Lab 04 – Python / SenseHat (1)

The python programming language is used quite extensively for the Raspberry Pi. There are many python packages to support interfacing, etc. on the RPI, and python is therefore a good language for pilot implementations on the RPI.

You may develop your programs on whatever platform you prefer, and then transfer the files to the RPI. The RPI already have python installed (both v2 and v3).

The python interpreter can be found at:

- https://www.python.org/downloads/
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The **Wing IDE 101** is a decent multi-platform IDE (You may use whatever IDE you want).

- https://wingware.com/downloads/wingide-101

Even the (multi-platform) simple IDLE (standard python editor) is usable for our projects, and IDLE is also found on Raspbian.

Python comes in two main flavors:

- Python 2
- Python 3

We shall use Python 3 (which seems to be 3.5x on Raspbian stretch).

There are many python books and tutorials freely available on the internet. These

1. https://docs.python.org/3/ (with Tutorial)
2. https://wiki.python.org/moin/BeginnersGuide/Programmers
3. http://www.davekuhlman.org/python_book_01.pdf
4. https://www.tutorialspoint.com/python3/python3_tutorial.pdf

The two first are generic sources/tutorials, while the two last references are for complete books.

You don't need to be an expert, but some python will be required.

You may want to edit files on your laptop, and then transfer those to the RPI. Using WinSCP is a nice solution (on windows).

Exercise

A) Checking that everything works

You may need to enable **IDLE** in the menus. Go to the Main Menu Editor, and enable **IDLE** for **Python 3** in the Programming options.

1. Start a shell and enter **python3**
    a. This starts the interactive shell (so-called REPL – Read Evaluate Print Loop)
    b. You can exit the interpreter by means of the **exit()** function.
2. Load the **BirthdayParadox.py** file in the **IDLE** editor
3. Run the file. A python shell should appear.
4. In a terminal/shell window:

```
python3 BirthdayParadox.py
```

B) Graphical Hello World

In the IDLE editor:

```
# Hello DAT235 with Tkinter
from tkinter import *

root = Tk()     #     handle for the window
Label(root, text="Hello DAT235").pack()
Root.mainloop()
```

When you run this small program, a Tkinter window should appear.

Beware: The "" may need to be reformatted if you do a copy-paste.

C) SenseHat Hello World

Find the "SenseHat emu" pdf file.

Also: https://pythonhosted.org/sense-hat/api/

"HelloWorld_SenseHat.py"

Download it to the RPI.

Run it in IDLE or run it in a shell (`$python3 HelloWorld_SenseHat.py`)

D) SenseHat – temperature and humidity

Check out the “humidity_and_temperture.py” file.

Modify it so that it also prints out the current temperature to the SenseHat.