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Getting Started

Learn how to use the Python editor to make programs for the robot!


```python
# Add your Python code here. E.g.
from microbit import *


while True:
    display.scroll('Hello, World!')
    display.show(Image.HEART)
    sleep(2000)
```

INTRODUCTION

Learn how to use the Python editor to make programs for the robot!

Step 1

Build Your Robot

- Welcome to the the Invent! micro:bit Python course.

- Before you can start learning to code, we need to know how to create and upload programs to the **BBC micro:bit** that powers your robot.

- To get started, **build up your robot like in the picture.**

⚠️ At all times, make sure the **left motor** is plugged into **M1**, and the **right motor** is plugged into **M2**!

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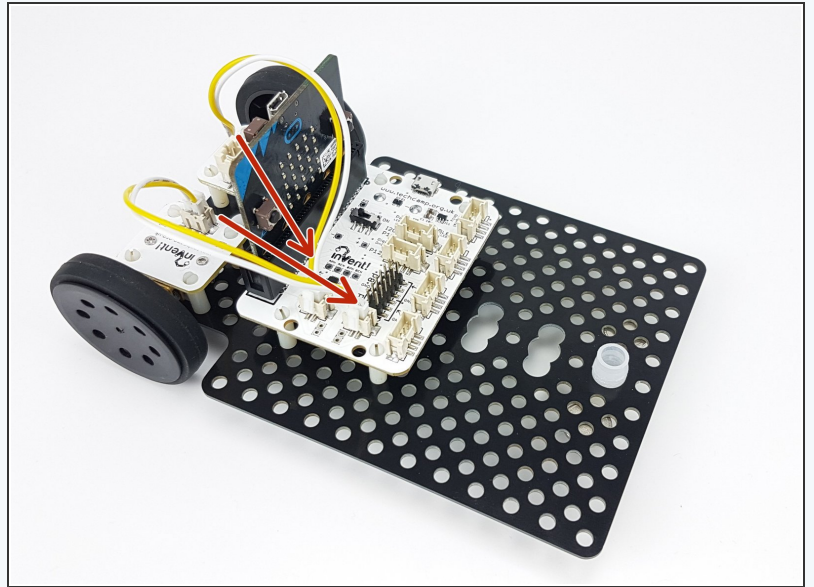
Step 2

Open the Editor
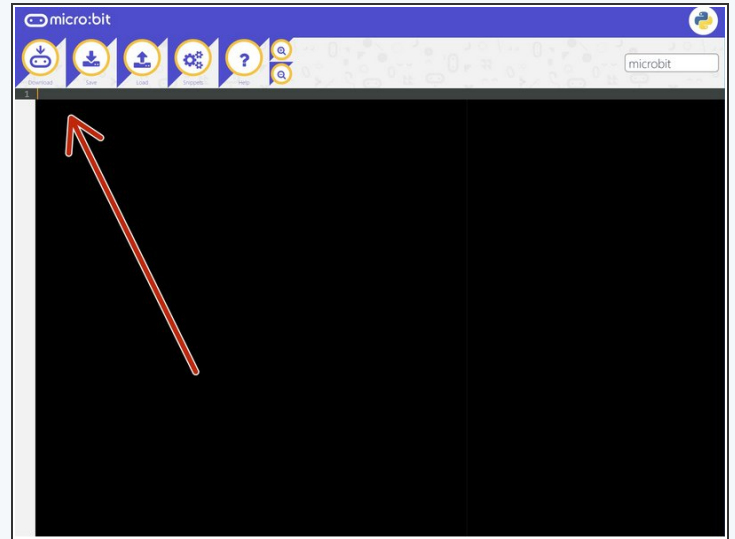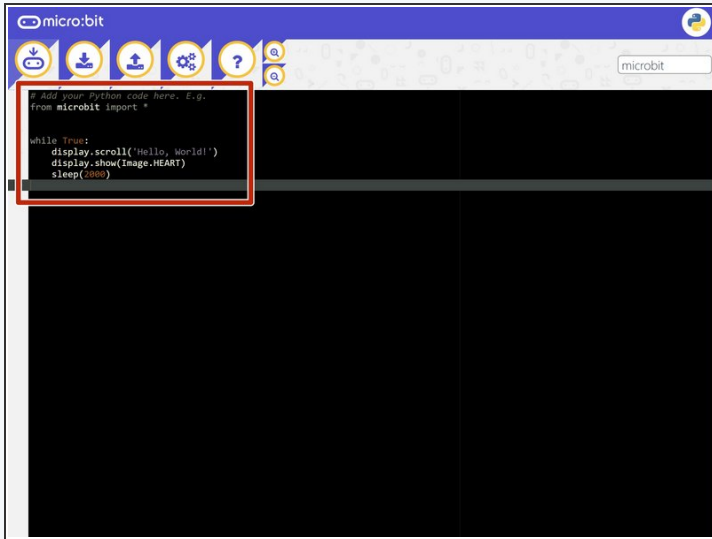
- We're going to be using a **web based Python editor** to write programs for the micro:bit - head to this link (https://drive.google.com/open?id=1hzofVGb9QVIYNQk_N9QCzvCXswRNr0iI) to download it, and save the file to your memory stick.

