

# Coursework II:

## Hints

COMP0169 Team

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Based on requests from a few students we are sharing a PDF with expected outputs for coursework 2. Note that your results might look slightly different. Your visualizations also might look different if you are using an older version of the coursework template, in that case consider downloading the latest template from Moodle.

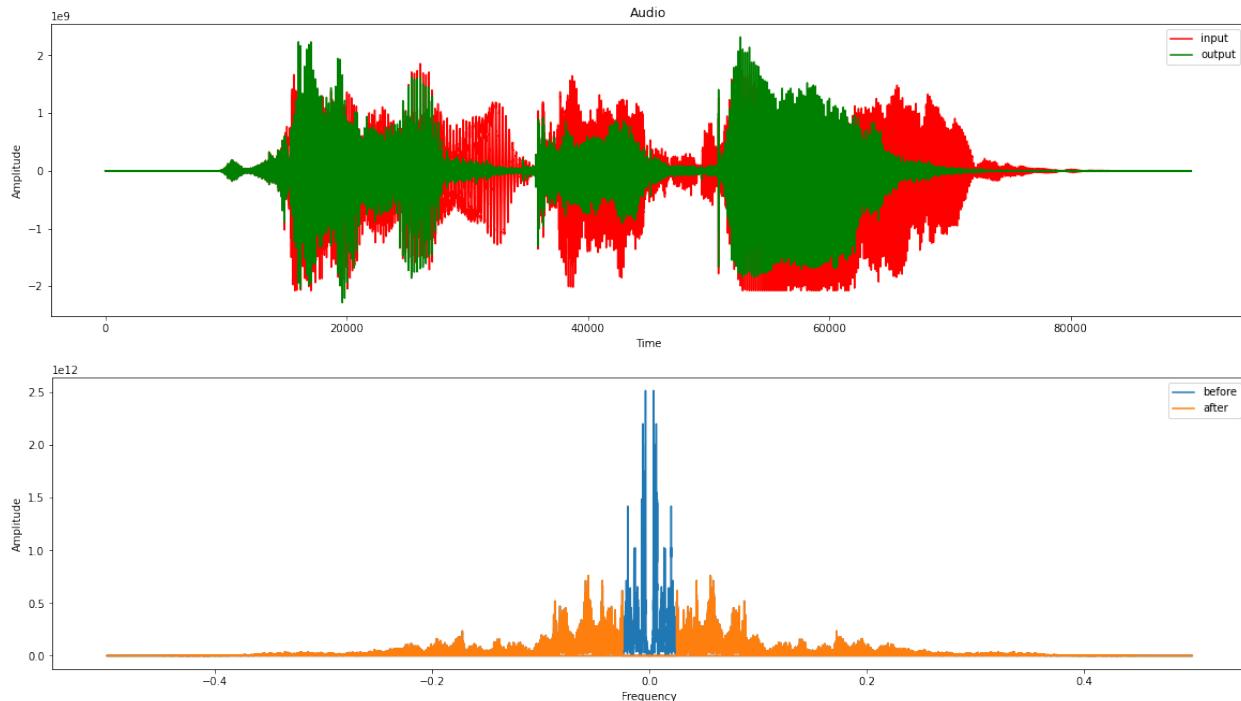
The total points for this exercise is **100**.

Please refer to Moodle for the due dates.

