

Deliverable 2

Tutorial Group: iSolutions (SEOC 6)

Team: Plant

Team Members

Scott Hofman (s0943941) – stumpitron@gmail.com

Callum Jamieson (s0923194) – callumscottjamieson@gmail.com

Simon Zhong (s1159359) – simondzhong@gmail.com

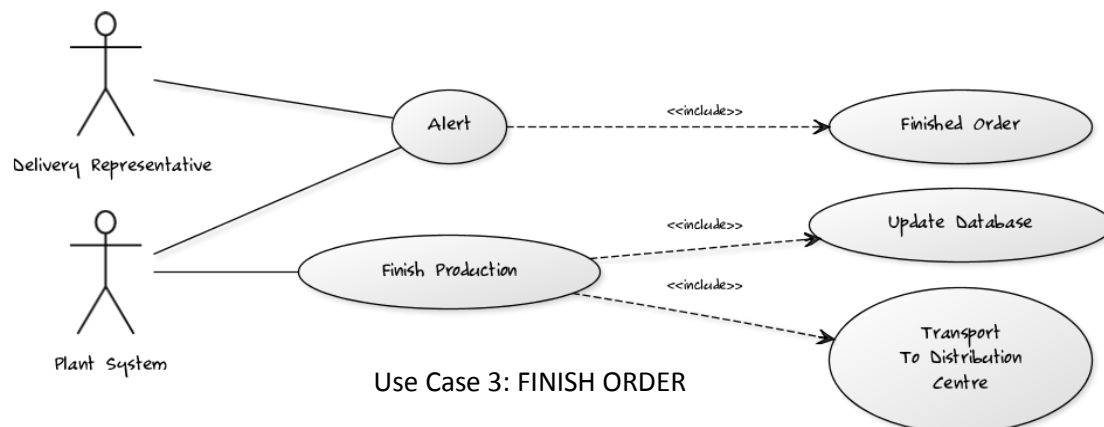
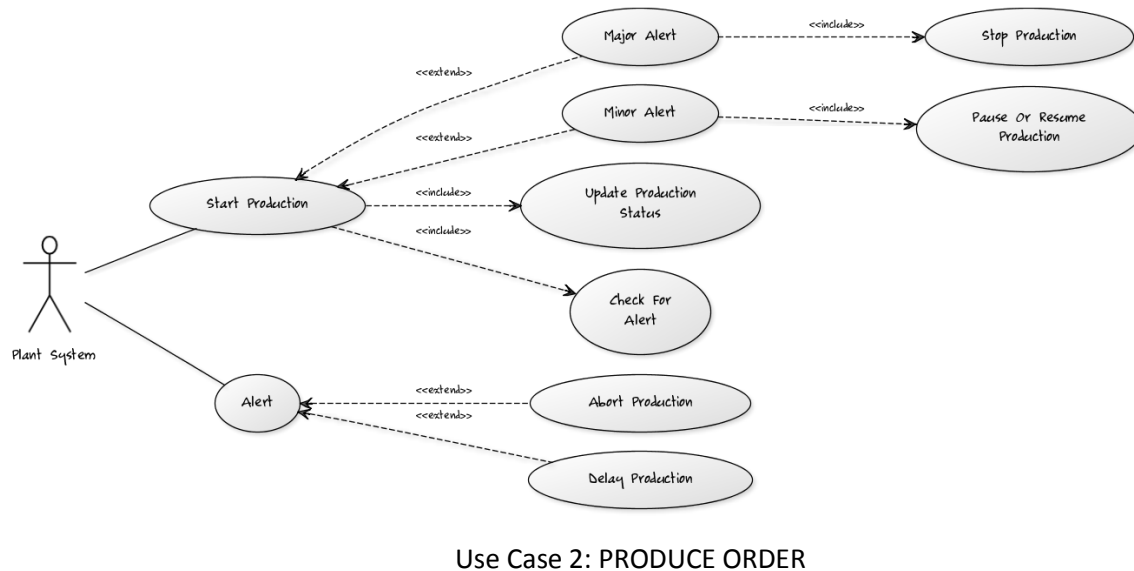
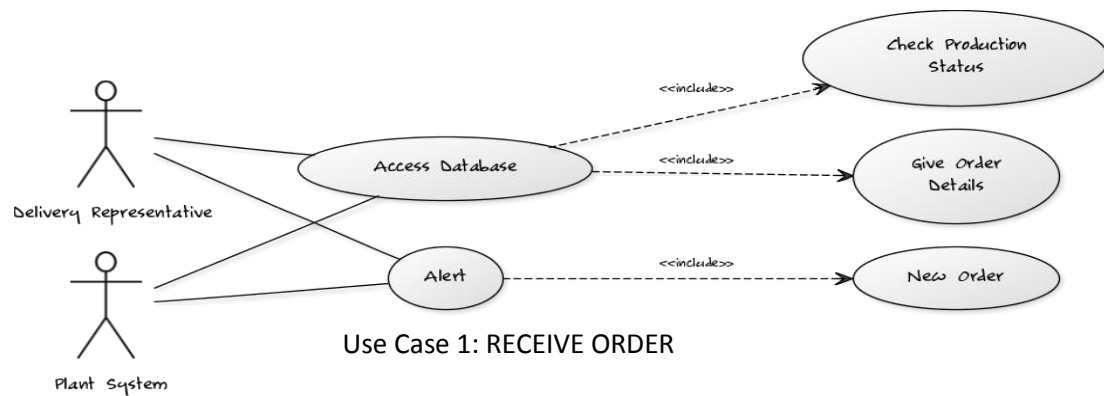
Andrei Manolache (s0923322) – s0923322@sms.ed.ac.uk