- Unzip the file, and click on the **editor.html** file to load the editor. Make sure this is saved to your computer - ask your teacher where you should save it.

- **Delete** all of the code already in the editor to leave a **blank screen**.

Step 3

Add the Starter Code

- We've made some **starter code**, that makes the motors and some other modules much easier to use - you will need to include this in **every program you make**.

- **Download** the starter code python file from here: [Get the Starter Code!](https://drive.google.com/file/d/1VgLKH6Qhb47pchbd6QYZijyIrgz9yUmo/view?usp=sharing) (https://drive.google.com/file/d/1VgLKH6Qhb47pchbd6QYZijyIrgz9yUmo/view?usp=sharing)

- **Save** the file to your memory stick so you always have a copy.

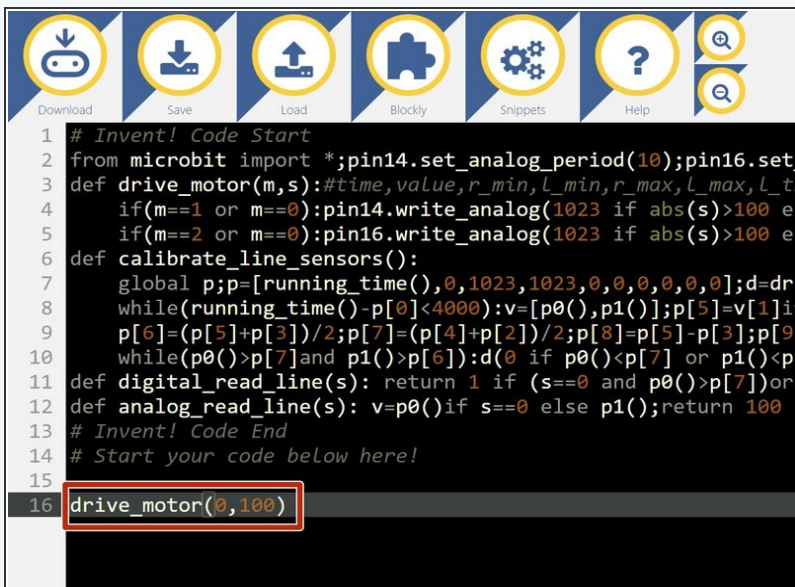- Let's start a test program by copying **all** of the starter code into the editor. It should look **like the picture!**

- (i) If you've done any Python before, you might notice that this code doesn't look very good, and isn't laid out very well - hopefully your code will never look like this! **It has been deliberately condensed** to make it as small as possible, so it doesn't take up too much space on your screen.

```
1  # Invent! Code Start
2  from microbit import *;pin14.set_analog_period(10);pin16.set_anal
3  def drive_motor(m,s):#time,value,r_min,L_min,r_max,L_max,L_thr,r_
4      if(m==1 or m==0):pin14.write_analog(1023 if abs(s)>100 else(a
5      if(m==2 or m==0):pin16.write_analog(1023 if abs(s)>100 else(a
6  def calibrate_line_sensors():
7      global p;p=[running_time(),0,1023,1023,0,0,0,0,0,0];d=drive_m
8      while(running_time()-p[0]<4000):v=[p0(),p1()];p[5]=v[1]if v[1
9      p[6]=(p[5]+p[3])/2;p[7]=(p[4]+p[2])/2;p[8]=p[5]-p[3];p[9]=p[4
10     while(p0()>p[7]and p1()>p[6]):d(0 if p0()<p[7] or p1()<p[6] e
11 def digital_read_line(s): return 1 if (s==0 and p0()>p[7])or(s an
12 def analog_read_line(s): v=p0()if s==0 else p1();return 100 if(v>
13 # Invent! Code End
14 # Start your code below here!
15
16
```

Step 4

Make a Test Program

- Always start your programs after the line that says **Start you code below here!**

