

Machine translation: -

- For this project I have used prebuilt model by MARIAN (attached with transformer library) model to translate from one language to another.
- This model has created with six layers of autoencoder with more than 98% of efficiency, which provide amazing results with no change in semantic meaning of language.
- I have used two model first convert French into English and another convert Spanish into English.
- I have created function which automatically detect spoken language with the help of SPACY Language detection and give a result into English. If the customers speak another language except French, Spanish, and English then it will give SORRY message.
- The reasons behind choosing MARIAN (transformer) are, it gives high accuracy and less memory consumption as compared to self-made machine translation.
- Self-made autoencoder for machine translation could require ton of data, which will slow down the system and self-made autoencoder could be prone to errors.

MARIAN models: -

French to English: - "Helsinki-NLP/opus-mt-fr-en"

Link: - <https://huggingface.co/Helsinki-NLP/opus-mt-fr-en?text=Mon+nom+est+Wolfgang+et+je+vis+%C3%A0+Berlin>

Spanish to English: - "Helsinki-NLP/opus-mt-es-en"

Link: - <https://huggingface.co/Helsinki-NLP/opus-mt-es-en>

Memory Requirements: -

Usually, deep learning model requires at least 16 **GB of** RAM with powerful GPU. Most recent, NAVIDIA RTX 3090 is enough for any deep learning model or AI project with any complexity. Generally, project that acquire visual data such as video, graphics or sound require more storage. As, we are working with text data I believe following requirement could enough to run end to end model,

- GPU with lot of space (NAVIDIA GTX 1080 or equivalent could enough)
- Fast CPU such as intel i7
- RAM (16 GB)
- Having SSD is not mandatory but it will give cutting edge

References: -

<https://www.sabrepc.com/blog/Deep-Learning-and-AI/machine-learning-memory-requirements>

<https://huggingface.co/docs/transformers/main/en/index>

<https://pypi.org/project/scalene/0.9.16/>