CPSC 231 - Lab

BASE REPRESENTATIONS

What is a String?

A sequence of chars

What is a char?

A datatype with size 1 byte

- Large enough to contain any ASCII or UTF-8 unit

What is a byte?

A unit of data that consists of 8 bits

What is a bits?

A binary digit – the basic unit of information

In computing

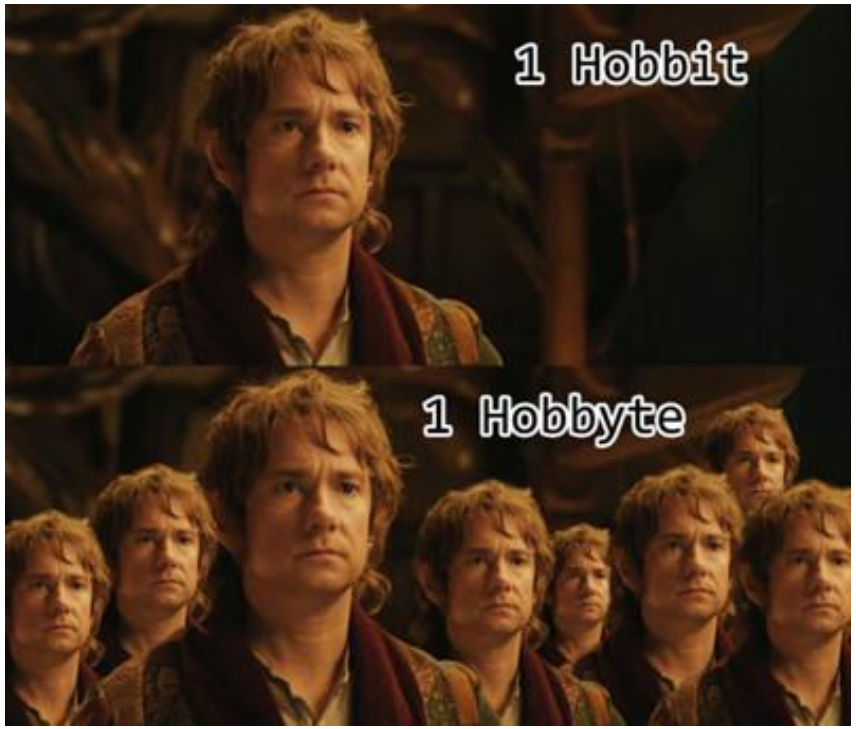


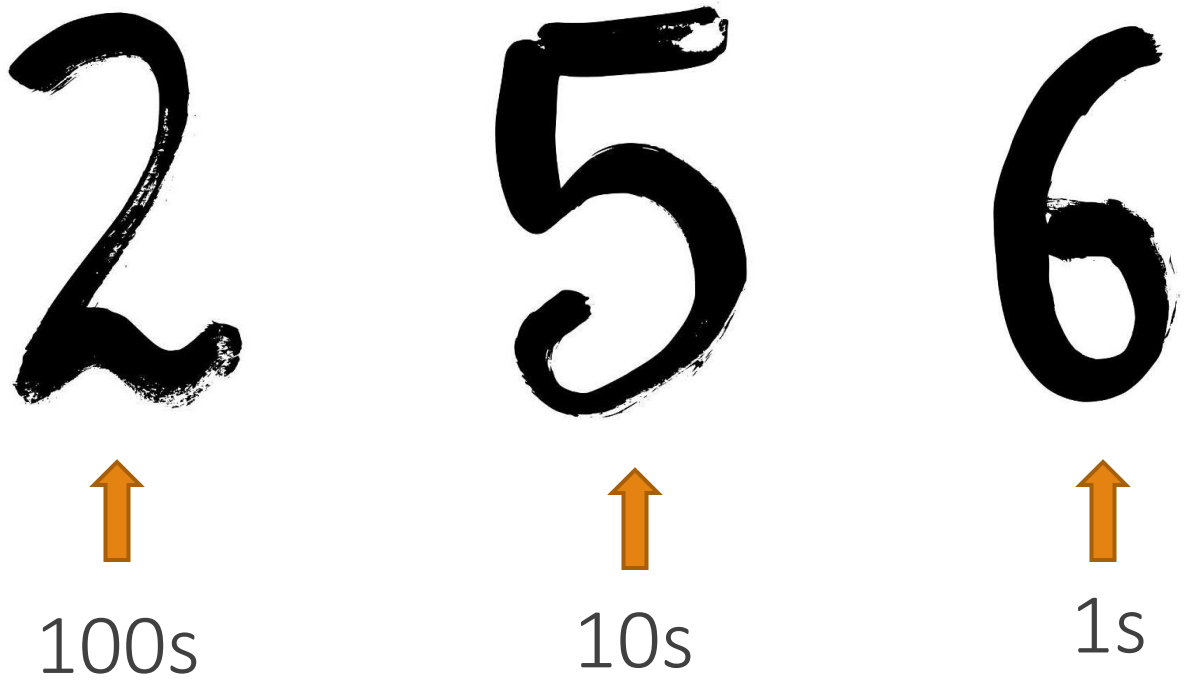
Image source: Comic.browserling.com

What is a binary?

