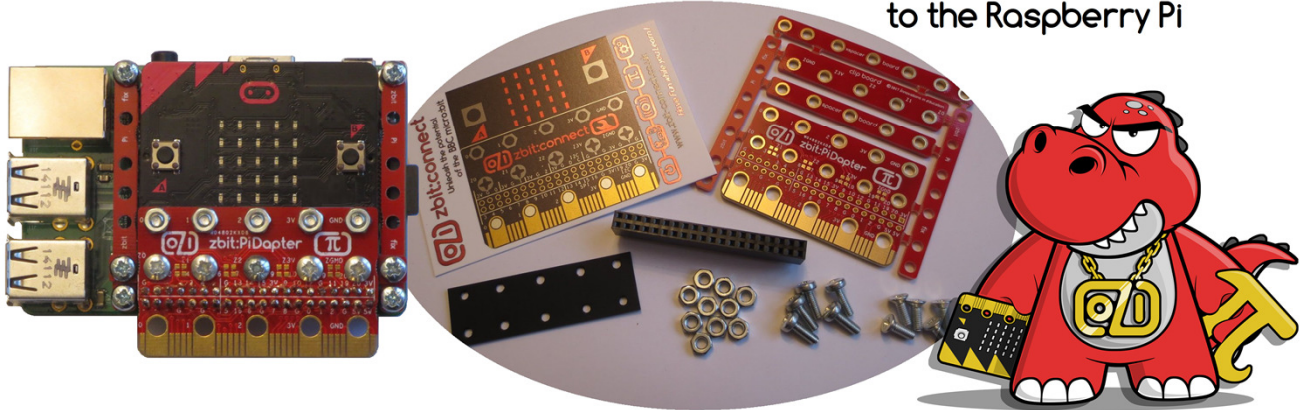
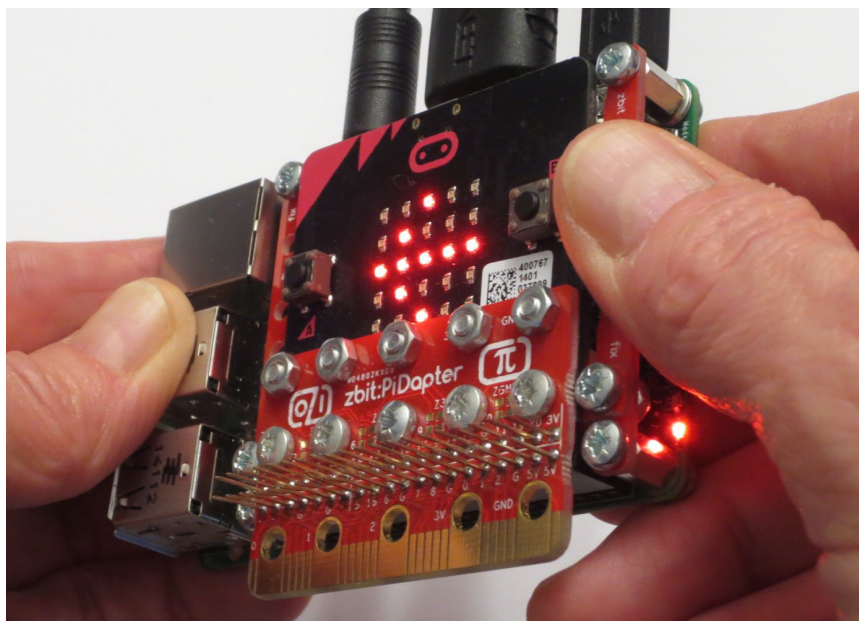


zbit:PiDapter

connecting the BBC micro:bit
to the Raspberry Pi



Example P1 – Tilt Controlled Raspberry Pi game of 'Snake' !



This zbit:PiDapter example shows you how to write a game of 'Snake' in Python on the Raspberry Pi and convert it to be 'Tilt Controlled' using your micro:bit as a 'Sense Hat' plugged onto your Raspberry Pi

Parts required

- 1 x zbit:PiDapter
- 1 x zbit:connector (*Optional* - see page 2 for details)
- 1 x Raspberry Pi (Model B+, 2 or 3)
- 1 x BBC micro:bit !!!



