Inventory Management System Developed By Using OSGI Framework

(Producer Consumer Design Pattern)

Submitted by:

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IT17045940– (Dias A M A P)
IT17079396– (Himantha G H M K)

Introduction

The application we have developed is a simple Inventory Management System. The system mainly contains the following features given below.

- Maintain Customers
- Maintain Stock Details
- Maintain Salary of the Employees
- Maintain Warehouse Information regarding the stock
- Maintain Orders
- Maintain Tasks
- Maintain Supplier Information

Maintain Customers

The system will keep track of all the customers in the system. The details will be saved in the database bundle inside an Array List. The system will also provide reporting features as well. Where all the records of the customers will be displayed in a particular format on the console as a report. Application also provide the features to add a new customer , delete or even find a customer using the customer ID. InventorySubscriber bundle is used to perform the above actions where the InventorySubscriber2 bundle (inventorySubscriberReport.jar) is used to generate reports.

Maintain Stock Details

This contain similar features as the above. Stock details will be stored in the database bundle in the above-mentioned format. Adding new stock , deleting or finding a new stock using the stock ID can be done using the warehouseSubsciber bundle. Reporting of the stocks which are available can be obtained using the InventorySubscriberReport.jar.

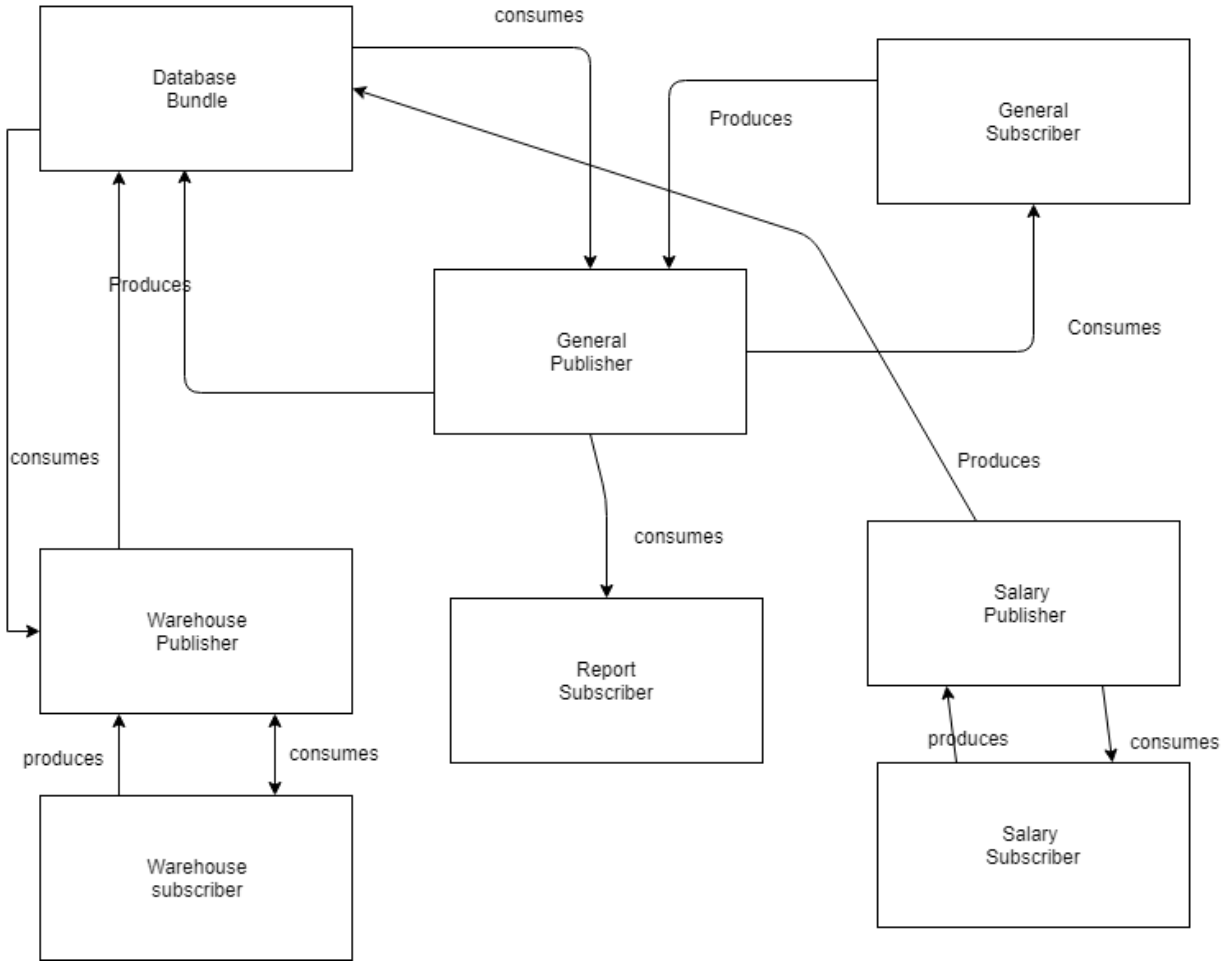
Maintain Salary of the Employees

Contains similar features as above. All operations related to the salary maintaining of the employee is done using the SalarySubscriber bundle. Can find the payments which have been previously done by using the Employees ID. Reports of the salary details are generated from the InventorySubscriberReport.jar.

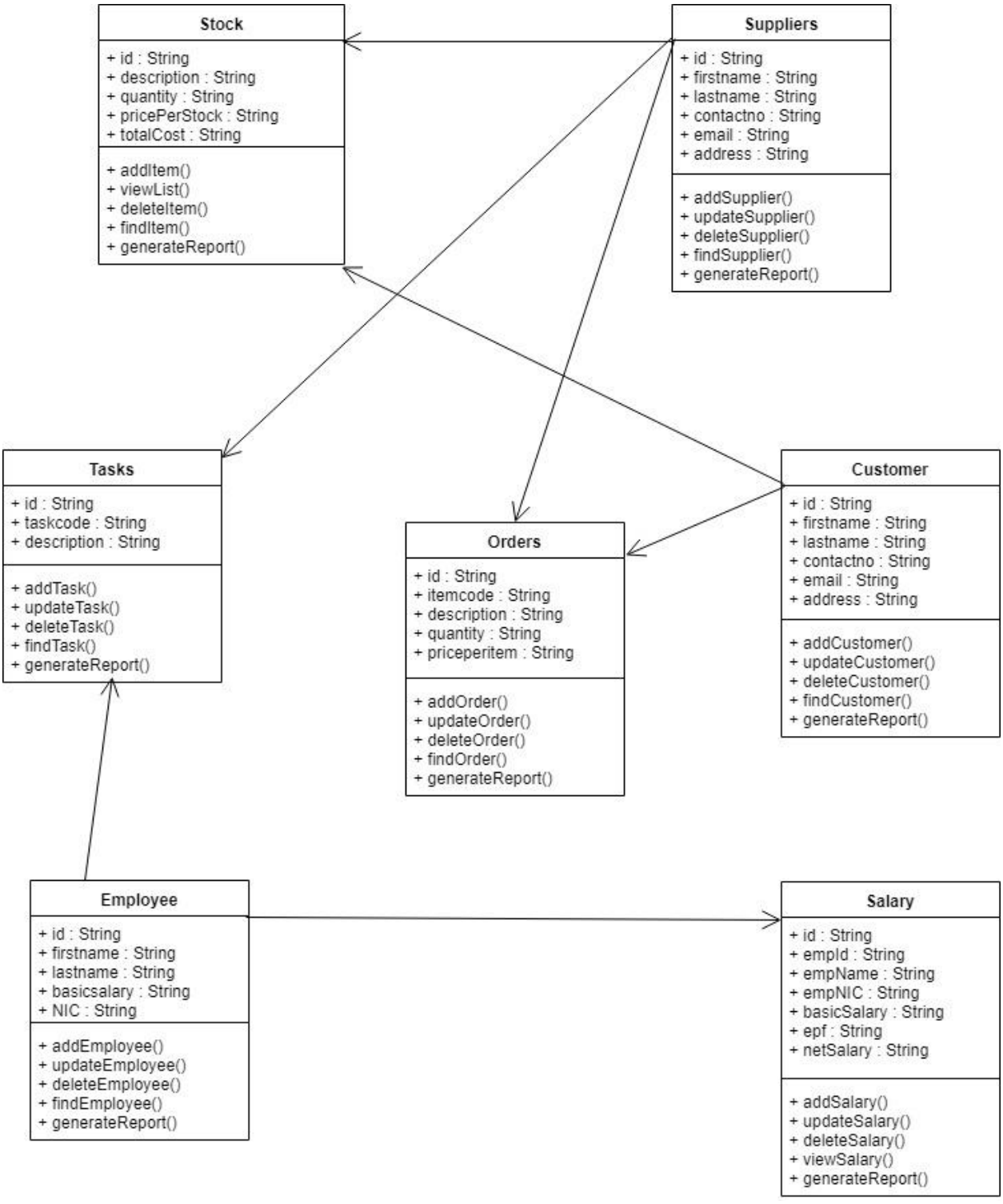
Maintain Orders , Tasks and Supplier Information