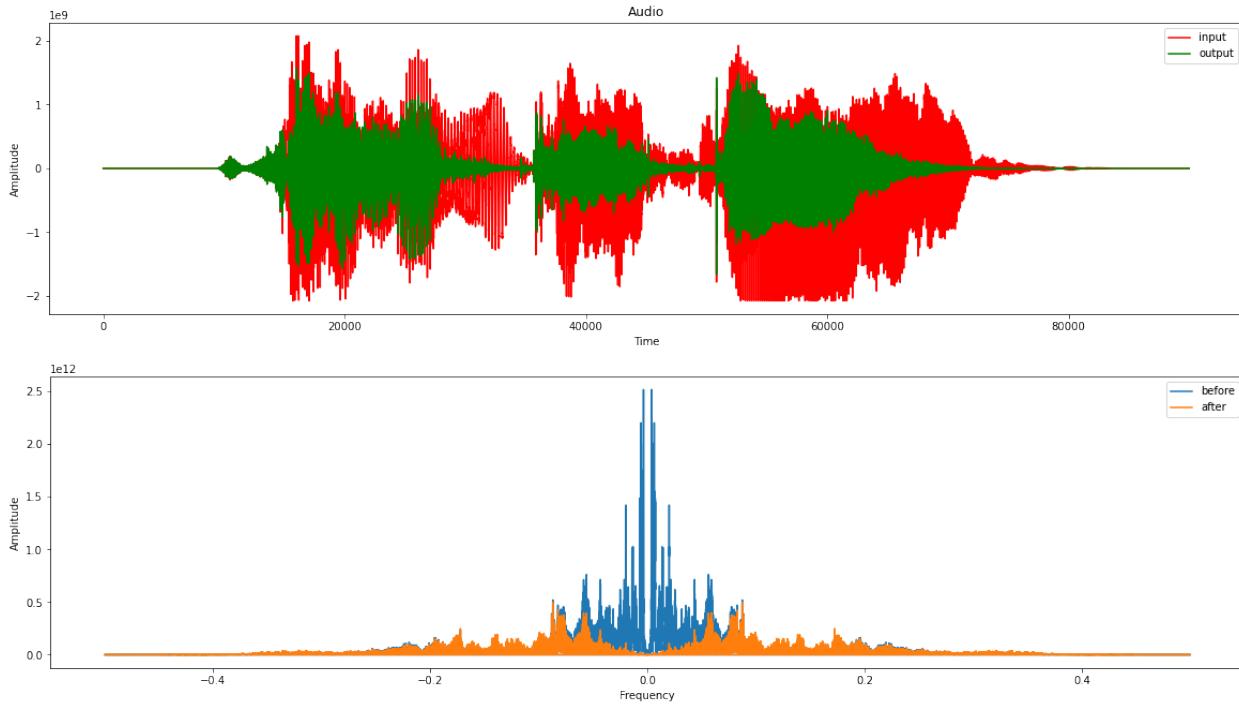
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## 1 Image, audio; all the same(20 points)

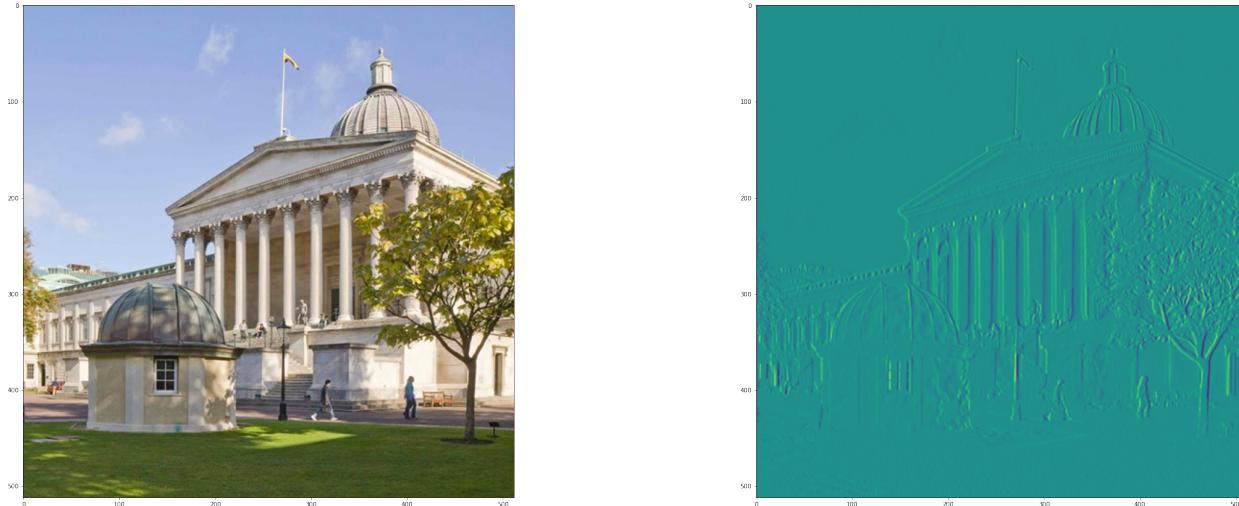
**Q1a:** Below are the expected images for FFT based audio filtering your results might look different based on the threshold used for filtering.



