

MORE ON SCRATCH

We have now come to the flag end of our first chapter it's time for us to summarise everything that we learnt so far ,we first saw how to make our cat move, how to make her rotate, what was the introduction to programming? And then I told you how to group a bunch of tasks? And there lies the heart of programming, right? we spoke about loops and variables and i told you how you can make the cat recite tables, then we went ahead and showed you a couple of fun examples using our newly learnt programming skills it is now time to see a few more topics in scratch which we will take up in the forth coming chapter.

Hey you can see there are so many featured projects available in scratch, you can always explore them, but before we get into the details of how to design our own scratch game there are many important concepts available in scratch so let us have a look at them.

Let us start with arithmetic operators. What are those? Pretty straight forward pull this, this side ok I have put this here now I will enter let say five here and six here and when I double click on this you see I get eleven, double click eleven. Double click eleven right? if you change this let's say to fifteen and then double click, you will get five plus fifteen which is twenty ok and whatever is the result if you would want you can you can now put let's say ten and eight here, double click you will get two. Ok now look at this, there is something more that you can do, let me delete ten here and let me put this here you see what happened? I repeat I can put this here do you see what's happening here, I can put this here so five plus fifteen is twenty, twenty minus eight is, what is it? Whatever is the answer, you will see that here, it's twelve correct? And I can go on doing this in fact I can take a subtraction thing and then I can divide the answer by two and I can pull this entire thing here like this, so you take this and place it here so it is five plus fifteen is twenty minus eight is twelve by two is six double click and you will see six ok? You can ease this, you can use these arithmetic operators the way you want and also there is an interesting function here, see what this does? Isn't that self explanatory? I don't have to explain this to you correct? It fix a random number from one to ten double click ten, double click six again four, double click one double click six, double click four, double click one see it is very random it doesn't follow any pattern ok don't worry so much about how exactly this is done? That's a very complicated subject all together but you please be aware of this very beautiful facility of scratch, which gives you a number between one to ten picked randomly. So it is not just limited to one to ten as you would have guessed you make this hundred it will pick a number from one to hundred, I just made this hundred right now double click you will get a random number twenty two between one to hundred twenty two, twenty three, fifty five, twenty three, fifty eight, seven, ninety seven, eighty five, eighty four you see there is no particular pattern, you can start from any number up to any number ask for a random number you will see we will using this a whole lot in our explanation throughout our course we will be using this, right? So scratch is that way very interesting and very straight forward and self explanatory that you just see it you could guess what this function is ok, So let me do something very interesting then let me keep this aside may be even delete this, let me do something interesting. Let me consider, I have to

pick a random number from one to hundred and put that here you see what I am doing and then pick another random number from one to hundred and put that here, and what is a result? Double click on it one ninety so you pick a random number you pick a another random number, you are adding it double click one forty four so some of two random numbers pick between one to hundred is giving you some random number here and some random number here, is giving you so much ok ninety five, one sixty one, one thirty nine, hundred and so on in fact what you can do is you can make our cute cat recite these numbers, let's see how she can do it? Go to looks, go to say hello keep it here double click on it she will say hello, you take whatever you want, you want her to call out my name? Hi sudarshan! Double click, she say 'hi sudarshan'! What you can also do is delete this, can you guess what i am going to do next pick this and put this here what will she say now, she will tell you a random number the answer basically she less spit out one one two, twenty four, one forty four, seventy three and so on, one not four ok I can play around this and make this ok remove this what was this doing here? You see the pieces here I pick a random number from one to hundred this was not required ten in ten not required, you can put whatever you want here, put whatever you want here and make the cat say, I will just make her say ten plus twenty, what is that? You all know its thirty but let me see whether see says thirty or not, double click here and she says thirty hey! That's right, so it so much fun to keep doing this you know the you can just try whatever you want, go to the operators and do whatever kind of operations you want and then make her say whatever you type right? Isn't that awesome? Right so now it's left for you to explore these things and now move onto the next topic.

We will now make our cat ask your age and say something about you, what is that? What exactly does she ask for and what will she do based on your age? You should wait and see, ok so now, let me teach you something go to operators and you see this join, this is nothing but two strings that you type here will be joined as the one string, you see you type let's say my name here and a space and you type nptel it will show 'sudarshan nptel' ok, whatever you want you can put ok? New space and then Delhi here it will show you newdelhi ok? You put first space second it will show you first and second ok so of what use is this? Let me make the cat do something and then make it clear to you what could be an application of joining these two strings, let me now go to looks and take say and then let me create a variable called name. Ok done so name will contain nothing to begin with as you know it always starts with zero set name to let say your name, my name I will put sudarshan space so name will be put as sudarshan and cat will say call out my name right now, you see what's happening, it will say sudarshan but I want her to say hello sudarshan, how do i do that? Pretty simple. Remove this, Say hello here space and then put a name here it will say hello and whatever is the name said to sudarshan perfect! Now click on this, she will say 'hello sudarshan' is that clear? Perfect. So she now saying 'hello sudarshan' and then I want her to take my age let's say I create a variable called age and I will set age to whatever is my age ok, age is now thirty five and I want her to tell me whether I am an adult or not? Off course I know I am adult, I am eighteen plus but I want the cat to decide whether that I am eighteen plus or not? How do I do that? There is something called if look, an if look which does the following, so if the age is greater than or equal to eighteen how do I do that? Go to operators am being little fast here because I have a felling you are now, you people are now familiarising yourself with the

