

2.5 PROGRAMMING LANGUAGES AND IDE

HIGH LEVEL LANGUAGES

- Eg: Python, Java etc
- Each instruction in a high level code represents many machine code instructions.
- The code will work on many different computers and processors
- Data can be stored in different structures like lists and arrays
- The code is easy to read and understand
- The code has to be converted into machine code for the computer to understand it
- Programs will be less memory efficient as there is no control over what the CPU does

LOW LEVEL LANGUAGES

- Eg: Machine code (binary) and assembly language
- Each instruction only represents one instruction of machine code
- Low level languages are written for one particular machine or processor
- To store data the programmer needs to understand how the CPU manages memory
- Low level code is difficult to read and understand
- Machine code can be executed without translators
- Programs are more memory efficient as you control what the CPU does

TRANSLATORS

High level languages have to be translated to machine code for the computer to understand them.

Assemblers - turn assembly language into machine code

Compilers - Translate all of the code in on go to create an executable file. A compiler can take a long time but the final code runs quickly and gives a list of errors for the entire program.

Interpreters - Translates the code one instructions at a time. This means the program will run more slowly. No executable file is created so the code will need to be translated every time it runs. The interpreter will stop after each error which is helpful when debugging

IDE'S (INTEGRATED DESIGN ENVIRONMENTS)

IDE's help programmers develop their code. They have a range of features to do this:

Editors - the area which the code is written in. Includes line numbers and colour coding for different features of the code (variables, comments etc)

Run Time Environment - Lets the programmer run the code quickly to test it for errors

Error Diagnostics - includes diagnostic tools to help find and solve errors

A Translator - to translate the code into machine code

Breakpoints - Stop the program on certain lines so that information up to that point can be gathered.