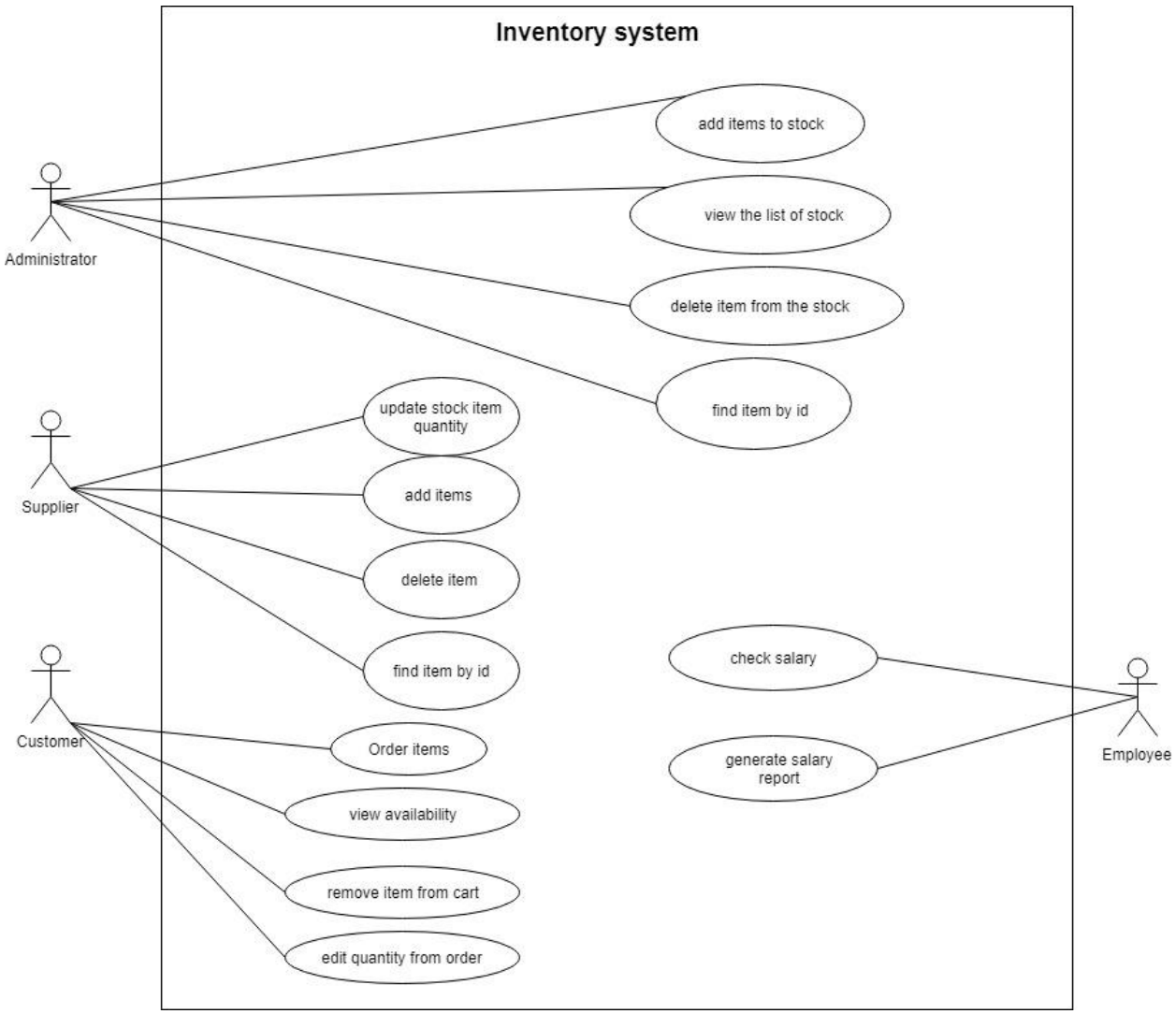
This contains almost the exact same functions as explained above. All the actions related to this is performed by using the InventorySubscriber bundle. And the calculations and operations are taken place inside the InventoryPublisher. Information is saved in the InventoryDatabase inside various static Array Lists.

Application Architecture



Usecase and Class Diagram


Stock
+ id : String
+ description : String
+ quantity : String
+ pricePerStock : String
+ totalCost : String
+ addItem()
+ viewList()
+ deleteItem()
+ findItem()
+ generateReport()
Suppliers
+ id : String
+ firstname : String
+ lastname : String
+ contactno : String
+ email : String
+ address : String
+ addSupplier()
+ updateSupplier()
+ deleteSupplier()
+ findSupplier()
+ generateReport()
Tasks
+ id : String
+ taskcode : String
+ description : String
+ addTask()
+ updateTask()
+ deleteTask()
+ findTask()
+ generateReport()
Orders
+ id : String
+ itemcode : String
+ description : String
+ quantity : String
+ priceperitem : String
+ addOrder()
+ updateOrder()
+ deleteOrder()
+ findOrder()
+ generateReport()
Customer
+ id : String
+ firstname : String
+ lastname : String
+ contactno : String
+ email : String
+ address : String
+ addCustomer()
+ updateCustomer()
+ deleteCustomer()
+ findCustomer()
+ generateReport()
Employee
+ id : String
+ firstname : String
+ lastname : String
+ basicsalary : String
+ NIC : String
+ addEmployee()
+ updateEmployee()
+ deleteEmployee()
+ findEmployee()
+ generateReport()
Salary
+ id : String
+ empId : String
+ empName : String
+ empNIC : String
+ basicSalary : String
+ epf : String
+ netSalary : String
+ addSalary()
+ updateSalary()
+ deleteSalary()
+ viewSalary()
+ generateReport()


Inventory system
Administrator
add items to stock
view the list of stock
delete item from the stock
find item by id
Supplier
update stock item quantity
add items
delete item
find item by id
Customer
Order items
view availability
remove item from cart
edit quantity from order
check salary
generate salary report
Employee

Installation Procedures

IDE used to develop the application was Eclipse Oxygen using OSGI Framework. All exported and imported services are added to the MANIFEST.MF file using the IDE itself.

Classes were complied by using the felix.jar file

The command used to execute the compile is as follows

javac -cp C:\Suren\felix-framework-4.0.3\bin\felix.jar *.java service*.java

Once all the source files are compiled and results in with the generated class files we created the JARs using the below command.

- **jar cfm database.jar MANIFEST.MF -c**
- **jar cfm inventoryPublisher.jar MANIFEST.MF -c**
- **jar cfm inventorySubscriber.jar MANIFEST.MF -c**
- **jar cfm inventorySubscriberReport.jar MANIFEST.MF -c**
- **jar cfm salaryPubisher.jar MANIFEST.MF -c**
- **jar cfm salarySubscriber.jar MANIFEST.MF -c**
- **jar cfm warehousePublisher.jar MANIFEST.MF -c**
- **jar cfm warehouseSubscriber.jar MANIFEST.MF -c**

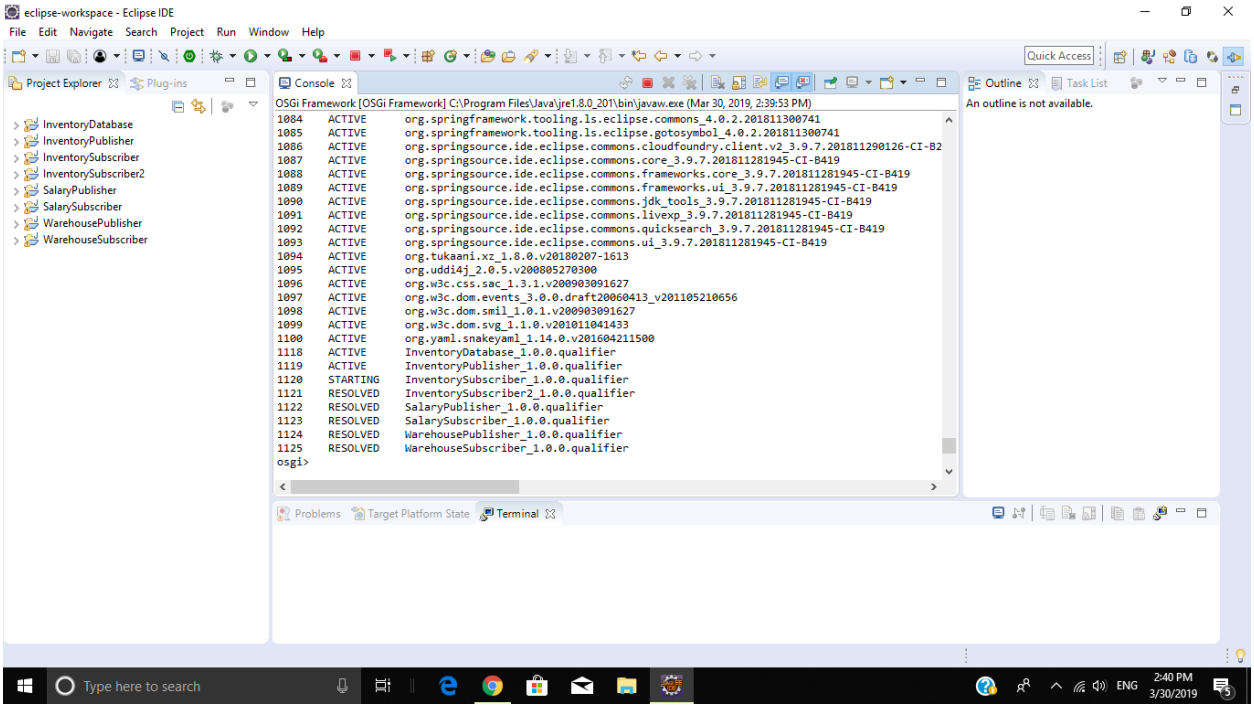
Once the jar files are generated, we can install the above jar files and then once completed we can start the bundles as required.

