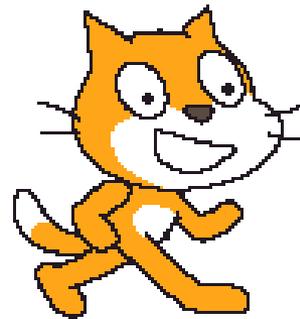


Programming with....

SCRATCH





Scratch Interface

Some computer programs just run and continue on their own with no input from the user e.g. your program to play a tune.

However, many programs to react to events (things that happen), such as:

- the click of a mouse or press of a key;
- the tilt of a game controller;
- a swipe of a smartphone screen;
- a body movement detected by a motion-sensing controller such as a Kinect

In Scratch, event blocks have a curved top (sometimes called a "hat"):



Reacts when the green flag is clicked.
Often used to start a program.



Reacts when a key is pressed. Click the small black triangle to select the key you want to detect. Useful for controlling a sprite, or triggering an action.



Reacts when a sprite is clicked. Useful for controlling characters in a program

Event Driven Programming

- This will constantly repeat the code inside the loop – NEVER stopping until the program ends



When the green flag is clicked it will continuously play the meow sound



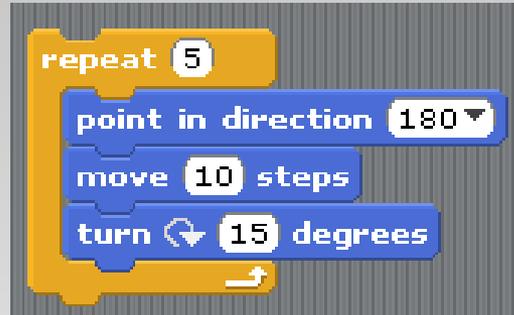
When the up arrow is pressed it will continuously move forward by 10 steps

Loops – Forever Loop

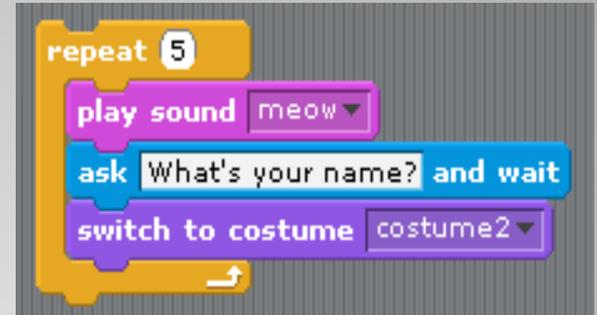
- This will repeat the code inside the loop a specified number of times



Will move 100 steps forward then turn 90 degrees **10 times**



Will point 180 degrees, move 10 steps forward then turn 15 degrees **5 times**



Will play the meow sound, ask 'what is your name' and change its costume **5 times**

Loops - Fixed

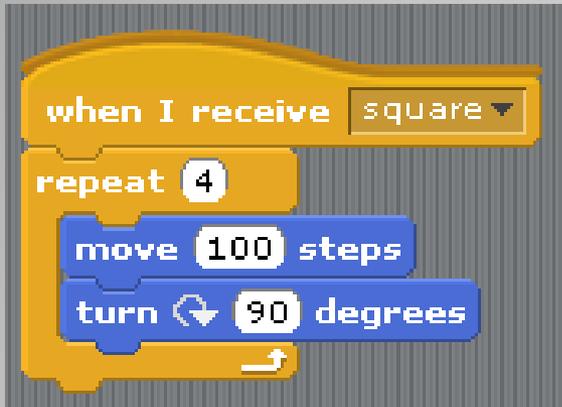
- This is when a loop contains another loop inside it
- In this case, the program starts the outer **repeat**, then **enters the inner repeat**, which carries on until it's finished. The outer repeat then carries on and so on...!



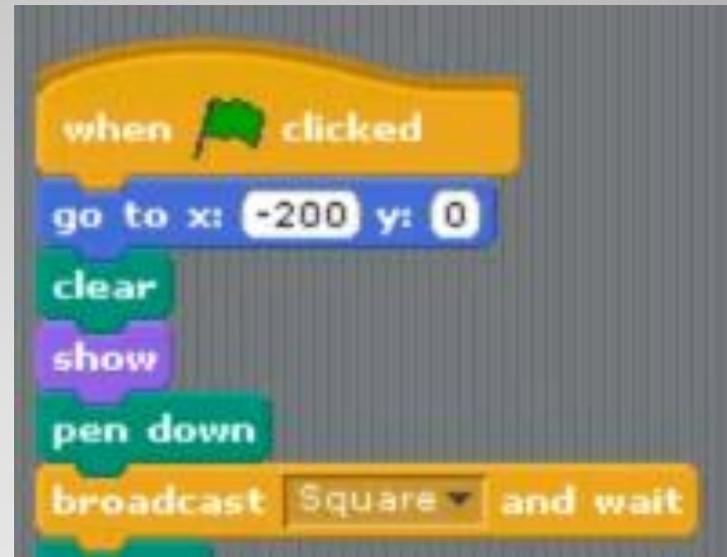
The outer loop causes the 4 passes of the inner loop to be completed 3 times.

