

# Artificial Intelligence

## ASSIGNMENT 2 – CHECKPOINT 1

GROUP 07

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# Project Specification

## Natural Language Processing (NLP Problems): Detecting Offense

In an NLP Problem, the textual data should be processed and transformed into appropriate datasets. Then, an initial exploratory data analysis should be carried out, along with different pre-processing and feature engineering techniques. The employed machine learning algorithms should be tested and compared (performance during learning, confusion matrix, precision, recall, accuracy, F1 measure) and the time spent to train/test the models.

This project aims to identify how offensive a given text is, by attributing a score from 0 – 5 (5 being the most offensive).

The test file contains 9000 labels and ratings from a balanced set of age groups from 18-70. The annotators also represented a variety of genders, political stances and income levels.

# Related Work

- Splitting into train, dev and test sets: <https://cs230.stanford.edu/blog/split/>
- N-Grams: <https://www.lexalytics.com/lexablog/context-analysis-nlp>
- Synonyms/Antonyms and POS: <https://www.journaldev.com/46194/natural-language-processing-tasks>
- “Method for Detecting and Rating Humor Based on Multi-Task Adversarial Training”: <https://arxiv.org/pdf/2104.10336v1.pdf>

# Tools and Algorithms

Machine learning algorithms:

- SVM
- Neural Networks
- Logistic Regression

Pre-processing of data:

- Porter Stemmer
- Bag of words
- Part of Speech (POS)
- Handling negation
- Synonyms/Antonyms
- N-grams
- Slang data sheet

Import of 'transformers' library to use the BERT Pre-Trained Language Model?

# Implemented Work

Language of choice is Python (Jupyter Notebook).

- Label data tidying (round floats to integers)
- Partition of data into dev, train and test sets
- Experiments with SVM and Logistical Regression