So that is good people got it OK so very important to understand the executive conference in which we are using is that what it's good for us special tokens expression allowing your relation to involve the current assembly position OK we have the dollar sign which is something that the audience member knows but is also a special token double$ which is not accepted the philosophical government specific no the double OK so in the current in the end what is the location counter monoxide it is appointed 4.4 million computing the size of an array you use pointer arithmetic use subtracting to point this is indent what you did in left OK OK so if you understand that at the location counter is really the cursor and also you have to understand that it's a value that is not manageable just your nabila because it's not manageable by US programmer you only are able to read it you are only read only you are able to access it only in the read only manner you don't change it you cannot say you know something else because it's a concert it's something that only the assembler can let's say taking into account as an American so if you understand that the current position is something that the location counter always expressed you will understand that if you're right the jump column instruction this is in fact an infection look because you say jump here jump here jump here jump to me jump to me jump to me this is very OK that was all of no consignee then let's do the start of the current session so this means that you have to read about it will not insist that more of that but you have to know what sign means remove the section of the idea but it's alright you can define your own sections of code in your code if you write something like this section data defined by if I go to end so on you can count something like that data second size 8 the starting address the starting off the starting address of the current section if you have if you don't have a section defined you're comment section you will be the current second if you don't define anything else don't means in fact the starting address of your segment documents if you already have it this means this double$ again this is something specific to mask you don't have double$specifically dollar minus dollar dollar from the beginning of the segment as a scanner because it is the subtraction of two pointers and you know very well that the time the output type of that subtraction of the pointers it is a scalar value from the point of view of the data point in time it's address there's an officer this is the point of time it's an address address of here down the dollar means address of start of the current section so dollar minus dollar dollar means current size section for the example above this will be done is there that bytes of data given of course I will post these things let's take some examples regarding location conference Bing OK I do have here underway as a logical fracture but only in my mind because from the point of view of the assembly and from the processor this will be only a memory area which is labeled from the point of view of this table the persistent doesn't care about labeling from the assembler of course the assembly translate to the processor number there got a little City Council OK I I I can tell you that the office of the beginning of a segment is 0 but it's not true this was true in here it's not true because you see nothing department which is really the starting of that you see in your current segment on the first which is the starting off that you see in the data below in the left most corner below you see on the first column also the stock increase the opposite of the beginning of the data segment it's not 0 00120 and so on so these are really the addresses the offsets to which only the \*\*\*\*\*\* is loaded by the operating system so that is why you inherit that when you when you let's say run your program by means of your you will always have the same options because only department is looking at these options but if right independently of that not anymore is for sure that you will obtain the same sentence always is OK offset the doubt I got zero offset they are zero this is not really true offset of it's not 0 offset of 80012000401 thousand but Even so I don't care which is really the opposite of fiction but I do care that the offset of the end of day minus the onset of the beginning of a is what I wrote in the first hour Q - P it's a subtraction of two pointers will issue for us and will pay for me really the number of bytes between the beginning of this array quotes and the end of this week so the expression that I have to write here is now if you understand that then you use it in left tell me does anybody understand is really the size of a my mind is the size of an array I hope so no let's see in which other ways can I write that so let's suppose I OK and I'm writing now LPGA define why I can write also defined by it if I know exactly that I didn't right here more than that 55 minutes yeah so this apposed issue with that I will not throw right more than that what do you think about that does it offer us the same value usually not but in our case yes why because a is the first one please write like that here at the conference comment in this case yes it's the same value because a is the first defined element in the data segment so this is through only in the case that my raised the first divine element in the array because the dollar dollar means on one hand he offered those data but we have to get is the same thing as offset of a because it's the same thing in this case this is true but in the general case it's not if you have something else in mind before OK yeah because you right define word define bikes because I use data definition relatives that the first two cases these are memory address they do have addresses and they are not constants alone I mean after writing