

EMBEDDED SYSTEMS

Workshop Level 1 - Be Ready for

WHO AM I ?

My Name: Ahmed Ibrahim Asl

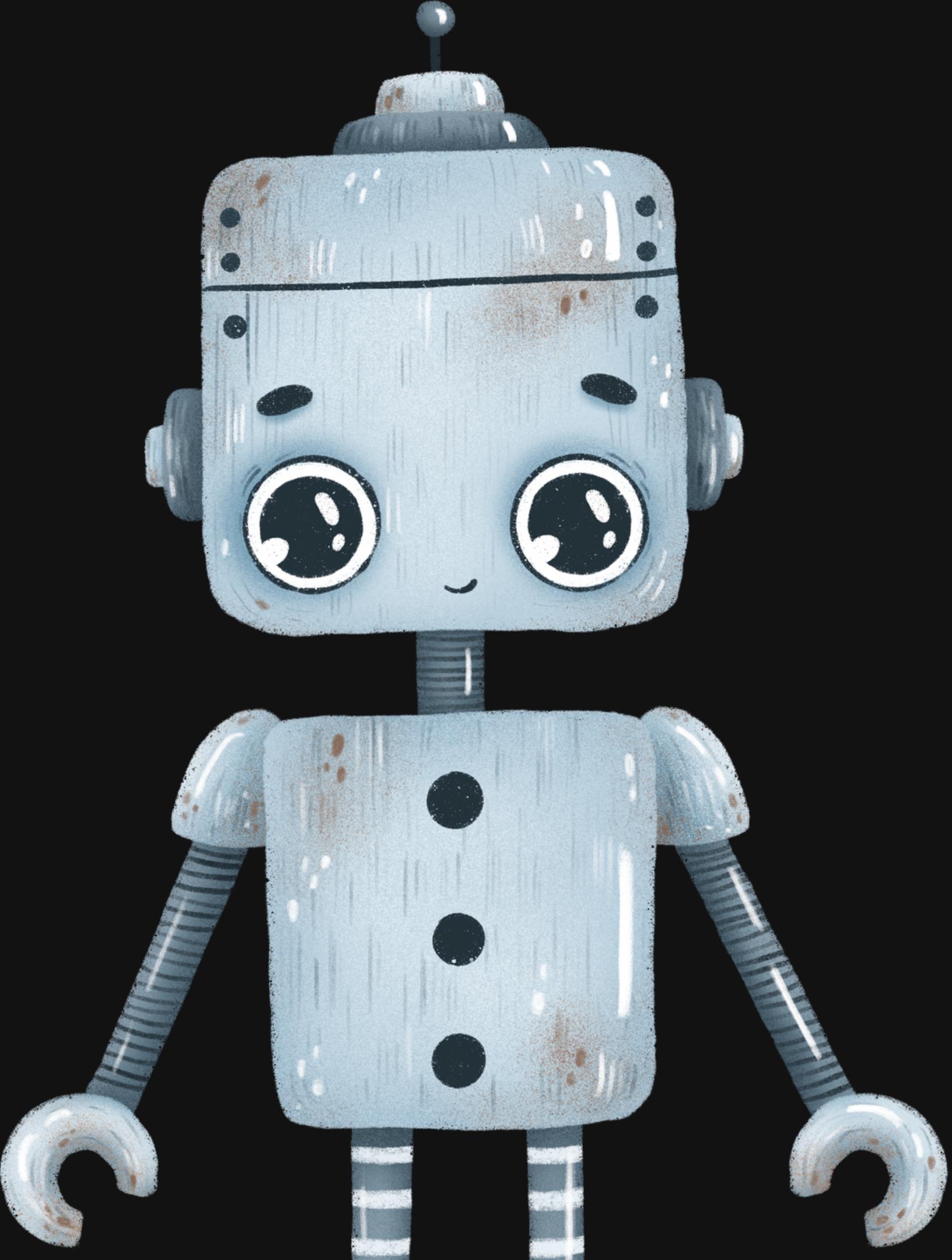
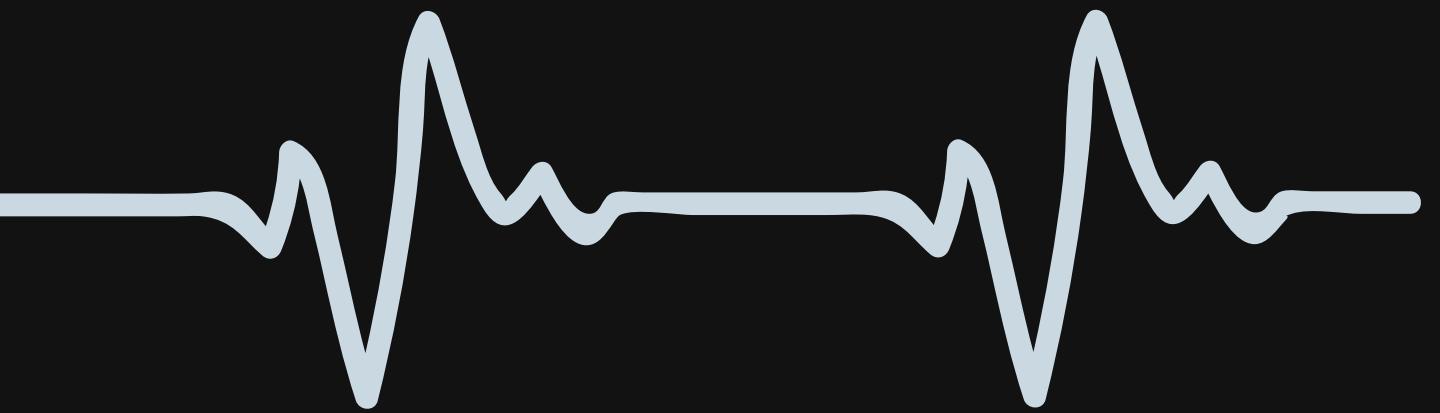
Embedded software engineer

