

Group 19
Team OctoPi

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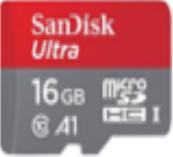
Who are we?





Our Product

Bill of Materials

Part Name	Picture of Template	Description/ Specification	Quantity	Cost (CAD)
Raspberry Pi		N/A	1	\$55.97
Micro SD		16 GB	1	\$9.30
Printer Cable		6ft/1.8m	1	\$4.43
Printer Cable		6ft/1.8m	3	\$4.60
3D Printed Case + Stand		ABS/PLA	1	\$0
Wall plug		3 Amp/5Volt	1	13.99
TOTAL COST(GST=\$3.59)				\$101.08

Why Raspberry Pi?

	Raspberry Pi	Arduino	Node MCU
WIFI Compatible	Yes	No	No
Enough Computational Power	Yes	No	No
Price	High	Medium	Low
Multiple IO Ports	Yes	No	No
Cost Effectiveness for project	Yes	No	No
Total	13	6	7

Legend: **Green** = 3 Points

Yellow = 2 Points

Red = 1 Point

Ideation

*New CustomPanel2.grid x New CustomPanel3.grid

3D Printers of Makerspace

Available:	In Use	Finished Prints
Printer 1	Printer 4 Time left: 01:04:31	Printer 7
Printer 2	Printer 5 00:02:11	
Printer 3	Printer 6 2:10:35	

Time Until Makerspace Closes:

07:42:35

3D Printers

Available	In Use
Printer 1 Printer 2 Printer 4 Printer 6	Printer 3 4h 10mi Printer 5 1h 12mi

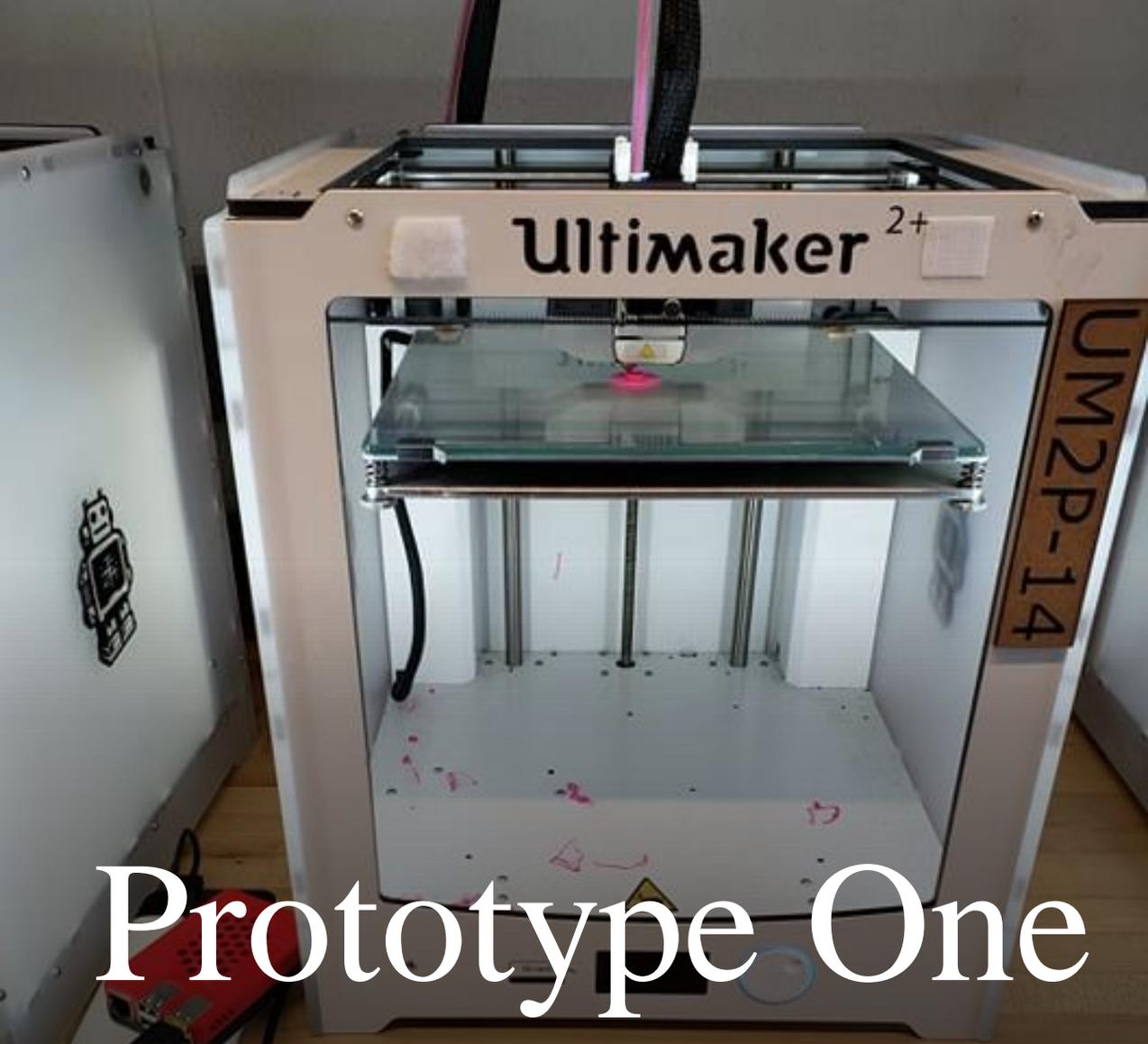
← Colour of filament in printer displayed

