

Python coding for Minecraft

by arpruss (/member/arpruss/)




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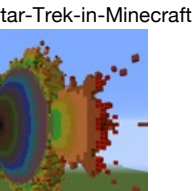
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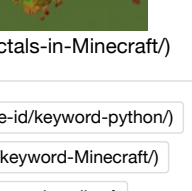
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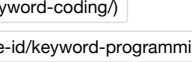
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This Instructable shows how to install and use a mod I wrote that lets you control Minecraft with python scripts. I'll focus on Windows, though OS X and Linux should work just as well.

Python scripts can generate neat in-world things, and there are many examples on the web. With a few lines you can draw a giant glass sphere, and with a bit more work make a giant Sierpinski triangle in the sky (<http://jinux.blogspot.com/2013/05/drawing-sierpinskis-triangle-in.html>) and even import obj files like a space shuttle (<https://github.com/martinohanlon/minecraft-renderObj>). I myself made fun scripts to draw a water-filled glass donut (<https://github.com/arpruss/raspberrjammod/blob/master/src/mcpipy/donut.py>) and a gigantic Klein bottle (<https://github.com/arpruss/raspberrjammod/blob/master/src/mcpipy/klein2.py>), to turn everything around into TNT (<https://github.com/arpruss/raspberrjammod/blob/master/src/mcpipy/explosify.py>) and to control Minecraft with your brain using a MindFlex EEG toy. There is a whole book introducing programming using python scripts for Minecraft (<http://www.amazon.com/Adventures-Minecraft-David-Whale/dp/111894691X>), and you can even make simple Minecraft-based games. I will also show how to do simple (and sometimes more elaborate) turtle-based drawings in Minecraft, while you can ride along with the drawing as the turtle.

For a while now you could write python scripts for Minecraft on the Raspberry

Pi (<https://mcpi.py.wordpress.com/2013/02/22/getting-minecraft-pi-edition-running/>). I wanted my kids to be able to do that, but we don't have a Pi, plus it would be nice to do this with the full desktop Minecraft. You could run your own server with the Raspberry Juice plugin (<http://dev.bukkit.org/bukkit-plugins/raspberrypi/>) which enables most of the python scripts to work. But not everyone wants to install and configure a server.

So I wrote the Raspberry Jam Mod (<https://github.com/arpruss/raspberrijammod>) for Minecraft 1.8 that emulates most of the Raspberry Pi Minecraft protocol (about the same as the Raspberry Juice plugin provides) and lets Raspberry Pi python scripts run with full desktop Minecraft.

I later found out that someone wrote the mcpiapi mod (<https://github.com/kbsriram/mcpiapi>) for Minecraft 1.7.10 a couple of weeks earlier. This Instructable is written for Raspberry Jam mod and Minecraft 1.8, but I'll note the differences for mcpiapi and Minecraft 1.7.10. Most of my work was with Python 2.7, but I'll cover Python 3, too.

I assume that you have basic facility with creating folders and downloading, unzipping, and copying files on Windows (or your operating system of choice).

You can create Python scripts for Minecraft with a text editor, the IDLE environment which comes with Python, or with Visual Studio Python Tools on Windows. The last is actually the nicest in some ways, so I'll have some optional steps on how to do that.

This summer I plan to teach coding and basic 3D geometry to gifted middle- and high-schoolers using Minecraft, Raspberry Jam Mod, Python and Visual Studio.

If you want to do this with Minecraft Pocket Edition on Android instead, I have an Instructable (<http://www.instructables.com/id/Python-Coding-for-Android-Minecraft-PE/>) for that, too.