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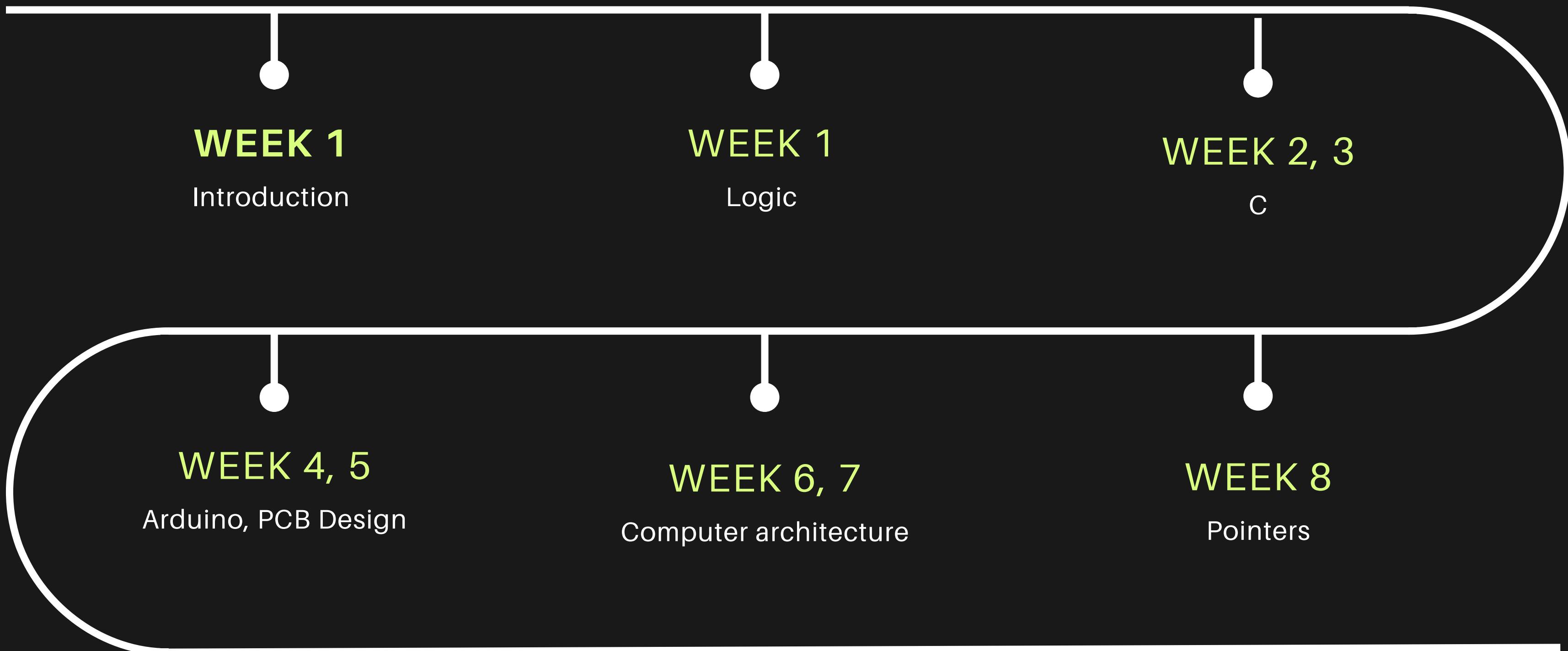


WHAT IS EMBEDDED ?