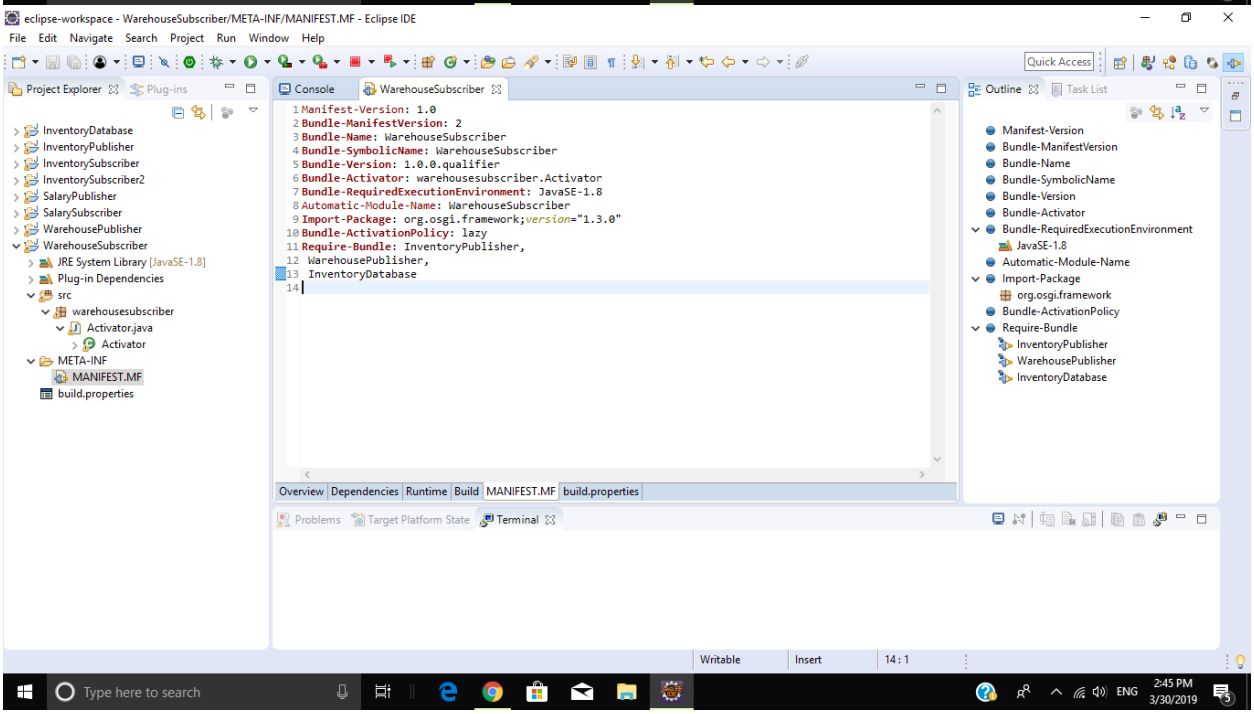
To install and Start the jar type the following commands

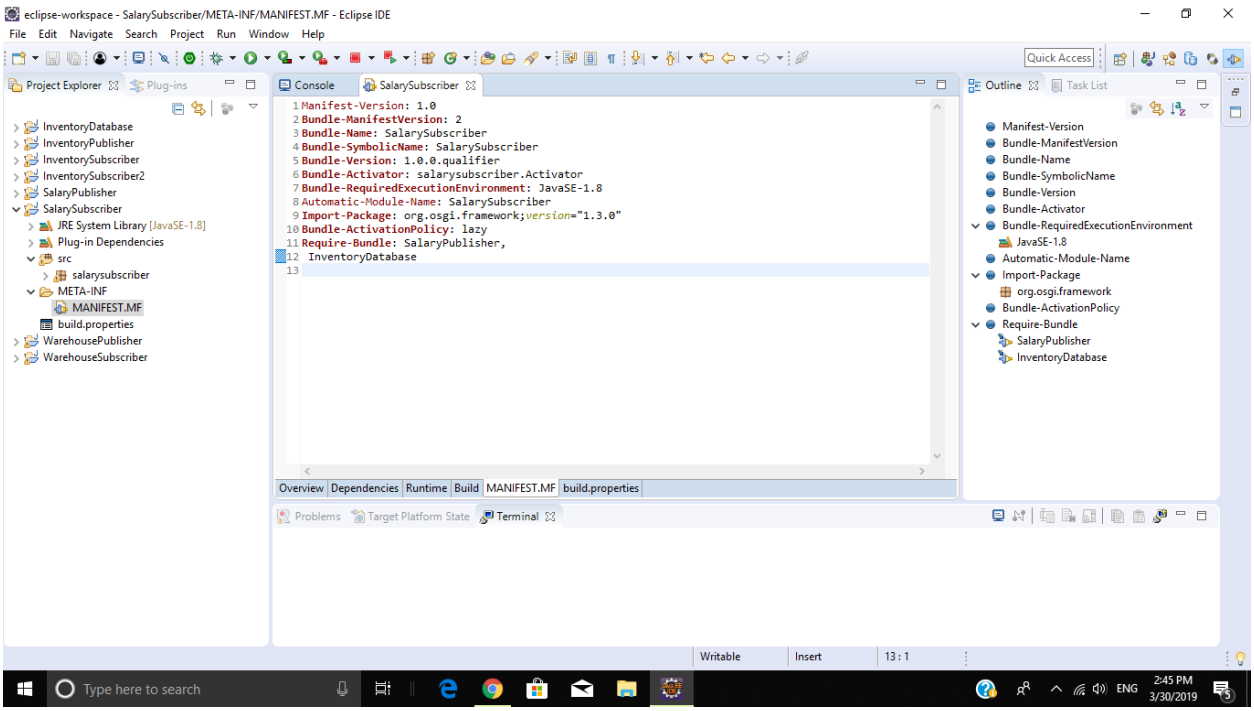
install file:/C:/suren/SA_ASSIGNMENT1/database.jar

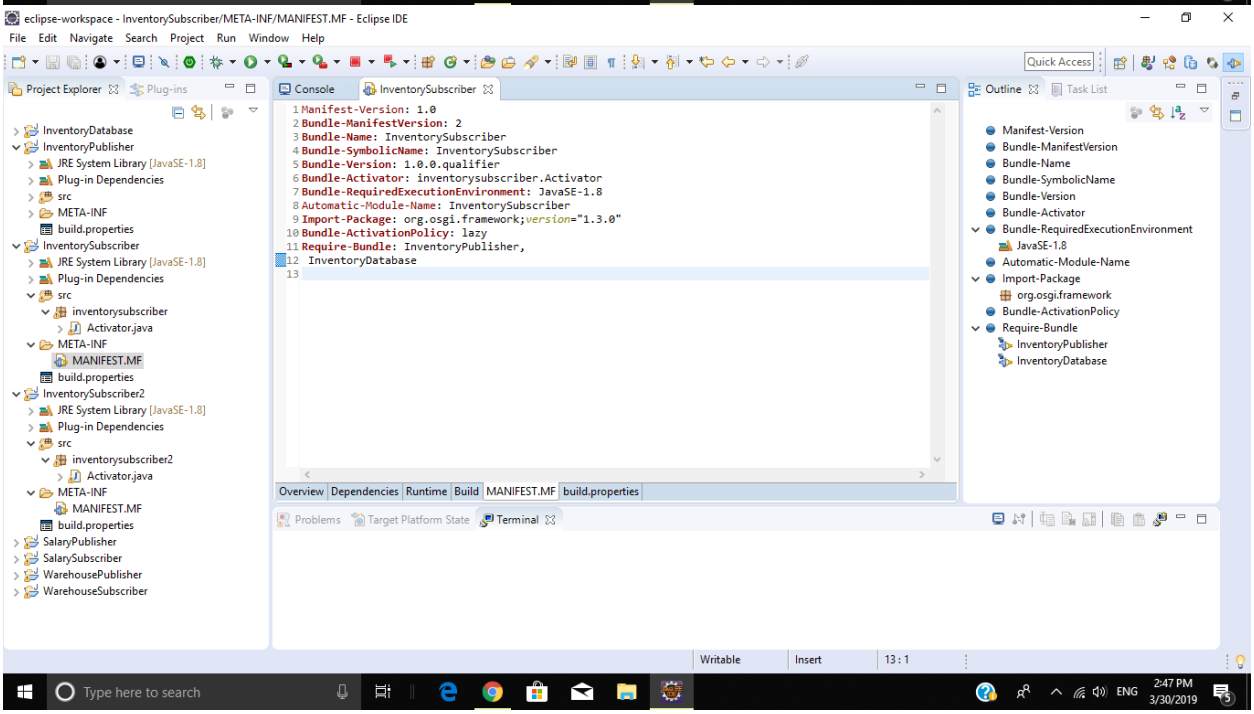
start file:/ C:/suren/SA_ASSIGNMENT1/database.jar

