

SOLUTION TO LOOPING PROBLEM

So I hope you people tried doing what I asked you to do, Right? If you dint? Don't worry we are there to help you. How do we go about this? Here we are going to help you out with understanding of this really really involved computer science concept. The question that I asked in a previous video clip is not a very straight forward one, if you are not into programming already you should have found it very difficult to even understand what I was asking you to do. So don't worry listen to me careful, let's go step by step.

Firstly let me teach you what is this data thing here, click on it you will get these two things, click on make a variable and you will get, you will ask you will be asked to type in a variable name, let me now type a variable name as a num click on ok. So you see a num gets created here it is assigned zero and also num sits here, pull it and keep it here double click on it you will gets it value zero. So num is zero so I can set num to some number put this here, set num to ten when you do this and then execute this number is now ten you see its updated to ten here and when you go here and double click on this it will say ten, it will say ten correct? Now when you say change num by one and execute that num initially was set to ten and then you changed it by one which means by one means what you incremented ten by one and you get eleven double click on num you will see eleven correct? Let us double click on this once again this is just like these are all blocks of instruction you are giving right? Num is equal to eleven why don't you double click on this? I double clicked go back you will see twelve here come back double click it becomes thirteen, double click fourteen, double click fifteen so what do I do? Look at this I will take go to this control and take a repeat loop and put this here can you guess what's going to happen now? I repeat num was fifteen and I am going to change num by one ten times when I double click on this you see the computer is going to very quickly execute this piece of instruction ten times no no that is very certain thing we want to pause the video and think what's happening here? One even parallelly try doing what exactly I am trying to do here right? It's not so easy same time not very difficult it takes times to this to sink it, I double click on this and you will see the magic happen, I double click num is fifteen now I am going to double click this, double clicking yeah I did it now immediately this became twenty five, why? That's because num got incremented by one ten times, if I make this fifty then num gets incremented by one fifty times and so many double click on this I mean to double click by the way but if I double on this num will get incremented by fifty which means this becomes seventy five let me see double click boom! This became seventy five now what is more beautiful about this, these thing happen really really fast how fast? I put thousand here and you will see how quickly this becomes incremented by thousand, thousand num will get incremented one by one thousand times and hence this should become yes! One zero seven five now ready lets double click, double clicked quickly this became one zero seven five that why computers are very fascinating and programming a computer is more fascinating because the power is in your hands to make it compute, it computes really really fast, very very fast correct? Ok. So now let me do something I will set the number to zero ok? This is the part of this code now let me remove this, this doesn't

matter, double clicking on it as I told you will show you the existing numbers value but that's there here itself so we don't need to worry let me keep it here so I can see it properly and let me remove this, this is not useful now what will happen if I press this number will be assigned zero and then number will increment one at a time and will become thousand. These things will happen so fast that you will not even notice what's happening. Double click here you see it became thousand correct? Now let us go slowly and see what is happening here? You will be surprised that this is so easy to do, go to control go to wait and tog in wait here now you all know what is going to happen. Right? Set number to zero change number by one wait for one second so you can peacefully see how these changes one by one with the seconds pause in between, all of you I am sure you would have guessed what this is going to do. Let us double click and see what exactly it does, double click! And here its starts one two three four five six seven and so on, you see this it's now incrementing it will go on like that till one thousand I don't have so much time so let me just stop this come back instead of thousand let we make this just twenty and see what happens? So double click on this once again one two three you see this will go on till twenty, four five six seven eight nine ten you see as you can note you are basically creating a counter which changed one number every second so basically this takes twenty seconds. Correct? Twenty!! There you are hip hip hurray!! So we wrote a first neat code correct so this is what loop does, it helps you it gives you the power to repeat something repeatedly for a designated amount of time. Please note one thing that you should do and another thing you shouldn't do, one thing you must do is you must pause and then write your own codes try to play around not just do what exactly we did but do a lot more than what we are showing, play around and use all these things and try to understand what is what? You can always click on, let's say u dint understand what is wait for one second right click on it you will get a help click on it and there you are, you get all the details about that particular command wait specified number of seconds and continuous with next block with the example here correct? Let's close this so you should try doing this that is what you are supposed to do and what you are not supposed to do is simply stick to what we are explaining you should not be doing that. We are using example to explain things so that we will motivate you to explore more stuff so please go ahead and explore a lot more things here before going any further only then can you understand programming really well so let's get back to our original question. I was just going to teach you something that going to come very handy in solving this problem, what problem? The cat is trying to go ahead and come back and then keep going ahead and keeps coming back and then it incrementally keeps moving like this and it get's braver brave with time. Right? How do we programme that using a repeat until loop? How do we avoid writing a huge code for it? Remember? It was going twenty steps at a time twenty first forty next and then back sixty next and then back so let us try doing that using repeat until the repeat lopper ok so I will take this repeat lopper and then put here and ten times I will make him go ahead, how do I do that? Motion move twenty steps, instead of twenty steps I will say twenty steps times one, twenty steps times two twenty steps times three, how do I do that? I mean that sounds little complicated, let me figure this out on scratch. How do I do this? Let me go to data, create a variable called steps, steps is the number of steps that the cat takes and yeah there you are! Steps gets created and initially steps will be twenty and then I am gonna change steps by increments of twenty which means what does this do? See what this does. We discuss this when you double click on this you see