A positional number system that uses a base Of 2

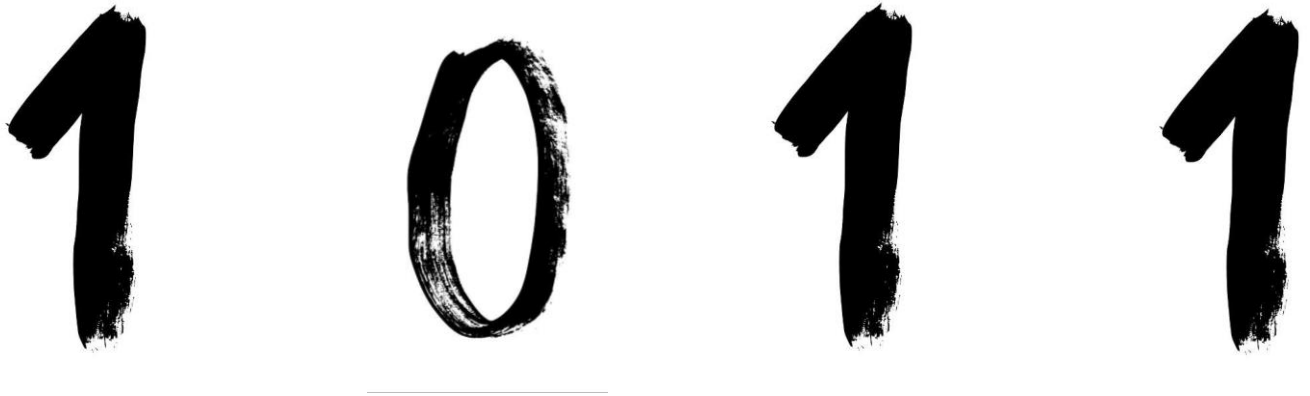
Image source: Comic.browserling.com

A decimal number {0,1,2,3,4,5,6,7,8,9}



$$2\times100 + 5\times10 + 6\times1 = 256$$