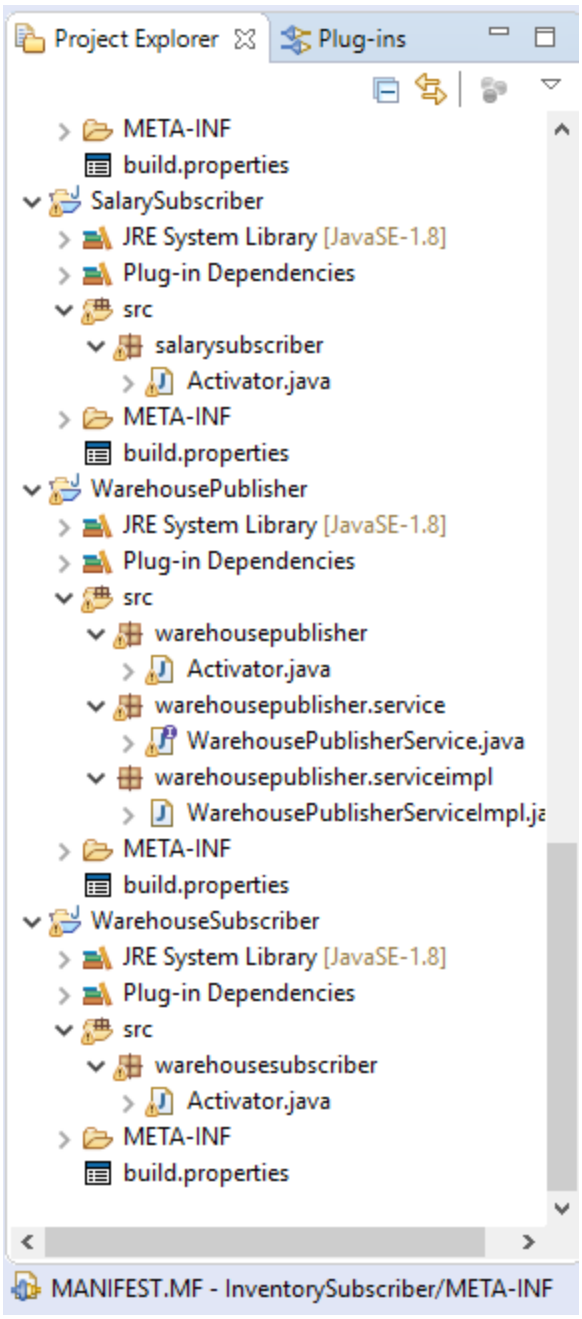
Sample Screenshots

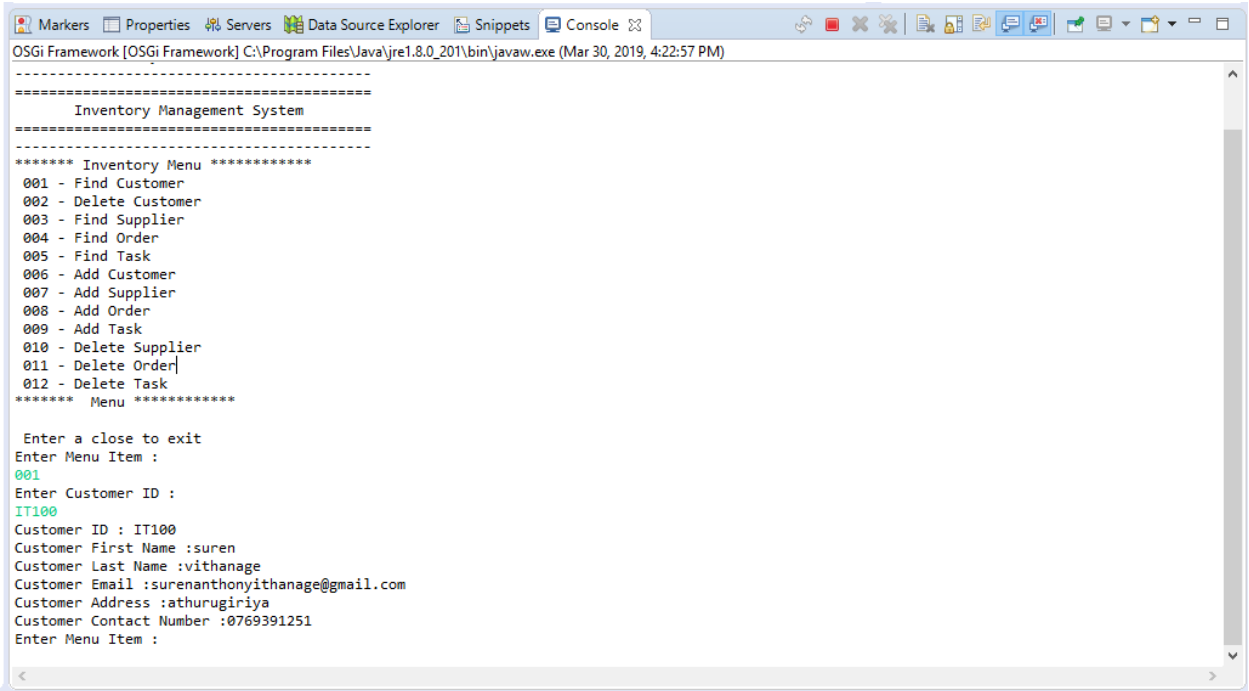


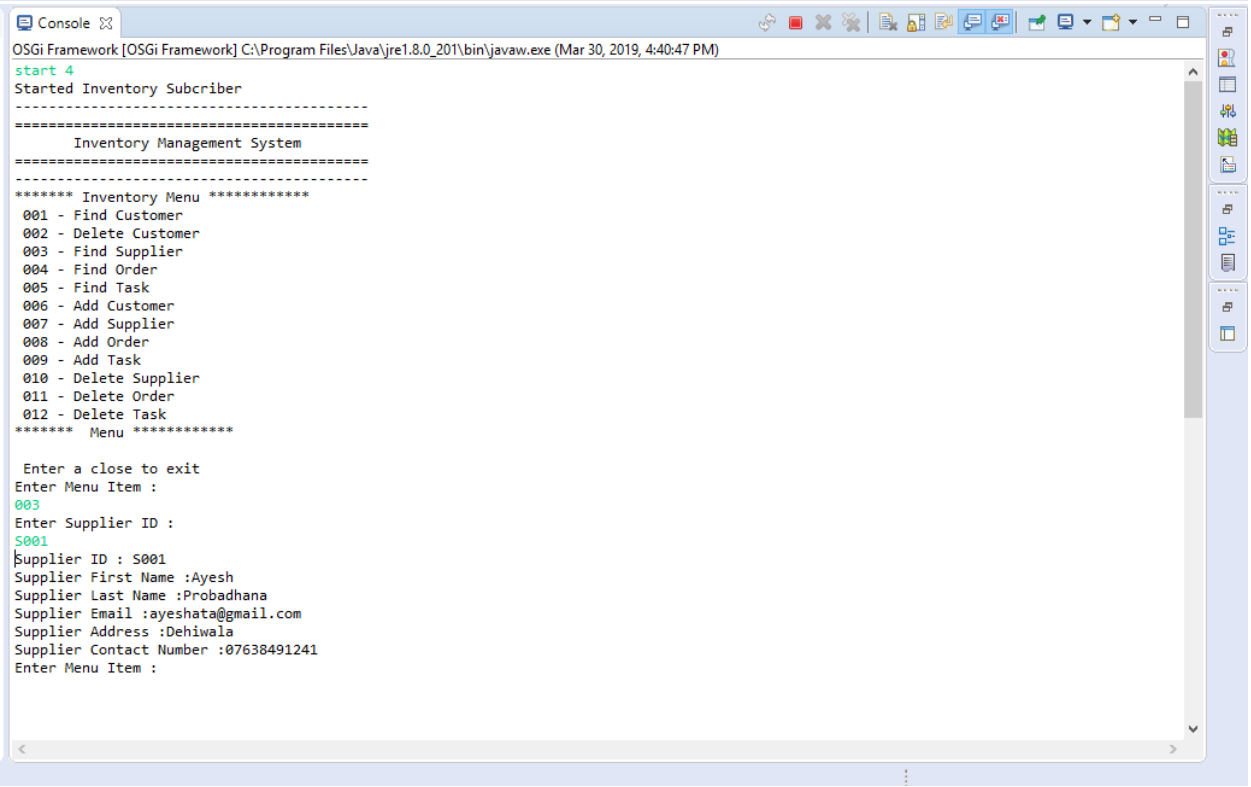


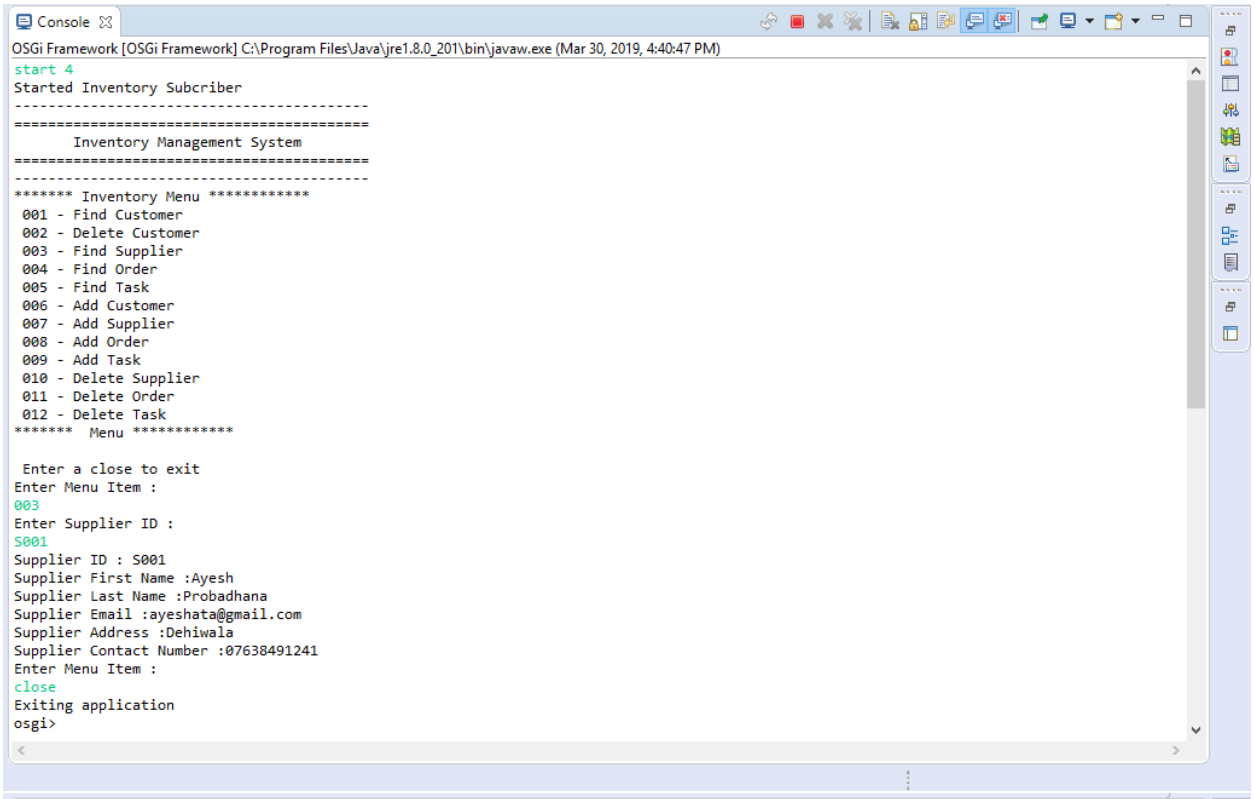

eclipse-workspace - SalarySubscriber/META-INF/MANIFEST.MF - Eclipse IDE
File Edit Navigate Search Project Run Window Help
Quick Access
Project Explorer
Plug-ins
InventoryDatabase
InventoryPublisher
InventorySubscriber
InventorySubscriber2
SalaryPublisher
SalarySubscriber
JRE System Library [JavaSE-1.8]
Plug-in Dependencies
src
salarysubscriber
META-INF
MANIFEST.MF
build.properties
WarehousePublisher
WarehouseSubscriber
Console
SalarySubscriber
1 Manifest-Version: 1.0
2 Bundle-ManifestVersion: 2
3 Bundle-Name: SalarySubscriber
4 Bundle-SymbolicName: SalarySubscriber
5 Bundle-Version: 1.0.0.qualifier
6 Bundle-Activator: salarysubscriber.Activator
7 Bundle-RequiredExecutionEnvironment: JavaSE-1.8
8 Automatic-Module-Name: SalarySubscriber
9 Import-Package: org.osgi.framework;version="1.3.0"
10 Bundle-ActivationPolicy: lazy
11 Require-Bundle: SalaryPublisher,
12 InventoryDatabase
13
Overview Dependencies Runtime Build MANIFEST.MF build.properties
Outline
Task List
Manifest-Version
Bundle-ManifestVersion
Bundle-Name
Bundle-SymbolicName
Bundle-Version
Bundle-Activator
Bundle-RequiredExecutionEnvironment
JavaSE-1.8
Automatic-Module-Name
Import-Package
org.osgi.framework
Bundle-ActivationPolicy
Require-Bundle
SalaryPublisher
InventoryDatabase
Problems
Target Platform State
Terminal
Writable
Insert
13 : 1
