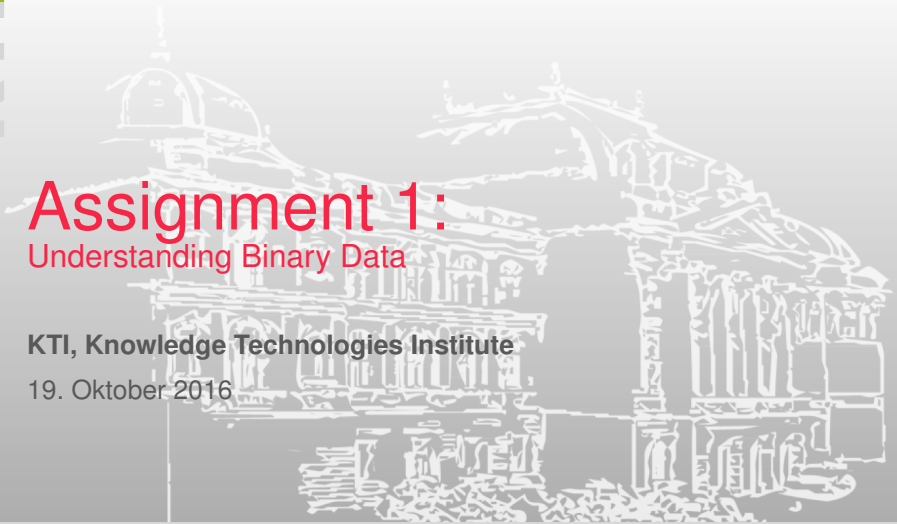


Assignment 1:
Understanding Binary Data

KTI, Knowledge Technologies Institute

19. Oktober 2016

Binary Data

- Data stored as Bits (0 , 1)
- Machine readable
- Lowest abstraction layer

```
01000010010011010010011
00100110000010000000000
00000000000000000000000
00000000001101100000000
...
```

Bits, Bytes and Words

Problem: We can't express a value using a single bit

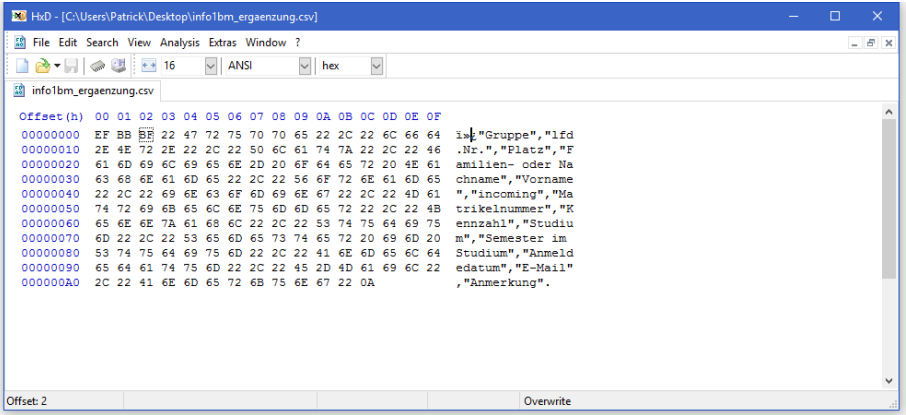
Solution: Group individual bits together

- by 8: byte
- 16, 32, or 64 bits: word (+ other sizes)

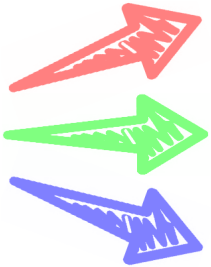
Example:

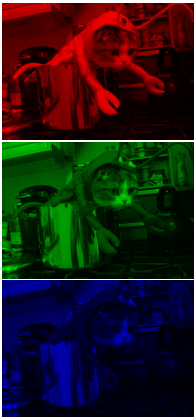
- 1 text character = 1 byte (2^8 values)
- "A" = 0100 0001(bin) = 41(hex)

Hex View of a CSV Document



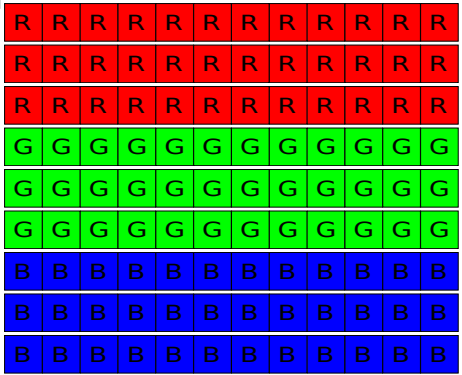
Storing Data



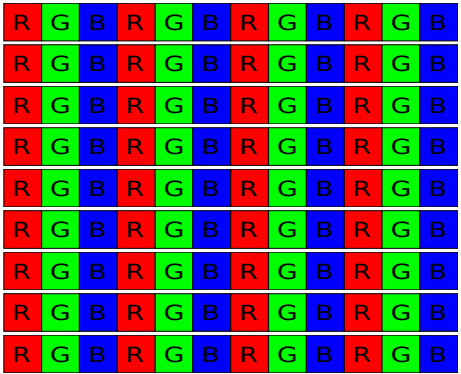


Storing Data – Sequential or Parallel

Sequential



Parallel



Why do we need this?

1. Sensor data is often stored that way
2. Biomedical data is usually such sensor data
3. You will have to read such a file for Assignment 1

Assignment Overview

- Load (open) source file
- Read data
- Store in better readable data-structure (provided!)
- Dump as pickle 
- Test your program
- Upload to the Palme