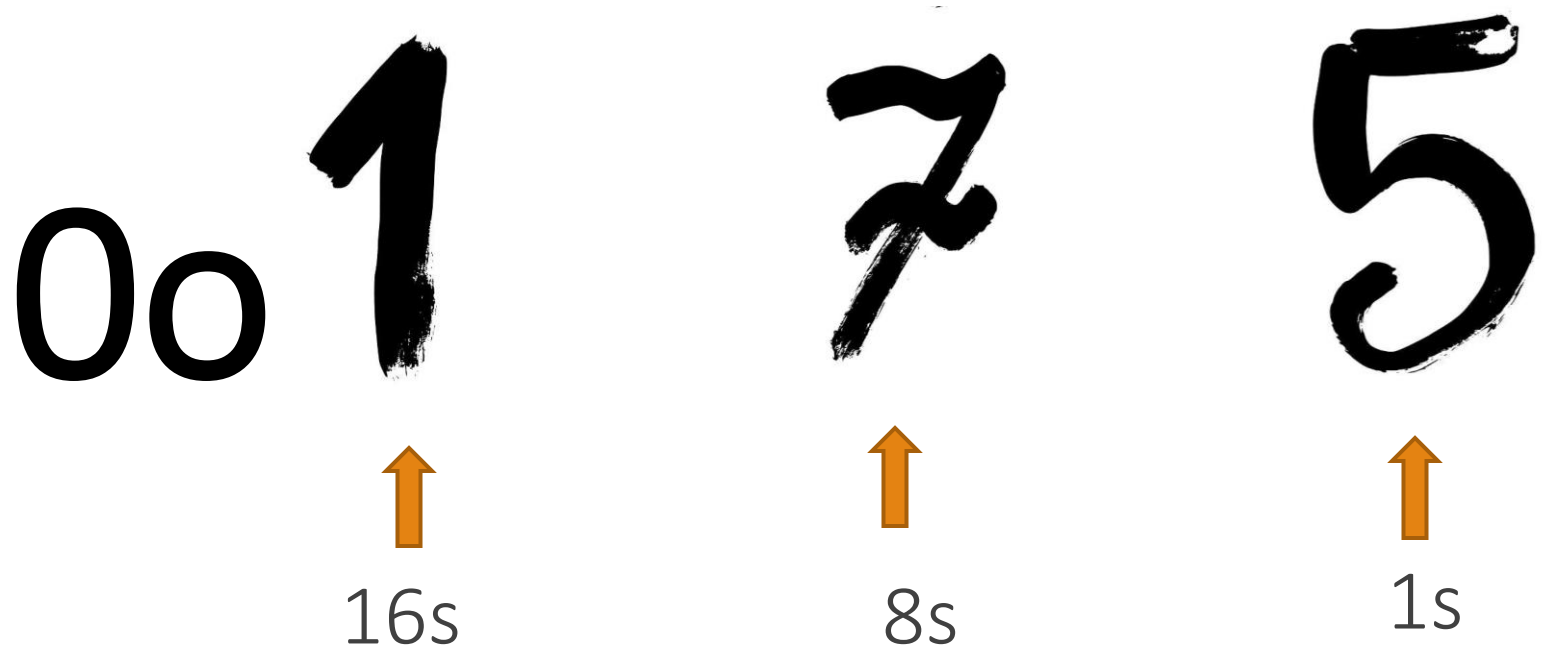
A decimal number {0,1}

0b 

8s 4s 2s 1s

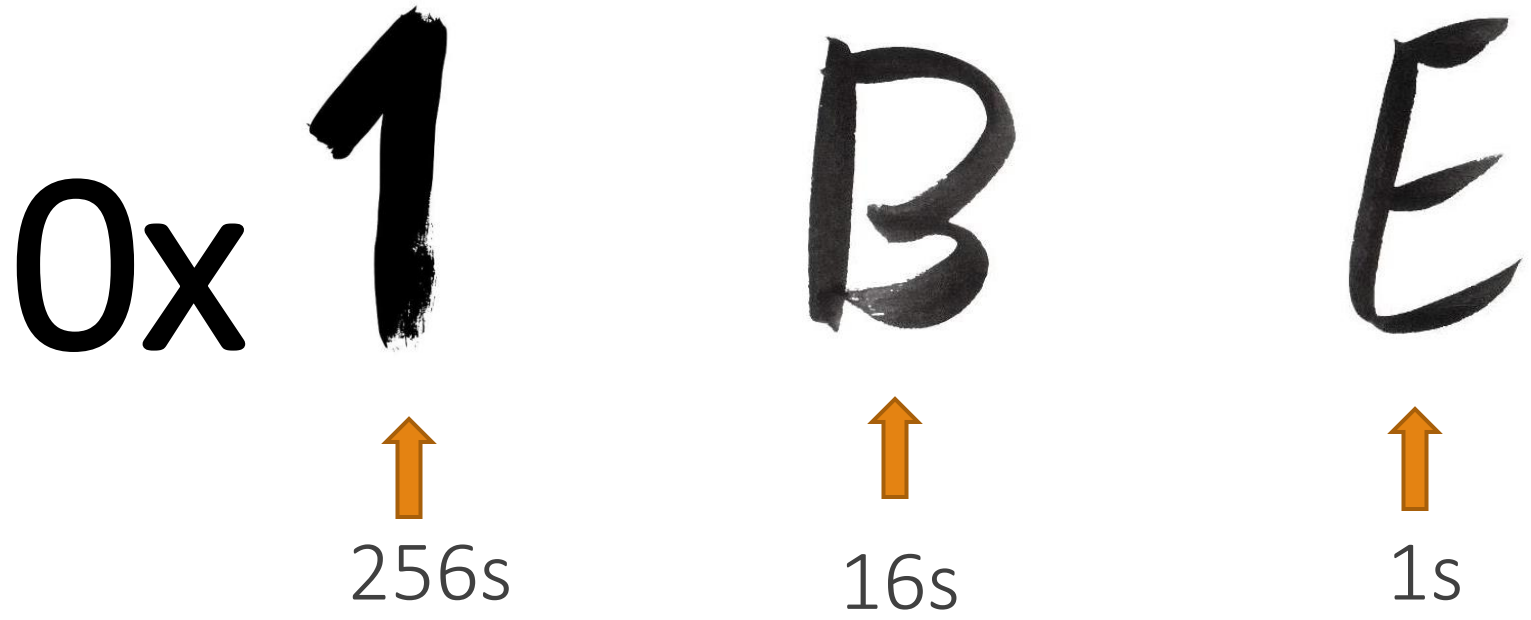
$$2\times2^3+ 5\times2^2+ 6\times2^1 + 1\times2^0 = 256$$

