

# SMA Assignment Report

## Dataset Used:

- CNN-DailyMail News Text Summarization:  
<https://www.kaggle.com/datasets/gowrishankarp/newspaper-text-summarization-cnn-dailymail>
- The CNN / DailyMail Dataset is an English-language dataset containing just over 300k unique news articles as written by journalists at CNN and the Daily Mail. The current version supports both extractive and abstractive summarization, though the original version was created for machine reading and comprehension and abstractive question answering.
- But, due to time and resource constraints I have used just **500** articles and their summary.

## Results:

- BERT-Score before fine-tuning:
  - Average BERT-Score for 500 summaries:
    - Precision: 0.775
    - Recall: 0.778
    - F1 Score: 0.775

```
Final Cumulative BERT Scores:  
Precision: 0.7750833678245544  
Recall: 0.7775522745847702  
F1 Score: 0.7750406475067139
```

- BERT-Score after fine-tuning:
  - Average BERT-Score for 500 summaries:
    - Precision: 0.782
    - Recall: 0.842
    - F1 Score: 0.811

```
Final Cumulative BERT Scores:  
Precision: 0.7828612419366836  
Recall: 0.8422643060684204  
F1 Score: 0.8110984798669815
```

- **ROUGE-Score:**
  - Average ROUGE-Scores for 500 summaries before fine-tuning:
    - Rouge-1: 0.269
    - Rouge-2: 0.090
    - Rouge-L: 0.179
    - Rouge-Lsum: 0.178

```
ROUGE Scores:  
ROUGE-1: 0.26941902662018546  
ROUGE-2: 0.09034284229034925  
ROUGE-L: 0.17888537540792387  
ROUGE-Lsum: 0.17825343392491783
```

- **ROUGE-Score:**
  - Average ROUGE-Scores for 500 summaries after fine-tuning:
    - Rouge-1: 0.367
    - Rouge-2: 0.166
    - Rouge-L: 0.235
    - Rouge-Lsum: 0.234

```
ROUGE Scores:  
ROUGE-1: 0.36774779748743025  
ROUGE-2: 0.1667095171355023  
ROUGE-L: 0.235075239718949  
ROUGE-Lsum: 0.23484841763519826
```

- **BLEU-Score before fine-tuning:**
  - Average BLEU-Scores for 500 summaries:
    - BLEU-Score: 0.292

```
Average BLEU Score: 0.29171001991417306
```

- **BLEU-Score after fine-tuning:**
  - Average BLEU-Scores for 500 summaries:
    - BLEU-Score: 0.290

```
Average BLEU Score: 0.2909516874985539
```