Week 1

Theory

1. Convert the following decimal numbers into binary and hexidecimal:

    - 14
    - 63
    - 255
    - 300

2. Convert the following binary numbers into and decimal and hexidecimal:

    - 00101000
    - 10111010
    - 01100110

3. Add the following numbers in binary (show your working and carry-bits)

    - 00101000 + 10110010
    - 01101011 + 00110001
    - 10101011 + 10110001 (notice what happens).

4. Write the following hexidecimal as binary and as decimal:

- 01
- 0B
- 66
- C5
- FF

Digital Circuits

Python

1. What are the types of the following (use the 'type()' function):

    - 6
    - 6+8
    - 3*2
    - 4.3
    - 6 + 4.3
    - [3,4,5]
    - [3,4,5] + [2,3]

- “Hello”
- “Hello” + " world"

2. Given the list of floats:

   ```
   heights = [1.82, 1.70, 1.68, 1.85, 1.78, 1.58]
   ```

   write a for-loop that

   ```
   i. adds all the numbers up
   ii. finds the mean
   ```

3. Given a list that contains 8 ’0’s and ’1’s, for example:

   ```
   bits = [0,1,1,0, 0,0,1,0]
   ```

   write code that turns this into a decimal number and print it out.

4. (Harder) You can join 2 strings with ‘+’, for example:

   ```
   mystring = "Hello" + " " + "world"
   ```

   given a list of strings

   ```
   list_of_strs = ["Alpha","Beta","Gamma","Delta"]
   ```

   use a loop to turn this into a single string:

   ```
   "Alpha - Beta - Gamma - Delta"
   ```

Linux

There are lots of excellent programs for linux. Try installing the following (sudo apt-get install XX):

```
inkscape
chromium-browser
frozen-bubble
```

Once they are installed, you can either run them from the commandline-or find them on the start menu.