Type here to search
ENG
2:45 PM
3/30/2019

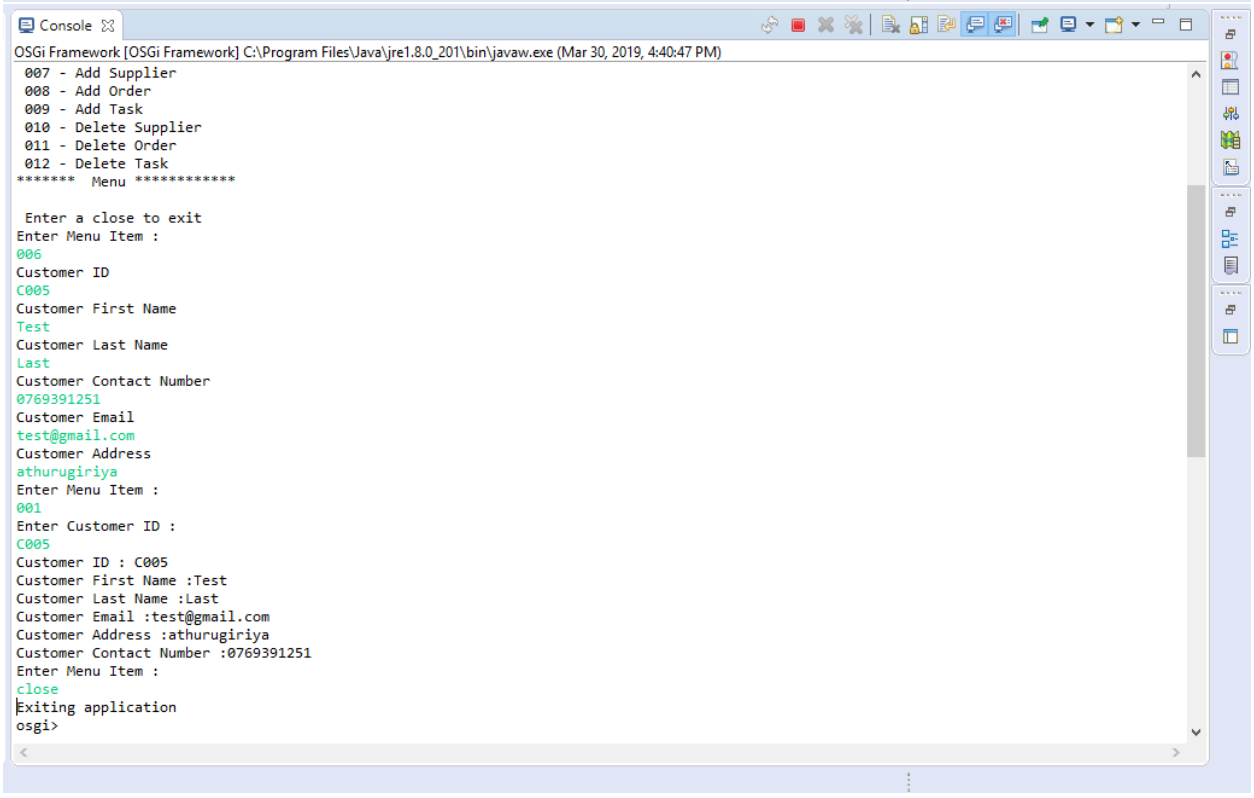

eclipse-workspace - InventorySubscriber/META-INF/MANIFEST.MF - Eclipse IDE
File Edit Navigate Search Project Run Window Help
Quick Access
Project Explorer
Plug-ins
InventoryDatabase
InventoryPublisher
JRE System Library [JavaSE-1.8]
Plug-in Dependencies
src
META-INF
build.properties
InventorySubscriber
inventorysubscriber
Activator.java
MANIFEST.MF
InventorySubscriber2
inventorysubscriber2
SalaryPublisher
SalarySubscriber
WarehousePublisher
WarehouseSubscriber
Console
InventorySubscriber
1 Manifest-Version: 1.0
2 Bundle-ManifestVersion: 2
3 Bundle-Name: InventorySubscriber
4 Bundle-SymbolicName: InventorySubscriber
5 Bundle-Version: 1.0.0.qualifier
6 Bundle-Activator: inventorysubscriber.Activator
7 Bundle-RequiredExecutionEnvironment: JavaSE-1.8
8 Automatic-Module-Name: InventorySubscriber
9 Import-Package: org.osgi.framework;version="1.3.0"
10 Bundle-ActivationPolicy: lazy
11 Require-Bundle: InventoryPublisher,
12 InventoryDatabase
13
Overview Dependencies Runtime Build MANIFEST.MF build.properties
Outline
Task List
Manifest-Version
Bundle-ManifestVersion
Bundle-Name
Bundle-SymbolicName
Bundle-Version
Bundle-Activator
Bundle-RequiredExecutionEnvironment
JavaSE-1.8
Automatic-Module-Name
Import-Package
org.osgi.framework
Bundle-ActivationPolicy
Require-Bundle
InventoryPublisher
InventoryDatabase
Problems
Target Platform State
Terminal
Writable
Insert
13 : 1
Type here to search
ENG
2:47 PM
3/30/2019

