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The World of Languages
and Languages of the World

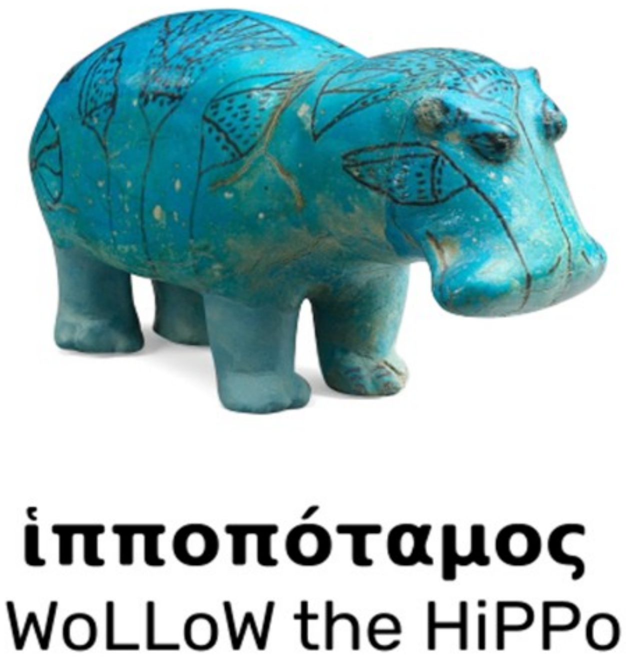
The Language of Computing

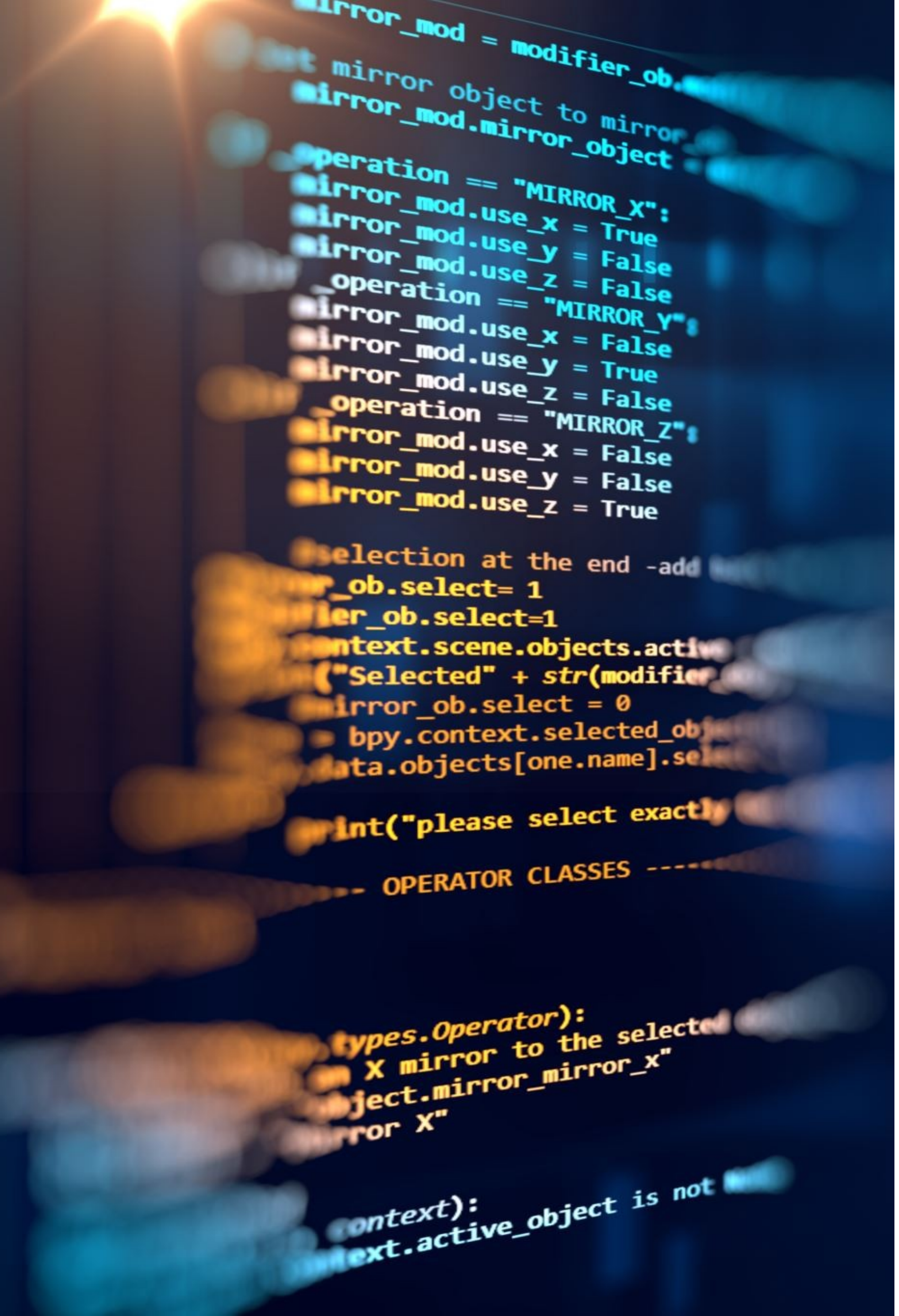
You guessed it: computing and coding are languages!