something like that in both cases it's feasible to write move LA 17 or not like that because you will obtain that was from the chair I move NGA can write something like this it's true it's nothing personal it's OK because they're create the memory variable that defines the starting point in the memory so I go to the address defined by G and I will put there how many bytes 4 minutes because they told me that to put 4 miles if I was writing here I the command wants to put a starting from that address towards if I was writing amash this means that the same address I would make only one so anyone of these three instructions is OK because I have parked what you said you said now thank you if I'm writing here thank you dollar minus 8 is it correct or not it's OK from the point of view of dollar minus 8 and it's OK if I if I want that AJ could be defined as this means what so it's a command address to the assembler just just so this is a very so we try to get refinement constant yeah it's like the cons in C++ I'm defining the concept of symbolic constant and of course you're right there is no memory area assigned to NJ this man so you might want down to right here move LPGA eggs in this way this would be a syntax error because you don't have a memory area associated with that is why trying to dereference this memory area will be a mistake figure being a constant reason doesn't offset formula apply with no basic care so it's could go in memories but not what we expect the constant you want now to force the interpretation they say because it is a constant it can appear in the constant part of a offset specification formula yes of course it can appear but on the other hand there's a it's not the memory of so it cannot appear there as the offset or something it will appear you're right as being really the length I mean if this is 19 you can use these LPGA in whatever offset specification formula do you like I mean you can write a IE plus every people by 2 + v minus LG it's correct but this doesn't mean that they're a it is an obstacle but it's not an obstacle it is an immediate value because it is already computed as a as a symbolic constant so you can write like that but it doesn't mean that you write something there that is the end result Ng there is no such thing if you use a you don't have the address of LG that uh when specification formula book got hello I hey you you got and so but I'll come so and you can use it as a constant wherever you want to improve the only difference between using the data definition directive a data definition directive what does it do it's a comment addressed to the board correctly generally invites generate invites generating bites is the proof find out you don't check gate during that is why you don't have an address because you don't generate anything your memory OK so if it's OK to use like that but then you don't you cannot use it like that so in fact really for the sake of computing the real length of this state array all these three variance options are not true can you give me the 4th one also true Depends how many and I want out here expression which is also true but different from these three options or different from these two because I don't use a Q IT use the data definition directive and I want to see something else that dollar might say and the dollar minus dollar dollar but in the end to obtain also the what is the if I if I will put here for example see if I double work something of course that other virtually see minus 8 OK but then I still have this question LPGA if I weren't and please don't tell me something else that is free but again or something like that no it's not check that out so far yes there's a new I thought I like to keep it simple but you do understand that right it's the most interesting thing about it right now what did he say in the economy of financial segment the time difference if I'm using NGA with the defined word was defined by what is why do you think in the moment define OK and now I'm just constructing the expression based on which I want to make the computing so I can refer it as a gun stop determinable this every time as the N said it exists if I'm here the outfit of MGA is the current position it's exactly like dollars it's exactly by location count so I can use it so you see now second thing such as have not listen just someone offered just some location counter which is something practice this is really very let's say self explaining regarding the way in which the assembler is generating for itself all the device do you understand telephone OK let's because in 10 minutes we'll have to finish because I want word stone move the location counter you see the example and it's really what they discussed don't let me just say it's OK it's from the point of view of point of it but it's subtracting some pointers you can use it as a variable because you have space allocated for it probably the same correct but only because the first elementary data set and JQ it's OK but when you want to use it as a variable it will be a syntax error because you don't have space allocated for 18 levels again something that I didn't wrote on the whiteboard but with present here in 2000 and right also like that then Katie find all this data why because data is the beginning it's the opposite of the beginning of the second that is identified exactly with the exact same options like wanna fortunately this isn't possible and because it will issue a syntax error it's giving especially it's not simple because no one's OK but they are it's not anymore like it doesn't warm us the offset of the beginning interpreted as something bigger I mean something that is like a father dressed that would let you do you subtract the normal set and then let's say to inside my it's something that you cannot know what they didn't allow you to make this let's say identification that offset of data is 0 bold or something