An Octal number {0,1,2,3,4,5,6,7}



$1\times8^2+ 7\times8^1+ 5\times2^0 = 77$

A Hexadecimal number {0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F}



$$1\times16^2+ 11\times16^1+ 14\times16^0 = 446$$

There are 11 types of people

01- Those who understand binary

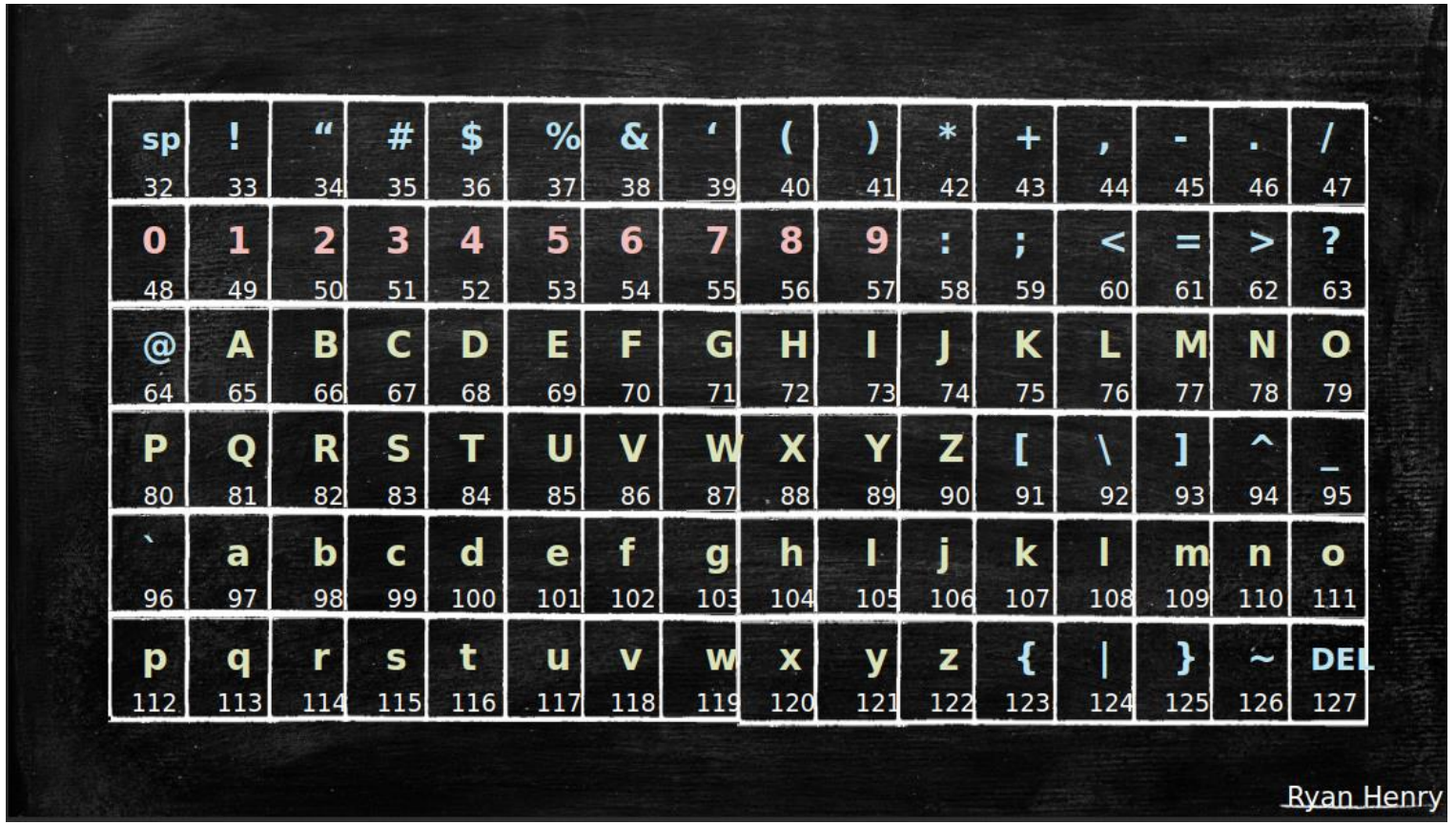
10- Those who don't

11- those who write bad jokes on binary

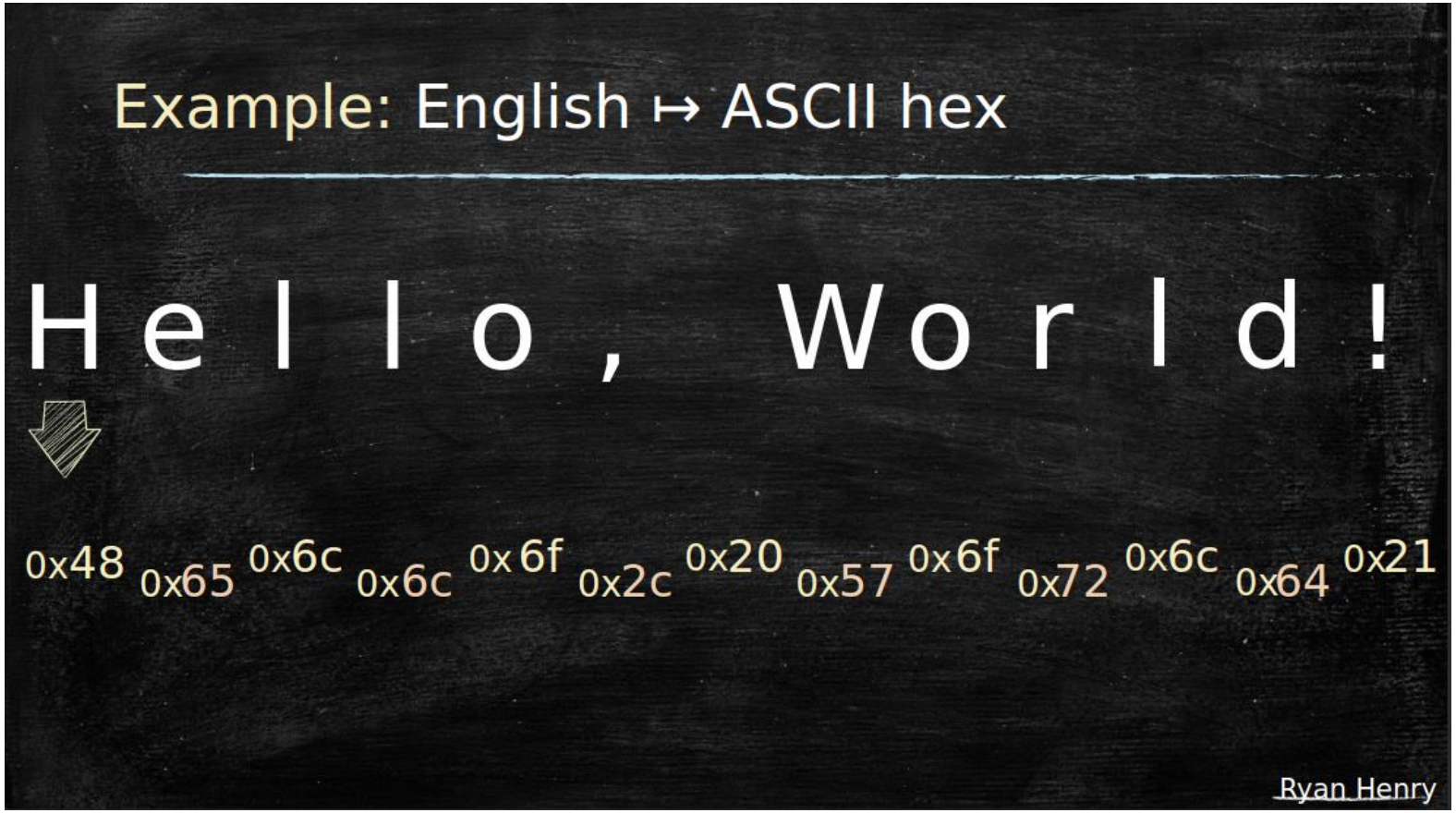
