

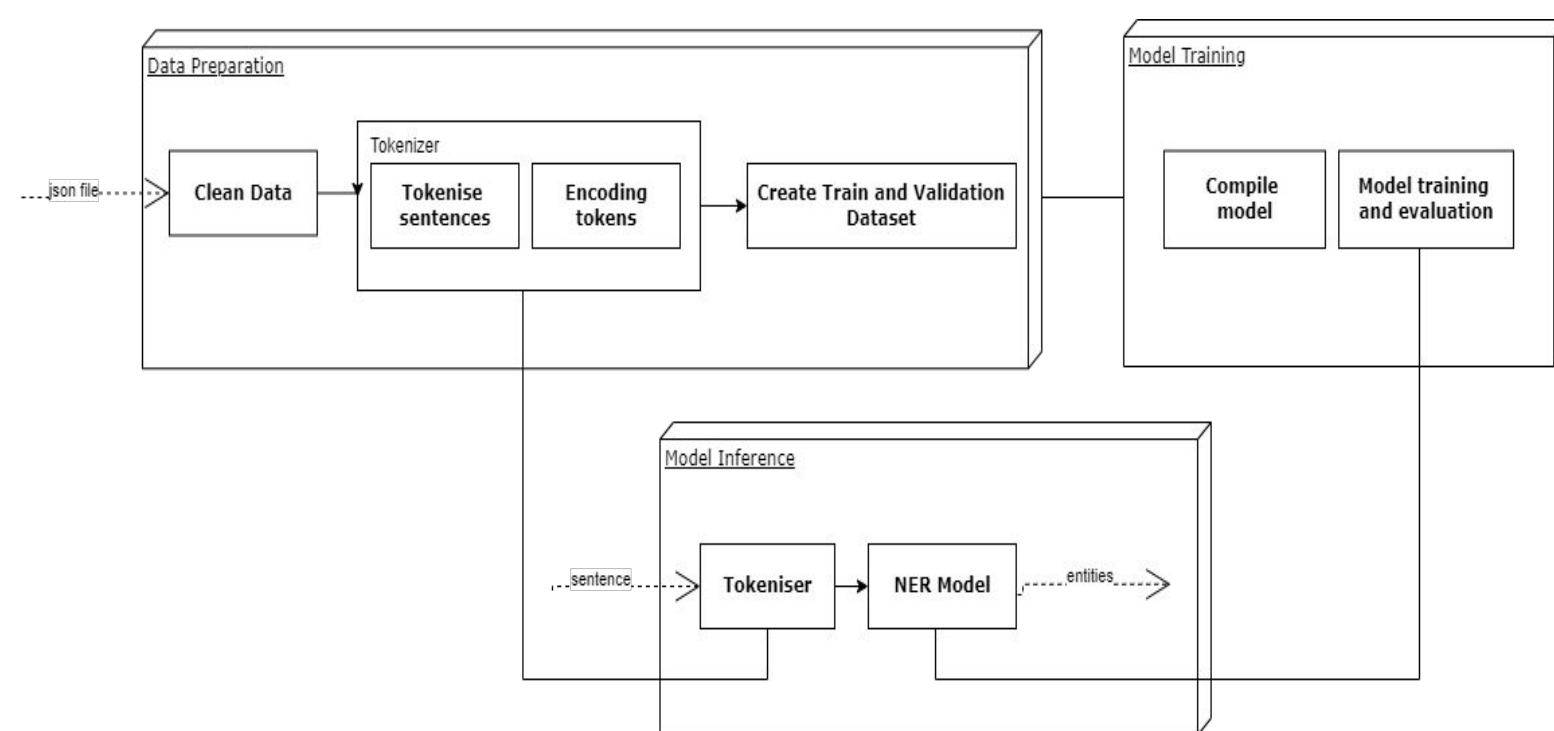
BERT Named Entity Recognition on Emergency Response System

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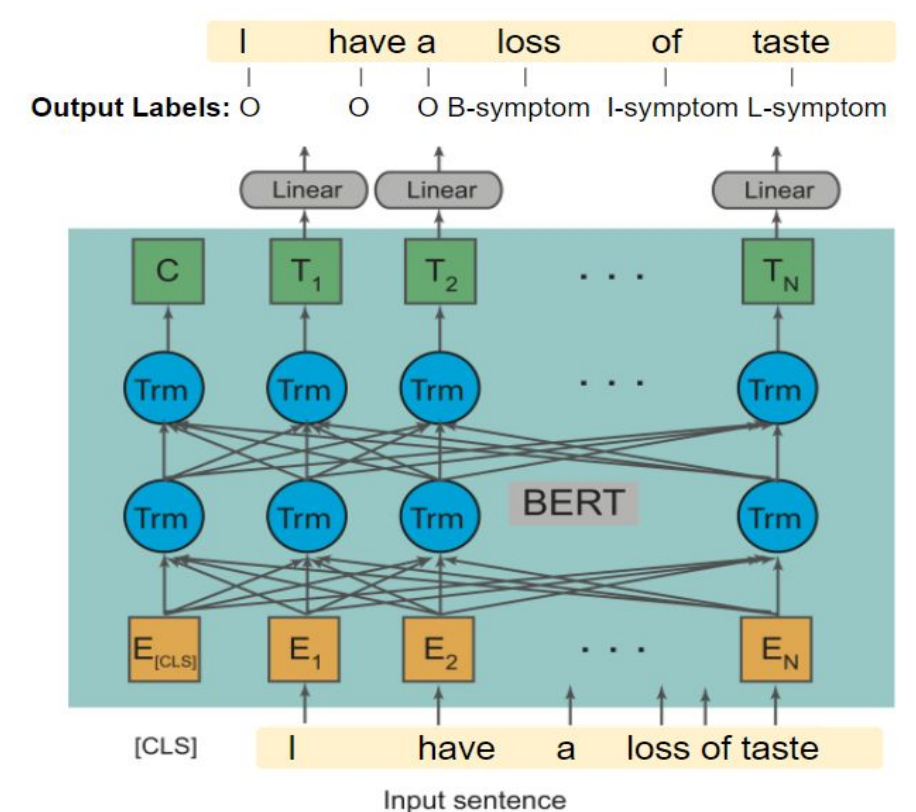
Introduction

Named Entity Recognition (NER) aims to recognise words or phrases from pre-defined categories called named entities in text. The Emergency Response System is a NER-based application developed to aid call operators by extracting key information from the caller and replacing the need for manual insertion by call operators into the command control system. The purpose of the project is to improve on the NER model of an existing Emergency Response System by providing a more convenient and rapid approach for developers to build and deploy a NER model and include additional detection of covid-related entities.

Design and Implementation



Automated NER System



BERT Model Architecture

A robust training pipeline called the **Automated NER System** was developed to train BERT-based NER models in bulk and identify the best NER model architecture for a target dataset. It consists of three modules: Data Preparation, NER Model, Model Inference.

Experimental Results

roBERTa NER model obtain the highest accuracy and f1-score on the curated datasets related to the Emergency Response System. It was shown that with data augmentation, distilBERT and BERT had a significant increase in performance while roBERTa did not benefit from it.

Datasets	NER Model	F1-score	Accuracy
Emergency Response Dataset	BERT	0.907	0.719
	RoBERTa	0.948	0.735
	DistilBERT	0.893	0.614
COVID Dataset	BERT	0.930	0.602
	RoBERTa	0.935	0.596
	DistilBERT	0.934	0.598

Performance of Different NER Models