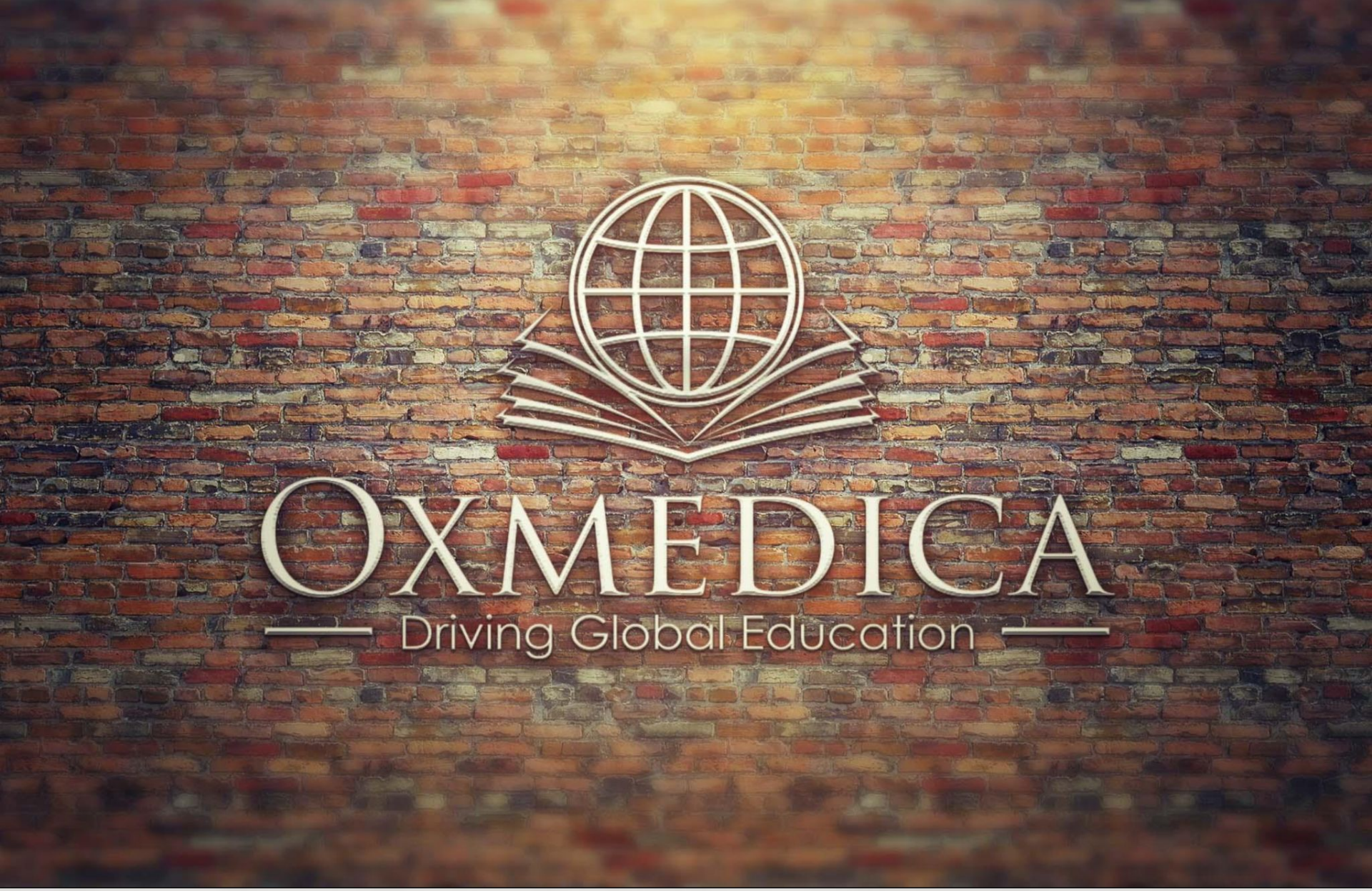

Introduction to Google Colab and Programming

What is programming?

- A tool to implement algorithms and software
- Critical to being good at AI
- But less important than understanding the maths behind the algorithms!

Programming languages

- R, C, C#, C++, Rust, Javascript, HTML, Python, bash, Swift…etc
- All of modern machine learning is done through **Python**
- We're going to learn some basic Python and try to implement some algorithms.

The key to learning Python

- **Time!** More time spent writing code, the better you'll become. Boring by true.
- **Projects!** It can be quite dull when you're learning but doing projects helps motivation.
- **Notes?** I find it helpful to make notes and use Notion to do this. Other people recommend just spending more time coding rather than making notes. Up to you.
    - If you make notes, you must make them yourself to truly benefit. There is zero benefit in using other people's notes!

Example Notes

Python

This page is slowly going to be a better version of the OneNote one

Python Details

- Versions
- .py files
- Jupyter Notebooks and Jupyter

Python Libraries

- Fundamentals
  - Base Python
  - pandas
  - NumPy

Example Notes

torch

▼ **Basic Methods**

Sum

```
.sum()

# Full version
torch.sum(input, dim, keepdim=False, *, dtype=None) → Tensor
```

- Returns the sum of all elements in the `input` tensor.
- Can sum along a given dimension (rather than the default which is summing for everything).
- Link
- Summing along dimension 0 → a row vector of the sum of the coumns
- Summing along dimension 1 → a column vector of the sums of the rows
- Might want to keepdims=True to keep it as a 2 dimensional Tensor

▼ **Generators**

Generators

```
.Generator()
```

- Creates and returns a generator object that manages the state of the algorithm which produces pseudo random numbers.
- Can set the random seed and use it in other PyTorch functions so that they do the same thing.

Find today's notebook and set up Google Colab

- Today's notebook is available at my website: www.harrymayne.com
- You'll need to use a Google account or set one up if you don't have one.
- **Organisation:** You're going to get slides and notebooks everyday. Think about creating folders for each week or day…etc