Note: All coding problems to be submited with Github Link. Do not Upload the files/folder. Use git commands only.

Note: this is the distribution of questions:

(a) Question 1 to Question 3: Required for everyone.

(b) Question 4 to Question 5: Bonus question for both Graduate Students and Undergraduate Students

Problem 1 (10 points)

For each of the following norms, explain what properties will they favor when used in reconstruction error: L_0, L_1, and L_2

Problem 2 (30 points)

Given a set of contrast images with sharp geometric edges (e.g. photo-lithography masks for microprocessor manufacturing) write down a formulation for reconstruction error that would work best. Justify your choice.

Problem 3 (20 points)

Given a set of images of wild life taken in their natural habitat write down a formulation for reconstruction error that would work best. Justify your choice.

Bonus for both undergraduates and graduates beyond this line.

Problem 4 (40 points)

Given distributions p and q. If q is parameterized by θ, how would you choose the value for θ to make q closest to p among all possible q's.

(a) Write down formulation of how would you measure the closeness of q to p.

(b) Explain what you would do to maximize this closeness (i.e. make q and p maximally close, or minimally different or divergent)

Problem 5 (40 points)

Write a report on one of the following topics related to GANS:

(a) InfoGAN https://arxiv.org/abs/1606.03657

(b) CycleGAN https://arxiv.org/pdf/1703.10593.pdf