**Online Store and Warehouse**

**Overview**:

The intention of this project is to show how to create, run and get key business insights from a online retailer's SQL database.

The operational database is MySQL and represents the customer facing online store and the warehouse fufilling the orders placed by the customers.

Bots programmed in python are used to send queries to the database and generate the customer and worker activity.

A data warehouse is constructed along side the operational database. This database has data from the operational database, historical data from bricks and motar stores the online retailer has previously bought out and also purchased social media data. All this data within the ware house is cleaned, transformed using Pandas so it appropiate for data analysis and visualisation.

Complex data analysis is done using pandas and numpy. Visualisation is done using Tableau.

**Company Parts**

Online Store

customers can make purchases from online store. Sporting goods, books, electronics, gardening and home goods.

Warehouse

Company has a warehouse for shipping orders to customers.

Retail financing

Customers can finance their purchases via inhouse financing.

**Program Parts**

**MySQL Database**

Stores information on customers, orders, warehouse activies, products, suppliers, customer financing.

**Main Program**

keeps track of time (tick). updates the bots, and database and visualisations as necessary.

**Customer and worker bots**

Basic AI bots to represent action of customers and warehouse workers sending relevant SQL queries.

**Datawarehouse**

Stores information from companies that have been taken over and merged. (customers, suppliers, products workersetc.)

Social media information is also included.

Datawarehouse also merges relevant information from the operational database.

Datawarehouse organises the data into clear views relevant for different parts of the company marketing, financing, fraud detection, HR etc.

**Data Visualisation**

Tableau - links into datawarehouse.

product sales over time

Most productive worker

Breakdown of customer purchases

**Bots**

**Basic Bot**

when called by the main program can send and print out SQL queries to database.

**Customer Bot**

Extends basic bot and represent a customer. using python chance functions, differnt customer bots can be programmed to act differerntly by having different chance variables. For example bots can have different product preferneces and shopping frequencies based on a class variable.

Customer bots can also have the option to make their purchases for cash or using financing. Customers can also check if their orders are correct, if incorrect they can apply for a refund from the company. Customers can also commit fraud by claiming they didn't receive a product when they did and get an undeserved refund.

Using chance variables Customer bots can also have different financing default rates and different rates of fraud.

**Warehouse Worker Bot**

Picks customer orders and ships them.

Bots can have different efficiency rates and different mistake rates.

**Visualisation**

put in mock ups of visualisations.

**Iterations**

Iteration 1:

Draw out schema by hand - done

Iteration 2:

Create data in csv - done

Create dummy data orders and customers etc. - done

Write sql code to create data - done

Create basic sql queries to get data - done

Iteration 3.

Set up python program - done

Get python to connect to mysql - done

Send basic query to retrieve data - done

Send query to update data - done

Iteration 4.

Write out description of bots - done

Create super basic bot that can put in an order - done

Create basic customer bot - done

create basic warehouse bot - done

Iteration 5.

Customer bot can place an order

worker bot can be assigned an order and pick it.

Once order is complete customer can check if it is correct.

iteration 6.

Customer makes payment when placing order

Customer can use finance when placing order

Iteration 7.

worker can make mistakes

customers can apply for refunds

customers can cheat -request undeserved refund.

Iteration 8:

create basic visualisations

sales over time

sales per product

sales per customer

productivity per worker

worker mistakes

Iteration 9:

create more customers

create more workers

create products

run and review database with more workers

iteration 10:

online retailer has bank account

online retailer can buy from suppliers when stocks run low.

online retailer now pays workers

online retailer collects payments from customers

iteration 11:

review visualisations.

interation 12:

review data warehouse