Generative Models Assignments

Assignment 1 –Generation using Huggingface transformers pipeline

Task:

Use gpt-2 (or similar) model to generate text.

For example: input is “Best cricketer is” and the model should complete the sentence.

Test with different prompts and models

Show your experimentation (like different models and prompts) in the notebook

(mention in your submitted notebook)

Submit:

Notebook inside “generativemodels” folder in your shared submission folder

Assignment 2 – Next token prediction using barebones transformer model

Task:

Use Huggingface GPT2LMHeadModel and use it to predict the next token, given an input

Understand the steps such as tokenization, probability distribution (logits) and interpreting them

1. Run the code in colab or your laptop
2. Change the code as follows:
    a. Add the highest probability next token to the input
    b. Add it to the input sequence
    c. Make it predict the next token

    Repeat the above in a loop to predict 10 next tokens

    Print the final output sequence

    Repeat the above for at least 2 different prompts
3. Replace GPT2LMHeadModel with another model that is more powerful and can still run on the hardware you have (laptop or colab)
    Use assistance from AI chatbot like claude or gemini or copilot to get suggestions on which models would work well in your runtime environment
4. Compare responses (at least 3 models and 2 prompts each)

Assignment 3 – Text classification, NER, question answering and semantic similarity with medical domain specific pre-trained transformer model RoBERTa

Task:

Use domain specific model and demonstrate how it can do text classification, NER, Semantic similarity and domain specific question answering by means of prompts and responses.

Assignment 4 –Text to image using Stable Diffusion or similar

Task:

Use stable diffusion model or any other text-to-image model from HuggingFace and create a python app that will generate image from a text prompt.

The app should

1) prompt the user to input a text

2) Use stable diffusion model (such as CompVis/stable-diffusion-v1-4) or any other text-to-image model HuggingFace to generate image from text prompt

3) Print the generated image in the output

Submit:

Working notebooks or python codes. Put them in your shared submission folders (inside GenerativeModels subdirectory). Email to Vijay vijay95051@gmail.com and Saakshi notifying them about your submission