How to use base representation in python?

```
decimalNumber = 256

binaryNumber = 0b100010010

octalNumber = 0o407

hexadecimalNumber = 0x1a0
```

Ascii Table


sp 32 ! 33 " 34 # 35 $ 36 % 37 & 38 ' 39 (40) 41 * 42 + 43 , 44 - 45 . 46 / 47
0 48 1 49 2 50 3 51 4 52 5 53 6 54 7 55 8 56 9 57 : 58 ; 59 < 60 = 61 > 62 ? 63
@ 64 A 65 B 66 C 67 D 68 E 69 F 70 G 71 H 72 I 73 J 74 K 75 L 76 M 77 N 78 O 79
P 80 Q 81 R 82 S 83 T 84 U 85 V 86 W 87 X 88 Y 89 Z 90 [91 \ 92] 93 ^ 94 _ 95
` 96 a 97 b 98 c 99 d 100 e 101 f 102 g 103 h 104 i 105 j 106 k 107 l 108 m 109 n 110 o 111
p 112 q 113 r 114 s 115 t 116 u 117 v 118 w 119 x 120 y 121 z 122 { 123 | 124 } 125 ~ 126 DEL 127
Ryan Henry

Ascii Table


Example: English ↦ ASCII hex
H e l l o , W o r l d !
0x48 0x65 0x6c 0x6c 0x6f 0x2c 0x20 0x57 0x6f 0x72 0x6c 0x64 0x21
Ryan Henry