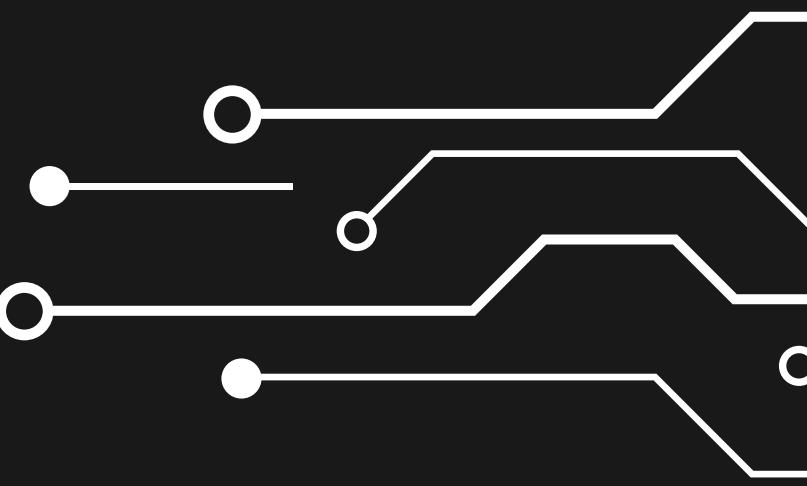
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Road Map



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TYPING!



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- 1 what is meaning of Programming ?
- 2 Difference between Programming and coding ?
- 3 Programming Language? / (High Level - low level)
- 4 Difference between (IDE - code editor- text editor)
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- 6 Compiler - interpreter - Editor
- 7 Compilation Process
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What is a Programming ?

written instructions given to computer to perform an action

these instructions: has to be very specific because computers are not smart as they seems !

CODING

**INVOLVES FOCUSING ON DETAILS OF
IMPLEMENTING A SOLUTION AND WRITE
THE SPECIFIC COMMANDS NECESSARY
TO ACHIEVE A PARTICULAR TASK**

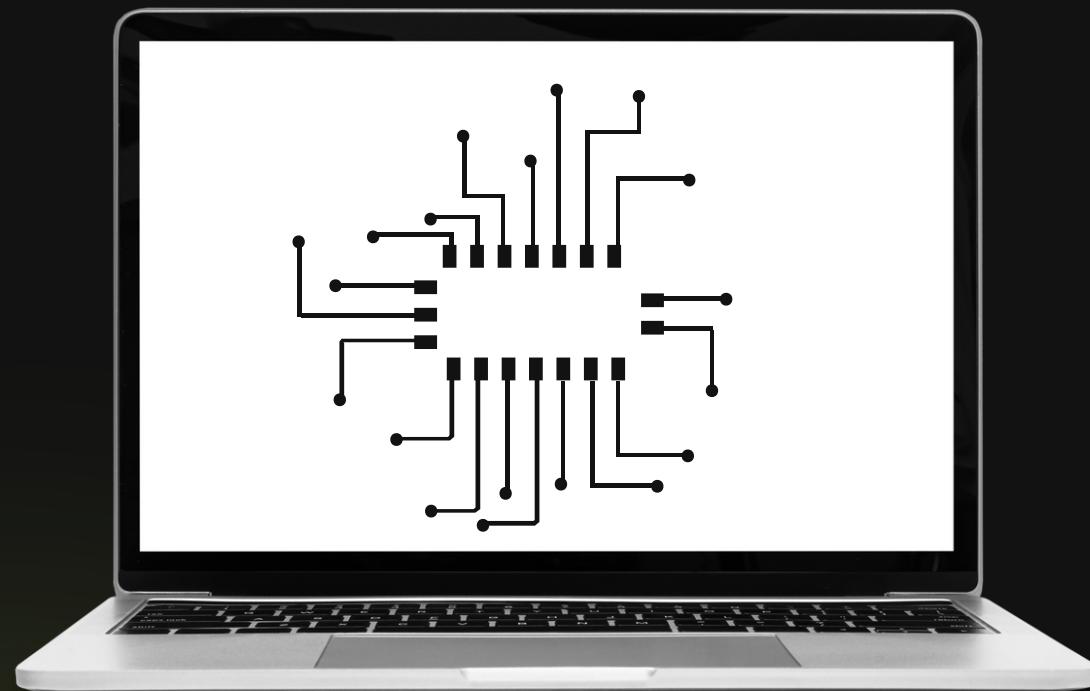
PROGRAMMING

**A PROCESS THAT INVOLVE
DEVELOPING SOFTWARE OR APPLICATION
IT'S NOT ONLY ACT OF WRITING CODE
(CODING)
BUT ALSO TASKS LIKE ANALYZING
PROBLEMS,
DESIGN SOLUTIONS FOR THESE PROBLEMS**