Ankit Sawa (s1105191) – ankitsawa@yahoo.co.in

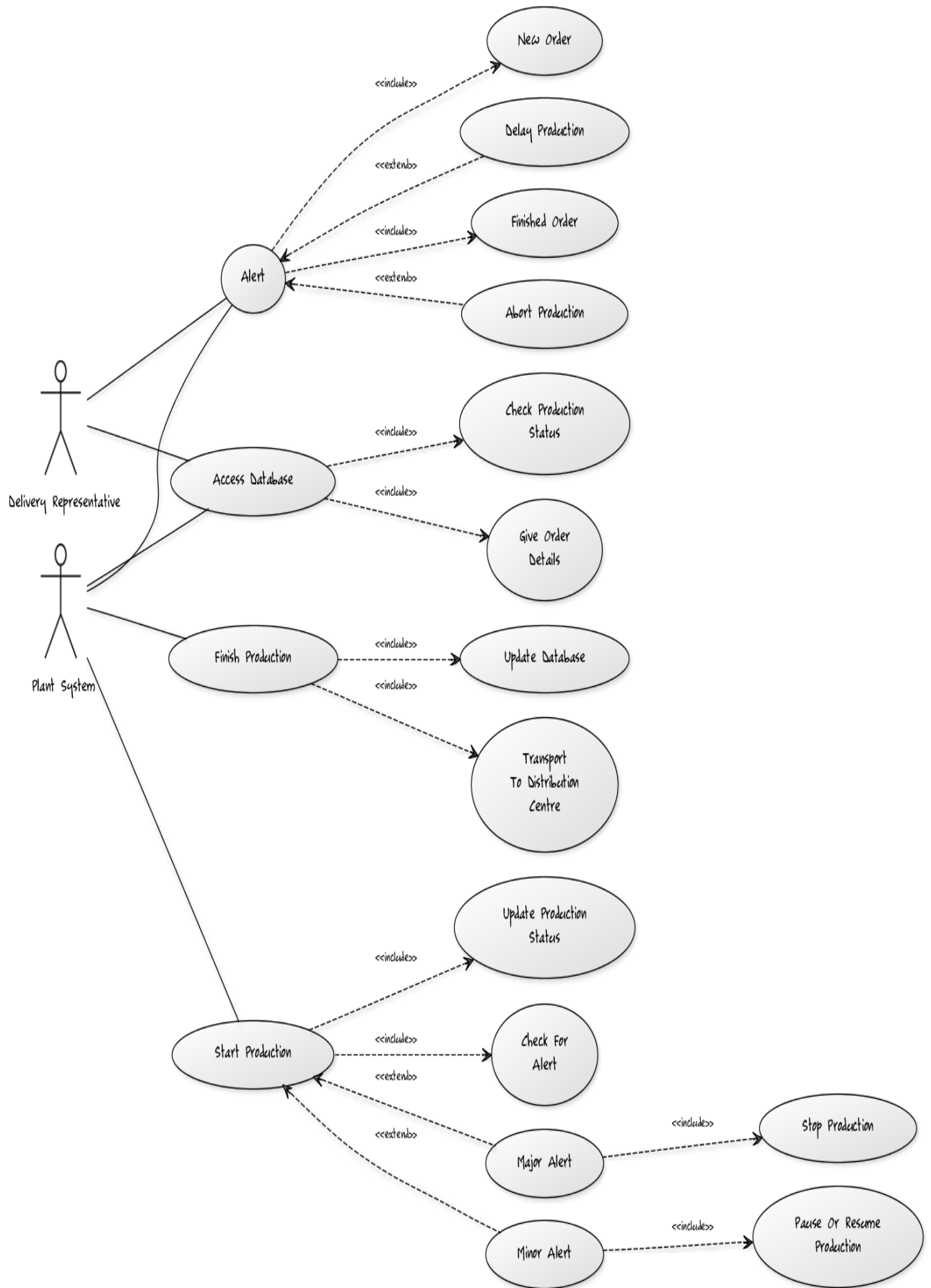
Table of Contents

Prioritised Use case.....	3
Change History of Use Case	5
Class Diagram.....	6
Change History of Class Diagram	7
Sequence diagram.....	8
Activity Diagram.....	9
Java Implementation.....	10
Testing.....	11
Testing Argumentation:	11
Test Result log.....	11

