UNIVERSIDAD POLITÉCNICA DE YUCATÁN

BIS

FULL NAME:

KARLA DELGADO AVENDAÑO

QUARTER:

FIRST (JANUARY-APRIL)

MAYOR:

DATA

GROUP:

1A

SUBJECT:

ALGORITHMS FUNDAMENTALS

INDEX

INTRODUCTION

In this research document the different stages of program compilation will be shown as well as explained in detail one by one, starting from what is known as a "Lexical Analysis" until the "Optimization" process of our code.

The various levels of programming will also be showcased and reviewed, both of them having a detailed mention of how to identify each one, as well as some examples to get a better understanding on the differences between the two levels.

STAGES OF PROGRAM COMPILATION

For a code to be translated into something easy to work with and humanly understandable it needs to go through several stages, these are divided into six to be completely checked and cleaned before running and compiling a program. The stages go as follows:

-Lexical analysis: The source code is broken into atomic data (the smallest type of meaningful data) and used to create "tokens" that identify various elements. The final job of this stage is to remove any unnecessary spaces and redundant syntax from the code.

-Symbol table construction: Like the name mentions, all the variables, constants and arrays are stored in tables, in the case of variables these are checked to determine what type of data they are.

-Syntax analysis: The tokens go through a check up to ensure that all the rules of the programming language are correctly used, if errors are found it will pop up a message announcing it.

-Semantic analysis: The variables that were previously separated go through another process to confirm that they contain the correct data within them.

-Code Generation: Machine Code gets created thanks to the tokens; this makes the complex language become simpler and lower leveled.

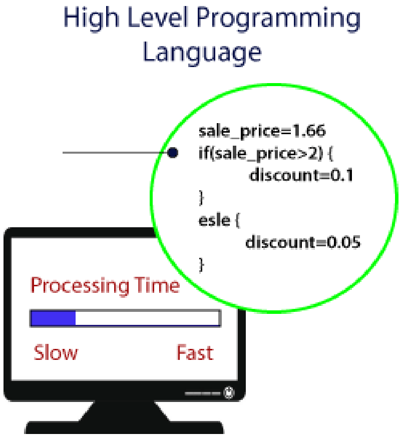
-Optimization: makes the program more efficient in a faster way and using fewer resources possible.

LEVELS OF PROGRAMMING:

The most basic classification of programming languages is divided by two, High-Level Languages and Low-Level Languages.

High-Level (C, C++, JAVA…):

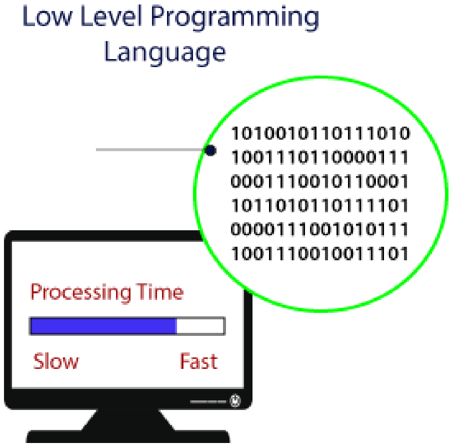
These types of languages can only be understood by humans, they are more “English-like”, this making it easier for programmers to work, however this type of language need to be translated for the machine to understand it, but this can happen thanks to an interpreter or a compiler.



```
sale_price=1.66
if(sale_price>2) {
        discount=0.1
}
esle {
        discount=0.05
}
```

Low-Level (Machine code, Assembly):

This language can only be understood by the computers, it is made up by a binary pattern (only 0 and 1), to program in this language there needs to be a good understanding and memorization of different binary codes, which can be difficult for programmers.



```
1010010110111010
1001110110000111
0001110010110001
1011010110111101
0000111001010111
1001110010011101
```

CONCLUSION

Thanks to all the information that was previously presented, we can conclude that programming not only depends on the person in charge of telling the machine what to do, but also it is very important that the machine we use is capable of examining and clean the program, this also helps us as programmers to understand the various reasons we could get an error within the code we are creating.

We can also mention the importance of knowing the two levels of programming, this is because it gives a more extensive explanation between the relations that exist within a programmer and a computer by teaching how we tend to do everything possible to make a computer understand what we are telling them to do.

REFERENCES

-TeachAllAboutIt. (s. f.). Stages of Compilation. Teach All About It. Recuperado 7 de enero de 2022, de https://teachallaboutit.school/stages-of-compilation/

-BBC. (s. f.). Program construction. Bitesize. Recuperado 7 de enero de 2022, de https://www.bbc.co.uk/bitesize/guides/zmthsrd/revision/3

-Chawla, M. (2016, 16 Julio). Levels of Programming Languages. The Bit Theories. Recuperado 7 de enero de 2022, de https://thebittheories.com/levels-of-programming-languages-b6a38a68c0f2