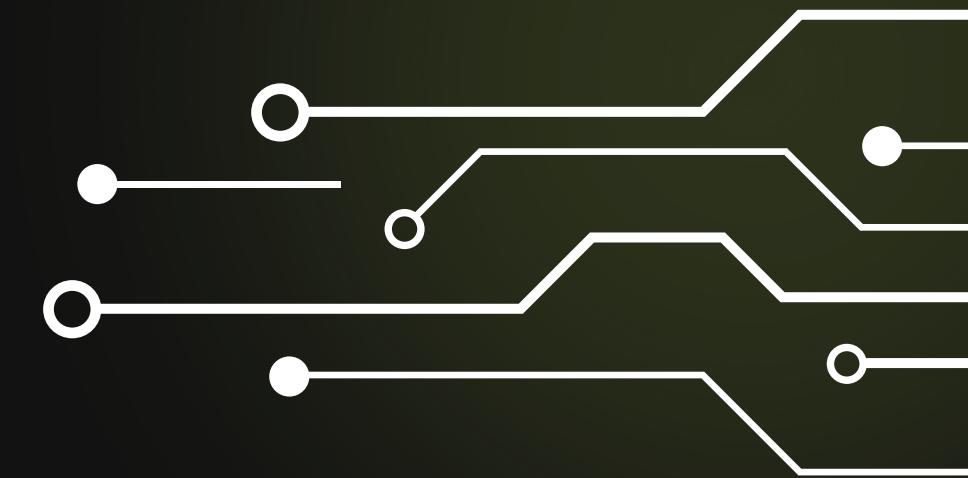
How do we
write these
instructions ?



COMPUTER LANGUAGE



- Computers doesn't speak our language computer speaks 0s and 1s (this will be covered in logic part of workshop)
- Problem we have now is 0s 1s are so hard for us to use to write fully functional programmers, what do you think we do ?



PROGRAMMING LANGUAGES

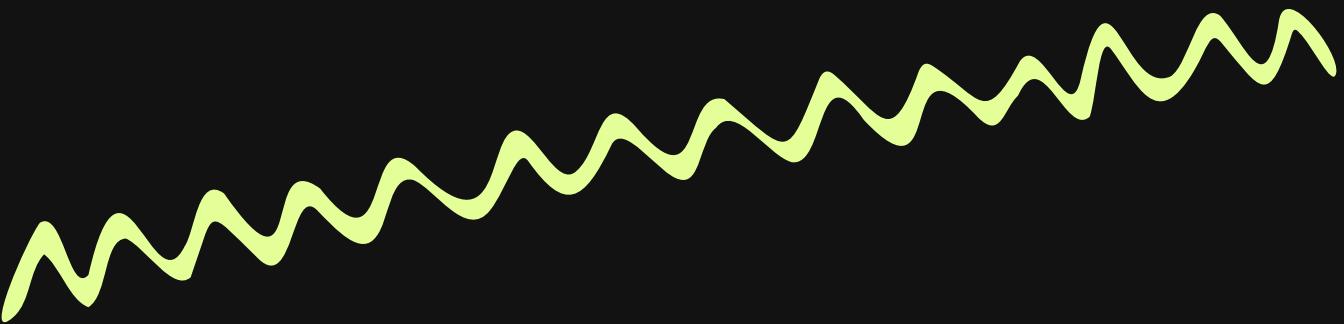


Language used to write instructions to computer much easier than using 0s and 1s

So if we want to learn Programming we have to go for all programming languages right ?

NO, Programming languages is like Tools some of them can be used in multiple of things General Purpose Tool

and some can only be used in one specific area Specific Purpose Tool





High level

- similar to English, needs translator to be executed
- like **Example:** python (they are General Purpose can be used in multiple of areas: Ai, automation,), C (Embedded systems).



Low Level

- similar to Machine Language zeros and one's.
 - doesn't require a translator to be executed
- Examples:** assembly

where do we
write these
instructions ?