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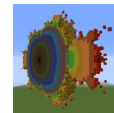
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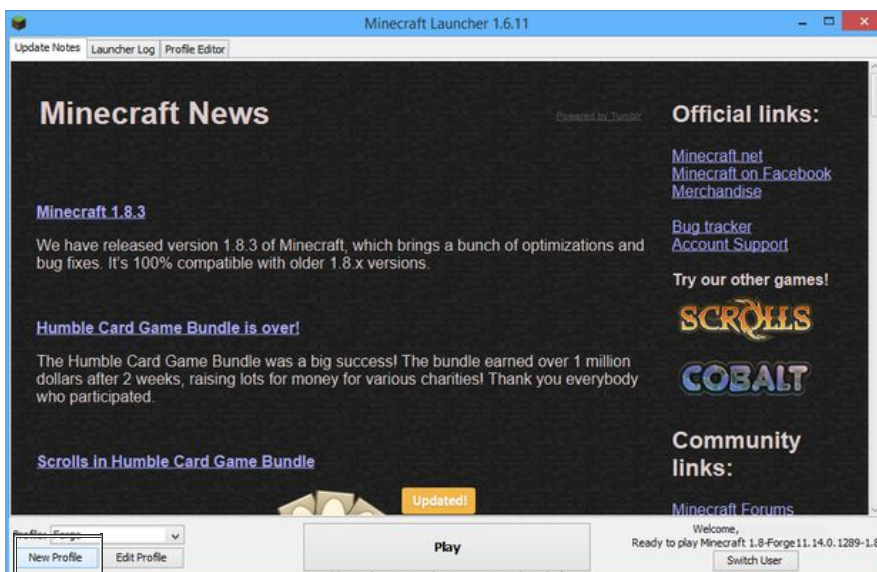
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Step 1: Install Forge for Minecraft



(/file/FW6UVHVI7MXZ8VK/)

(/file/F3W2QU1I7MXZ9F2/)

The Forge manages Minecraft mods, and is needed for the Raspberry Jam Mod (and the mcpapi mod for 1.7.10 as well).

I assume you have Minecraft installed.

1. You need to run Minecraft 1.8 once (and it needs to be exactly 1.8, not 1.8.3, say). To do that, start the Minecraft Launcher, and after logging in, click on New Profile. Set the profile name to anything you want (e.g., "Test of 1.8") and then go to "Use version" and select "Release 1.8". Then click on "Save Profile", make sure the new profile is selected in the launcher, and click on "Play". Start a world and make sure it works.
2. Exit Minecraft and Minecraft Launcher.
3. Download Forge for 1.8 installer. The version that I've been using is 11.14.0.1289 and can be directly downloaded here (<http://files.minecraftforge.net/maven/net/minecraftforge/forge/1.8-11.14.0.1289-1.8/forge-1.8-11.14.0.1289-1.8-installer-win.exe>). (Versions 11.14.1.1334 and the currently latest 11.14.1.1411 (<http://files.minecraftforge.net/>) also seem to work, but I haven't tested them as thoroughly.)
4. Run the Forge installer. Default settings should work.
5. Start Minecraft. You will now have a new Forge profile.

1.7.10 variant: Make a 1.7.10 profile in step 1, get your 1.7.10 Forge from here (http://files.minecraftforge.net/maven/net/minecraftforge/forge/index_1.7.10.html) in step 3.



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cragglemc (/member/cragglemc)

11 days ago

Reply

Hi, nice mod and tutorial, thanks! Is there a particular reason the client version is read only? I want players to be able to write and run their own scripts and the changes be saved. Happy to have a go at implementing this myself and sending you a pull request, but thought I'd check to see if you just didn't think it was doable first.



arpruss (/member/arpruss) (author) ▶ **cragglemc (/member/cragglemc)**

Reply

In our family, we use the read only mode plus the scan.py script to extract stuff we (well, not me but the kids) built on servers, for backup.

10 days ago



arpruss (/member/arpruss) (author) ▶ **cragglemc (/member/cragglemc)**

Reply

Normally, you run this in single player, with read only turned off. You can also run the mod on a server. However, if you're connecting to a server you don't control, obviously you can't change things on that server, so you must switch to read only mode.

10 days ago



nukerat (/member/nukerat)

25 days ago

Reply

is there any alternative to forge since i'm on minecraft sp??



nukerat (/member/nukerat) ▶ **nukerat (/member/nukerat)**

15 days ago

Reply

another problem(maybe related), is that python wont create blocks,but doesn't show errors



arpruss (/member/arpruss) (author) ▶ **nukerat (/member/nukerat)**

Reply

Do the bundled scripts work?

15 days ago



arpruss (/member/arpruss) (author) ▶ **nukerat (/member/nukerat)**

Reply

Is Minecraft SP that hacked launcher that removes authorization checks? I wouldn't want to put effort into supporting that.

25 days ago

Anyway, Forge is necessary if you want to use Desktop Minecraft.