Below are the expected images for moving average based audio filtering your results might look different based on the size of the widow used for filtering.



**Q1b:** Below is the expected image for the vertical edge detection task.

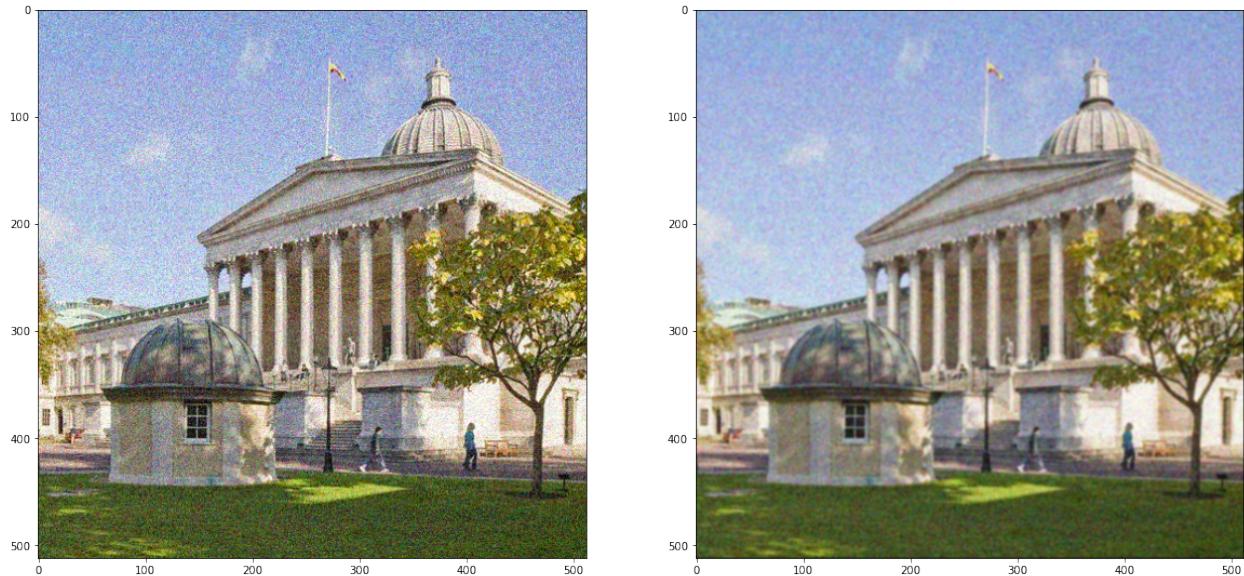


**Q1c:** Below is the text output of our reference solution. However any solution with a reasonably high L1 distance between input\_image and input\_modified images and a low L1 distance between filtered and modified filtered images is considered correct.

L1 distance between input\_image **and** input\_modified images: 84.99  
 L1 distance between filtered **and** modified filtered images: 0.0

## 2 Denoising (35 points)

**Q2a:** Below is the expected image for the Gaussian denoising task with a  $5 \times 5$  Gaussian filter.



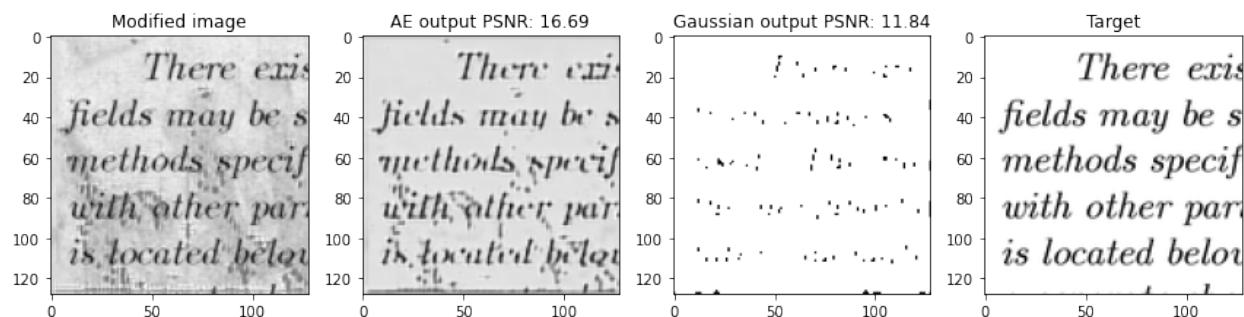
**Q2b:** Below is the output of our reference solution for the network based denoising task. Note that your results might look slightly different.