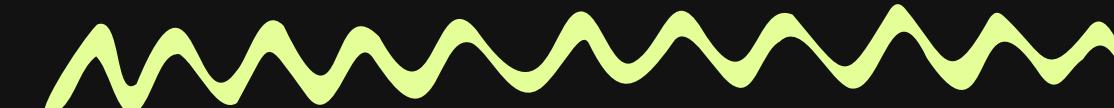


Text editor

A simple, lightweight software tool that allows you to create and edit plain text files providing minimalistic features like typing, deleting, saving and opening files. used for general text editing tasks and can be used for writing code in various programming languages with a lack of features.

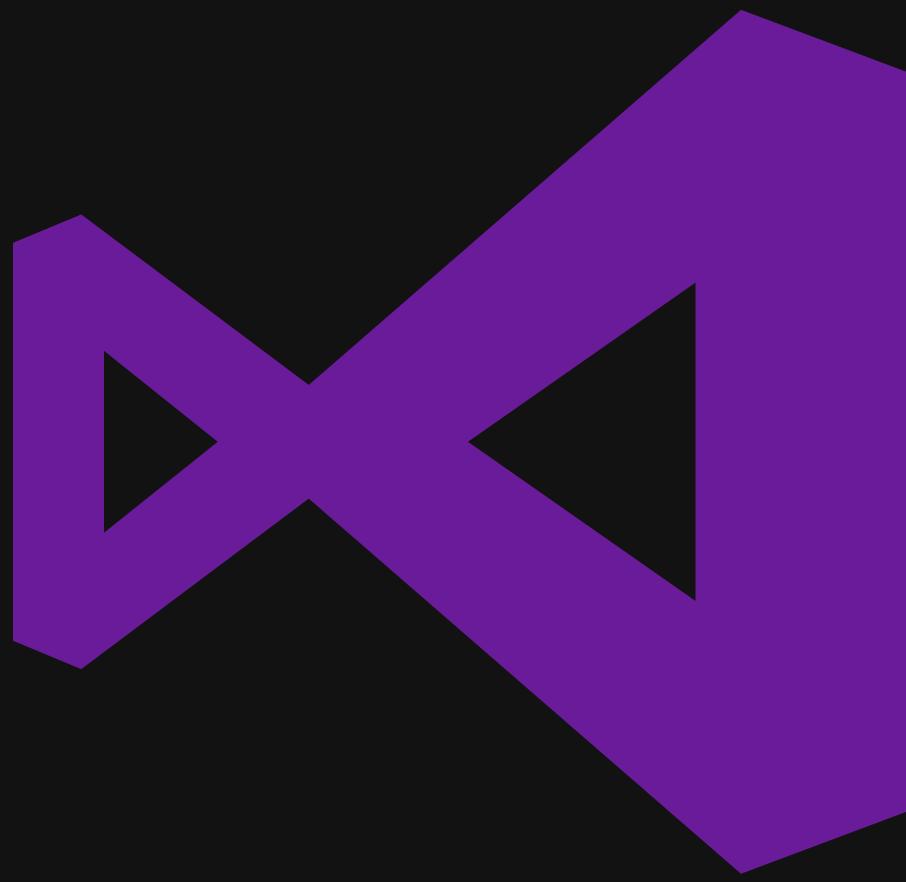
Code editor

software tools designed to help programmers by offering advance features like syntax highlighting, code execution and some of them offer terminal access, highly customizable with extensible plugins.