If you can't run Forge, you can use RaspberryJamMod Pocket Edition for Android Pocket Edition, or RaspberryJamMod for Minetest.



nukerat (/member/nukerat) ▶ **arpruss (/member/arpruss)**

25 days ago

Reply

well i guess i'll just buy minecraft;

Awesome job with the mod! Playing on a raspberry pi can result over time to be a bit boring and limited.....



nukerat (/member/nukerat)

15 days ago

Reply

Does someone know what the error "no module named connection" means when i try to run a script?



arpruss (/member/arpruss) (author) ▶ nukerat (/member/nukerat)

Reply

It may mean your script isn't in the right folder, and can't find the mcpi\connection.py module.

15 days ago

If you can't figure this out, post your script's beginning.



badideasrus (/member/badideasrus)

2 months ago

Reply

you didnt actually change anything in step 10. set it to false people. XP. pretty obvious though.... (also, thanks for this! i'm just starting to learn python, and this will give me tons more reason to actually practice XP)



arpruss (/member/arpruss) (author) ▶ badideasrus (/member/badideasrus)

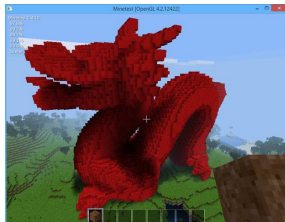
Nice catch. :-)

2 months ago

Reply

By the way, I now also have a mod for Minetest that lets you do most of this.

<http://github.com/arpruss/raspberryjammod-minetest>



(<http://cdn.instructables.com/FJF/FLFP/IF3SR154/FJFFLP/IF3SR154.LARGE.jpg>)



brianchadorourke (/member/brianchadorourke) made it!

5 months ago

Reply

After some fiddling and re-reading instructions, I got it to work. Super job!



(<http://cdn.instructables.com/FPQ/FM31/IBGCSHC7/FPQFM31IBGCSHC7.LARGE.jpg>)



arpruss (/member/arpruss) (author) ▶ brianchadorourke

(/member/brianchadorourke)

5 months ago

Reply

Thanks! You might also try the chess.py script.

Was there anything in my instructions that didn't work?



brianchadorourke (/member/brianchadorourke) ▶ arpruss (/member/arpruss)

5 months ago

Reply

I got to playing with donuts and sphere. Hollow donuts, then hollow spheres; then hollow sphere inside a hollow sphere. I am sure there is much more elegant code. Gotta add your own tabs to this; but you'll get the picture.

```
import mcpi.minecraft as minecraft

import mcpi.block as block

mc = minecraft.Minecraft.create()
mc.postToChat("Brian's Sphere")

#little sphere inside big sphere

#big sphere
radius = 50

playerPos = mc.player.getPos()
for x in range(radius*-1,radius):
    for y in range(radius*-1, radius):
        for z in range(radius*-1,radius):
            if x**2 + y**2 + z**2 < radius**2:
                mc.setBlock(playerPos.x + x, playerPos.y + y +
                    radius, playerPos.z - z - 20, block.COBBLESTONE)

radius = 40

playerPos = mc.player.getPos()
for x in range(radius*-1,radius):
    for y in range(radius*-1, radius):
        for z in range(radius*-1,radius):
            if x**2 + y**2 + z**2 < radius**2:
                mc.setBlock(playerPos.x + x, playerPos.y+4 + y +
                    radius, playerPos.z - z - 20, block.AIR)

#little sphere
radius = 37

playerPos = mc.player.getPos()
for x in range(radius*-1,radius):
    for y in range(radius*-1, radius):
        for z in range(radius*-1,radius):
            if x**2 + y**2 + z**2 < radius**2:
                mc.setBlock(playerPos.x + x, playerPos.y +10 + y +
                    radius, playerPos.z - z - 20, block.COBBLESTONE)

radius = 30

playerPos = mc.player.getPos()
for x in range(radius*-1,radius):
    for y in range(radius*-1, radius):
        for z in range(radius*-1,radius):
            if x**2 + y**2 + z**2 < radius**2:
                mc.setBlock(playerPos.x + x, playerPos.y + 15 + y +
                    radius, playerPos.z - z - 20, block.AIR)
```



arpruss (/member/arpruss) (author) ▶ brianchadorourke
(/member/brianchadorourke)

5 months ago

Reply

Thanks! Here's my cheating version of two concentric spheres. :-)

```
from mcturtle import *

t = Turtle()
```

```
t.turtle(None)
t.penwidth(100)
t.penblock(COBBLESTONE)
t.go(0) # going distance 0 draws a single pen pixel
t.penwidth(80)
t.penblock(AIR)
t.go(0)
t.penwidth(74)
t.penblock(COBBLESTONE)
t.go(0)
t.penwidth(60)
t.penblock(AIR)
```



brianchadorourke (/member/brianchadorourke) ▶ arpruss (/member/arpruss)

Your instructions were fine. It was a matter of me paying attention to what version of minecraft, forge, etc, I had my profile set to. Once I had that figured out, it worked correctly. Chess.py was cool. But the pieces aren't moving when I click them (hahahaahah).