← Will send email to user when completed

↑ printer will go here when print starts
↑ shows time rem. in pr.

Time left in day

6h 41min



Prototype One



Setting up OctoPrint

The screenshot shows the OctoPrint website homepage. At the top, there is a dark navigation bar with the OctoPrint logo and links for Blog, Forum, Download, Donate, Plugins, FAQ, and More... Social media icons for GitHub, Twitter, Facebook, YouTube, and RSS are also present. The main header features the OctoPrint logo and the tagline "The snappy web interface for your 3D printer." with a cartoon octopus mascot. Below this, three key features are highlighted: "Full remote control & monitoring" (with a Wi-Fi icon), "Compatible and extendable" (with a puzzle piece icon), and "100% Open Source" (with a GitHub icon). Each feature includes a brief description and a "Learn more" link. A section below mentions that development is supported by patrons on Patreon and features the LulzBot logo. At the bottom, there are two prominent buttons: "Support the project!" and "Download". An advertisement for MongoDB Atlas is visible at the bottom center.

OctoPrint.org Blog Forum Download Donate Plugins FAQ More...     

OctoPrint

The snappy web interface for your 3D printer.

Created & maintained by Gina Häußge



 **Full remote control & monitoring**
Control and monitor every aspect of your 3D printer and your printing jobs right from within your browser.
[Learn more](#)

 **Compatible and extendable**
OctoPrint's powerful plugin system allows extending its functionality with awesome plugins from the community.
[Learn more](#)

 **100% Open Source**
Free and open source software released under the Affero General Public License (AGPL).
[Learn more](#)

OctoPrint's development is made possible through the support of all the awesome patrons on [Patreon](#) and







 MongoDB Atlas is the most reliable cloud database service available. Try now!

ADS VIA CARBON

Connection

State

State: **Starting**

File: **UM2_yoda.gcode**

Uploaded: 2019-11-22 00:58:20

User: **GNG1103#19**

Timelapse: -

Filament (Tool 0): **8.43m / 25.35g**

Approx. Total Print Time: **2 hours**

Print Time: -

Print Time Left: -

Printed: - / **3.3MB**

Print

Pause

Cancel

Files

Search...