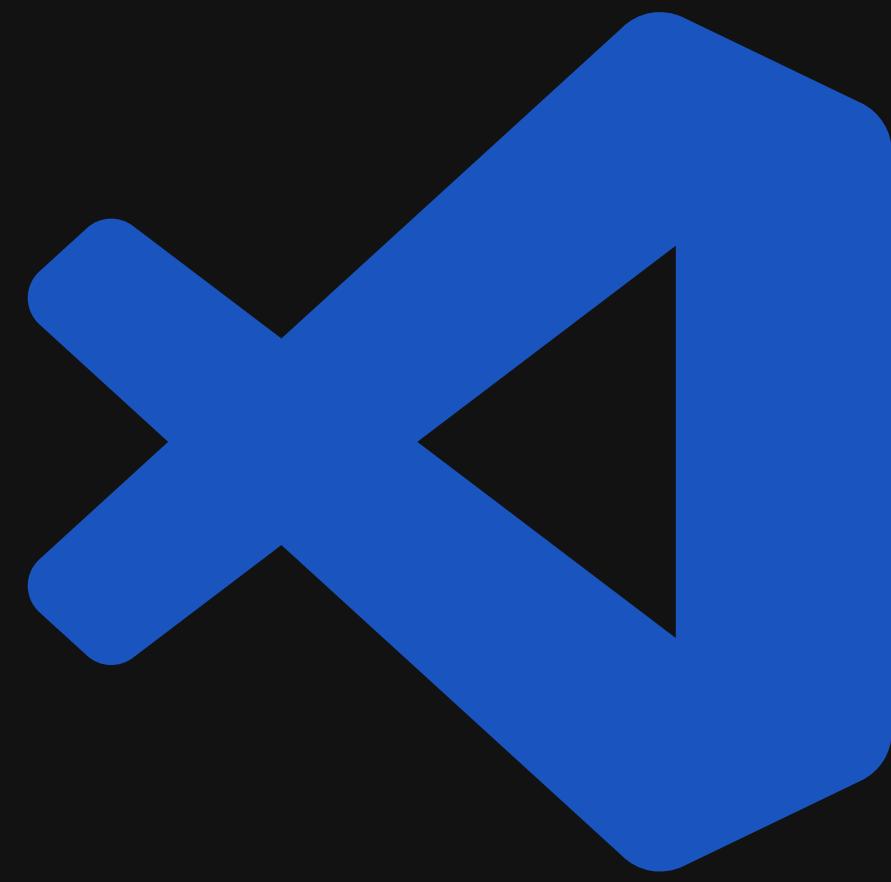


IDE

IDE (Integrated Development Environment): software package that combines a code editor with multiple of development tools. plus I can offer paid features to further enhance the programming experience."



