National College of Ireland

Configuration Manual

MSc Research Project
Data Analytics

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Project Submission Sheet
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Student Name:	Shivakumar Patil
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Configuration Manual

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1 Initial codes to load data

Note: The first 2 codes are to be run in the following order to make sure both Flickr 8k and 30K datasets are loaded into Google Drive:

1.1 Notebook 1: Code 1 Load Flickr8k

Objective: Flickr8k image dataset is loaded.

Key Operations: Mounting Google Drive for accessing files. Setting up Kaggle API credentials for dataset downloading.

1. **Mount Google Drive:** Give permission to mount your Google Drive.
2. **Kaggle API:** The Flickr8k dataset is loaded directly from Kaggle API into Google Drive.

1.2 Notebook 2: Code 2 30K images caption generator v3.ipynb

Primary Objective: To generate captions using VGG16 and LSTM model and load Flickr30K dataset

Order of execution

1. Load and Data prep
2. Model Building using VGG16
3. Data Pre processing
4. Model build
5. Evaluation
6. Predict and Demo

Key Operations: Importing various libraries for data handling (Numpy, Pandas), image processing (Keras preprocessing) and deep learning (Keras layers and models).

2 Notebook 3: Code 3 CLIP 300 v3.ipynb

Primary Objective: OpenAI's CLIP model is run using this code.

Order:

1. CLIP Model Setup
2. Data Handling
3. Caption Translation and Text to Speech
4. Evaluation using BLEU scores

3 Notebook 4: Code 4 vit gp2 v2.ipynb

Primary Objective: Vision Transformer (ViT) and GPT-2 based model for image caption generation

Order of execution:

1. Data Load
2. Data Processing
3. Model initialization
4. Feature extraction and Tokenization
5. Model Training
6. Evaluation

4 NLP Application Codes

1. **searchable database.ipynb:** Searchable image database using NLP techniques.
2. **Sentiment analysis on the captions from the Flickr8k dataset.ipynb:** Performs sentiment analysis on Flickr8k dataset captions.
3. **Top Trending v2.ipynb:** To fetch top trending words in images dataset

5 UI code

Flask UI CLIP.ipynb: Flask based web application with CLIP model backend for caption generation of the image uploaded

6 Dataset used

When code 1 and code 2 are run both the Flikr 8K and 30K sets are downloaded through the Kaggle API in the folder:

7 Google Collab Configuration and Python code

All the code was written using Python 3 and using V100 GPU hardware setting in Google Collab.