Prioritised Use case

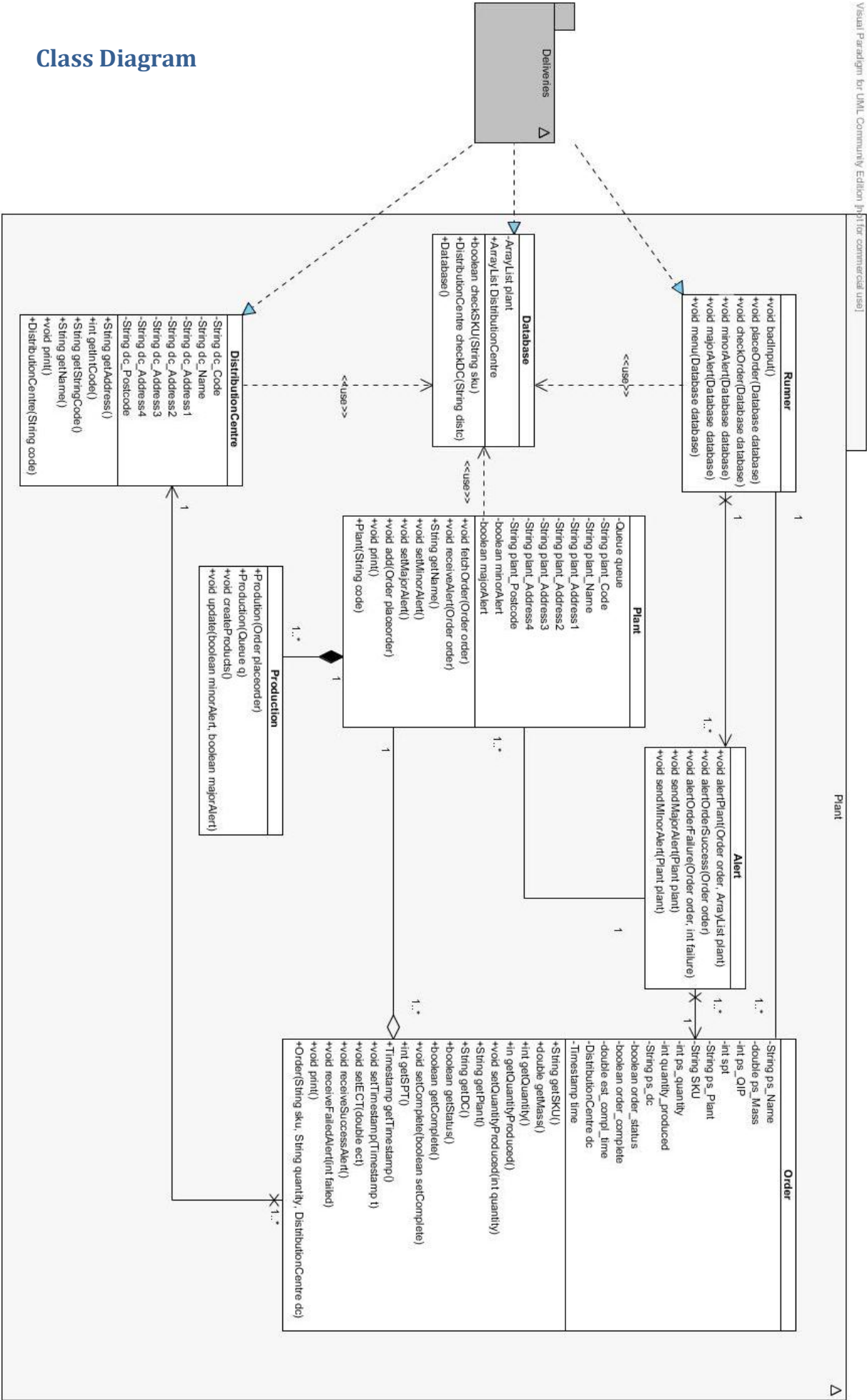


We have prioritized the Receive Order use case as the main priority use case as we need an order first before we can produce or finish and send it off. The 2nd priority use case is the Produce Order use case as we need to produce after an order is received and before we can send it off. Our 3rd and final priority use case is the Finish Order use case as we need to receive an order and produce before we can finish and delivery to the required distribution centre. So eventually we are implementing all of our use cases since they are interconnected.