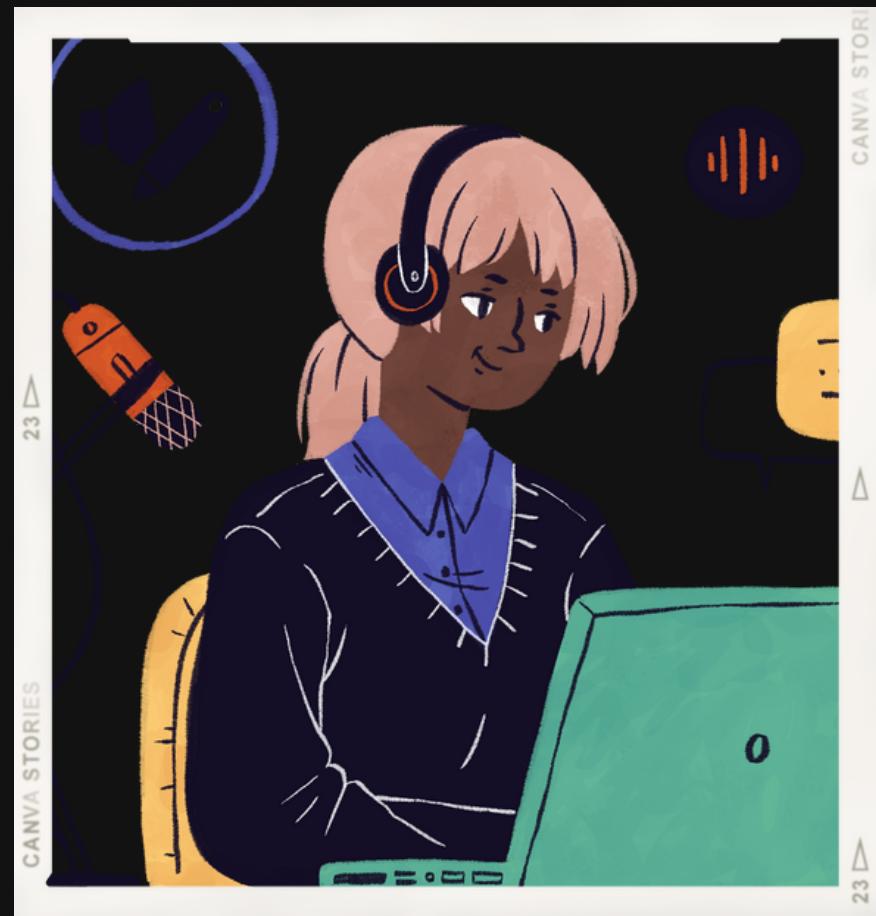
Visual studio



visual studio code



IDE Team



Editor

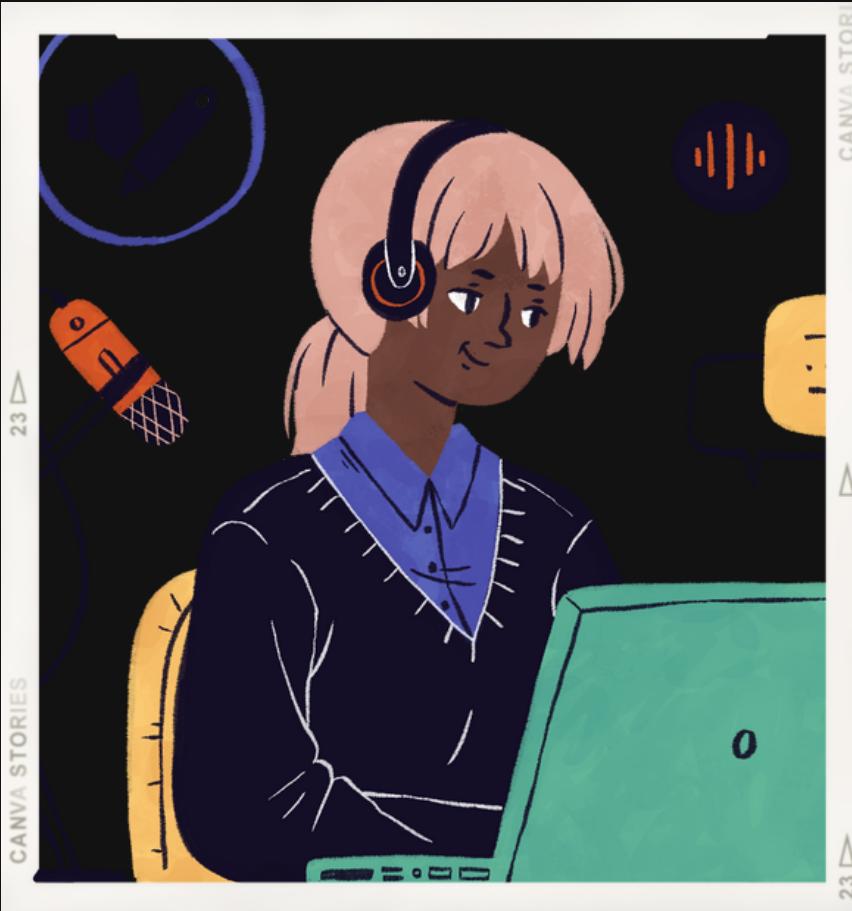


Compiler



Interpreter





Editor

I am your the mothers for all programmer, I can provide a space for Programmers to experiment there ideas in safe space, sadly I can just protect them from making syntax errors. Programmers feels safe with since I known almost all programming languages.





Think of me as detective who take your project and analyze it piece by piece slowly to ensure everything is right then I translate it into machine code and give you binary file to run your program so in next time you wouldn't need to repeat translation process again you would just run the binary file

