Why Program? - What do we say?

So now we're going to Start learning the actual Python language So what do we say you can think of this is almost like writing almost like writing a story we're going to start with a basic vocabulary we're going to talk a little bit about lines or sentences then we're gonna start talking about how to put those sentence together to make a coherent paragraph as it were and you just have to accept the fact that when I start teaching you this stuff it's not gonna make sense for about 6 or 7 more chapters and so just sort of bear with me except I mean I read went from me confused confused confused confused confused holy macro list sci any of you will go through that same thing so just learn the first parts accept the fact that its not necessary makes sense install it doesn't a big picture and start with vocabulary will start to make senses and then will have little short stories in paragraphs and so this is a short story about how to count the words in Python it's got a couple of paragraphs and we are going to look at all of this stuff eventually so we start with a set of reserved words and what are reserved words well their words that Python expects can you use these words that they're going to mean exactly what Python expects to mean then what it really means that you are not allowed to use them for any other purpose in the purpose that Python wants its for part of the contract its like when you have a dog and you go what did you think of that television program and the dog has no idea what you are saying when you say do you do you wanna wait until Saturday to to go to the veterinarian in the dog still doesn't know if you say and then you go like how would you like to take a walk and then the dog goes walk I know what that means n hits the door right and so the way the dog sees you is blah blah blah blah blah blah blah blah blah food blah blah blah blah treat blah blah blah blah blah that's kind of help Python looks at these reserved words when you say class it goes class Eau I know what that means now if I say ZAP it's like ohh ZAP something that you get to decide or its a maybe a variable name so reserved words are simply words that when you use these words in Python And there's only a few of them like and or Dell or if maybe passed maybe in lot of these you wont endup using them it's just these are reserved for Python And part of the Python vocabulary this is Python vocabulary now when I when we move from words to sentence is you see that Python is a series of lines of Python ***** ** **** means they have an order because the computer wants to know what next next next So what next is already talked about an assignment statement that basically says X2 mathematical state this is a directive to say this variable value to this who addicted in a location and existent in your memory with direct and 2 and remember that I asked you to name it ** is a variable something you made up you chose that and so it but it's python's job to remember it so this says go to whatever that X is there's a 2 in there now pull that X back out add 22 it which makes it 4 and stick it back in X and so that makes this before so X is a 4 and print xzz go look up that thing that was in X and print it out and so these are like each line has something to it I'm using a reserved word well actually thats a function but its its a reserved word 2 so there's reserved words and all these things then you combine these there are operators classes in operator equals and operator these things do things and will learn all this stuff in time so the basic building blocks of lines of Python as we take these lines in Python And build them up we end up making paragraphs programming in paragraphs and so one of the things that it's important is I showed you how to do interactive Python so you just type Python And you type a statement statement and statement those get really tiring after about 3 or 4 lines of Python because start making mistakes and you have to even start over so that the better thing to do is to add your program gets a little larger to write a script put your Python instructions in a file and then tell Python to read from the file and then run the script as its entered in that file we tend to name these files with dot PY and I've got a series of videos that you can watch to figure out how this all works like I said you can type interactively to Python And its a great way to experiment with Python check to see if a statement does what you think is but it's just the way script after we are past one or 2 lines of code we write in files and then run it separately so there are couple of basic patterns and it's really important to understand each of these patterns and like i said will teach you these patterns separately and then will combine them together when you combine so you have to suspend disbelief we have a couple of different patterns one is a sequence of steps do this then do this then do this conditional is like skipping something repeated does it over and over and over again computers are really good at repeating stuff much better than people people get tired going over and over doing the same thing and then we have store and repeated steps as well and so if we take a look at this and we take a look at a Python program this is a piece of code this is a little script if you type this into a code take this code Python code into a file and ran it it starts at the beginning and then it goes to the next line in the next line in the next line and Python executes the scripts as you write them so it says stick stick a variable to find a place called in your memory called X stick two into that OK then go to the next one print that out so the program is producing output now go read X and add two to it and stick it back in X so