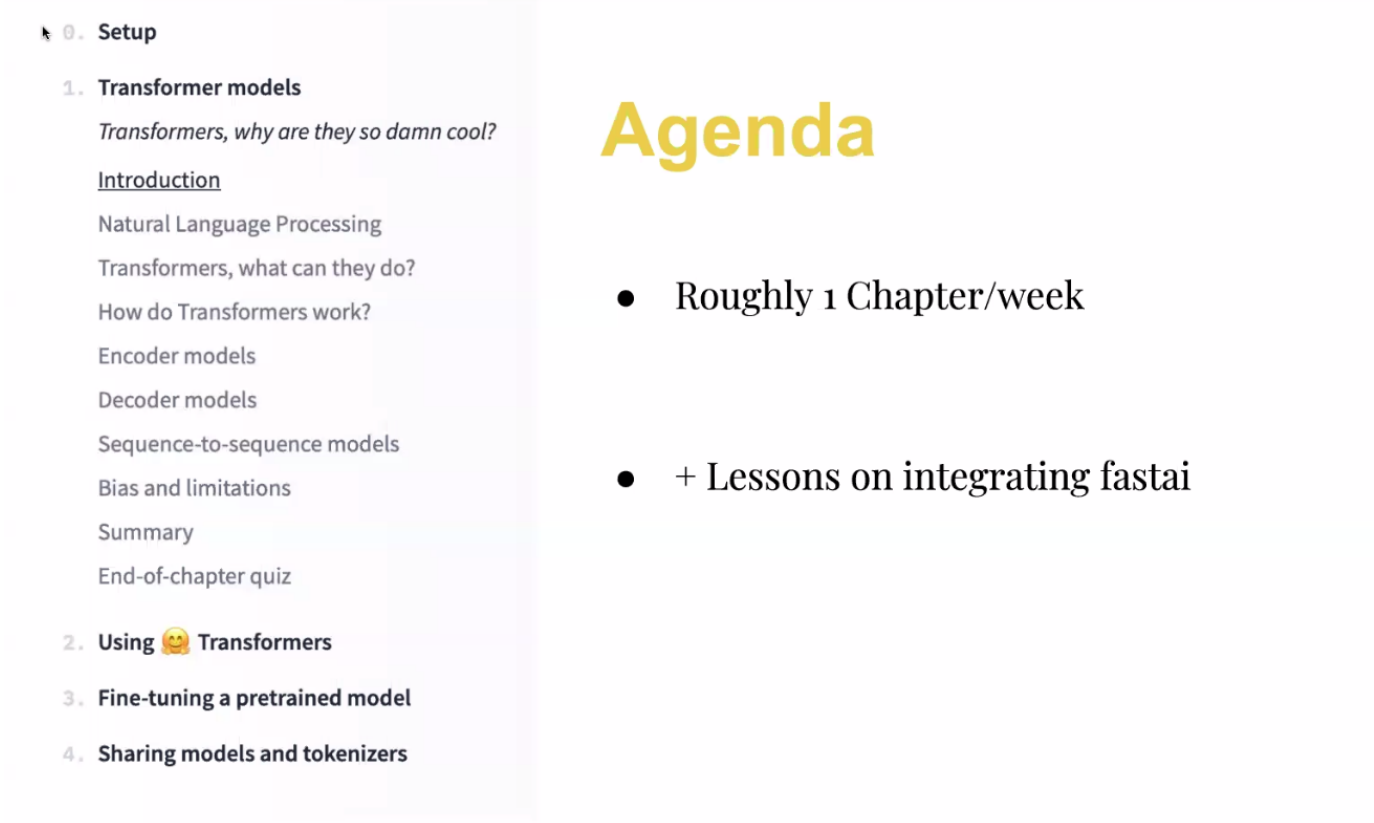
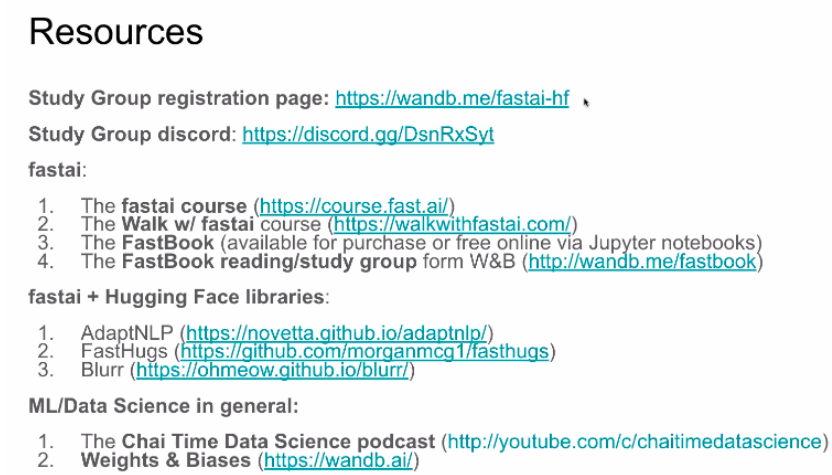