Compiler



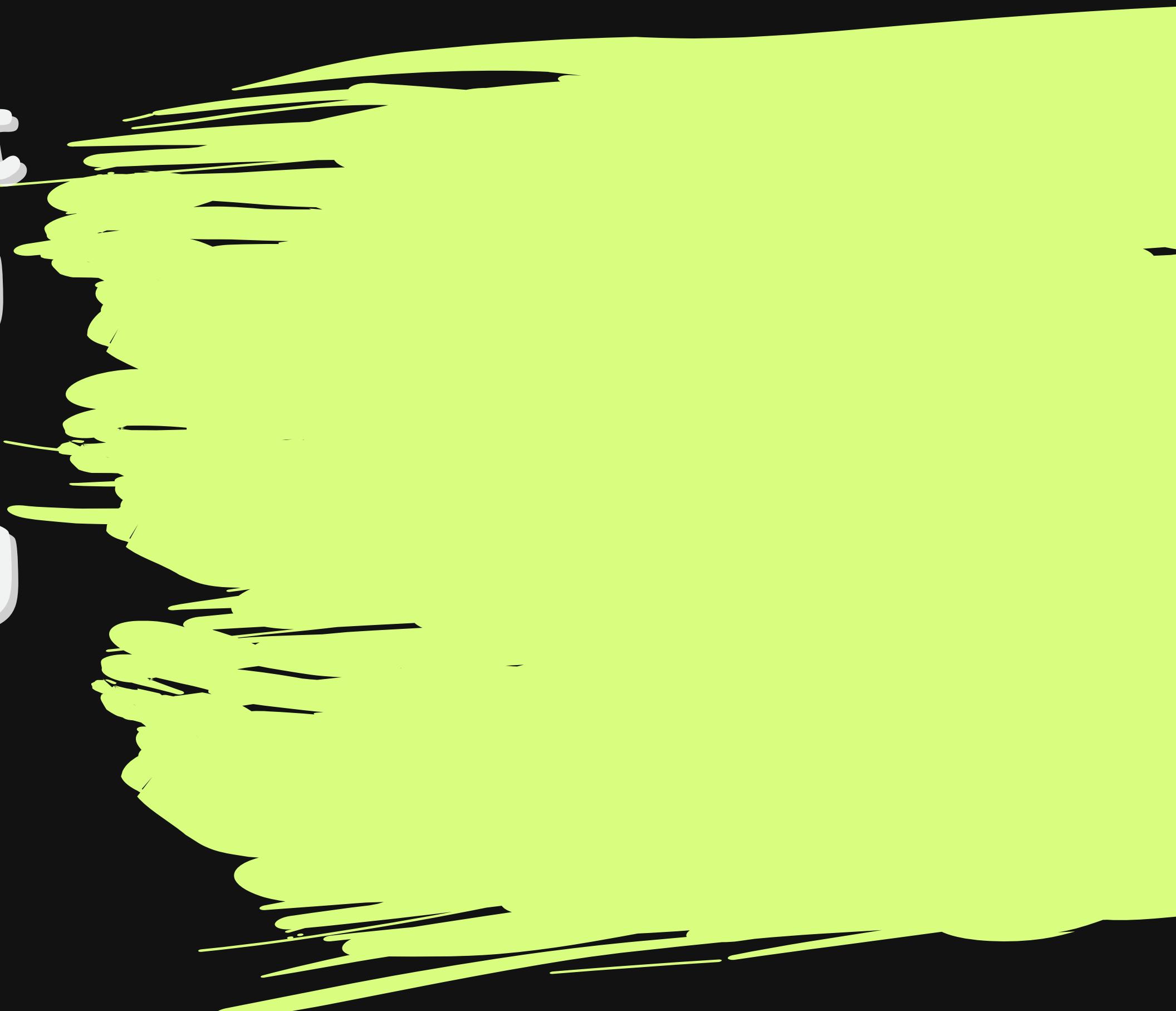


I am fast, I don't have time, me as well capable of translating the programming languages into machine code, unlike compiler I will run your instructions line by line while execution if you have an error it will be detected during the execution

Interpreter



so Now what
programming
Language
are we going
for ?



WHY C ?!

C is considered to be closer to hardware than C++, since This is because C does not have as many features as C++ like object-oriented programming. These layers add features of abstraction between the programmer and the hardware which make it more difficult to control the hardware directly, C++ would be better choice for applications like GUI application requires higher level of abstraction

OOP ?!

oop stands for "Object-Oriented Programming", supported variety of programming languages, the idea is to teach computer how to model real objects like people or game characters allowing developers to write code in more organized and maintainable way



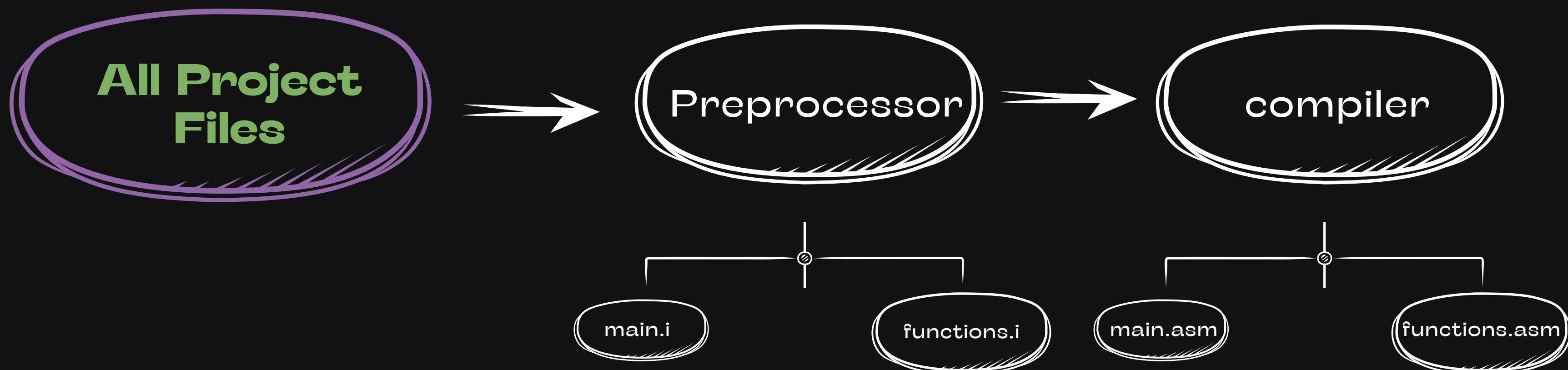
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CMD BASICS

- ① Relative path - absolute path / create a workplace folder
- ② open the workspace
- ③ experiment with making folders and view them
- ④ create a C file & open it
- ⑤ run it
- ⑥ automate this process 

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Compilation Process



Compilation Process

