Large Language Models (LLMs):
Democratise AI with Low-Code/No-Code for Text, Images, and Audio

*Content generation and content analysis in 3 lines of python code*

Each exercise can be executed in 1 minute to 5 minutes using V100 GPU in Google Colab
Some of the exercises use LLMs from Google, Facebook, Microsoft and OpenAI and apply them to Biomedical, Built Environment, and e-Banking data (i.e. text, images, and sound)

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**Part 1: Prompting**
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**Low-Code AI using the Huggingface pipelines**
[ ex1 ] Text generation with instruction-trained models: zero-shot prompting (basic prompts)

**No-Code AI using the Huggingface pipelines (changing the prompt Not the code)**
[ ex2 ] Prompt engineering: zero-shot, few-shot, and Chain-of-Thought (CoT) prompting

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**Part 2: Low-Code AI using the Huggingface pipelines**
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[ ex3 ] Generative AI with Multimodal Large Language Models (LLMs): text to video
[ ex4 ] Generative AI with Multimodal Large Language Models (LLMs): text to image
[ ex5 ] Sequence of words: Predicting a "masked" word
[ ex6 ] Text Classification: zero-shot text classification
[ ex7 ] Text Classification: Sentiment Analysis (SA)
[ ex8 ] Token Classification: Named-entity recognition (NER)
[ ex9 ] Text feature extraction: text similarity (comparing two words or sentences)
[ ex10 ] Image Classification: zero-shot object detection
[ ex11 ] Image Classification: zero-shot or open vocabulary image classification
[ ex12 ] Image Classification: assigns a label to an image
[ ex13 ] Image feature extraction: image similarity (comparing two images)
[ ex14 ] Image segmentation: semantic (pixel-level), instance, and panoptic segmentation
[ ex15 ] Audio Classification: zero-shot audio classification
[ ex16 ] Audio Classification/Speech Recognition: Keyword Spotting (KWS); Language Identification (LID)
[ ex17 ] Automatic Speech Recognition (ASR): converts a speech signal to text
[ ex19 ] Audio generation: from generating speech (including singing) to generating music

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**Part 3: few lines of code without using the Huggingface pipelines**
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[ ex20 extra ] Text Similarity with embeddings: few lines of code
[ ex21 extra ] Audio generation with speaker's voice character: few lines of code
[ ex22 extra ] Audio generation with Massively Multilingual Speech models: few lines of code

Protein Amino Acid sequences instead of word sequences
[ ex23 extra ] Protein language models to predict amino acid sequences: few lines of code

Evaluation metrics to assess the performance of the models
[ ex24 extra ] Standard metrics (Accuracy, Precision, Recall, F1-score): few lines of code

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_A hands-on 101 Tutorial_ by M Arguello-Casteleiro (University of Southampton) and T Furmston (University of Manchester)