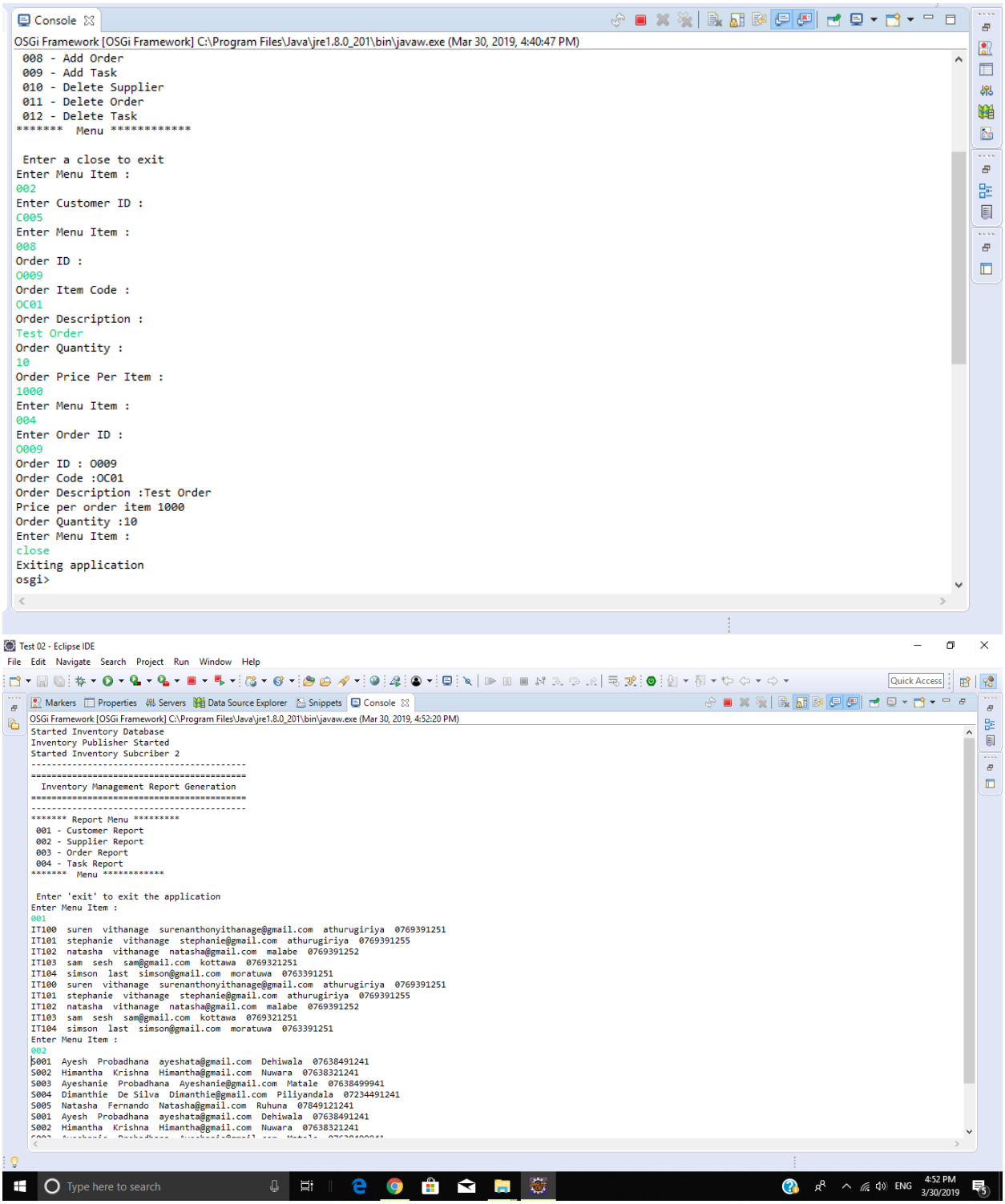

Project Explorer
Plug-ins
META-INF
build.properties
SalarySubscriber
JRE System Library [JavaSE-1.8]
Plug-in Dependencies
src
salarysubscriber
Activator.java
META-INF
build.properties
WarehousePublisher
JRE System Library [JavaSE-1.8]
Plug-in Dependencies
src
warehousepublisher
Activator.java
warehousepublisher.service
WarehousePublisherService.java
warehousepublisher.serviceimpl
WarehousePublisherServiceImpl.ja
META-INF
build.properties
WarehouseSubscriber
JRE System Library [JavaSE-1.8]
Plug-in Dependencies
src
warehousesubscriber
Activator.java
META-INF
build.properties
MANIFEST.MF - InventorySubscriber/META-INF

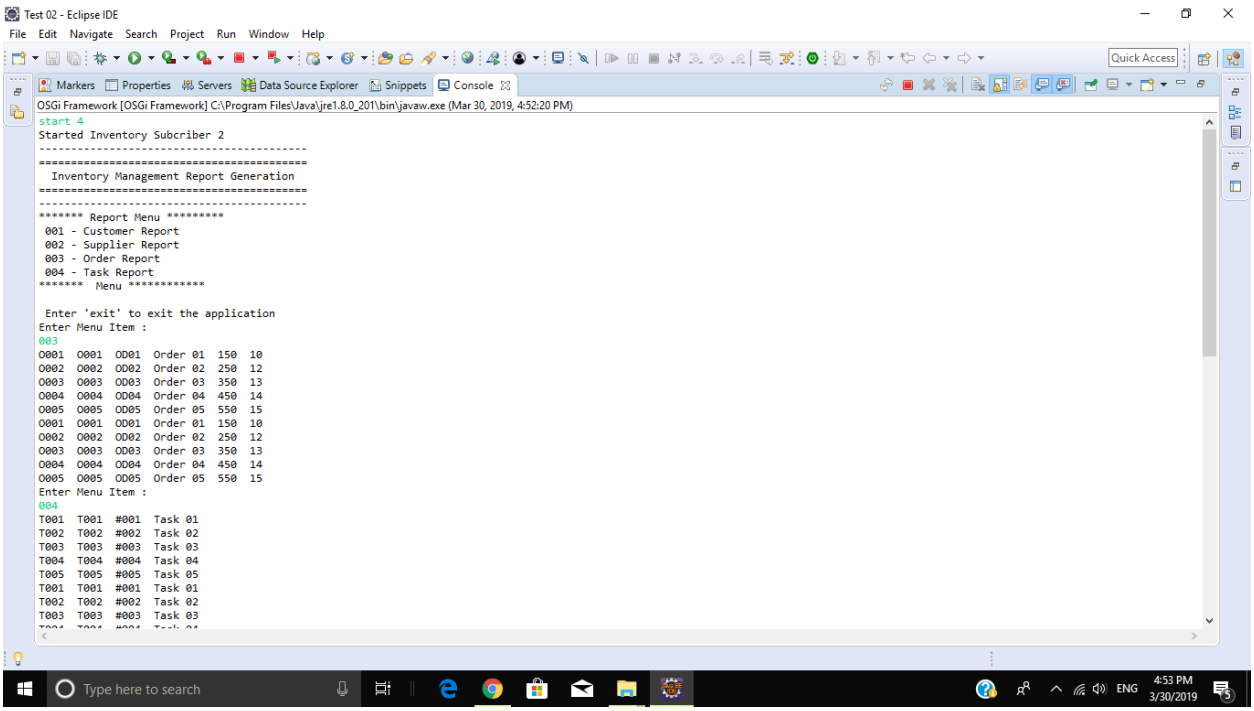

Markers Properties Servers Data Source Explorer Snippets Console
OSGi Framework [OSGi Framework] C:\Program Files\Java\jre1.8.0_201\bin\javaw.exe (Mar 30, 2019, 4:22:57 PM)
Inventory Management System
******* Inventory Menu ************
001 - Find Customer
002 - Delete Customer
003 - Find Supplier
004 - Find Order
005 - Find Task
006 - Add Customer
007 - Add Supplier
008 - Add Order
009 - Add Task
010 - Delete Supplier
011 - Delete Order
012 - Delete Task
******* Menu ************
Enter a close to exit
Enter Menu Item :
001
Enter Customer ID :
IT100
Customer ID : IT100
Customer First Name :suren
Customer Last Name :vithanage
Customer Email :surenanthonyithanage@gmail.com
Customer Address :athurugiriya
Customer Contact Number :0769391251
Enter Menu Item :

