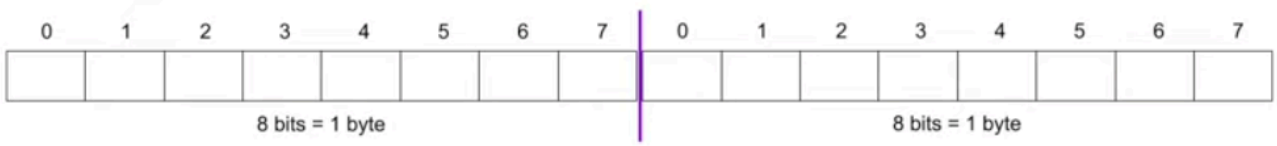
- -> notebooks from this lecture: https://github.com/ine-rmotr-curriculum/freecodecamp-intro-to-numpy
- ***NumPy <- a Python library for data processing***
  - -> 20 years old <- this is considered old for a Python library
  - -> it's a library
  - -> numeric computing -> it's to calculate things with numbers
  - -> it has a limited scope
  - -> processing large amounts of data
  - -> Python is not the best language for efficiency when it comes to processing large amounts of data
  - -> but numpy is efficient for this
  - -> it's not as popular, but it's important
- ***-> numpty tutorial outline***
  - ***-> a detailed low level explanation***
    - bite sizes
    - why numpy is used
    - why you need a low level optimised tool
    - a low level optimisation
  - -> then a more complex explanation
- ***-> why numpy is important***



RAM

8 GB =
8192 MB =
8,388,608 KB =
8,589,934,592 B(bytes) =
68,719,476,736 b(bits)

D	B
0	0
1	1
2	10
3	11
4	100
5	101
6	110
7	111
8	1000

  - -> computers can only process 1's and 0's
  - -> RAM <- Random Access Memory
  - -> the hard drive stores long term data -> but to process it, it has to be loaded into the RAM of the computer first
  - -> this translates into the number of bits which the computer can store
  - -> the objective is to explain how we can use less memory for the same data -> efficiency
  - -> optimising the least amount of memory use for a problem
  - -> we have a series of 1's and 0's
  - -> any decimal number needs to be stored in a binary format
  - -> we are working in powers of 2
  - -> to work out the number of decimal numbers that can be stored in n bits
  - -> the number of decimal numbers that can be stored
  - -> in this example, we can store up to 7 numbers
  - -> you can go from 0 up to 1, 1
  - -> 2^n <- n bits, 2^n numbers can be stored with this
- ***-> question***

- ***Why is Numpy an important, but unpopular Python library?***
  - Often you won't work directly with Numpy. <- This one - you can't see the actual data (all of it) you are working with - but you can see summary statistics which are printed out as a result of this
  - It is extremely slow.
  - Working with Numpy is difficult.