5 months ago

Reply



arpruss (/member/arpruss) (author) ▶ brianchadorourke (/member/brianchadorourke)

5 months ago

Reply

Did you *right* click them while holding a *sword*?



brianchadorourke (/member/brianchadorourke) ▶ arpruss (/member/arpruss)

I did after you mentioned it. Really cool. I've had a bunch of fun of using the TNT block in clearSpace.py and blowing things up. I'm having a great time with your instructable. Thanks.

5 months ago

Reply



gammerguy (/member/gammerguy)

8 months ago

Reply

Wow! Like O_O wow

This is epic!

YOU COULD MAKE COMPLETE CONTRAPTIONS JUST FROM ONE COMMAND!?!?! Do you know what this means for ME? (I'm a heavy user for command blocks and I stink at building) No more messing up and trying to recreate contraptions for videos and instructables! Dude if you could make a vanilla compatible plug-in you would be like o-0 amazing. I don't know anyone who is o-0 amazing...



arpruss (/member/arpruss) (author) ▶ gammerguy (/member/gammerguy)

Reply

Now there is support for blocks with NBT tags, like command blocks. The support is unofficial.

```
Minecraft.conn.send("world.setBlock",x,y,z,id,meta,"{id:\"blockType\",othertags...}")
```

I know nothing about command blocks, so I don't know that the tags for one should read.



arpruss (/member/arpruss) (author) ▶ gammerguy (/member/gammerguy)

Reply

The python script cannot set the commands on command blocks at this point.
What is vanilla?

8 months ago



gammerguy (/member/gammerguy) ▶ arpruss (/member/arpruss)

Reply

but in theory you could make a Tnt Cannon using python? I bet you could even make a longer range Tnt Cannon right?

8 months ago



MartinO3 (/member/MartinO3) ▶ gammerguy (/member/gammerguy)

Reply

Or a cannon that can point in any direction
<http://www.stuffaboutcode.com/2013/04/raspberry-pi-minecraft-cannon.html>

6 months ago



arpruss (/member/arpruss) (author) ▶ MartinO3 (/member/MartinO3)

Reply

Or a hand-grenade that simulates movement in different gravities:
<https://github.com/arpruss/raspberryjammod/blob/master/pylscripts/mcpi.py/grenade.py>

5 months ago



gammerguy (/member/gammerguy) ▶ arpruss (/member/arpruss)

Reply

Vanilla is I guess slang for Unmodded Minecraft and to answer your question for how they work you just input a minecraft command into one then connect it to redstone or a button. It can hold longer commands than the chat commands.

8 months ago



arpruss (/member/arpruss) (author) ▶ gammerguy (/member/gammerguy)

Reply

My mod definitely needs the Forge. Without the mod, you could run a server with a Raspberry Juice plugin.

8 months ago



AndrewL13 (/member/AndrewL13) ▶ gammerguy (/member/gammerguy)

Reply

@gammerguy if you ever need a builder, I'm here. I've been on several creative servers and I am known for my building skills. Email me the server, time, and your username. My email address is hawk6040@gmail.com (I made my email address when I was 8)

7 months ago



gammerguy (/member/gammerguy) ▶ AndrewL13 (/member/AndrewL13)

Reply

I'll keep that in mind. Thanks :)

7 months ago



arpruss (/member/arpruss) (author) ▶ gammerguy (/member/gammerguy)

Reply

Can you point me to good information on how command blocks work?

8 months ago



arpruss (/member/arpruss) (author)

6 months ago

Reply

Why don't you try it from the command-line first, before trying it from within Minecraft. The error messages will be clearer.
I should add that my scripts currently don't work with python 3 so well

**wnorman (/member/wnorman)** ▶ arpruss (/member/arpruss)

Reply

here is what it says when I try running the donut.py script in the console (cmd.exe) I have XXXXXX the user name for personal safety

```
C:\Users\XXXXX\AppData\Roaming\.minecraft\mcpi\mods\pyt
donut.py
Traceback (most recent call last):
File "donut.py", line 9, in <module>
from mc import *
File
"C:\Users\XXXXX\AppData\Roaming\.minecraft\mcpi\mods\py
line 5
, in <module>
from mcpi.minecraft import *
File
"C:\Users\XXXXX\AppData\Roaming\.minecraft\mcpi\mods\py
.py", line 1, in <module>
from connection import Connection
ImportError: No module named 'connection'

C:\Users\XXXXX\AppData\Roaming\.minecraft\mcpi\mods\pyt
```

**arpruss (/member/arpruss)** (author) ▶ wnorman (/member/wnorman)

Reply

I just updated the python3 scripts to fix bugs in them. (I only use python2.)

