**NLP – Classifier for Aspect Based Sentiment Analysis**

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**Instruction for Running**

To train and evaluate the model, navigate to the "src" folder, and run the "tester.py" script using the command:

“python tester.py”

There are 2 available optional arguments:

* n\_runs: number of runs you want to execute. The default is 5.
* gpu: The ID of the GPU on which you want to run the model.

**Structure**

* “data” folder: contains the training and validation datasets in CSV format.
* “src” folder: contains the source code for the model, including the main classifier, the Bert model, the dataset & Tokenizer, the data augmentation, and the tester script.

**Problem Description**

The goal of this project is to predict the polarity (negative, neutral, or positive) of a given aspect category in a sentence. For instance, given the sentence " I have never left a restaurant feeling as if I was abused", the objective is to predict a negative polarity for the aspect category " RESTAURANT#PRICES" associated with the term "restaurant".

**Description of the model**

**Data Augmentation**

To improve the performance of the model and avoid the potential limitations resulting from the limited training dataset, the original training data is augmented using an adjusted EDA technique: synonym replacement and swap target words while considering the specifics of ABSA.

The logic of the data augmentation methods has been derived from the two following papers:

* "Data Augmentation in a Hybrid Approach for Aspect-Based Sentiment Analysis" by Tomas Liesting, Flavius Frasincar, Maria Mihaela Trusca

<https://arxiv.org/abs/2103.15912>

* "Improving Short Text Classification Through Global Augmentation Methods" by Vukosi Marivate & Tshephisho Sefara

<https://link.springer.com/chapter/10.1007/978-3-030-57321-8_21>

**Model**

Our model is based on a pre-trained BERT transformers model that encodes the input sentences. The pretrained BERT model is based on a restaurant specific extended version of the initial BERT presented by Devlin et al. 2018. Indeed, the original BERT model has been post-trained in a self-supervised way (NSP and MLM) on restaurant reviews coming from Yelp (Xu et al. published in NAACL 2019). We then use the encoded sentences as input to a classification model to predict the polarities. For the aspect-based sentiment classification (ABS), we use a local context focus mechanism model proposed by Zeng et al. , which internally employs a BERT self-attention with multiple attention heads.

**Results**

Our model achieved the following results over 5 runs:

Dev accs: [88.56, 88.83, 86.97, 86.97, 86.44]

Test accs: [-1, -1, -1, -1, -1]

Mean Dev Acc.: 87.55 (0.96)

Mean Test Acc.: -1.00 (0.00)

Exec time: 2990.76 s. ( 598 per run )