Assignment 1

1. True or False. If false write the correct statement.

GANs are composed of two models that compete against each other in order to produce a good distribution over latent space.

1. What is the role of generator?

* To sort the images by color.
* To piece together real images to make a fake.
* To create realistic looking fake images.
* To find real image in pile of fake.

1. What is the primary goal of the discriminator in probabilistic sense?

* Capture the probability of class y:P(y)
* Capture the conditional probability p(y/x)
* Capture the probability of the features x P(x).
* Capture the probability of x and y: p(x ∩y)

1. What is the primary goal of the generator in probabilistic sense?

* Capture the probability of x and y: p(x ∩y)
* Model the features x conditioned on classy : P(x/y)
* Model the union of x and y : P(xUy)
* Capture the probability of class y : P(y)

1. How does the discriminator learn over time?

* Comparing the images to the ones on the internet.
* Getting feedback on if its classification was correct.
* Receiving user input.
* Using feedback from the generator.

1. How does generator learn over time?

* Generating more diverse images.
* Receiving user feedback.
* Using feedback from the discriminator.
* Comparing the fake to a real image.

1. Write two filters for edge detection. Give the matrix for horizontal and vertical edge detection.
2. Write the value of padding for
   1. Valid convolutions
   2. Same convolutions
3. Write the size of output for
   1. Valid convolution
   2. Same convolution
4. Write the formula of output if

n = input image size

p = padding

f = filter size

s = stride length

1. Define the following
   1. Tokenization
   2. End-of-sentence <EOS> and
   3. Unknown words <UNK>
2. What is the input given to generator for image generation? How does a generator produce different output at every run?
3. What is catastrophic forgetting? What is the main cause?

Assignment-2

1. what is one hot vector and where it is used?
2. Give a point wise action for building RNN for language modelling.
3. Give the difference between GRU and LSTM.
4. Describe bidirectional RNN (BRNN).
5. What are the different usage of GANs?
6. Describe BCE cost function.
7. What are the challenges of generative models?
8. Define different types of transformers. Give examples of each.
9. Describe different types of prompt engineering with examples.
10. Describe generative AI project lifecycle.
11. Describe training process of GPT-3
12. A) Define the terms
    * 1. Tautology
      2. Contradiction
      3. Contingency
      4. Satisfiability.
    1. Give a tabular representation categorization tautology, contradiction and contingency as
       1. True/False
       2. Satisfiable/unsatisfiable
       3. Valid/invalid
    2. Determine whether the following statement is tautology, contradiction, or contingency.

PVQ ----> QVR

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| P | Q | R | (PVQ) | (QVR) | (PVQ)🡪 (QVR) |
| T | T | T | T | T | T |
| T | T | F | T | T | T |
| T | F | T | T | T | T |
| T | F | F | T | F | F |
| F | T | T | T | T | T |
| F | T | F | T | T | T |
| F | F | T | F | T | T |
| F | F | F | F | F | T |