## Higher Diploma in Science in Data Analytics

Multi-Paradigm Programming Shop Assignment

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## Assignment Overview:

The aim of this assignment is to build a shop program and match the following functionalities:

• The shop CSV should be modified to also hold the initial cash value for the shop.

• Read in customer orders from a CSV file.

• The shop must be able to process the orders of the customer.

• Operate in a live mode, where the user can enter a product by name, specify a quantity, and pay for it.

## What is Multi-Paradigm Programming

First, we need to understand that programming can be defined as communication between a computer and end user and having the computer follow instruction and complete what it is asked to do. When we hear the term programming paradigm we can assume that they are referencing the way we think and approach problems. For example, when we use procedural programming, we organise our code by using procedures and or functions, while object orientated programming is based on objects which use methods and functions.

## Object-Oriented Programming

When creating the shop in Java we use object-oriented programming. Object-oriented Programming uses classes and objects. This language model is based on the idea that programs will be organized around data, or [objects](https://searchmicroservices.techtarget.com/definition/object), as opposed to functions and logic. Programmers will identify what objects they need to manipulate and how they relate to each other ([Data Modelling](https://searchdatamanagement.techtarget.com/definition/data-modeling)). Object-oriented Programming is much easier to modify and maintain. The ease of development and efficiency of the language make it a better choice than a procedural language.

When creating the shop in java each class has its own file which makes it easier to pull information and update method or information relating to that class. This is great benefit as I can jump from different classed generating getter, setters and toStrings, so I can pull the information that I need into the main class. Each class has a constructor which initializes a newly created object and will be called when an object of the class is created. I didn’t realise until I had a quick google search that Java does not support any header file. Loops in Java for me were very straight forward as I was able to iterate an array by calling the array or using array.length (For Live Mode). I used various for loops to pull information from arrays that are checked and validated either from the user input of CSV file. The main issue that I seem to have come across was a FOR loop for the live shop. I created a Boolean variable and set it to false and when true is found it will accept the user input, but when run sometimes it works first time and other times the same input will have to be entered in a few times before the response is true. Overall, I found Java much easier to use and get my head around.

## Procedural Program

When creating the shop in C we used a procedural programming approach and takes more of a top down approach to programming. The program takes a problem and breaks that problem into sub-procedures. These sub-procedures are kept broken down until the sub-procedure can be solved. This can be tricky when a developer needs to edit the program because when more and more changes made to the code it can becom very difficult to locate and edit all related elements.

When creating the shop in C the ability to use classes in separate files like in OOP is not used. All the code in within a single file and considering that my program was not huge I can see how quickly the language can get very untidy. In C at the beginning of the file we need to create a struct or structs, we also need to add stdio.h which is the header file that is used in C. Struct are like what a class is in Java and contain different information such as the shops products stuck will hold a char for name and a double for price. C also uses pointers that are used store and or manage the addresse of dynamically allocated blocks of memory. Loops in C I found more difficult as the index needed to be defined in the struct. Overall the C section of this assignment was the hardest for me as a lot of external research needed to be completed. I am happy that I completed this section as I have gained great knowledge of the Language