**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.

**Useful code**

#!/usr/bin/python

import time; # This is required to include time module.

from datetime import datetime

# The number of seconds since 1-1-1970 12am to current time.

ticks = time.time()

ticks = ticks + 10000

a\_timeAsString = time.ctime(ticks)

print(ticks)

print (datetime.fromtimestamp(ticks))

import random

def decision(probability):

return random.random() < probability

def main():

i = 0

while i < 50:

print(decision(.10))

i+=1

if \_\_name\_\_ == "\_\_main\_\_":

main()

**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

create basic warehouse bot

Iteration 5.

Update customer bot

Update worker bot

main program can generate appropriate customer and worker sql queries over a given time period at different speed. eg. 6 months worth of data in 1 mionute.

Iteration 6.

Update database complexity (financing, pallets etc.)

update complexity of customer bot (cheat and steal)

update complexity of worker bot (makes mistakes)

main program can detect customer theft

review and clean database code.

Iteration 7:

Create historic data of previous stores

Book shop

Sportsware store

Home goods

Financing

Social media

Iteration 8:

Set up code to merge data from multiple sources

Write out differnt data views

Iteration 9.

put different views here

Interaction 10.

Connect tableau to mysql or python

Create basic visualisations