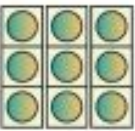# ASTRO PI

Python 3 Cheatsheet

To add **Astro Pi** functionality to your python programs add the following lines to import the library for the Sense HAT library:

```python
from sense_hat import SenseHat

sense = SenseHat()
```

From that point forwards you can use any of the set of functions from the Sense HAT Library.

LED Matrix		
	`sense.set_pixel(0, 0, 255, 0, 0)`	Sets the top left LED to the colour red.
	`sense.show_letter("J", 0, 0, 255)`	Displays the letter "J" on the screen in blue.
	`sense.show_message("msg", scroll_speed=.1, text_colour=[0, 255, 0])`	Displays the message "msg" on the matrix in green.
	`sense.load_image( "creeper.png", redraw=True)`	Load an 8x8 image (in this case "creeper.png") file from the system and display it on the matrix.
	`sense.clear()`	Clears the LED and switches them all off.
	`sense.set_rotation(r=0)`	Sets the rotation of the LED matrix.
	`sense.set_pixels(pixelList)`	Uses the pixel list provided to draw a picture, the pixelList is a list of [R,G,B] values in a list.

Movement		

	`angles = sense.get_orientation_degrees()`
	`pitch = angles.get("pitch")`
	`roll = angles.get("roll")`
	`yaw = angles.get("yaw")`
		Finds out the current orientation of the Astro Pi board and stores it as a structure called "angles". We can then find out the individual values of pitch, roll and yaw.

	`heading = sense.get_compass() + 180`	FInds out the current compass orientation of the board and returns the angle of north.

Plotting Pixels	Rotating letter "J"

Plotting Pixels:

```python
import time
from sense_hat import SenseHat

sense = SenseHat()

r = (255,0,0)
g = (0,255,0)
b = (0,0,255)

pic = [
r,r,r,r,r,r,r,r,
g,g,g,g,g,g,g,g,
b,b,b,b,b,b,b,b,
r,r,r,r,r,r,r,r,
g,g,g,g,g,g,g,g,
b,b,b,b,b,b,b,b,
r,r,r,r,r,r,r,r,
g,g,g,g,g,g,g,g
]

sense.set_pixels(pic)
```

Rotating letter "J":

```python
import time
from sense_hat import SenseHat

sense = SenseHat()

purple = (255, 0, 255)
sense.show_letter("J", purple)

while True:
        angles = sense.get_orientation_degrees()

        pitch = int(angles.get("pitch"))
        roll = (angles.get("roll"))

        if 45 <= pitch < 135 and 45 <= roll < 135:
                sense.set_rotation(r=90)
                print ("left")
        elif -135 <= pitch < -45 and 45 <= roll < 135:
                sense.set_rotation(r=270)
                print ("right")
        elif -45 <= pitch < 45 and 45 <= roll < 135:
                sense.set_rotation(r=0)
                print ("up")
        elif -45 <= pitch < 45 and -135 <= roll < -45:
                sense.set_rotation(r=180)
                print ("down")

        time.sleep(0.1)
```