Uploaded: 12 days ago

Size: 718.8KB

UM2_dino.gcode

Uploaded: 2 days ago

Size: 1.8MB

UM2_Starman_3.gcode

Uploaded: 12 days ago

Size: 6.8MB

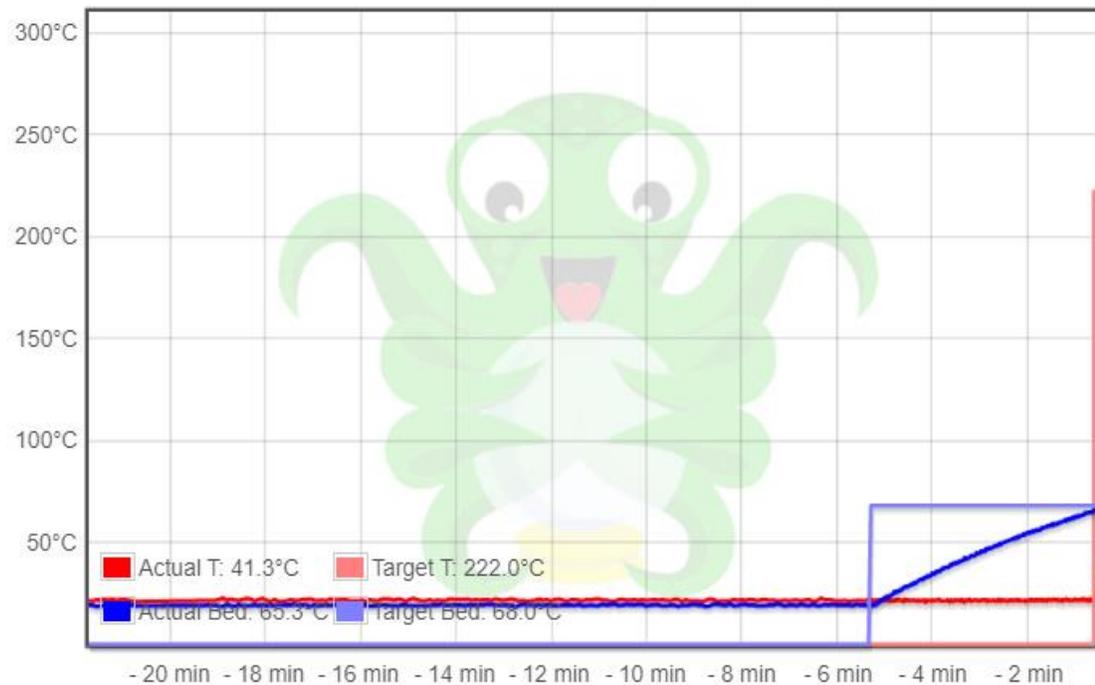
Temperature

Control

GCode Viewer

Terminal

Timelapse



	Actual	Target		Offset		
Tool	41.3°C	-	222 °C +	✓	▼	0 °C
Bed	65.3°C	-	68 °C +	✓	▼	0 °C

```
GET /api/job HTTP/1.1
Host: example.com
X-API-Key: abcdef...
```

```
HTTP/1.1 200 OK
Content-Type: application/json
```

```
{
  "job": {
    "file": {
      "name": "whistle_v2.gcode",
      "origin": "local",
      "size": 1468987,
      "date": 1378847754
    },
    "estimatedPrintTime": 8811,
    "filament": {
      "length": 810,
      "volume": 5.36
    }
  },
  "progress": {
    "completion": 0.2298468264184775,
    "filepos": 337942,
    "printTime": 276,
    "printTimeLeft": 912
  },
  "state": "Printing"
}
```

UTM#1 - Notepad



File Edit Format View Help

```
11, "filepos": null, "printTime": null, "printTimeLeft": null, "printTimeLeftOrigin": null}, "state": "Offline"}
```

3D PRINTER DASHBOARD

Printer	Status	Time Left	Clear Bed	File Name
UTM#1	OFFLINE			
UTM#2				
UTM#3				
UTM#4				