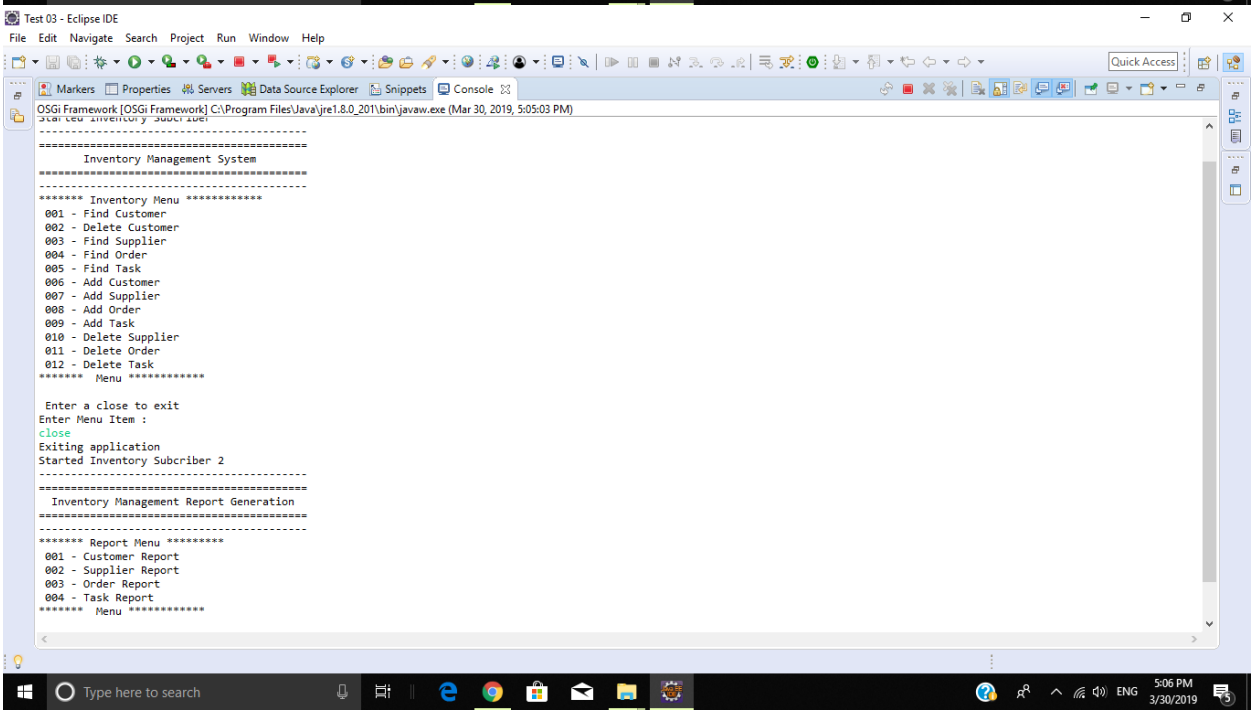

Console
OSGi Framework [OSGi Framework] C:\Program Files\Java\jre1.8.0_201\bin\javaw.exe (Mar 30, 2019, 4:40:47 PM)
start 4
Started Inventory Subcriber
Inventory Management System
******* Inventory Menu ************
001 - Find Customer
002 - Delete Customer
003 - Find Supplier
004 - Find Order
005 - Find Task
006 - Add Customer
007 - Add Supplier
008 - Add Order
009 - Add Task
010 - Delete Supplier
011 - Delete Order
012 - Delete Task
******* Menu ************
Enter a close to exit
Enter Menu Item :
003
Enter Supplier ID :
S001
Supplier ID : S001
Supplier First Name :Ayesh
Supplier Last Name :Probadhana
Supplier Email :ayeshata@gmail.com
Supplier Address :Dehiwala
Supplier Contact Number :07638491241
Enter Menu Item :

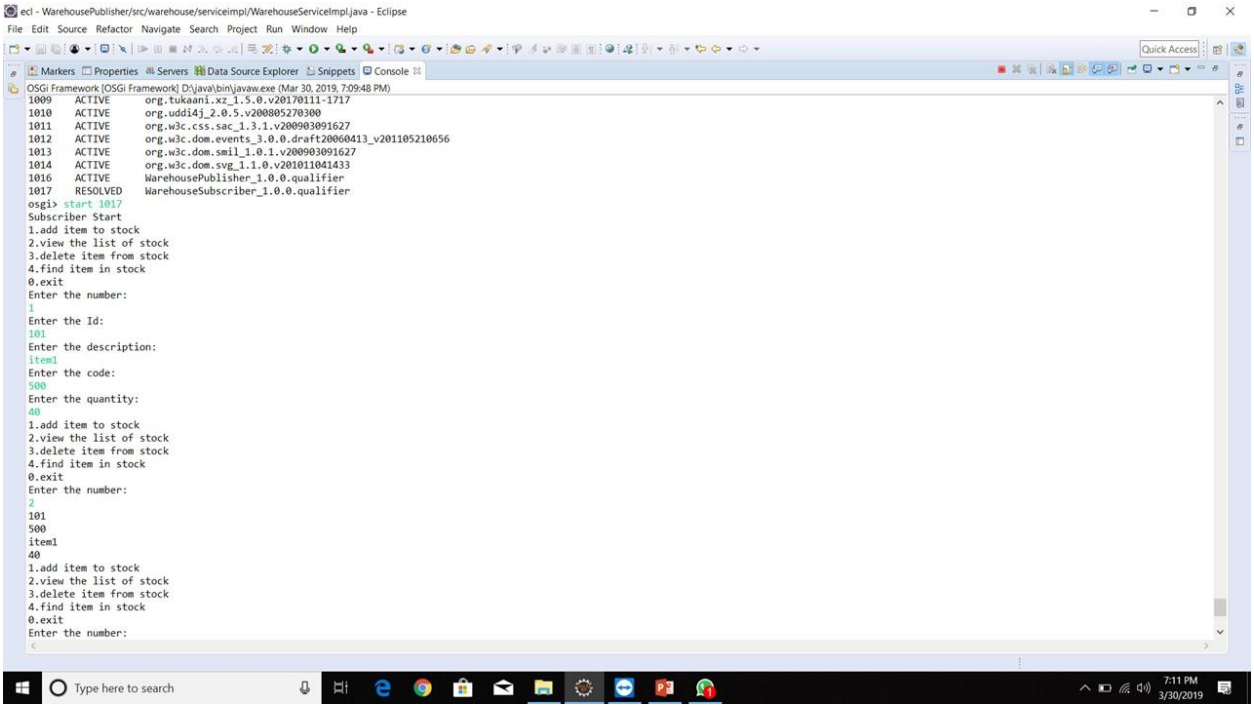

Console
OSGi Framework [OSGi Framework] C:\Program Files\Java\jre1.8.0_201\bin\javaw.exe (Mar 30, 2019, 4:40:47 PM)
start 4
Started Inventory Subcriber
==========
Inventory Management System
==========
******* Inventory Menu ************
001 - Find Customer
002 - Delete Customer
003 - Find Supplier
004 - Find Order
005 - Find Task
006 - Add Customer
007 - Add Supplier
008 - Add Order
009 - Add Task
010 - Delete Supplier
011 - Delete Order
012 - Delete Task
******* Menu ************
Enter a close to exit
Enter Menu Item :
003
Enter Supplier ID :
S001
Supplier ID : S001
Supplier First Name :Ayesh
Supplier Last Name :Probadhana
Supplier Email :ayeshata@gmail.com
Supplier Address :Dehiwala
Supplier Contact Number :07638491241
Enter Menu Item :
close
Exiting application
osgi>