- Add the line **drive_motor(0,100)** at the end of the program. This makes both motors drive **forwards at 100%**.

```
1  # Invent! Code Start
2  from microbit import *;pin14.set_analog_period(10);pin16.set_
3  def drive_motor(m,s):#time,value,r_min,L_min,r_max,L_max,L_t
4      if(m==1 or m==0):pin14.write_analog(1023 if abs(s)>100 e
5      if(m==2 or m==0):pin16.write_analog(1023 if abs(s)>100 e
6  def calibrate_line_sensors():
7      global p;p=[running_time(),0,1023,1023,0,0,0,0,0,0];d=dr
8      while(running_time()-p[0]<4000):v=[p0(),p1()];p[5]=v[1]i
9      p[6]=(p[5]+p[3])/2;p[7]=(p[4]+p[2])/2;p[8]=p[5]-p[3];p[9
10     while(p0()>p[7]and p1()>p[6]):d(0 if p0()<p[7] or p1()<p
11 def digital_read_line(s): return 1 if (s==0 and p0()>p[7])or
12 def analog_read_line(s): v=p0()if s==0 else p1();return 100 
13 # Invent! Code End
14 # Start your code below here!
15
16 drive_motor(0,100)
```

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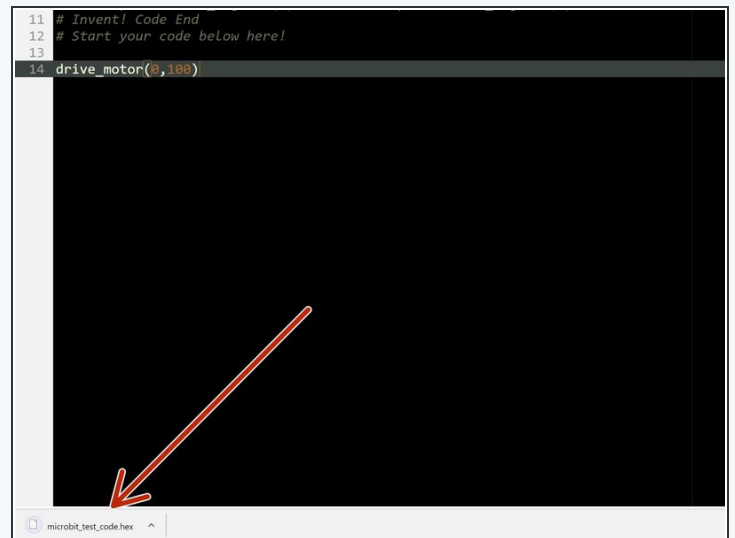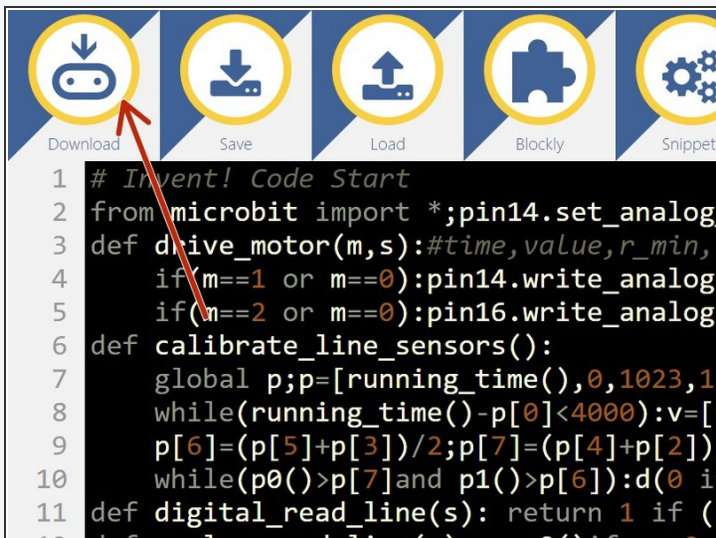© 2022   courses.techcamp.org.uk/   Page 4 of 8

Step 5

Name the Program

- It's always important to **name your program**, so you know what it does later!

- In the box in the top right of the window, name your program **microbit_test_code** like in the picture

Step 6

Download the File

- Finally we need to **download** the program, so we can send it to the micro:bit.

- Click the **Download** button in the top left - this will save the program to your **Downloads folder**.

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Step 7

Upload to your micro:bit

- The file we just downloaded is a **HEX file** - this is what we need to send to the micro:bit to make the program run.

- **Plug in your micro:bit** with the USB cable.