Objectives

- Today we will…

  - Consider computing and coding as a language
  - Look at how computers process instructions through binary code
  - Explore the keyboard
  - Crack some codes





Let's go! How much do you know?

- What do you know about computing and coding?
- Have you tried coding yourself at school or at home?
- Have you come across binary code?
- Is computing a language?

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Machine Language

All data is represented in one way in a computer – binary code!

Binary is a system of using 1s and 0s

Machine language for the "Hello":

01001000 01100101 01101100 01101100 01101111

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What is binary code?

- Computers use circuits and switches.

- These are either on or off.

- In Binary 1 = on and 0 = off

Bits, Bytes and the Alphabet

- 0 or 1 = 1 Binary Digit (bit)
- 8 Bits = 1 Byte = 1 letter of the alphabet
- Hello = 01001000 01100101 01101100 01101100 01101111

- Can you find the binary code for the letter o?
- What about the letter e?
- What else do you notice?

Bits, Bytes and Prefixes:

Match the term with the digital representation and the number word.

- Kilo (k)
- Mega (M)
- Giga (G)
- Tera (T)

- One billion
- One thousand
- One million
- One trillion

- 1,000,000
- 1,000,000,000,000
- 1,000,000,000
- 1,000

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So, what do these represent?

- 1000 Bytes = 1 ___________________
- 1000 Kilobytes = 1 ___________________
- 1000 Megabytes = 1 __________________
- 1000 Gigabytes = 1 ___________________

Gigabyte Terabyte Kilobyte Megabyte

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Converting Binary

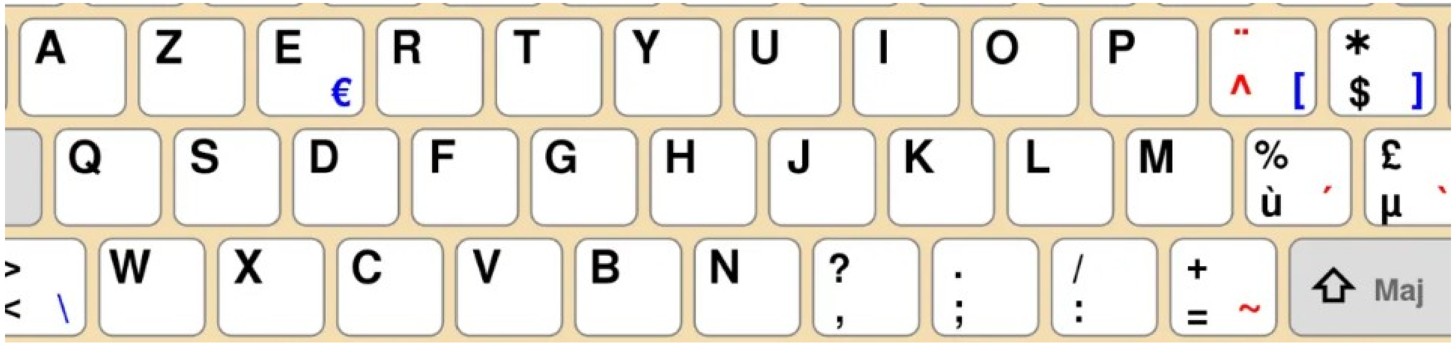
- You can convert binary to decimal and vice versa!
- You can convert binary to all the keys on your keyboard!

1. How many letters are on a keyboard?
2. How many numbers are on a keyboard?
3. What kind of special characters can you type?
4. Do keyboards change depending on the country you are in? **What changes?**

- The keys on our keyboard can be encoded as binary. This code is called the American Standard Code for Information Interchange (ASCII).

Keyboards

- On a standard British keyboard, we have 26 letters which can be written in upper and lower case. We have 20 numbers: 10 above the home row and 10 to the right.
- Some languages need additional characters. In German, for example, you need to be able to type ä ö ü ß, so the keyboard looks slightly different.
- In different countries, they may need a different currency sign.
- Some languages have a different script and so need different characters entirely.
- Letters are positioned differently depending on frequency of use in that language. Can you spot any differences from the keyboard you know to this section of a French keyboard?



Over to you!

01101100 01101001 01110110
01100101 01110010 01110000
01101111 01101111 01101100
00100000 01100110 01100011

01101000 01100001 01110110
01100101 00100000 01100110
01110101 01101110

In pairs, crack these two codes!

Write your name in binary code

Send a secret message (don’t make it too long!) to your partner in binary code. Can they decode it?

Use your worksheet to help you.

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A Final Thought...

Why do you think English is the main language of computing and technology?

Tell your parner three things you have learnt today.

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