3D PRINTER DASHBOARD

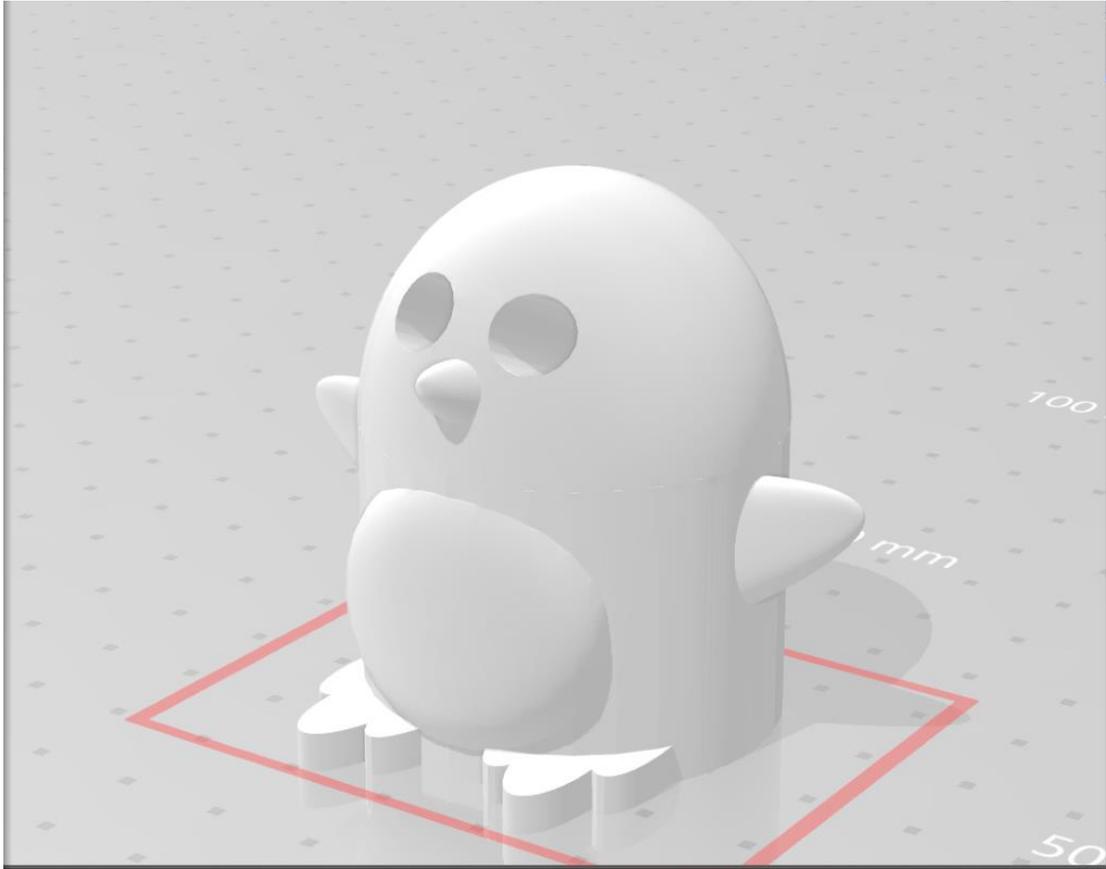
Printer	Status	Time Left	Clear Bed	File Name
UTM#1	Operational			
UTM#2				
UTM#3				
UTM#4				

3D PRINTER DASHBOARD

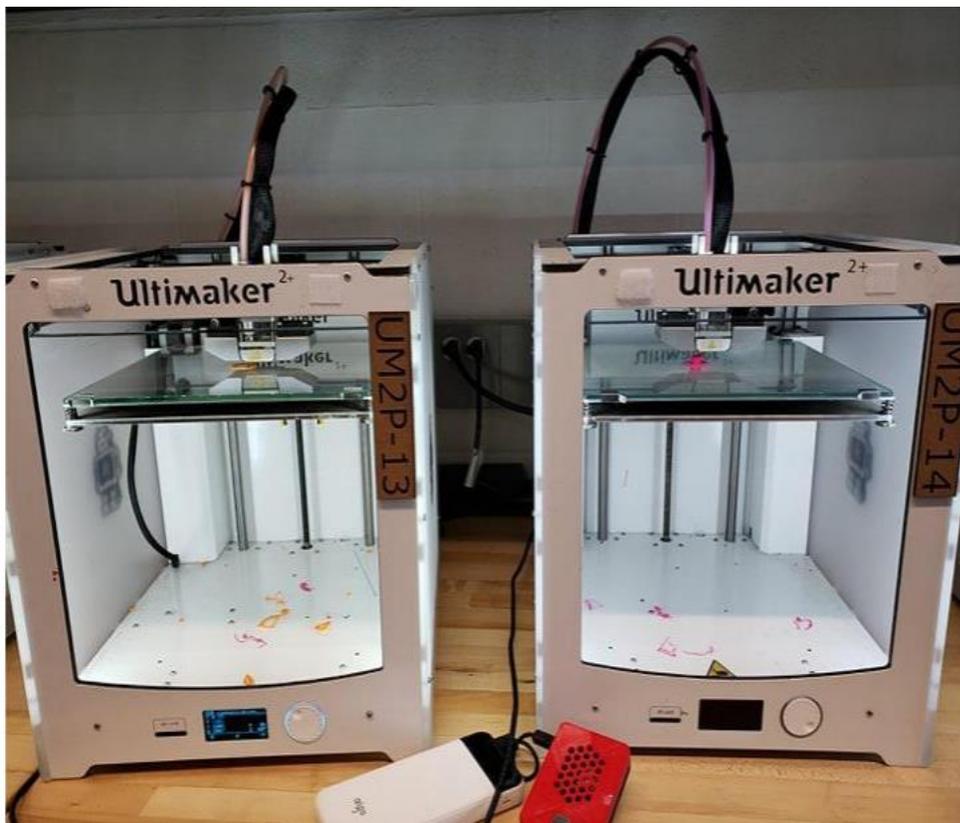
Printer	Status	Time Left	Clear Bed	File Name
UTM#1	In Use	114 min 33 sec	X	penguin.gcode
UTM#2				
UTM#3				
UTM#4				