X is 4 then print that this side over here this is called a flow chart I'm not gonna make draw flowcharts I'm only gonna drop a few times that in ways that I think will help you but you can think of it as Python when it finishes something it goes on to the next one unless you tell it otherwise finishes this goes on to the next one finishes this goes on to the next one finishes this and now the program is all done and so that's sequential steps you just type them in Python runs it they're they're important but sort of uninteresting 'cause you know there you can't can only get so far and you can't really make them intelligent 'cause it's always gonna do the next one so the next thing we do is water called conditional steps and this is where it starts get intelligent I mean where you are able to encode your brain into the computer like don't wait a second let's only do this step if something is true and the the syntax that we tend to use here is the reserve word if if OK and so the if is like a little fork in the road you can go one way or you can go another way and you're asking a question so inside the if statement right here there is a question saying is X less than 10 that's a that revolves is resolves to a true or false if it's less than 10 that's true if it's greater than 10 it's false and so then what we do is if it's less than ten we have this indented block of code there's also this: tells us we're in the beginning of an indented block of code and So what it basically says is if this is true run that code if it's false skip that code so it can either run it or skip it depending on this question that's being asked now if you look at this code it's pretty obvious what's going on it comes down X is 5 if X is less than 10 that's true so it runs this code and prints out smaller and then it comes back here at DN dense the next basic sequential this ends up being kind of a block if X is greater than 20 if X is greater than 20 oh Quebec QC if X is greater than 20 this turns out to be false because X is 5 and so it skips this so the bigger never comes out and then it continues on and prints Finney oops that's a typographical error make that a lowercase print and then prints Finney so it comes in runs this skips this and then finishes OK so here is the last one we'll talk about the repeated steps we'll get back to store and retrieve store and retrieve a later but for now we're just going to talk about three of the four this is another program and the key is is that we're gonna use this same choice where we're gonna go in but then we're gonna run for awhile and then we'll have an exit condition where we get out so this is a repeated over and over and over and over again and this is the essence of how we make computers do things that are seemingly difficult while there are more naturally difficult for people OK and so how do we encode this notion that we wanna do something for not forever but for a while how do we encode that notion and so we do it in this way so we have our statement sequentially go to this while while is a keyword and it's asking another question that's a true false question is end greater than zero I I read this as as long as N remains greater than zero keep doing this indented block and you have a calling at the end and then you have two lines of code that's indented so that tells us what the loop is and then this is now D indented and so it comes in and if this is true if this is true if this is true it runs these two lines prints out in and is 5 and then it says n = n - 1 which makes N B4 it goes back up and it goes up and it asks this question again is end greater than zero if it is continue on in prints 4 and then subtracts it and does that 432 and prints out one then it comes up and now after this and is now zero and is now zero and and is no longer greater than zero so it takes sort of the exit ramp and goes down here so it takes the X ramp and goes to here and runs the next line now we're gonna cover all this again so I'm just trying to give you the big picture next couple of chapters we're gonna hit all these things again and we're gonna hit them in much more detail with a lot better information this is now sort of like combining these and again I I don't want you to really like know this stuff just you will know this in a couple of weeks you will see this program again but this shows you how we combine those patterns of repeated sequential and conditional together so this is a bit of sequential code comes in here runs this which happens ask for file name then it opens the file and creates a data structure called a dictionary this is all sequential now the four is another form of loops so this is gonna loop for awhile and then this is within a loop we can even have two indents and that's another loop so these are like repeated and then it goes it double s down to the next sequential bit then it does this here's another loop it's gonna run and then here's a conditional it's gonna run and then when it's all done we print out the last thing and this is of course is the the the program that does you know the IT figures out the most common word in prints that most common word out and so this is a Python short story it reads out some data it reads a name of a file it opens that file it talks about how to make a histogram and then it looks through for the most common word so don't worry too much about this over the next couple weeks we'll fill in the pieces so that you absolutely understand every single line of this code so that's a quick overview of chapter one stick with us you realize you it will be Chapter 7 before this makes too much sense you really gotta have to trust that you are learning important things and that it all makes sense when we bring it together like in chapter seven in a few weeks