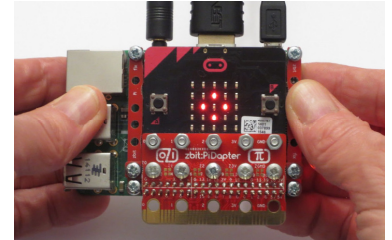


Write 'Snake' in Python on the Raspberry Pi controlled by external GPIO PushButtons

- Download 'The PiTrol' Instruction Manual from www.ThePiTrol.com
- If you have a 'PiTrol' Controller, plug it onto the GPIO Header on the Raspberry Pi. (If not, attach 4 PushButtons connecting GPIO pins 15(Right), 16(Up), 18(Down) & 22(Left) to 3V when the PushButtons are pressed with pull down resistors of ~4k7 to GND so they are 0V when not pressed)
- Follow **The PiTrol Steps 1 to 6** (*not Step 7* which will be covered in **Example Sheet P2**) to enhance the Pygame version of 'Snake' called 'Wormy' so it is controlled by the JoyStick on **The PiTrol** (or by the 4 individual PushButtons attached to GPIO pins)

Plug your micro:bit onto your Raspberry Pi using zbit:PiDapter

- Disconnect 'The PiTrol' from your Raspberry Pi.
- Solder the **40 way connector** to the **underside** of zbit:PiDapter as described in the **zbit:PiDapter Assembly Instructions**.
- Attach your **micro:bit** to **zbit:PiDapter** using the M3 screws (Note that this example only uses micro:bit GPIO P0, P1 & P2 so the use of the **zbit:connector** is *optional*).
- Carefully plug the **40 way connector on zbit:PiDapter** into the 40 way header on the **Raspberry Pi** with the **micro:bit covering the top of the Raspberry Pi**
- (Optionally the **Xspacer** with the **zbit:pi:fix** boards can be used to provide additional mechanical fixing (requires extra M2.5 screws, nuts and spacers)



Convert 'Snake' game to be 'Tilt' Controlled

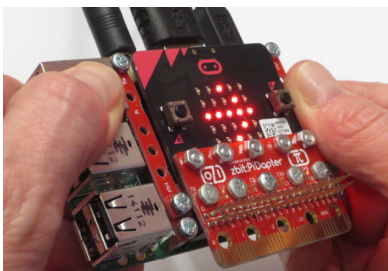
Write **micro:bit** code in **Block**, **JavaScript** or **Python** to continually 'read' the 'X' and 'Y' axis acceleration.

- If 'X' is less than -500 it is being tilted 'Left' so set P2=0, P1=0 and display Left Arrow
- If 'X' is greater than +500 it is being tilted 'Right' so set P2=1, P1=1 and display Right Arrow
- If 'Y' is less than -500 it is being tilted 'Down' so set P2=0, P1=1 and display Down Arrow
- If 'Y' is greater than +500 it is being tilted 'Up' so set P2=1, P1=0 and display Up Arrow
- If P2 or P1 change, set P0=1 for 250ms
- Also, if micro:bit Button 'A' is pressed, set P0=1 for 250ms (this can be used to start a new game)



Modify **Raspberry Pi Python** code to continually 'read' GPIO.BOARD input 12 (GPIO.BCM input 18) from micro:bit P0

- If it has changed:-
 - 'read' GPIO.BOARD 10 (GPIO.BCM 15) from micro:bit P1
 - 'read' GPIO.BOARD 8 (GPIO.BCM 14) from micro:bit P2
- Use the state of these 2 inputs to set the new direction of the 'Snake'



Play 'Tilt' Controlled 'Snake'

- Hold the **Raspberry Pi** in both hands
 - Press **micro:bit Button 'A'** to start a new game
 - Tilt the whole **Raspberry Pi Up, Down, Left or Right** to control the direction of the 'Snake'
- You now have a 'Tilt' Controlled game of 'Snake' !**

For this project
the use of the
zbit:connector...



...is *optional* as it only uses '**large pad**'
GPIO P0, P1 & P2

See '**zbit:connect family guide**' for more details

For updates follow **Twitter @ZbitConnect**

Have Fun while you Learn!



www.zbit-connect.co.uk