Session 1 :

- start looking section 0 and 1
- least FASTAI part how the transformer works ,what kind of NLP tasks it's suited for and how do they work
- burrify level api for doing prediction on huggingface
- Resources and homework (improving how the transformers work)

Resources :



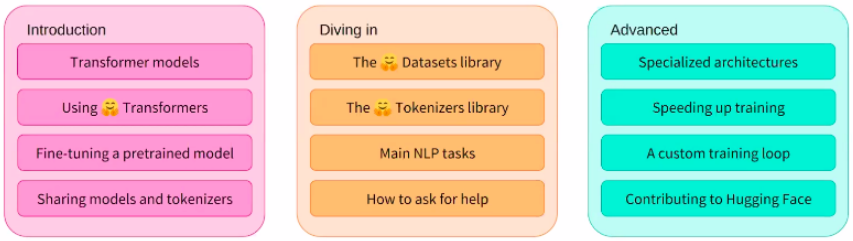
links willl be there in resources section

setting up a working environment

for installing transformers

```
pip install transformers[scentecepiece]
```

1. Transformer models: **Introduction**



What is NLP and general Info

What is it?

"NLP is a field of linguistics and machine learning focused on understanding everything related to human language."

What are some common NLP tasks?

1. **Sequence Classification**: Classify whole documents (sentiment, is/not spam, is/not grammatically correct, whether two sentences are logically related)
2. **Token Classification**: Classify individual words (grammatical category like noun, verb, adj.), NER like person, location, organization)
3. **Text Generation**: Complete a prompt with auto-generated text, fill in the blank, given a sentence in one language translate it into another, summarize a larger document
4. **Extractive Q&A**: Given a question and a context, extract the answer based on the information provided in the context

what is transfromer and what it can do ?

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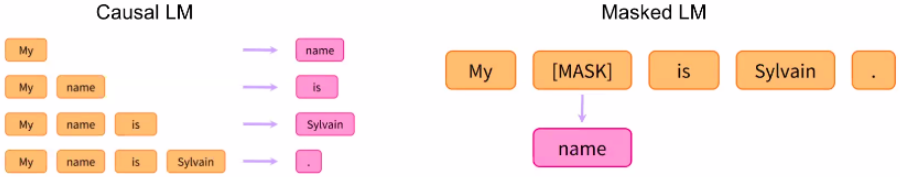
`note: while installing with pip you can pass -qq so that it won't give more clutter on screen`

`AutoTokenizer` : automatically infer the correct objects based on the model name or paths we are passing

`BertTokenizer` : use AutoTokenizer it's better cause it automatically detects what kind of problem you are working on

1. Transformer models: **How do Transformers work?**

"All the Transformer models mentioned above (GPT, BERT, BART, T5, etc.) have been *trained as* ***language models***."



To use these models for specific tasks (like NER, classification, summarization, etc…), we use **transfer learning** where the pre-trained language models are **fine-tuned** "in a supervised way" for the specific task

`encoder` transformers works through encoding the inputs and builds a representation , convert the text into the self attention as it's main component the output is high level representation of inputs

`decoeder` : generally focused on generating the output (generating higher level representation of what encoder is doing)

What is attention layer :

this will tell model to specific attentionn to certain words in the scentece which we've passed when dealing with the representation of each word

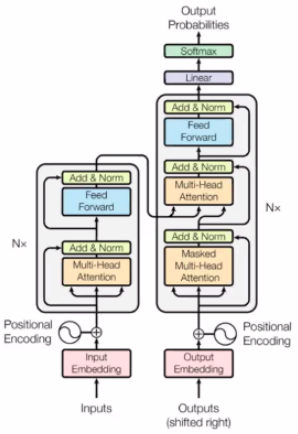
Architecture

1. Transformer models: **How do Transformers work?**

The original architecture

Attention Is All You Need
https://arxiv.org/abs/1706.03762

The Illustrated Transformer
https://jalammar.github.io/illustrated-transformer/



look at this : https://theaisummer.com/transformer/

Jay's blog on transformers : https://www.youtube.com/watch?v=-QH8fRhqFHM

Natural language understanding takss : Albert, bert ,destilbert ,etc
Decoder model : CTRL, GPT, Gpt-2 , Transfromer CL
Sequence to sequence model : here the input length is not equal to the output length
eg : BART/mBART,M2M100, MarianMT, Pergasus, PropetNet, T5/mT5

lot fo of the models are having some bias and limitations are mentioned on the website

read more papers slides are shared on email

Homework

Homework

1. Read the **Attention Is All You Need** paper (and Jay Alammar's *"The Illustrated Transformer"*)

2. Read the **BERT** paper (and Jay Alammar's *"The Illustrated BERT, ELMo, and co. (How NLP Cracked Transfer Learning)"*)

3. Get acquainted with one or more of the fastai Hugging Face libraries; see if you can build a basic classification model of some sort