

# fast\_demo

March 30, 2024

## 1 FullControl 1-minute demo

**run all cells in this notebook in order (keep pressing shift+enter)** this quick demo shows how a design can be created with a list of points for nozzle movement with or without extrusion

the design is visually previewed, then gcode is created for a specific printer and saved to a file

for more information, see the [FullControl overview notebook](#)

*<this document is a jupyter notebook - if they're new to you, check out how they work: [link](#), [link](#), [link](#)>*

*run all cells in this notebook in order (keep pressing shift+enter)*

**first, import fullcontrol to have access to its capabilities**

```
[ ]: import fullcontrol as fc
```

**create and preview a design (a list of steps telling the printer what to do)**

```
[ ]: # create an empty list called steps
steps=[]
# add points to the list
steps.append(fc.Point(x=40,y=40,z=0.2))
steps.append(fc.Point(x=50,y=50))
steps.append(fc.Point(x=60,y=40))
# turn the extruder on or off
steps.append(fc.Extruder(on=False))
steps.append(fc.Point(x=40,y=40,z=0.4))
steps.append(fc.Extruder(on=True))
steps.append(fc.Point(x=50,y=50))
steps.append(fc.Point(x=60,y=40))
# transform the design into a plot
fc.transform(steps, 'plot')
```

**set filename, printer and print settings**

```
[ ]: filename = 'my_design'
printer = 'ender_3'
# printer options: generic, ultimaker2plus, prusa_i3, ender_3, cr_10,
↳ bambulab_x1, toolchanger_T0, toolchanger_T1, toolchanger_T2, toolchanger_T3
```

```
print_settings = {'extrusion_width': 0.5, 'extrusion_height': 0.2, 'nozzle_temp':
    ↪ 210, 'bed_temp': 40, 'fan_percent': 100}
# 'extrusion_width' and 'extrusion_height' are the width and height of the
    ↪ printed line)
```

**save gcode file to the same directory as this notebook** do not edit this line of code - it uses values defined in the previous code cells

make sure you execute the previous cells before running this one

```
[ ]: fc.transform(steps, 'gcode', fc.GcodeControls(printer_name=printer,
    ↪ save_as=filename, initialization_data=print_settings))
```

**get creative!** check out [other tutorials](#) to see how to create designs like this gear/thread example with just one line of code

```
[ ]: steps = [fc.polar_to_point(centre=fc.Point(x=0, y=0, z=i*0.005), radius=10,
    ↪ angle=i*4.321) for i in range(1000)]
fc.transform(steps, 'plot', fc.PlotControls(neat_for_publishing=True, zoom=0.7))
```

**random mesh example**

```
[ ]: from math import tau
from random import random
steps=[fc.polar_to_point(centre=fc.Point(x=0, y=0, z=i*0.001),
    ↪ radius=10+5*random(), angle=i*tau/13.8) for i in range(4000)]
fc.transform(steps, 'plot', fc.PlotControls(neat_for_publishing=True, zoom=0.7))
```