Change History of Use Case

1. Creation of Database class as a way for Deliveries and Plants to communicate
2. Creation of Alert class to allow Deliveries and Plants to signal each other to check for changes in the Database
3. Deliveries updates the Database (with product SKU, pallets, and Plant ID) and sends an Alert to start an order.
4. We have removed stock, as stock will be maintained by Deliveries, i.e. Plant creates all the quantity specified in an order
5. We are not Arranging Production details as all details are provided in the database
6. Estimated production time is updated as a part of the production process

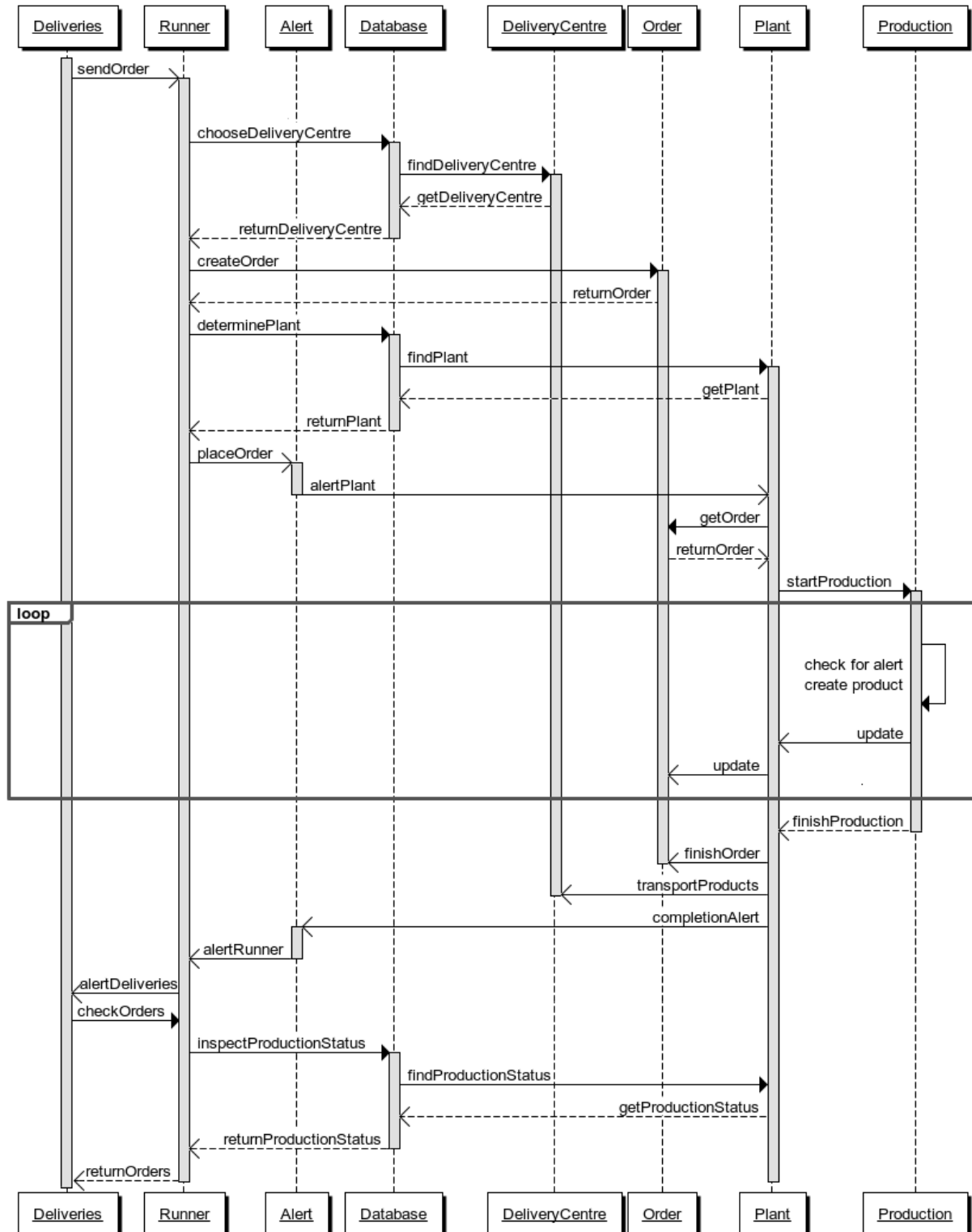


Class Diagram

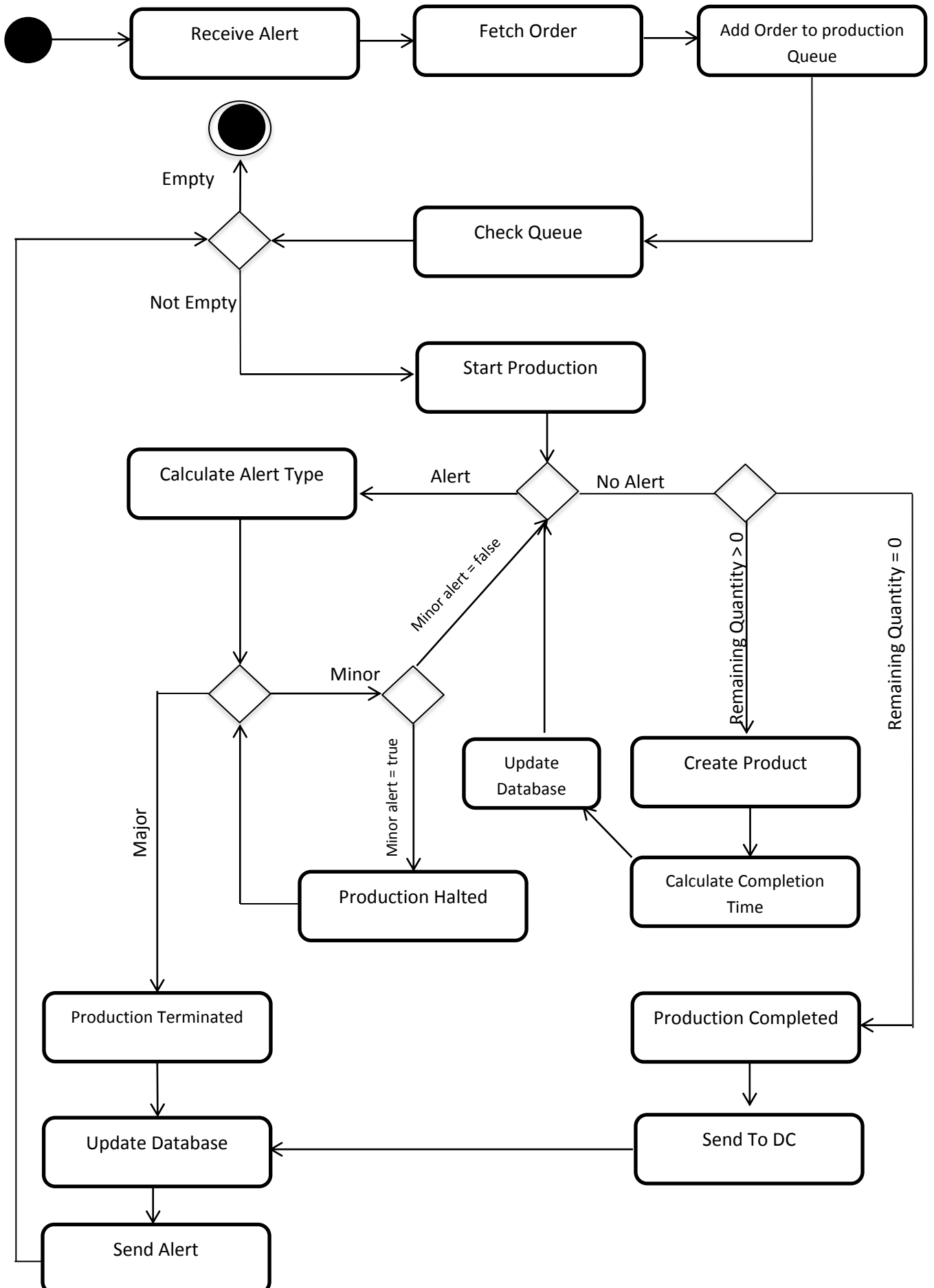
Change History of Class Diagram

1. Creation of Runner Class, which serves as Deliveries's interface with Alert, Database, DistributionCentre, and Order
2. Database contains only created Plants and DistributionCentres, so Deliveries can only observe the statuses of the DistributionCentre and the Orders in Plants
3. DistributionCentre has a few additional functions that return database attributes so DistributionCentre can be checked by Deliveries via the Database
4. Removed stock information, as the Deliveries group will handle stock in Distribution Centres
5. Alert returns information on order status, halt or abort orders, and signals the start of production as a way for Deliveries to communicate with Plants
6. Alert's Delay() is renamed to sendMinorAlert() and Alert's Failure() is renamed to sendMajorAlert() for more descriptive function names
7. Added a queue of Orders to Plant, as Orders are performed by FIFO
8. Orders has get and set methods for Production, so Orders can update its production status
9. Plant receives minor and major Alerts and relays the Alert to Production, so Plants can respond to minor and major Alerts
10. Production uses Plant's priority queue of Orders to produce for orders by FIFO
11. Production uses update() to halt, and abort creating products so Production can respond to minor and major Alerts
12. Order is now created from information given by Deliveries so it can be passed to Plant via Alert, which is then stored in Plant's queue of Orders
13. Order receives a timestamp to indicate when production starts and is expected to complete