- If this is the first time the micro:bit has been plugged in, the computer might do some **setup** - once its finished, the micro:bit should appear like a **USB drive.**

- Open up the **File Explorer**, and click on the **MICROBIT** drive that has appeared. It should look like the picture.
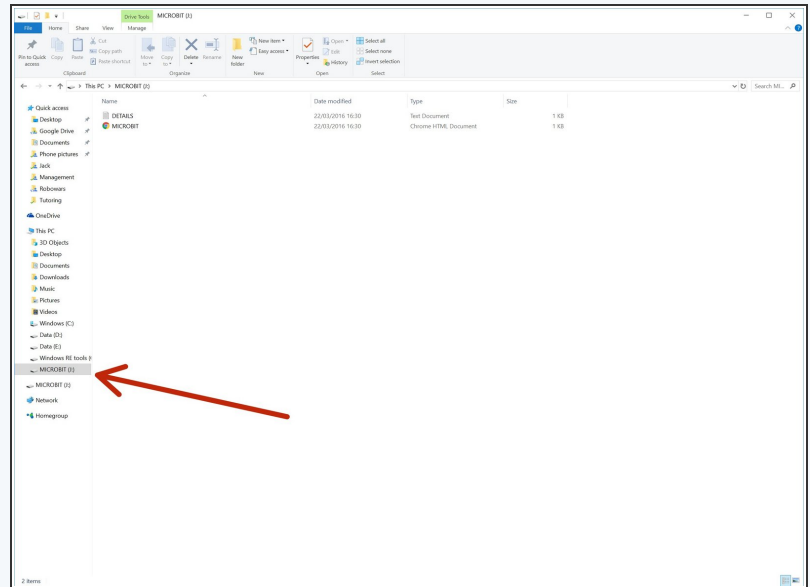
Step 8
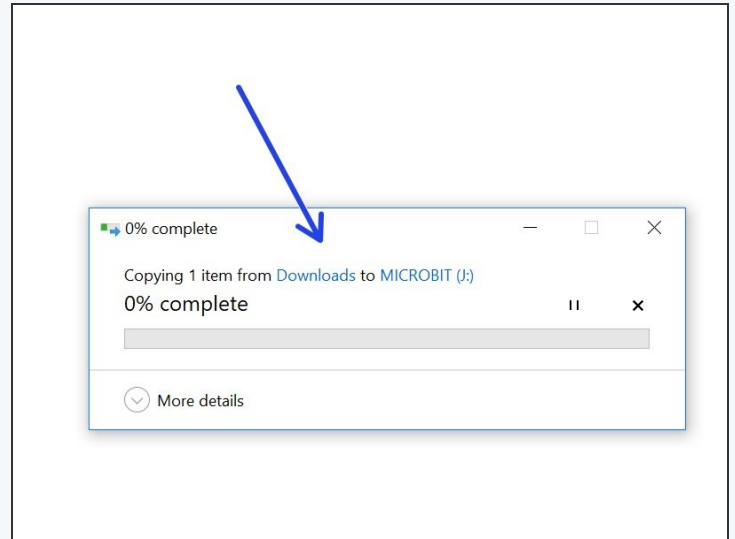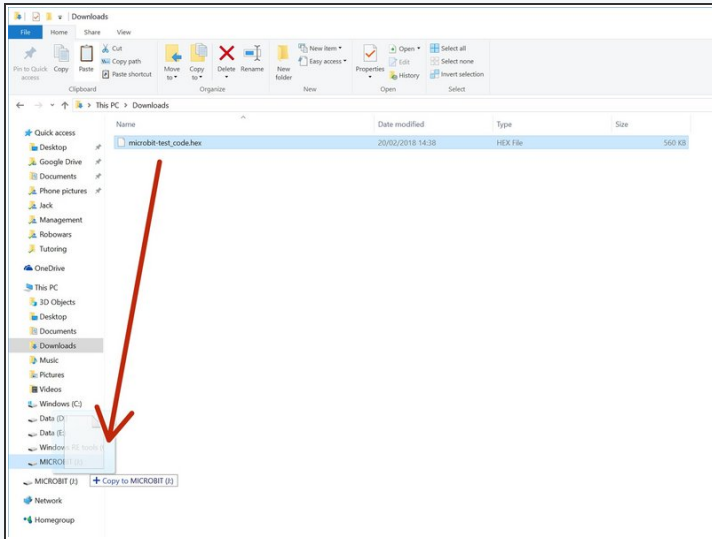
- All we need to do is copy the **HEX file** to the **MICROBIT drive!**

- Go to the **Downloads** folder, and drag the **microbit_test_code.hex** file onto the MICROBIT drive.

- **Wait** for it to copy, and that's it!

- Unplug the USB cable and **turn on the power switch** on the circuit board to start the program.

⚠ The program will run **automatically** - **make sure your robot doesn't run off the table**

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Step 9

Backup

- Don't forget, everything you do is only saved in the **browser**, and in any **HEX files** you download!

- Just in case, it's a good idea to **save** any important files that you might want again later to your **memory stick**.

- Try it now - **click the save button** to download a **.py** (Python) file, which you can **save to your memory stick.**

- You can then **load** these files in the editor later to get your code back.

- (i) We're all done! Head onto the next section to make a start on the first section.