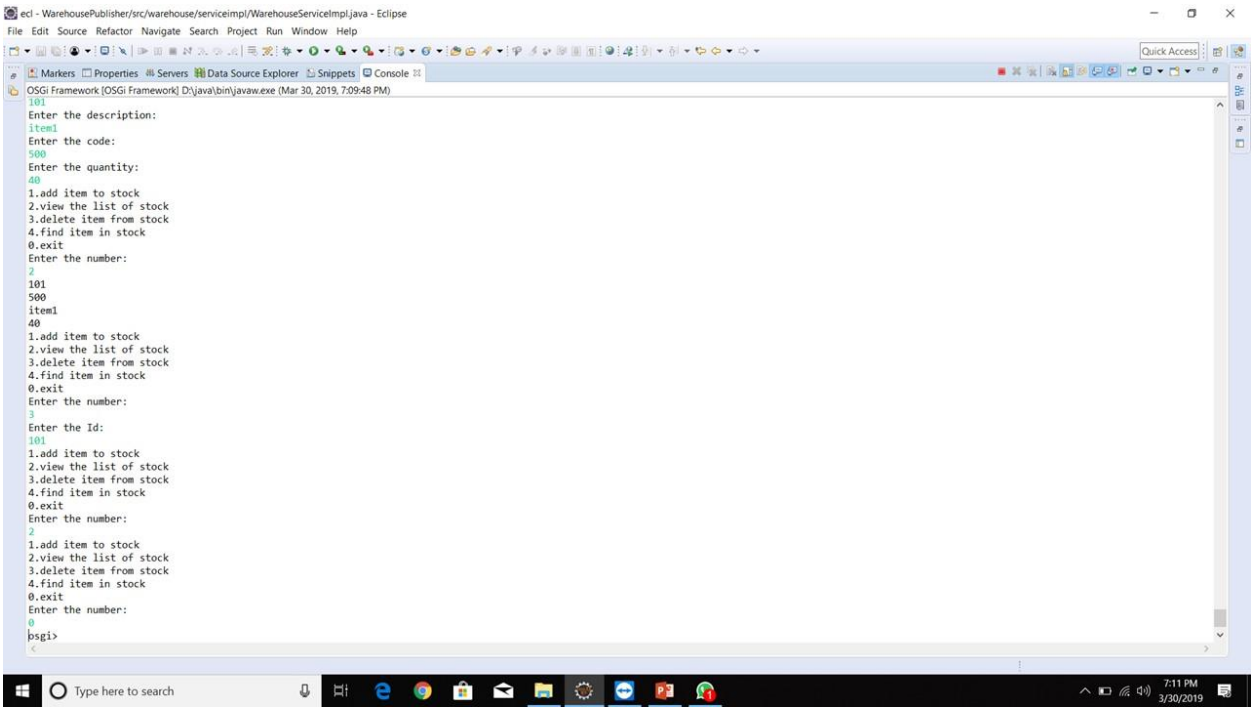

Console
OSGi Framework [OSGi Framework] C:\Program Files\Java\jre1.8.0_201\bin\javaw.exe (Mar 30, 2019, 4:40:47 PM)
007 - Add Supplier
008 - Add Order
009 - Add Task
010 - Delete Supplier
011 - Delete Order
012 - Delete Task
******* Menu ************
Enter a close to exit
Enter Menu Item :
006
Customer ID
C005
Customer First Name
Test
Customer Last Name
Last
Customer Contact Number
0769391251
Customer Email
test@gmail.com
Customer Address
athurugiriya
Enter Menu Item :
001
Enter Customer ID :
C005
Customer ID : C005
Customer First Name :Test
Customer Last Name :Last
Customer Email :test@gmail.com
Customer Address :athurugiriya
Customer Contact Number :0769391251
Enter Menu Item :
close
Exiting application
osgi>


Console
OSGi Framework [OSGi Framework] C:\Program Files\Java\jre1.8.0_201\bin\javaw.exe (Mar 30, 2019, 4:40:47 PM)
008 - Add Order
009 - Add Task
010 - Delete Supplier
011 - Delete Order
012 - Delete Task
******* Menu ************
Enter a close to exit
Enter Menu Item :
002
Enter Customer ID :
C005
Enter Menu Item :
008
Order ID :
O009
Order Item Code :
OC01
Order Description :
Test Order
Order Quantity :
10
Order Price Per Item :
1000
Enter Menu Item :
004
Enter Order ID :
O009
Order ID : O009
Order Code :OC01
Order Description :Test Order
Price per order item 1000
Order Quantity :10
Enter Menu Item :
close
Exiting application
osgi>
Test 02 - Eclipse IDE
File Edit Navigate Search Project Run Window Help
Quick Access
Markers Properties Servers Data Source Explorer Snippets Console
OSGi Framework [OSGi Framework] C:\Program Files\Java\jre1.8.0_201\bin\javaw.exe (Mar 30, 2019, 4:52:20 PM)
Started Inventory Database
Inventory Publisher Started
Started Inventory Subcriber 2
Inventory Management Report Generation
****** Report Menu *********
001 - Customer Report
002 - Supplier Report
003 - Order Report
004 - Task Report
******* Menu ************
Enter 'exit' to exit the application
Enter Menu Item :
001
IT100 suren vithanage surenanthonyithanage@gmail.com athurugiriya 0769391251
IT101 stephanie vithanage stephanie@gmail.com athurugiriya 0769391255
IT102 natasha vithanage natasha@gmail.com malabe 0769391252
IT103 sam sesh sam@gmail.com kottawa 0769321251
IT104 simson last simson@gmail.com moratuwa 0763391251
IT100 suren vithanage surenanthonyithanage@gmail.com athurugiriya 0769391251
IT101 stephanie vithanage stephanie@gmail.com athurugiriya 0769391255
IT102 natasha vithanage natasha@gmail.com malabe 0769391252
IT103 sam sesh sam@gmail.com kottawa 0769321251
IT104 simson last simson@gmail.com moratuwa 0763391251
Enter Menu Item :
002
S001 Ayesh Probadhana ayeshata@gmail.com Dehiwala 07638491241
S002 Himantha Krishna Himantha@gmail.com Nuwara 07638321241
S003 Ayeshanie Probadhana Ayeshanie@gmail.com Matale 07638499941
S004 Dimanthie De Silva Dimanthie@gmail.com Piliyandala 07234491241
S005 Natasha Fernando Natasha@gmail.com Ruhuna 07849121241
S001 Ayesh Probadhana ayeshata@gmail.com Dehiwala 07638491241
S002 Himantha Krishna Himantha@gmail.com Nuwara 07638321241
Type here to search
ENG
4:52 PM
3/30/2019


Test 02 - Eclipse IDE
File Edit Navigate Search Project Run Window Help
Quick Access
Markers Properties Servers Data Source Explorer Snippets Console
OSGi Framework [OSGi Framework] C:\Program Files\Java\jre1.8.0_201\bin\javaw.exe (Mar 30, 2019, 4:52:20 PM)
start 4
Started Inventory Subcriber 2
Inventory Management Report Generation
******* Report Menu *********
001 - Customer Report
002 - Supplier Report
003 - Order Report
004 - Task Report
******* Menu ************
Enter 'exit' to exit the application
Enter Menu Item :
003
O001 O001 OD01 Order 01 150 10
O002 O002 OD02 Order 02 250 12
O003 O003 OD03 Order 03 350 13
O004 O004 OD04 Order 04 450 14
O005 O005 OD05 Order 05 550 15
O001 O001 OD01 Order 01 150 10
O002 O002 OD02 Order 02 250 12
O003 O003 OD03 Order 03 350 13
O004 O004 OD04 Order 04 450 14
O005 O005 OD05 Order 05 550 15
Enter Menu Item :
004
T001 T001 #001 Task 01
T002 T002 #002 Task 02
T003 T003 #003 Task 03
T004 T004 #004 Task 04
T005 T005 #005 Task 05
T001 T001 #001 Task 01
T002 T002 #002 Task 02
T003 T003 #003 Task 03
Type here to search
ENG
4:53 PM
3/30/2019


Test 03 - Eclipse IDE
File Edit Navigate Search Project Run Window Help
Quick Access
Markers Properties Servers Data Source Explorer Snippets Console
OSGi Framework [OSGi Framework] C:\Program Files\Java\jre1.8.0_201\bin\javaw.exe (Mar 30, 2019, 5:05:03 PM)
Inventory Management System
******* Inventory Menu ************
001 - Find Customer
002 - Delete Customer
003 - Find Supplier
004 - Find Order
005 - Find Task
006 - Add Customer
007 - Add Supplier
008 - Add Order
009 - Add Task
010 - Delete Supplier
011 - Delete Order
012 - Delete Task
******* Menu ************
Enter a close to exit
Enter Menu Item :
close
Exiting application
Started Inventory Subcriber 2
Inventory Management Report Generation
******* Report Menu *********
001 - Customer Report
002 - Supplier Report
003 - Order Report
004 - Task Report
******* Menu ************
Type here to search
ENG
5:06 PM
3/30/2019


ecl - WarehousePublisher/src/warehouse/serviceimpl/WarehouseServiceImpl.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Quick Access
Markers Properties Servers Data Source Explorer Snippets Console
OSGi Framework [OSGi Framework] D:\java\bin\javaw.exe (Mar 30, 2019, 7:09:48 PM)
1009 ACTIVE org.tukaani.xz_1.5.0.v20170111-1717
1010 ACTIVE org.uddi4j_2.0.5.v200805270300
1011 ACTIVE org.w3c.css.sac_1.3.1.v200903091627
1012 ACTIVE org.w3c.dom.events_3.0.0.draft20060413_v201105210656
1013 ACTIVE org.w3c.dom.smil_1.0.1.v200903091627
1014 ACTIVE org.w3c.dom.svg_1.1.0.v201011041433
1016 ACTIVE WarehousePublisher_1.0.0.qualifier
1017 RESOLVED WarehouseSubscriber_1.0.0.qualifier
osgi> start 1017
Subscriber Start
1.add item to stock
2.view the list of stock
3.delete item from stock
4.find item in stock
0.exit
Enter the number:
1
Enter the Id:
101
Enter the description:
item1
Enter the code:
500
Enter the quantity:
40
1.add item to stock
2.view the list of stock
3.delete item from stock
4.find item in stock
0.exit
Enter the number:
2
101
500
item1
40
1.add item to stock
2.view the list of stock
3.delete item from stock
4.find item in stock
0.exit
Enter the number:
Type here to search
7:11 PM
3/30/2019


ecl - WarehousePublisher/src/warehouse/serviceimpl/WarehouseServiceImpl.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Quick Access
Markers Properties Servers Data Source Explorer Snippets Console
OSGi Framework [OSGi Framework] D:\java\bin\javaw.exe (Mar 30, 2019, 7:09:48 PM)
101
Enter the description:
item1
Enter the code:
500
Enter the quantity:
40
1.add item to stock
2.view the list of stock
3.delete item from stock
4.find item in stock
0.exit
Enter the number:
2
101
500
item1
40
1.add item to stock
2.view the list of stock
3.delete item from stock
4.find item in stock
0.exit
Enter the number:
3
Enter the Id:
101
1.add item to stock
2.view the list of stock
3.delete item from stock
4.find item in stock
0.exit
Enter the number:
2
1.add item to stock
2.view the list of stock
3.delete item from stock
4.find item in stock
0.exit
Enter the number:
0
osgi>
Type here to search
7:11 PM
3/30/2019