this segment of code now is different, this segment of code is different when you double click on this only this gets executed you all know that by this time correct? So when I click on this initially steps gets assigned by twenty ok? Double click steps is assigned by twenty and steps is changed by another twenty which is forty ok? And next if I again continue to say change steps by another twenty it becomes incremented by another twenty again if I say set oh I am sorry not set delete this change steps by twenty it will again get incremented by twenty ah! Well once again I need to give control wait for a second between stop so that I can see what's happening? Correct? So what will this do? All of you? It's only obvious once I click on this steps get to set to twenty go back see in one second it becomes forty one second sixty, one second eighty and then stops that's precisely what I want this code to execute and give me a output like this correct? This is what I expected. And that's precisely what it doing that right now, correct? Now what if I put this in a repeat loop, what happens? Ten times this entire things get's executed, what get executed? That sounds very complex you see let me just keep it aside this is not using, we are not using this all though we will soon come to this cat go back ok. Let me execute this. What will this give me? Repeat ten times this entire thing, double click let me see twenty forty sixty eighty, twenty forty sixty eighty is not visible because I am not putting a waits, wait here let me put that here forty sixty eighty, twenty forty sixty eighty it keeps doing this ten times correct? As simple as that but then what if I want this up to let's say thousand? How do I do this? I initially set steps by twenty and wait for a second and change steps by twenty and then let me remove this things and put a wait here but then I will not set this to twenty here itself see what I am doing slowly and patiently I will set steps to twenty but then repeat this ten times so that it keeps incrementing twenty at a time what does this do? Let's see double click on this you will see twenty forty sixty eighty hundred and so on hundred and twenty hundred and forty hundred and sixty and one eighty and finally two hundred correct? Two twenty oh its goes on its ten times right? So its Last one is actually two twenty we start with twenty so its two twenty, figure this out look at this code and see what it does it simply starts from twenty and ends in two twenty, what is the motive? What exactly am I doing? I have to move this cat incrementally right? Of what use of all these things? Now we are going to use this, we are going to use this and make this cat move the way we want her to move let's go back to this repeat and keep it here and what do I want the cat to do? I want basically a variable sets steps to twenty to come here sets steps to twenty and then what? I want her to move twenty steps ahead ok, instead of twenty I want to put steps here, what do I mean by steps here? I will take steps here and put this here please not what I am doing, is a need thing in scratch, nice facility in scratch. You set steps to twenty and you move twenty steps, first just execute this, lets see what happens ten times click she keeps moving ahead, that's what is expected with the pause of one second what happens now? Pull her back, what happens now? Double click, she moves ten steps, ten steps, ten steps steps is twenty move by twenty steps and then wait for a second ok? Keep doing this I can consider doing the following keep this here and then keep this here so that you set steps to twenty and then move twenty steps and then wait for a second move twenty steps correct? I was assigning steps to twenty here every time that's not required initially if you assign that should be enough, double click ahead twenty twenty twenty twenty twenty so on ten times let's watch her walk twenty twenty and then she stops of ten moments correct? Now what do we want? We want her actually go by twenty steps and come back by twenty steps you see so

now what I should do? Is I should go back motion move twenty steps steps ahead and move back a few steps. Please note the steps is a built in thing here I mean By that I mean steps here means the cat should move so many steps we are also calling the variable steps here don't be confused about it right? These two are actually different things here ok. So now she must move back by twenty steps how do we do that? Go to operators there is very nice facility here what is that? I can do multiplications of two things correct? I want to multiply minus one with data and take steps put that here I can multiply steps by minus one what do I mean by that? If steps is twenty steps times minus one is minus twenty so I make her move minus twenty steps so twenty steps ahead and twenty steps behind when I click on this, let me remove all these things these are not required we delete them ok, when I double click on this you see what happens, she keeps going back and coming forward, going back and coming forward you can put a second pause here to make her go ahead come back go ahead come back she will do this ten times come back, up come back twice up come back four five six and so on correct? Ok. So she is doing! we are almost there but what exactly , you remember what exactly we wanted her to do? We wanted her to go ahead twenty steps, come back twenty steps go ahead forty steps next. So so so! What do I do? Come back to data think I should use change steps by twenty ok, people this is where the place where things are getting slightly complicated and I tell you the reasons why it's getting complicated ok it's because as I am going slightly fast off course it is the lecture videos but you have to liberty to pause the video and think about what I am saying, if you don't do that I will be going on fast and fast right? So based on your taste and paste you may want to pause the video and then try yourself how exactly you can make this cat move ahead and come back an incrementally keep doing this so what is this go to set steps by twenty repeat this ten times move steps number of steps that steps is actually twenty so move twenty steps, steps is a same twenty, so move twenty steps wait for a second and move twenty steps in reverse direction minus twenty steps pause and then change steps by twenty means, steps is no more twenty it becomes forty here and then come back and start from here, you see I don't again assign steps twenty here I come back here and then I continue. What is steps now? Is actually forty. So wait for a second you will move for forty wait for a second and then you move back by forty and so on and you will be surprise to see that this is precisely what we wanted our cat to behave like. Double click twenty ahead twenty back, forty ahead forty back, sixty ahead sixty back, eighty ahead eighty back, hundred ahead hundred back one twenty minus one twenty one forty minus one forty one sixty minus one sixty one eighty minus one eighty two hundred minus two hundred now that must tiring right? But the cat doesn't get tired simply because it's a computer programme you can make her move the way you want her to move ok? Now can you play around these numbers here and make her move really fast and many numbers of times I leave it to you.