3D PRINTER DASHBOARD

Printer	Status	Time Left	Clear Bed	File Name
UTM#1	Paused	114 min 33 sec	X	penguin.gcode
UTM#2				
UTM#3				
UTM#4				



Prototype Two



3D PRINTER DASHBOARD					
Printer	Status	Time	Complete	Key Details	
UTM#1		00:00:00		Progress:	0
		00:00:00		File Name:	
UTM#2		00:00:00		Progress:	0
		00:00:00		File Name:	
UTM#3		00:00:00		Progress:	0
		00:00:00		File Name:	
UTM#4		00:00:00		Progress:	0
		00:00:00		File Name:	



```
def loadAndSave(url, key, file):
    headers = { "X-API-Key" : key }
    req = request.Request(url, None, headers)
    with request.urlopen(req) as resp:
        respJsonData = json.loads(resp.read())
    #print(respJsonString)
    with open(file, "w") as f:
        json.dump(respJsonData, f)
    print("Loaded and saved")
```

```
url1 = "http://192.168.137.199/api/job"
key1 = "B9DAC2A167DB4103A101C9336E5779E9"
file1 = "c:/Users/Tom Lin/Documents/gng 1103/Project/UTM1.json"

url2 = "http://192.168.137.199:5001/api/job"
key2 = "2465E8A4F0E84DF98747E4E74BFDA051"
file2 = "c:/Users/Tom Lin/Documents/gng 1103/Project/UTM2.json"
```

Sample Response file

```
▼ job:
  averagePrintTime:    null
  estimatedPrintTime:  6118.3317111706091
  ▼ filament:
    ▼ tool0:
      length:          4983.171220000037
      volume:          35.22396171674746
    ▼ file:
      date:             1574406988
      display:          "yoda.gcode"
      name:             "yoda.gcode"
      origin:           "local"
      path:             "yoda.gcode"
      size:             2040211
      lastPrintTime:   null
      user:             "GNG1103#19"
  ▼ progress:
    completion:        9.890839721969934
    filepos:           201794
    printTime:         1310
    printTimeLeft:     6221
    printTimeLeftOrigin: "mixed-analysis"
  state:              "Printing"
```

3D PRINTER DASHBOARD

Printer		Status	Time		Complete	Key Details		
UTM#1	Paused	Print Time Left	00:17:08	Printing	Progress:		76	
		Time Spent Printing	00:54:14		File Name:	penguin.gcode		
UTM#2	Printing	Print Time Left	02:02:53	Printing	Progress:		5	
		Time Spent Printing	00:13:30		File Name:	yoda.gcode		
UTM#3		Print Time Left	00:00:00		Progress:		0	
		Time Spent Printing	00:00:00		File Name:			
UTM#4		Print Time Left	00:00:00		Progress:		0	
		Time Spent Printing	00:00:00		File Name:			