Sequence diagram



Activity Diagram



Java Implementation

We created a fictionalised Runner class, which acts as a middle-man between Plants and Deliveries. With this class, the user can create an Order from a list of product SKUs. The program uses information from the Database to select the Plant and Distribution Centre, then places the Order within the respective Plant's queue. The Plant begins production which uses a real-time production function and creates the products specified by the order by FIFO. We have implemented an estimated completion time (which works in real time), which provides the number of seconds till an order is complete. We have limited Plants to work on only one order at any time. Upon Check Orders, the user can see the production process of each Plant. We have also implemented a Alert system, where the user can trigger a Minor Alert or Major Alert to any Plant. A Minor Alert indefinitely prevents production (even if no Order is in queue) until another Minor Alert is sent. A Major Alert removes the order at the front of the Plant's queue. Upon reaching 100% completion of an Order, the Product is removed from the Plant's queue and begins the next Order in the queue. As discussed with the Deliveries Group we do not manage stock, but we store quantity produced with each order if stock is needed. Also, we assume that the Distribution Centre always has sufficient storage space, and transportation is instantaneous.

Testing

Testing Argumentation:

The purpose of this short narrative is to provide justification for the adequacy of the tests we've done by showing how they relate to our sequence and activity diagrams.

We've divided the testing into two parts in order to achieve a high level of objectivity about the correctness of the software's implementation.

1. The first part checks how the system reacts when given different types of inputs making sure that regarding the input the programs work correctly. The System's Interface provides the user with multiple choices which includes making and checking an order, sending 2 different types of alerts and an exit option. The algorithmic interactions arranged in time sequence in both diagrams not only represent the blue print of the software's implementation but are also respected in the implementation itself. Placing an order or the Exit option has to be selected first in order for the program to run accurately with the sequence and activity diagram. The program still offers the possibility for the user to check for an order and to send alerts even if an order hasn't been placed but it shows the user that no order has been placed in the queue. Providing correct input will allow the program to switch to the next phase, for example selecting the product's SKU, the quantity and the distribution centre but at the same time the software survives the user's attempt to provide wrong input by providing text messages, specifying to the user to provide correct input.
2. For the second part we've used JUnit testing in order to test individual units of source code. We created a testing class for each existing class in the project and then we created a couple of testing instances for each method and the conclusion was that each returned the desired output making them fit for use.

Test Result log

Input Testing:

1.First phase:proving the correct input to visualize the system's behaviour:

run:

- (1) Place an Order
- (2) Check on Orders
- (3) Send Minor Alert
- (4) Send Major Alert
- (5) Exit

Select an option: 1

Available Products:

- (1020982648): Ariel
- (1002350932): Pampers
- (1023600676): Febreze
- (1043984673): Wella
- (1043986790): Clairol
- (1043980694): Head & Shoulders

(1043980535): Pantene
(1002374056): Olay
(1056700145): Crest
(1002670743): Vicks
(1048000457): Gillette Mach 3
(1048000458): Gillette Fusion
(1023100679): Duracell AA Batteries
(1035620983): Hugo Boss
(1035620560): Ghost
(1035620340): Lacoste
(1035620214): Max Factor

Select from the above SKU: 1035620214

Input quantity of pallets: 12

Available Distribution Centres:

(531): P&G Distribution
Hedley Avenue
West Thurrock
Essex
RM20 4AL

(532): P&G Distribution
Pimbo Road
Skelmersdale
Lancashire
WN8 9PE

(533): P&G Distribution
Wallisdown Road
Bournemouth
Dorset
BH11 8PL

Input Distribution Centre Code: 531

Sending Alert to Plants about the newly placed Order

The Plant Team is starting Order 1035620214

(1) Place an Order
(2) Check on Orders
(3) Send Minor Alert
(4) Send Major Alert
(5) Exit

Select an option: 1

Available Products:

(1020982648): Ariel

(1002350932): Pampers
(1023600676): Febreeze
(1043984673): Wella
(1043986790): Clairol
(1043980694): Head & Shoulders
(1043980535): Pantene
(1002374056): Olay
(1056700145): Crest
(1002670743): Vicks
(1048000457): Gillette Mach 3
(1048000458): Gillette Fusion
(1023100679): Duracell AA Batteries
(1035620983): Hugo Boss
(1035620560): Ghost
(1035620340): Lacoste
(1035620214): Max Factor