scratch programming and you are way too comfortable with whatever I am doing right? If not you may want to pause and then try it out yourself slowly and then see what is happening here ok? Ok. If the age is greater than seventeen, if age is greater than seventeen means what the age is greater than or equal to eighteen, seventeen is not allowed if the age is greater than seventeen then the cat will say, it says hey you are an adult, you can do anything you want, although this is not true you cannot do anything you want by anything you want I mean anything that is allowed for you to do right? But if the age is less than something it must say oh oh! You are not an adult. How do I do that? Go to control, go to if, go to data take your age, go to operators use this less than if age is less than eighteen which means seventeen sixteen fifteen and so on the cat must say, how do i make her say, cat must say oh oh! You are still a kid! The world is not so open for you ok, now what happens if I execute this let's see, i will click on it first ok, i should put a pause here you see that's very important, control and i make cat wait for let say three seconds and i am going to set my name to sudarshan the cat will say 'hello sudarshan', it will wait for three seconds and age I am going to enter here based on what is my age it will say so and so ok let's see, double click hello sudarshan wait for three seconds hey you are an adult you can do anything you want but if my age where to like say fifteen, I am far from fifteen but assuming that i am fifteen i double click on it, it will now come here, off course say hello sudarshan wait for three seconds my age is fifteen now it will come here, it will see that the my age is greater than seventeen no! Which means this will not get executed my age is less than eighteen yes! Fifteen is less than eighteen so this will get executed let's see. Double click on this hello sudarshan wait for three seconds and then this will happen, ok if you are finding this a little confusing what I will do is I will separate this from this forget this for the time being will not worry about this we will only look at this code, if age is fifteen double click it says oh oh! You are still a kid, if age is ten what will be the answer? Age is less than eighteen off course this should get executed let's see, double click yes! The same thing, if my age was twenty five then I am an adult it should say you are an adult double click yeah! You are an adult, you can do anything you want, now do you understand the importance of this loop? It just checks for a condition and does what you ask the cat to do here ok, now, let me add a small animation to it just for clarity, one second, hey you are an adult and move a few steps forward ok, it must move some twenty steps forward if one is an adult so set age is twenty five which means this must get executed, it must move twenty steps ahead see it says and it moves ok, let me give it a pause so that it is visible to you people. Wait for a second and then move, see it moves it says hey! You are an adult and moves by twenty steps again double click says hey you are an adult and moves twenty steps but if I am ten year old double click it says oh oh you are still a kid world is not so open for you it doesn't move ahead right? Because in my if loop here this gets executed and only this is displayed. Correct? Now if I were to take this and put this here let's say wait for a second and then move twenty steps backwards so if you are not an adult which is by the way the case here given that your age is ten she will move back a little ok, Let me say minus thirty, she obviously! Minus forty also so that she goes back twice the distance double click she goes back correct? Again double click she goes back correct? She says this and then goes back correct? But if it was some, if i was sixty here old she will call me an adult and go forward, if i was five year old, she will say I am not an adult and still a kid and she will go back. I believe you are seeing her move back here, five here let's say forty she will move ahead

correct? Perfect! Maybe, you may want to write this code and then check if it's really working the way it's working with me right and you may want to explore how it works with the different example and a small exercise for you all, what do you think the if then else loop does? This is called a loop ok? I told you how if then works, if then is what is given here you must tell me how if then else works? Go on. Before anything let me attach this here and try executing this programme for one last time with my age double click says 'hello sudarshan' and my age is given to be this and it moves forward and says you are an adult and you can do anything you want perfect! So let me move on to the next lesson.

So it was a whole lot of fun learning scratch, I must tell you people that not everyone has this bend for programming in the beginning, it takes some time to seize in your minds and scratch does that to your mind. You will have a clear understanding of how a loop works, we saw how a list works, what is a variable, what is a block? You see, block is something that repeatedly does a kind of instruction that you give and you can use that any where you want, it is actually called a functioning programming. Will see those details very soon, maybe you are wondering, Is programming so much fun? In fact it is indeed so much fun but scratch makes it a whole lot of fun so now let's switch our guess and look at python as a programming language trust me if you are very good at scratch you will not face any difficulty learning python. So you mean to say that there are a lot of similarities in python and scratch, I would say that they are exactly the same although you will not have this facility of drag and then using repeat loop and things like that, scratch is made for eight year old, python is a lot more powerful and hence given that it is a lot more powerful the way you write a piece of code in python is very different and can be just a little more challenging than how you do it in scratch.