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Introduction

C, Python, Java these are programming languages. The C programming language.

Some history: C was developed in 1988 by the ANSI, written for a n UNIX operation system. C language used in PHP, MySQL, Linux and assembly language.

C language is a collection of library functions. The building block for many modern languages. Has built-in function and operations, its fast and efficient and highly portable.

Advantages of C [1]:

- C is the building block for many other programming languages.
- Programs written in C are highly portable.
- Several standard functions are there (like in-built) that can be used to develop programs.
- C programs are collections of C library functions, and it's also easy to add functions to the C library.
- The modular structure makes code debugging, maintenance, and testing easier.

Disadvantages of C [1]:

- C does not provide Object Oriented Programming (OOP) concepts.
- There are no concepts of Namespace in C.
- C does not provide binding or wrapping up of data in a single unit.
- C does not provide Constructor and Destructor.

Python programming language:

Developed in 1991 by Guido van Rossum. Dutch programmer, in 1991. Has many uses but mainly used in web development (server-side), data analysis, software development system scripting.

Python is platform independent and is quite simple syntax like English.

[2] Runs on an interpreter Python runs on an interpreter system, meaning that code can be executed as soon as it is written. This means that prototyping can be very quick.

Python was designed for readability and has some similarities to the English language with influence from mathematics.

Python uses new lines to complete a command, as opposed to other programming languages which often use semicolons or parentheses.

Python relies on indentation, using whitespace, to define scope, such as the scope of loops, functions and classes. Other programming languages often use curly brackets for this purpose

Java programming language.

Java is an object oriented programming language platform independent. One of the most popular programming languages which is open source and secure.[3] Java is an object-oriented language which gives a clear structure to programs and allows code to be reused, lowering development costs. As Java is close to [C++](#) and [C#](#), it makes it easy for programmers to switch to Java or vice versa

Objective

This project will compare a shop program that have been written in C, Python and Java. While the C and Python shop program are written procedurally the Java is written in Object oriented programming.

This project will compare the procedural approach. And discuss how the OOP written in Java is an improvement in writing code.

Summary

The results will show that the OOP programming is a far better way to implement that procedural programming, easier to write than procedural programming and more secure.

The discussion will speak about the code and compare procedural programming python and C and make similarities to Java OOP.

It will be shown that OOP is more secure, and coding is easier to read and understand.

It will show that procedural programming is an outdated concept.

Results

Programming Language	Platform independence	Coding Difficulty: Easy = 1 Moderate = 2 Hard = 3	Security: Level 1 = bad Level 2 = good Level 3 = best	Writing code: 1 = easy 2 = moderate 3 = hard	OOP
C	No	3	2	2	Not OOP
Python	No	2	1	3	Can be OOP
Java	Yes	2	3	2	OOP

Discussion

This section will discuss the programming languages and the complexities that could have been a factor in the completion.

Knowledge of the programming languages:

Programming Languages	Level of familiarity
C	Beginner
Python	Intermediate
Java	Intermediate

The sample code for C programming component of this project was a great help. Learning the basic of C was a challenge. And I did find out a lot about how C is used.

The code:

The program allows the user to choose the customer type. A walk-in customer or a customer with bulk order. For all languages this is done with an infinite while loop only breaking the loop stops the program. The break will come when the customer is finished shopping. Explain? Customer walks into the shop, while loop number 1 runs to find out if the customer is a walk in or a bulk order customer. This is done by assigning numbers to the selection, 1 for walk in customer and 2 for bulk orders customer. And addition question is also asked allowing the customer to exit the shop, this is recorded as 0. If the customer enters 0 then the while loop will break, and the program will end. The customer makes the selection and if they choose 1 then the shop products will be displayed, each product will have an assigned number, in C and python this is the case but in java I allow the customer to type in the product name. The customer will be asked for the quantity if the shop has enough of that product the customers selection will be recoded in a struct and once the customer does not enter 0 the program continues to ask the customer for product and quantity selections. If the customer has enough products zero is entered and the will loop will break. Once the while is broken the program is sent back to the parent while, the customers budget is checked and if the customer has enough money then the customer money will be decremented by the (stock * quantity * price). The stock will be reduced, and the shop money will be incremented by the (products cost * quantity* price), the while loop will proceed and ask if the customer is a walk in or bulk customer, if the customer is a bulk order customer then, the customers .csv will be read. Product selection and quantity will be checked and calculated, and budget will also be checked if everything is in order then the shop stock quantities will decrement, and shop money will be increment by the amount of the order. The parent while loop will continue and ask it the customer is a walk in or bulk order. It the customer chooses to exit then parent while loop will break, and the program will end. Note, that in C and python the stock.csv will be updated with the reduced quantities of the customer's order amount.

This could have been done through some backend MySQL database. Which on reflection I should have done.

The Java is a bit different and I will explain what I used to complete the task here.

The java code is object oriented, so I used an interface to create an abstract class once the shop was created it gave me a good level of security. It is worth mentioning that the java and the python were written on the same pseudocode as C but no sample code was used to create the both java and python programs, but I wish there was for the python procedural program.

The stock updating was indeed the hardest part to figure out, the stock taken in form of an excel file was not ideally a good starting point. Stock in a realistic shop program is in some backend database like MySQL. In a backend database updating the stock is a CRUD operation, update statement. Reading in from a CSV file makes updating the stock difficult to update so I used this interpretation of that module to compare update the stock. Reading in (CRUD select * from database) and updating stock (Insert – from database where name = 'milk') so writing out to the same stock.

- Java uses an interface
- C used a struct
- Python uses a dictionary.

Factors related to my conclusions.

1. Knowledge of the programming language
2. Experience with programming and the individual language
3. Security, Java in this project is the most secure, because of the abstract class. Also, declaring class variable to be private which gives a level of encapsulation to make the program more secure than the others.

Conclusion

To conclude.

C procedural programming was a difficult program to write, but a certain factor of that was a lack of knowledge of the language. I would have liked to learn how C would have interacted with a database. I would think it would be more commonly used in applications than writing/reading to a CSV file. I would have to compare C and python as both were written in the procedural way. But I cannot compare procedural program to OOP concepts which makes procedural programming an outdated and inefficient concept.

C syntax is like Java, in fact syntax in C is the parent to Java because of C++.

Java is a better way to write the program, because it offers OOP concepts that the programmer uses to build an outline and make an object of that outline. This gives better security than procedural, code is easily read, and libraries are early imported when required.

I cannot compare python OOP concepts in this report. But I would expect that python OOP to be easier than Java OOP.

References

[1] [C Tutorial - Learn C Programming \(w3schools.in\)](https://www.w3schools.com/C/)

[2] [Introduction to Python \(w3schools.com\)](https://www.w3schools.com/python/)

[3] [Introduction to Java \(w3schools.com\)](https://www.w3schools.com/java/)