<https://github.com/arpruss/raspberryjammod/releases>

Make sure you get the python3-scripts.zip file.

**arpruss (/member/arpruss)** (author) ▶ wnorman (/member/wnorman)

Reply

Do you have the python3 version of the scripts? 6 months ago

I recommend using python 2.7.

**wnorman (/member/wnorman)** ▶ arpruss (/member/arpruss)

Reply

as far as I can tell they are if not where would I get them 6 months ago

**arpruss (/member/arpruss)** (author)

6 months ago

Reply

The python3 scripts are here:
<https://github.com/arpruss/raspberryjammod/releases>
 (see 0.14.6).

However, I've had trouble getting them working, so I really recommend the python2 scripts.

**wnorman (/member/wnorman)**

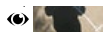
6 months ago

Reply

I have done as you said in your guide for 1.7.10 and when in minecraft i type /python donut as a test and it does nothing I do not get any error messages or anything if i type just the /python it does say invalid command or something to that extent any help you can offer me on this would be most welcome

**arpruss (/member/arpruss)** (author) ▶ wnorman (/member/wnorman)

Reply



You should check if python is on your path. Start a Windows command prompt (<http://www.7tutorials.com/7-ways-launch-command-prompt-windows-7-windows-8>) and type "python". If all goes well, you will be in a python shell. If you get an error message, you probably need to reinstall your python package.

6 months ago



wnorman (/member/wnorman) ▶ arpruss (/member/arpruss)

Reply

yes I am using mcpiapi and python works fine I am using python 3.4

6 months ago



arpruss (/member/arpruss) (author) ▶ wnorman (/member/wnorman)

Reply

Are you using mcpiapi?

6 months ago



wnorman (/member/wnorman) ▶ wnorman (/member/wnorman)

Reply

I should also note that this is on the windows version of minecraft

6 months ago



arpruss (/member/arpruss) (author)

7 months ago

Reply

I added a step in the instructions on how to use python to interface Minecraft with a toy EEG headset. It's kind of cool how you can fly up and down just by the power of the brain.



CLScientist (/member/CLScientist) made it!

7 months ago

Reply

I had some difficulty doing this with the 1.8 version of Minecraft, but I was able to do it easily with Minecraft 1.7.10 variant posted along side the 1.8 version in this instructable.



(<http://cdn.instructables.com/F3M/ZYLP/I8PQXAD7/F3MZYLPi8PQXAD7.LARGE.jpg>)



arpruss (/member/arpruss) (author) ▶ CLScientist (/member/CLScientist)

Reply

Which step did the 1.8 version have trouble with?

7 months ago



CLScientist (/member/CLScientist) ▶ arpruss (/member/arpruss)

Reply

When I ran the 1.8 FML profile of Forge with Minecraft 1.8 launcher would crash.

7 months ago



arpruss (/member/arpruss) (author) ▶ CLScientist (/member/CLScientist)

Reply

When I installed Forge on my system, it created a "Forge" profile. Did it do that for you?

7 months ago

And which version of Forge did you install? Some versions do crash. 11.14.0.1289 worked fine for me.



CLScientist (/member/CLScientist) ▶ arpruss (/member/arpruss)

Reply

It did that when I used Forge for version 1.7.10, but for Forge 1.8 it created a profile called FML.



arpruss (/member/arpruss) (author) ▶ CLScientist (/member/CLScientist)

Reply

Which version of the Forge did you download?



Brusk101 (/member/Brusk101)

8 months ago

Reply

WOOHOO!! SOMEONE ELSE WHO KNOWS HOW TO MOD!!!!I'll be doing some volts modpack insturtbles on it.



Jacob theg (/member/Jacob theg)

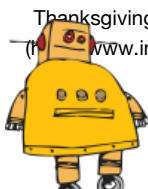
8 months ago

Reply

Awesome

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