3D PRINTER DASHBOARD

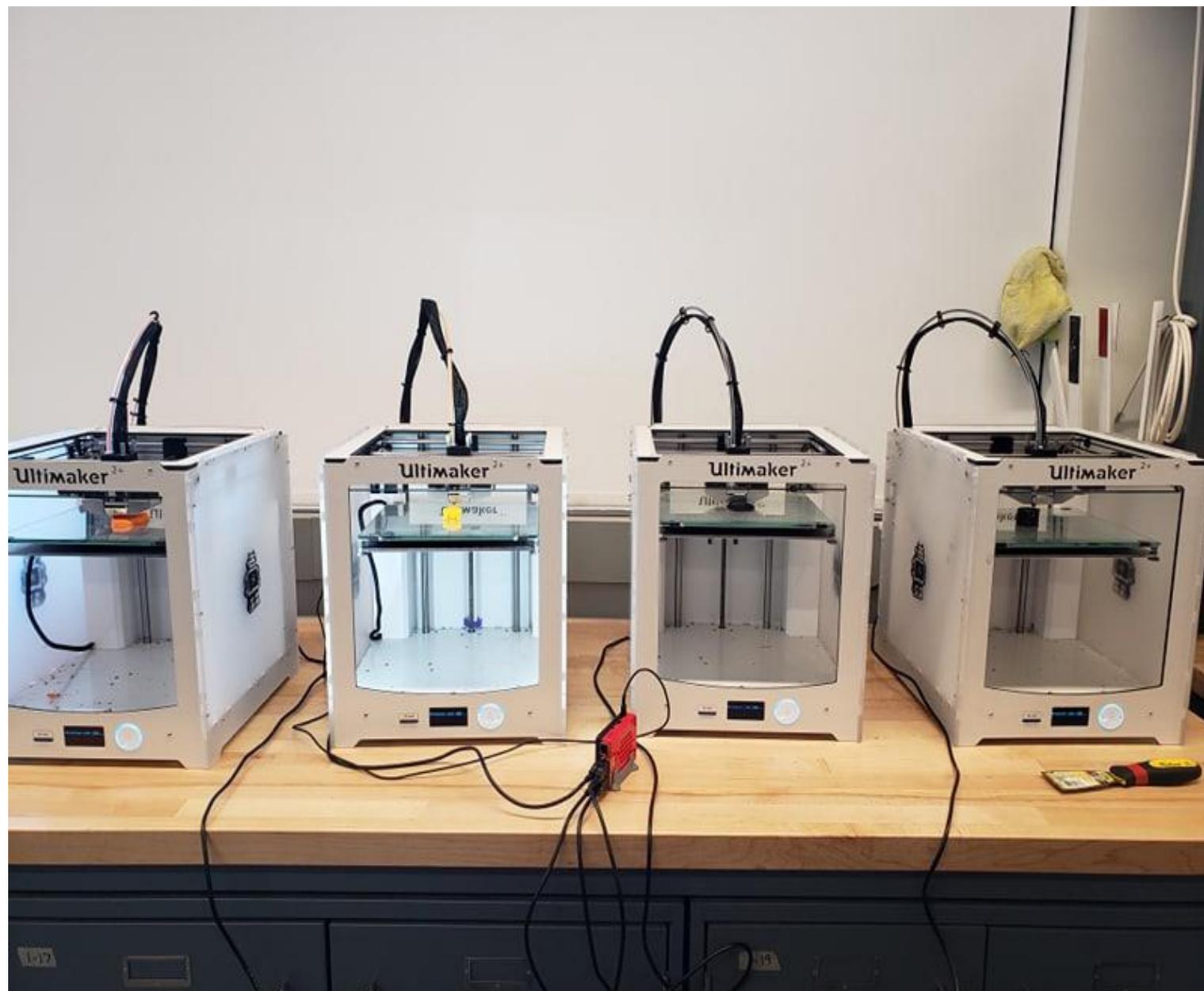
Printer		Status	Time		Complete	Key Details	
UTM#1	Operational	Print Time Left	00:00:00	Print Is Complete	Progress:	100	
		Time Spent Printing	01:11:22		File Name:	penguin.gcode	
UTM#2	Printing	Print Time Left	01:48:20	Printing	Progress:	19	
		Time Spent Printing	00:20:35		File Name:	yoda.gcode	
UTM#3		Print Time Left	00:00:00		Progress:	0	
		Time Spent Printing	00:00:00		File Name:		
UTM#4		Print Time Left	00:00:00		Progress:	0	
		Time Spent Printing	00:00:00		File Name:		

3D PRINTER DASHBOARD

Printer		Status	Time		Complete	Key Details	
UTM#1	Operational	Print Time Left	00:00:00	Print Bed Is Free	Progress:	0	
		Time Spent Printing	00:00:00		File Name:	penguin.gcode	
UTM#2	Printing	Print Time Left	01:16:51	Printing	Progress:	 42	
		Time Spent Printing	00:55:39		File Name:	yoda.gcode	
UTM#3		Print Time Left	00:00:00		Progress:	0	
		Time Spent Printing	00:00:00		File Name:		
UTM#4		Print Time Left	00:00:00		Progress:	0	
		Time Spent Printing	00:00:00		File Name:		



Prototype Three



Monochromatic UI Colour Palette



Printer		Status	Time		Complete	Key Details	
RED	UTM#1	Operational	Print Time Left	00:00:00	Print Bed Is Free	Progress (%) :	0
			Time Spent Printing	00:00:00		File Name :	No File Uploaded
BLACK	UTM#2	Operational	Print Time Left	00:00:00	Print Bed Is Free	Progress (%) :	0
			Time Spent Printing	00:00:00		File Name :	No File Uploaded
PURPLE	UTM#3	Operational	Print Time Left	00:00:00	Print Bed Is Free	Progress (%) :	0
			Time Spent Printing	00:00:00		File Name :	No File Uploaded
BLUE	UTM#4	Operational	Print Time Left	00:00:00	Print Bed Is Free	Progress (%) :	0
			Time Spent Printing	00:00:00		File Name :	No File Uploaded
						Filament Left:	773.99 g
						Filament Left:	408.00 g
						Filament Left:	978.86 g
						Filament Left:	1000.00 g

