Section 2 If statements

Introduction to conditions

In the introduction to code, we made the **BBC micro:bit (https://www.microbit.co.uk/device)** automatically shows the message "Hello world":

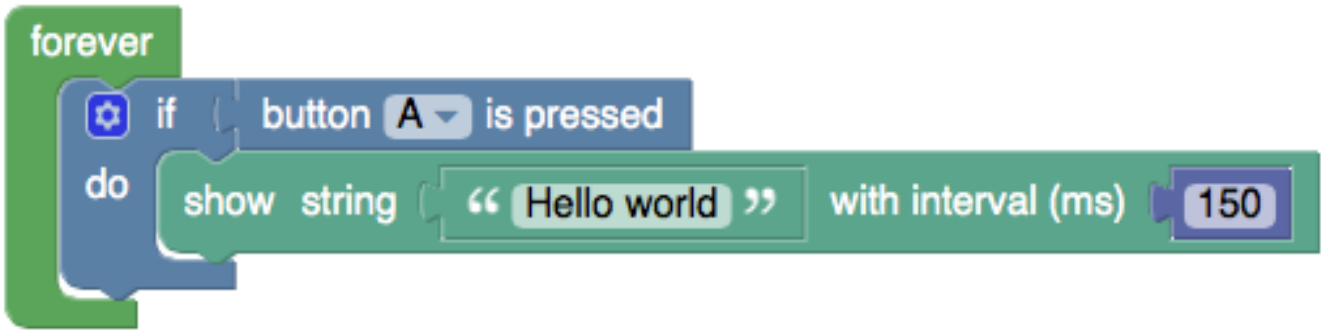
This statement, or code, will happen as soon as the **BBC micro:bit (https://www.microbit.co.uk/device)** is activated. This means it is unconditional. We can add a condition to make code function in certain ways:

- A calculator waits for the user in input numbers and a function, before outputting a result
- A game waits for the user to press a button at the right time before outputting their score
- A quiz waits for the user to choose the correct option, and if they are wrong the quiz will tell the user

In programming we use an **if (https://www.microbit.co.uk/td/if)** statement: if this condition is met, do something. Lets add an **if (https://www.microbit.co.uk/td/if)** statement to the code we had before; the BBC micro:bit will wait for the user to press a button before showing the image.

Write the code

Click the *if* category and drag an **if/do (https://www.microbit.co.uk/td/if)** block. Drag the **show string (https://www.microbit.co.uk/functions/show-string)** block we wrote previously into the *do* section of the block. Next click the *input* tab and drag a **button is pressed (https://www.microbit.co.uk/functions/button-is-pressed)** block, connect it to the open jigsaw of the **if (https://www.microbit.co.uk/td/if)** block. This is our criteria: *if button A is pressed*. We can change which input button (A or B) by clicking the arrow next to *A* and changing the input button. This means our **BBC micro:bit (https://www.microbit.co.uk/device)** is waiting for button A (the left button) to be pressed. Finally go to the *basic* tab and drag a **forever (https://www.microbit.co.uk/functions/forever)** block, and attach all our code inside. We add this block to ensure the **BBC micro:bit (https://www.microbit.co.uk/device)** is always waiting to show us this message, not just once. Your code should look like this:



Again, test the code in the **simulator (https://www.microbit.co.uk/td/simulator)** . Try clicking the *A button* on the **simulator (https://www.microbit.co.uk/td/simulator)** to display the "Hello world" message every time the **button is pressed (https://www.microbit.co.uk/functions/button-is-pressed)** .

More 'if' statements

You could now add additional conditions to your **if (https://www.microbit.co.uk/td/if)** statement. Here are some ideas:

- Change **button is pressed (https://www.microbit.co.uk/functions/button-is-pressed)** from asking for button A is pressed to button B is pressed
- Add another **if (https://www.microbit.co.uk/td/if)** statement within the current one, and make it so both buttons must be pressed to show the message
- Create a mini quiz that asks for one button to be pressed which represents an answer

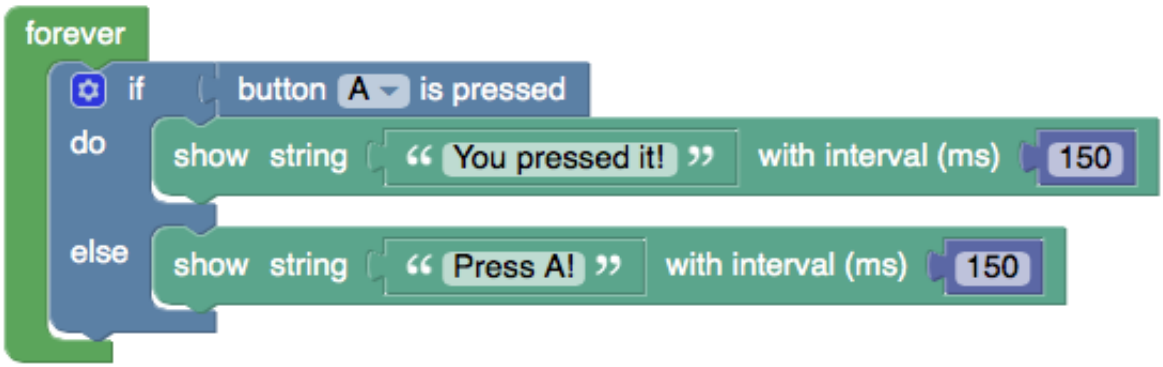
Else

What if the user does not press a button? What if the user presses the wrong button? We call this an else, because if the criteria of the if statement are not met then something else is done.

For example, we could make it so our **BBC micro:bit (https://www.microbit.co.uk/device)** tells us to "Press A!" button. Remove the **button is pressed (https://www.microbit.co.uk/functions/button-is-pressed)** and **show string (https://www.microbit.co.uk/functions/show-string)** blocks from the **if (https://www.microbit.co.uk/td/if)** block and right click it and select *Delete*. Now click the *If* category and drag out an **else if (https://www.microbit.co.uk/td/if)** block. Plug the **button is pressed (https://www.microbit.co.uk/functions/button-is-pressed)** and **show string (https://www.microbit.co.uk/functions/show-string)** blocks in the correct places.

We want the message "Press A!" to scroll across the **BBC micro:bit**

(https://www.microbit.co.uk/device) , so right-click the **show string (https://www.microbit.co.uk/functions/show-string)** block and select *Duplicate*. Drag this new block into the *else* section and replace the “Hello world!” with "Press A!". Your code should look like this:



So, to recap: the **forever (https://www.microbit.co.uk/functions/forever)** block makes sure our code **runs (https://www.microbit.co.uk/td/simulator)** forever. The **BBC micro:bit (https://www.microbit.co.uk/device)** checks if the user is pressing the left button, if the user is not then the “Press the button!” message will scroll across the LEDs. If the user is pressing the button then the “You pressed it!” message will scroll across the screen. Check this in the **simulator (https://www.microbit.co.uk/td/simulator)** or attach the BBC micro:bit to the computer then click **compile (https://www.microbit.co.uk/device/usb)** to send the code onto the BBC micro:bit.

What is a condition?

A condition is criteria that the user must meet for a certain function to be carried out.

Where next?

Section 1 Hello, world (https://www.microbit.co.uk/blocks/book/hello-world)

Section 2 If Statements (https://www.microbit.co.uk/blocks/book/if-statements)

Section 3 Variables (https://www.microbit.co.uk/blocks/book/variables)

Table of Contents (https://www.microbit.co.uk/blocks/book)