Select from the above SKU: 1002374056

Input quantity of pallets: 10

Available Distribution Centres:

(531): P&G Distribution
Hedley Avenue
West Thurrock
Essex
RM20 4AL

(532): P&G Distribution
Pimbo Road
Skelmersdale
Lancashire
WN8 9PE

(533): P&G Distribution
Wallisdown Road
Bournemouth
Dorset
BH11 8PL

Input Distribution Centre Code: 532

Sending Alert to Plants about the newly placed Order

The Plant Team is starting Order 1002374056

- (1) Place an Order
- (2) Check on Orders
- (3) Send Minor Alert
- (4) Send Major Alert

(5) Exit

Select an option: 2

London

(No orders are in queue)

Manchester

(No orders are in queue)

Newcastle

Product Name: Olay

SKU: 1002374056

Estimated Time Remaining: -3.17 seconds

Progress: 100%

10/10

Order is completed and sent to Distribution Center 532

Reading

(No orders are in queue)

Seaton Deleval

Product Name: Max Factor

SKU: 1035620214

Estimated Time Remaining: -20.00 seconds

Progress: 100%

12/12

Order is completed and sent to Distribution Center 531

(1) Place an Order

(2) Check on Orders

(3) Send Minor Alert

(4) Send Major Alert

(5) Exit

Select an option: 2

London

(No orders are in queue)

Manchester

(No orders are in queue)

Newcastle

(No orders are in queue)

Reading

(No orders are in queue)

Seaton Deleval

(No orders are in queue)

- (1) Place an Order
- (2) Check on Orders
- (3) Send Minor Alert
- (4) Send Major Alert
- (5) Exit

Select an option: 2

2.Second Phase:checking the system's behaviour when wrong inputs are presented:

run:

- (1) Place an Order
- (2) Check on Orders
- (3) Send Minor Alert
- (4) Send Major Alert
- (5) Exit

Select an option: 9

Please provide correct inputs

- (1) Place an Order
- (2) Check on Orders
- (3) Send Minor Alert
- (4) Send Major Alert
- (5) Exit

Select an option: 2

London

(No orders are in queue)

Manchester

(No orders are in queue)

Newcastle

(No orders are in queue)

Reading

(No orders are in queue)

Seaton Deleval

(No orders are in queue)

- (1) Place an Order
- (2) Check on Orders
- (3) Send Minor Alert
- (4) Send Major Alert
- (5) Exit

Select an option: 1

Available Products:

- (1020982648): Ariel
- (1002350932): Pampers
- (1023600676): Febreeze
- (1043984673): Wella
- (1043986790): Clairol
- (1043980694): Head & Shoulders
- (1043980535): Pantene
- (1002374056): Olay
- (1056700145): Crest
- (1002670743): Vicks
- (1048000457): Gillette Mach 3
- (1048000458): Gillette Fusion
- (1023100679): Duracell AA Batteries
- (1035620983): Hugo Boss
- (1035620560): Ghost
- (1035620340): Lacoste
- (1035620214): Max Factor

Select from the above SKU: pizza

Please provide correct inputs

Available Products:

- (1020982648): Ariel
- (1002350932): Pampers
- (1023600676): Febreeze
- (1043984673): Wella
- (1043986790): Clairol
- (1043980694): Head & Shoulders
- (1043980535): Pantene
- (1002374056): Olay
- (1056700145): Crest
- (1002670743): Vicks
- (1048000457): Gillette Mach 3
- (1048000458): Gillette Fusion
- (1023100679): Duracell AA Batteries
- (1035620983): Hugo Boss
- (1035620560): Ghost
- (1035620340): Lacoste
- (1035620214): Max Factor

Select from the above SKU: 999

Please provide correct inputs

Available Products:

- (1020982648): Ariel
- (1002350932): Pampers
- (1023600676): Febreeze

(1043984673): Wella
(1043986790): Clairol
(1043980694): Head & Shoulders
(1043980535): Pantene
(1002374056): Olay
(1056700145): Crest
(1002670743): Vicks
(1048000457): Gillette Mach 3
(1048000458): Gillette Fusion
(1023100679): Duracell AA Batteries
(1035620983): Hugo Boss
(1035620560): Ghost
(1035620340): Lacoste
(1035620214): Max Factor

Select from the above SKU: 1035620214

Input quantity of pallets: 0

Please provide correct inputs

Input quantity of pallets: 10

Available Distribution Centres:

