using Item ID
4  - Search Item using Item name
5  - Delete Item from the System
Select an option :
```

5.Delete Item

```
---------- Point of Sale System - Item Manager ----------
1  - Create Items
2  - Get all Items
3  - Search Item using Item ID
4  - Search Item using Item name
5  - Delete Item from the System
Select an option : 5
Enter Item ID To Delete : 2
Successfully deleted from the system 2



---------- Point of Sale System - Item Manager ----------
1  - Create Items
2  - Get all Items
3  - Search Item using Item ID
4  - Search Item using Item name
5  - Delete Item from the System
Select an option : 2


           ------- All Items -------

        ItemID          Item Name          Company Name          Price
           1          Samsung A10S          Phone Max          45000.00
           3          Cassava Chips         Shelower pvt          250.00
           4              Hot milo          Shelower pvt          150.00
           5                Bucket          Anohana pvt           450.00
           6                   Bag          Anohana pvt          1200.00
           7      iphone 14 Pro Max          Phone Max        400000.00



---------- Point of Sale System - Item Manager ----------
1  - Create Items
2  - Get all Items
3  - Search Item using Item ID
```

Output of Wholesale Management

1.Satrt

```
■ Console ×
Employee [OSGi Framework] C:\Users\Shavidini Ekanayake\.p2\pool\plugins\org.eclipse.justj.ope
MyPos Publisher service started
Wholesaler Publisher service started
DB Connection Successfull
Start Wholesale consumer Service



----------Point Of Sale System - Wholesaler Management----------
1  - Add a new Wholesaler to system
2  - Get all Wholesalers in the system
3  - Search Wholesalers using Id
4  - Delete a Wholesaler using Id
Select an option :
```

2.Add new Wholesaler

```
---------Point Of Sale System - Wholesaler Management----------
1  - Add a new Wholesaler to system
2  - Get all Wholesalers in the system
3  - Search Wholesalers using Id
4  - Delete a Wholesaler using Id
Select an option : 1
Enter Wholesaler company Name:
Susho pvt
Enter Contact Number:
0789009913
Wholesaler successfully inserted ...


Do you want to Add Another Wholesaler (y/n)
```

3.Get All Wholesaler

```
---------Point Of Sale System - Wholesaler Management----------
1  - Add a new Wholesaler to system
2  - Get all Wholesalers in the system
3  - Search Wholesalers using Id
4  - Delete a Wholesaler using Id
Select an option : 2
              Wholesaler id    Wholesaler Name         Contact Number
                   1             Shelower pvt          113009912
                   2              Phone Max            704008813
                   3             Anohana pvt           710943162
                   4             Hellola pvt           712993309
                   5             DataMTX pvt           770948990
                   6              Susho pvt            789009913


---------Point Of Sale System - Wholesaler Management----------
1  - Add a new Wholesaler to system
2  - Get all Wholesalers in the system
3  - Search Wholesalers using Id
4  - Delete a Wholesaler using Id
Select an option :
```

4.Search Wholesaler

```
----------Point Of Sale System - Wholesaler Management----------
1  - Add a new Wholesaler to system
2  - Get all Wholesalers in the system
3  - Search Wholesalers using Id
4  - Delete a Wholesaler using Id
Select an option : 3
Enter Wholesaler Id :
2
            Wholesaler id        Wholesaler Name Price        Contact Number
                2            Phone Max            704008813


----------Point Of Sale System - Wholesaler Management----------
1  - Add a new Wholesaler to system
2  - Get all Wholesalers in the system
3  - Search Wholesalers using Id
4  - Delete a Wholesaler using Id
Select an option :
```

5.Delete Wholeseler

```
----------Point Of Sale System - Wholesaler Management----------
1  - Add a new Wholesaler to system
2  - Get all Wholesalers in the system
3  - Search Wholesalers using Id
4  - Delete a Wholesaler using Id
Select an option : 4
Enter Wholesaler Id:
4
Successfully Deleted wholesaler


----------Point Of Sale System - Wholesaler Management----------
1  - Add a new Wholesaler to system
2  - Get all Wholesalers in the system
3  - Search Wholesalers using Id
4  - Delete a Wholesaler using Id
Select an option : 2
            Wholesaler id   Wholesaler Name        Contact Number
                1        Shelower pvt        113009912
                2          Phone Max        704008813
                3        Anohana pvt        710943162
                5        DataMTX pvt        770948990
                6         Susho pvt        789009913


----------Point Of Sale System - Wholesaler Management----------
1  - Add a new Wholesaler to system
2  - Get all Wholesalers in the system
3  - Search Wholesalers using Id
4  - Delete a Wholesaler using Id
Select an option :
```

Commands to install and run services

1.MyposDB service

```
C:\Users\USER\Desktop\New folder\SA-Assignment-1\org.apache.felix.main.distribution-7.0.5>java -jar bin/felix.jar
_____
Welcome to Apache Felix Gogo

g! install com.mysql.jdbc.jar                                               21:30:38Bundle ID: 17
g! install myposDb.jar
Bundle ID: 18
g! start 17 18
MyPos Publisher service started

g!
```

2.Employee Management Service

```
g! install employeePublisher.jar
Bundle ID: 22
g! install employeeConsumer.jar
Bundle ID: 23
g! start 22
Employee Management Publisher service up and running

g! start 23
Start Employee Management Service




---------- Point Of Sale System - Employee Manager----------
1  - Create Employee
2  - Get all Employees
3  - Search Employee using employee Id
4  - Delete Employee using employee Id
```

3.Bill Management Service

```
g! install billPublisher.jar
                                                      21:37:55Bundle ID: 20
g! install billConsumer.jar
                                                      21:38:25Bundle ID: 21
g! start 20
                                                      21:38:37Bill Publisher service started

g! start 21
                                                      21:38:46Start Bill consumer Service



----------Point of Sale System - Billing Management ----------
1 - create Bill
2 - Display all Bills
3 - Search for Bill by using bill Id
4 - Remove  a Bill from the system using bill id
Choose your option :
```

4.Item Service

```
g! install itemsPublisher.jar
Bundle ID: 25
g! install itemsConsumer.jar
Bundle ID: 26
g! start 25
Item Publisher up and running

g! start 26
Start Item Consumer




---------- Point of Sale System - Item Manager ----------
1  - Create Items
2  - Get all Items
3  - Search Item using Item ID
4  - Search Item using Item name
5  - Delete Item from the System
Select an option : _
```

5.WholeSaler Service

```
g! install wholesalePublisher.jar
Bundle ID: 33
g! install wholesaleConsumer.jar
Bundle ID: 34
g! start 33
Wholesaler Publisher service started

g! start 34
Start Wholesale consumer Service




----------Point Of Sale System - Wholesaler Management----------
1  - Add a new Wholesaler to system
2  - Get all Wholesalers in the system
3  - Search Wholesalers using Id
4  - Delete a Wholesaler using Id
Select an option :
```