Time Left
In Makerspace:

07:17:35

 **State**

State: **Operational**

File: **20mm-box.gcode**

Timelapse: -

Filament (Tool 0): **0.70m / 2.11g**

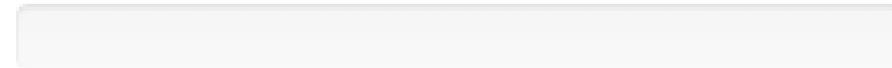
Approx. Total Print Time: **6 minutes**

Cost: **0.05 €**

Print Time: -

Print Time Left: -

Printed: - / **100.4KB**



 **Print**

 **Pause**

 **Cancel**

 **Filament Manager**

Tool 0

```
{
  "spools": [
    {
      "cost": 40.0,
      "id": 1,
      "name": "Spool 1 - Black",
      "profile": {
        "density": 1.25,
        "diameter": 1.75,
        "id": 1,
        "material": "PLA",
        "vendor": "Materio3D"
      },
      "temp_offset": 0,
      "used": 265.5547743560006,
      "weight": 1000.0
    }
  ]
}
```

```
url5 = "http://192.168.137.199/plugin/filamentmanager/spools"  
key5 = "B9DAC2A167DB4103A101C9336E5779E9"  
file5 = "C:/Users/Senthura/Desktop/Response Files for Printers/F#1.json"  
  
url6 = "http://192.168.137.199:5001/plugin/filamentmanager/spools"  
key6 = "2465E8A4F0E84DF98747E4E74BFDA051"  
file6 = "C:/Users/Senthura/Desktop/Response Files for Printers/F#2.json"
```

Filament Spools



☰ 10

Sort by: [Name \(ascending\)](#) | [Material \(ascending\)](#) | [Vendor \(ascending\)](#) | [Remaining \(descending\)](#)

Name	Material	Vendor	Weight	Remaining	Used	Action
Black	PLA	DasFilament	2600g	1682g	35%	
Green	PLA	DasFilament	800g	366g	54%	
Orange	PLA	GermanRepRap	750g	406g	46%	
White	PLA	DasFilament	800g	98g	88%	



Manage Profiles

Add Spool

Printer		Status	Time		Complete	Key Details	
RED	UTM#1	Cancelling	Print Time Left	00:00:00	Cancelling	Progress(%) :	0
			Time Spent Printing	00:00:00		File Name :	No File Uploaded
BLACK	UTM#2	Printer Is OFF	Print Time Left	00:00:00	Offline	Progress(%) :	0
			Time Spent Printing	00:00:00		File Name :	No File Uploaded
PURPLE	UTM#3	Printer Is OFF	Print Time Left	00:00:00	Offline	Progress(%) :	0
			Time Spent Printing	00:00:00		File Name :	No File Uploaded
BLUE	UTM#4	Finishing	Print Time Left	00:00:00		Progress(%) :	0
			Time Spent Printing	00:00:00		File Name :	No File Uploaded
						Filament Left :	721.26 g
						Filament Left :	366.42 g
						Filament Left :	950.90 g
						Filament Left :	956.73 g

Time Left
In Makerspace:

00:46:37

Printer		Status	Time		Complete	Key Details	
RED	UTM#1	Error	Print Time Left	00:00:00	Print Bed Is Free	Progress(%) :	0
			Time Spent Printing	00:00:00		File Name :	No File Uploaded
			Filament Left:	734.45 g			
BLACK	UTM#2	Pausing	Print Time Left	00:00:00	Print Bed Is Free	Progress(%) :	0
			Time Spent Printing	00:00:00		File Name :	No File Uploaded
			Filament Left:	403.77 g			
PURPLE	UTM#3	Paused	Print Time Left	00:00:00	Print Bed Is Free	Progress(%) :	0
			Time Spent Printing	00:00:00		File Name :	No File Uploaded
			Filament Left:	953.03 g			
BLUE	UTM#4	Detecting baudrate	Print Time Left	00:00:00	Offline	Progress(%) :	0
			Time Spent Printing	00:00:00		File Name :	No File Uploaded
			Filament Left:	966.37 g			
			Time Left In Makerspace:	00:00:00			

