technotes Documentation

Release 1

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ONE

KID'S ACTIVITIES

1.1 Minecraft Pi Edition

1.1.1 Basic commands

W	move forward
S	move backward
A	move left
D	move right
E	show inventory of blocks
1-8	select items in the quick bar
Space / Ctrl + Space	jump (ascend in fly-mode)
Shift / Ctrl + Shift	sneak (descend in fly-mode)
ESC	pause / menu
left mouse	destroy blocks
right mouse	place blocks
double **Space**	fly / fall
Tab	release mouse

1.1.2 List of python programs

Short-cuts

Ctrl + S	save
F5	run

Display the player's position

```python
from mcpi import minecraft

mc = minecraft.Minecraft.create()

x,y,z = mc.player.getTilePos()
mc.postToChat("x="+str(x)+", y="+str(y)+", z="+str(z))
```

Teleport (change the player's position)

In the following program, the player will be teleported 100 higher.

```
1  from mcpi import minecraft
2
3  mc = minecraft.Minecraft.create()
4
5  x,y,z = mc.player.getTilePos()
6  mc.player.setPos(x,y+100,z)
```

Build a huge block of activated TNTs

When you click one TNT, there will be an explosion around that block of TNTs.

```
1  from mcpi import minecraft
2
3  mc = minecraft.Minecraft.create()
4
5  x,y,z = mc.player.getTilePos()
6
7  tnt = 46
8  activated = 1
9  mc.setBlocks(x+1,y+1,z+1,x+5,y+5,z+5,tnt,activated)
```

Put a flower on the path

We will leave a flower when we are on a block of grass. Otherwise we will change the beneath block to a grass block.

```
1   from mcpi import minecraft
2   from time import sleep
3
4   mc = minecraft.Minecraft.create()
5
6   grass = 2
7   flower = 38
8   while True:
9       x,y,z = mc.player.getTilePos()
10      block_beneath = mc.getBlock(x,y-1,z)
11      if block_beneath == grass:
12          mc.setBlock(x,y,z,flower)
13      else:
14          mc.setBlock(x,y-1,z,grass)
15      sleep(0.1)
```

1.2 Pygame

1.2.1 List of pygame programs

Draw a circle

```
1  import pygame
2
3  width,height = 640,480
4  radius = 100
5  fill = 1
```

```
6
7   pygame.init()
8   window = pygame.display.set_mode((width,height))
9   window.fill(pygame.Color(255,255,255)) # white
10
11  while True:
12      pygame.draw.circle(window,
13                          pygame.Color(255,0,0), # red
14                          (width/2,height/2),
15                          radius,
16                          fill)
17      pygame.display.update()
18      if pygame.QUIT in [e.type for e in pygame.event.get()]:
19          break
```

Draw circles based on mouse move / position

```
1   import pygame
2   from pygame.locals import *
3
4   width,height = 640,640
5   radius = 0
6   fill = 1
7   mouseX,mouseY = 0,0
8
9   pygame.init()
10  window = pygame.display.set_mode((width,height))
11  window.fill(pygame.Color(255,255,255)) # white
12  fps = pygame.time.Clock() # FPS = Frame Per Second
13
14  while True:  # one frame per loop
15      for event in pygame.event.get():
16          if event.type == MOUSEMOTION:
17              mouseX,mouseY = event.pos
18          if event.type == MOUSEBUTTONDOWN: # mouse click
19              window.fill(pygame.Color(255,255,255)) # clear screen
20          radius = (abs(width/2 - mouseX) + abs(height/2 - mouseY))/2 + 1
21          pygame.draw.circle(window,
22                              pygame.Color(255,0,0), # red
23                              (mouseX,mouseY),
24                              radius,
25                              fill)
26      pygame.display.update()
27      if pygame.QUIT in [e.type for e in pygame.event.get()]:
28          break
29      fps.tick(30) # wait so that frame rate is 30 fps
```

1.3 Scratch

HARDWARE

2.1 Raspberry Pi

2.1.1 Default settings

login	**pi**
password	**raspberry**
hostname	**raspberrypi**
keyboard	UK

2.1.2 Basic commands

Config

```
$ sudo raspi-config
```

Start X server

```
$ startx
```

Reboot

```
$ sudo reboot
```

Shutdown

```
$ sudo shutdown -h now
```

Change datetime

```
$ sudo date --set="Sun Nov 18 1:55:16 EDT 2012"
```

Update

```
$ sudo apt-get update
$ sudo apt-get upgrade
```

2.1.3 Information

Check OS version

```
$ cat /proc/version
```

Check board version

```
$ cat /proc/cpuinfo
```

Display network interface and associated IP addresses

```
$ ifconfig
```

2.1.4 Short-cuts

Ctrl + C	kill currently running program
Ctrl + D	exit shell
Ctrl + A	move cursor to the beginning of the line
Ctrl + E	move cursor to the end of the line
Ctrl + Alt + Backspace	[optional] terminate the X server

2.1.5 Setup Keyboard

The default keyboard is UK. Let's change it to AU keyboard.

The trick is that Australia is not listed in the country list for the keyboard, we need to setup a US keyboard instead.

Change the keyboard config

```
$ sudo vi /etc/default/keyboard
```

```
XKBMODEL ="pc105"
XKBLAYOUT="us"
XKBVARIANT=""
XKBOPTIONS=""


BACKSPACE="guess"
```

Then run the following commands and reboot

```
$ sudo setxkbmap -layout us
$ sudo udevadm trigger --subsysstem-match=input --action=change
```

2.1.6 Utilities / Softwares

raspi-config tool

```
$ sudo apt-get install raspi-config
```

Minecraft

```
$ sudo apt-get install minecraft-pi
```

Screenshot : scrot

```
$ sudo apt-get install scrot
```

Mercurial

```
$ sudo apt-get install mercurial
```

2.2 Arduino

SYSTEM

3.1 Linux

3.2 Windows

3.2.1 Connect to Internet via Ethernet cable (from PC/laptop)

Control Panel –> **Network and Internet** –> **Network Connections**

Ctrl + select local and wireless connections, right click **Bridge Connections**

FOUR

PROGRAMMING LANGUAGE

4.1 Python