

## Week 1

### Theory

1. Convert the following decimal numbers into binary and hexadecimal:
  - 14
  - 63
  - 255
  - 300
2. Convert the following binary numbers into decimal and hexadecimal:
  - 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 hexadecimal 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

- adds all the numbers up
- 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.

## Week 2

### Types & Operators in Python

What is the resulting type of the following operations on types? (Note, that not all of them are valid!)

- $int + int \Rightarrow$
- $int - int \Rightarrow$
- $int * int \Rightarrow$
- $int / int \Rightarrow$
  
- $float + float \Rightarrow$
- $float - float \Rightarrow$
- $float * float \Rightarrow$
- $float / float \Rightarrow$
  
- $float + int \Rightarrow$
- $float - int \Rightarrow$
- $float * int \Rightarrow$
- $float / int \Rightarrow$
  
- $int + float \Rightarrow$
- $int - float \Rightarrow$
- $int * float \Rightarrow$
- $int / float \Rightarrow$
  
- $string + string \Rightarrow$
- $string - string \Rightarrow$
- $string * string \Rightarrow$
- $string / string \Rightarrow$
  
- $string + int \Rightarrow$
- $string - int \Rightarrow$
- $string * int \Rightarrow$
- $string / int \Rightarrow$
  
- $list + list \Rightarrow$
- $list - list \Rightarrow$
- $list * list \Rightarrow$
- $list / list \Rightarrow$

- $list * int \Rightarrow$
- $int * list \Rightarrow$
- $list * float \Rightarrow$
- $string * int \Rightarrow$