Printer		Status	Time		Complete	Key Details	
RED	UTM#1	Printing	Print Time Left	01:01:06	Printing	Progress (%) :	 49
			Time Spent Printing	01:03:05		File Name :	yoda.gcode
			Filament Left :	771.95 g			
BLACK	UTM#2	Heating Up	Print Time Left	00:00:00	Print Bed Is Free	Progress (%) :	0
			Time Spent Printing	00:00:00		File Name :	vader_cup_v03.gcode
			Filament Left :	404.53 g			
PURPLE	UTM#3	Printing	Print Time Left	01:17:04	Printing	Progress (%) :	 34
			Time Spent Printing	00:46:30		File Name :	yoda.gcode
			Filament Left :	978.86 g			
BLUE	UTM#4	Operational	Print Time Left	00:00:00	Print Is Complete	Progress (%) :	 100
			Time Spent Printing	01:02:25		File Name :	Vader.gcode
			Filament Left :	992.41 g			

Time Left In Makerspace: **04:49:38**



Future Work



Test with more printers.



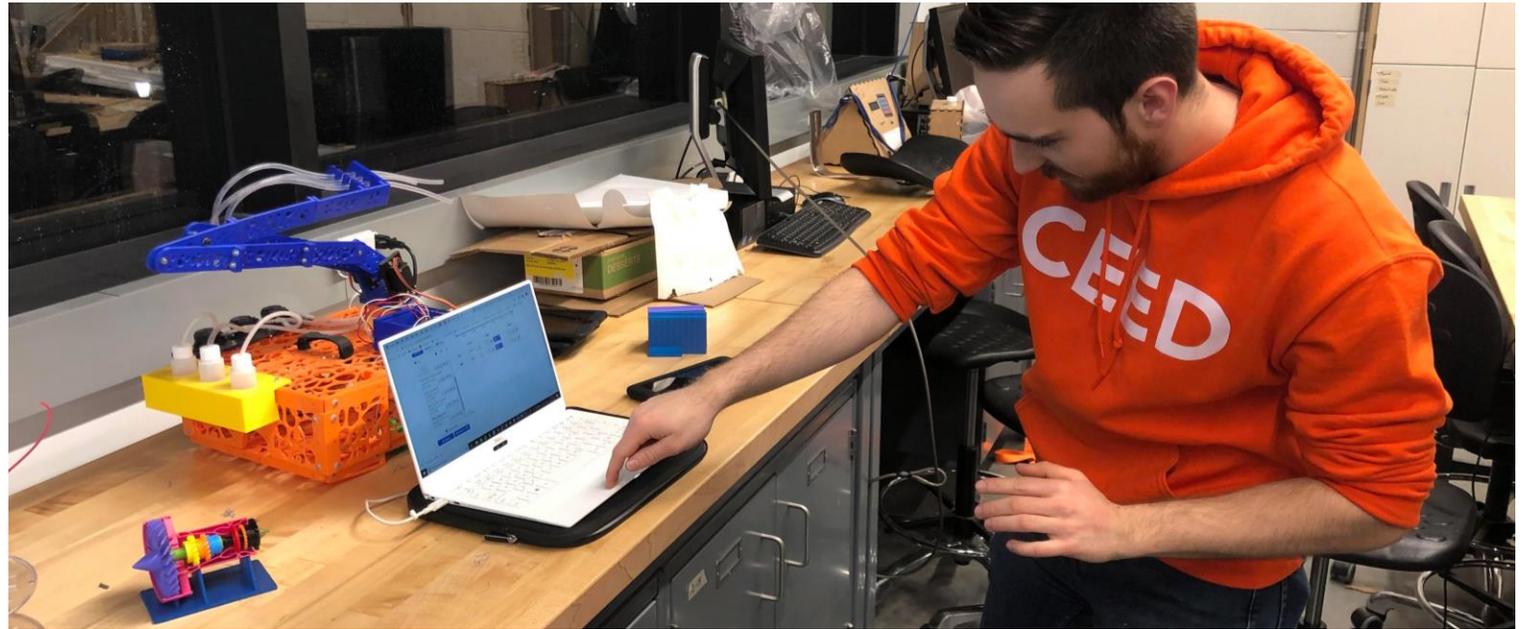
Test with multiple Raspberry Pi's



Project the UI onto a webpage



Implement a notification system



More User Tests

Lessons Learned

01

Start Early

02

Designate Tasks
Accordingly

03

Ensure reasonable
fidelity in projects

Thank You