Loops – Nested Loop

- This allows you to create your own events in Scratch and recall them for use later



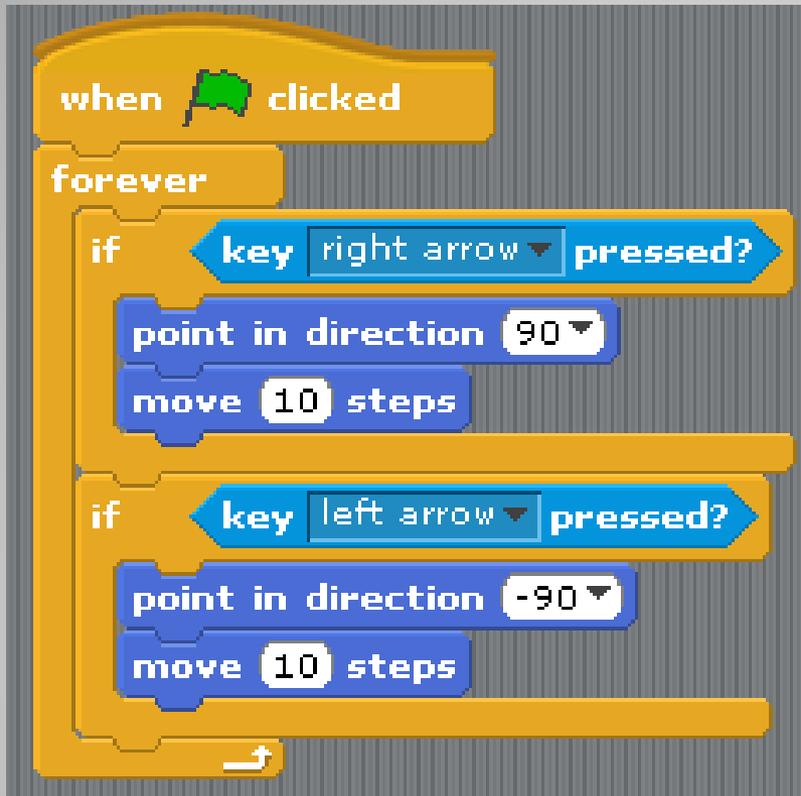
Sets up a broadcast called Square with code in it



When the Green flag is clicked it will go to the set co-ordinates and put the pen down then call on the Square code

Broadcast

- Allow the program to carry out the code if a certain condition has been met



In the code opposite

if the right arrow is pressed then the sprite will point direction 90 degrees and move 10 steps forward

Also if the left arrow is pressed then the sprite will point direction -90 degrees and move 10 steps forward

IF Statements

A variable is a space in a computer's memory where we can hold information used by our program – just like storing things in a box.

We should always give a variable a sensible name that tells us what kind of information is stored in it – just like putting a label on the box to tell us what's inside.

To create a variable in Scratch, we make a variable block.

Once a variable is created, the information stored inside it can be set or changed (that is, varied – hence the word “variable”).



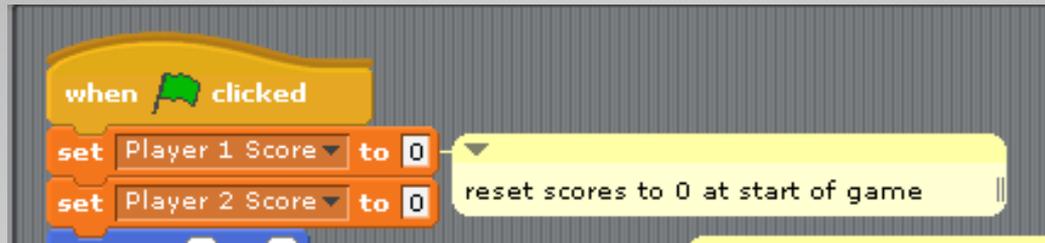
Variables

- Data Types are the type of information we allow our variable to store:

Data Type	Description	Example
String	Letters, symbols	Bob Jones
Integer	Whole Numbers	1, 55, 27
Real	Decimal Point Numbers	22.7, 86.9
Currency	Money	£19.99
Date	Date or Time	22/03/2014
Boolean	True / False or Yes / No	

Data Types

- An Assignment is simply when we assign a value to a variable



This can also be written in pseudocode:

SET total TO 0

Assignment

- This is the name given to calculations within in your program.

Arithmetic Expression	Description	Example
+	Addition	=Number1 + Number2
-	Subtraction	= Number1 - Number2
*	Multiplication	= Number1 * Number2
/	Division	= Number1 / Number2

Arithmetic Expressions