(531): P&G Distribution
Hedley Avenue
West Thurrock
Essex
RM20 4AL

(532): P&G Distribution
Pimbo Road
Skelmersdale
Lancashire
WN8 9PE

(533): P&G Distribution
Wallisdown Road
Bournemouth
Dorset
BH11 8PL

Input Distribution Centre Code: 3424

Please provide correct inputs

Available Distribution Centres:

(531): P&G Distribution
Hedley Avenue

West Thurrock
Essex
RM20 4AL

(532): P&G Distribution
Pimbo Road
Skelmersdale
Lancashire
WN8 9PE

(533): P&G Distribution
Wallisdown Road
Bournemouth
Dorset
BH11 8PL

Input Distribution Centre Code: 533

Sending Alert to Plants about the newly placed Order

The Plant Team is starting Order 1035620214

- (1) Place an Order
- (2) Check on Orders
- (3) Send Minor Alert
- (4) Send Major Alert
- (5) Exit

Select an option: 2

London
(No orders are in queue)

Manchester
(No orders are in queue)

Newcastle
(No orders are in queue)

Reading
(No orders are in queue)

Seaton Deleval
Product Name: Max Factor
SKU: 1035620214
Estimated Time Remaining: -0.83 seconds
Progress: 100%

10/10

Order is completed and sent to Distribution Center 533

- (1) Place an Order
- (2) Check on Orders
- (3) Send Minor Alert
- (4) Send Major Alert
- (5) Exit

Select an option: 2

London

(No orders are in queue)

Manchester

(No orders are in queue)

Newcastle

(No orders are in queue)

Reading

(No orders are in queue)

Seaton Deleval

(No orders are in queue)

- (1) Place an Order
- (2) Check on Orders
- (3) Send Minor Alert
- (4) Send Major Alert
- (5) Exit

Select an option: 5

3.Last when provind good and bad input:
run:

- (1) Place an Order
- (2) Check on Orders
- (3) Send Minor Alert
- (4) Send Major Alert
- (5) Exit

Select an option: 1

Available Products:

- (1020982648): Ariel
- (1002350932): Pampers
- (1023600676): Febreeze
- (1043984673): Wella
- (1043986790): Clairol
- (1043980694): Head & Shoulders
- (1043980535): Pantene
- (1002374056): Olay
- (1056700145): Crest

(1002670743): Vicks
(1048000457): Gillette Mach 3
(1048000458): Gillette Fusion
(1023100679): Duracell AA Batteries
(1035620983): Hugo Boss
(1035620560): Ghost
(1035620340): Lacoste
(1035620214): Max Factor
Select from the above SKU: 3434

Please provide correct inputs

Available Products:

(1020982648): Ariel
(1002350932): Pampers
(1023600676): Febreze
(1043984673): Wella
(1043986790): Clairol
(1043980694): Head & Shoulders
(1043980535): Pantene
(1002374056): Olay
(1056700145): Crest
(1002670743): Vicks
(1048000457): Gillette Mach 3
(1048000458): Gillette Fusion
(1023100679): Duracell AA Batteries
(1035620983): Hugo Boss
(1035620560): Ghost
(1035620340): Lacoste
(1035620214): Max Factor
Select from the above SKU: 1002670743

Input quantity of pallets: 0

Please provide correct inputs

Input quantity of pallets: 2

Available Distribution Centres:

(531): P&G Distribution
Hedley Avenue
West Thurrock
Essex
RM20 4AL

(532): P&G Distribution
Pimbo Road
Skelmersdale
Lancashire

WN8 9PE

(533): P&G Distribution
Wallisdown Road
Bournemouth
Dorset
BH11 8PL

Input Distribution Centre Code: 2

Please provide correct inputs

Available Distribution Centres:

(531): P&G Distribution
Hedley Avenue
West Thurrock
Essex
RM20 4AL

(532): P&G Distribution
Pimbo Road
Skelmersdale
Lancashire
WN8 9PE

(533): P&G Distribution
Wallisdown Road
Bournemouth
Dorset
BH11 8PL

Input Distribution Centre Code: 533

Sending Alert to Plants about the newly placed Order

The Plant Team is starting Order 1002670743

- (1) Place an Order
- (2) Check on Orders
- (3) Send Minor Alert
- (4) Send Major Alert
- (5) Exit

Select an option: 2

London

(No orders are in queue)

Manchester

(No orders are in queue)

Newcastle

Product Name: Vicks

SKU: 1002670743

Estimated Time Remaining: -0.67 seconds

Progress: 100%

2/2

Order is completed and sent to Distribution Center 533

Reading

(No orders are in queue)

Seaton Deleval

(No orders are in queue)

- (1) Place an Order
- (2) Check on Orders
- (3) Send Minor Alert
- (4) Send Major Alert
- (5) Exit

Select an option: