Iteration, basic programming constructs and loops | Part A

Hello, so far we've looked at sequence and selection as ways of controlling program flow. In this video we'll look at the third major construct which is iteration. You might have heard of the term loop which describes the block of iteration code. Very often, we need a program to repeat an action either a fixed number of times or until a condition is met.

We're going to write a Python program to print out the multiplication table of any number that the user enters. First, we need to declare a variable to hold the number. If the user doesn't enter a number, we'll need to ask them to enter it again and we can use a loop for this too. But first let's look at the code to print out the multiplication table. The code is really quite simple. So we have one variable that actually records what the user has entered as the number of the table that we are going to print out, and we're also in this piece of code going to use a counter, now for the counter we use a variable name **i**, and this is traditional its actually going right back to the 1960's when programming was quite a new skill and to use counters in loops the symbol **i** was used always as the counter of the loop so we're sticking with tradition and we are going to use that as well.

So we know what the users entered as the number that they want the times table for, we've got a counter for our loop so we know we know how many times we're are going to go round. The last variable we need is actually going to hold the value that's been calculated as the loop goes around.

So the first thing we are going to do, ask the user what number do you want us to print the times table for? Now here comes the block of iteration code called the loop, notice that we use a key word **for**, this is Python code but many other languages use similar syntax. So for **i** in range, now how many times do we want this loop to run, we want it to start and 1 and we want it to finish at 11 and if you think about it if its starting at 1 and finishing at 11 it's actually going to do 10 turns of the loop which is exactly what we want. We're going to print out the result and we're also going to multiply whatever number the user gave us by the number of turns that we're going around the loop, so we go round, if they put in the number 2 then the first time it's 1x2, the second time is 2x2, 3x2 and print out that result on the screen, so let's run the program.

So I think that I'm going to look at the 5 times table so I enter 5 as the number that I want to see the times table for and it prints it out for me nice and neatly. Now it wouldn't matter if I wanted to use a much larger number, I know my 5 times table but how about if I wanted to use a much bigger number let's say my 63 times table - which I don't know, so we enter 63 and it gives me the 63 times table so that is a very useful little program.