**Q2c:** Below is the output of our reference solution. Note that your images and PSNR values might look slightly different.

Input	AE	Gaussian	Targets
	26.5	13.9	
	25.9	13.9	
	25.8	13.8	
	26.0	13.9	
	27.2	14.5	

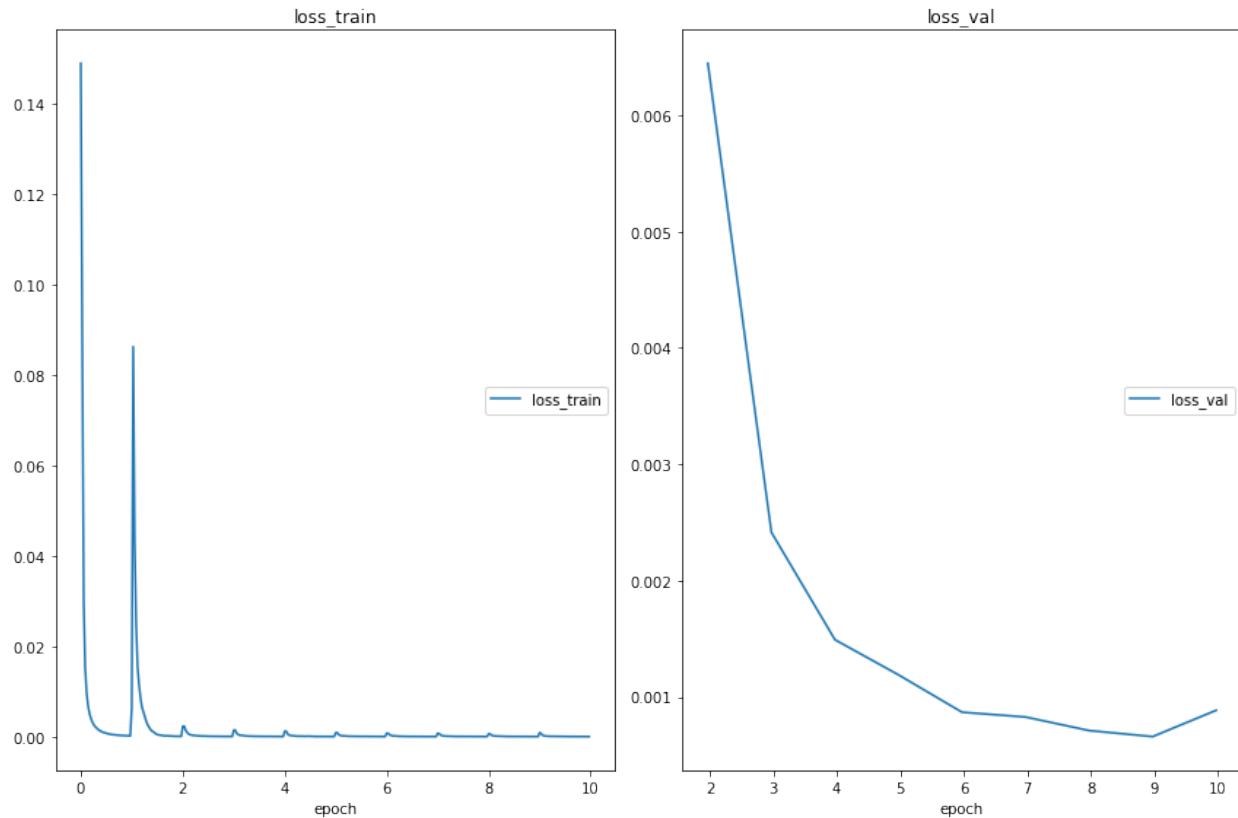
**Q2d:** Below is the output of our reference solution for Q2.d. Your results might look different. Any solution with a reasonably low MSE distance between the original image and the adversarial image and a large drop in PSNR value is considered correct.



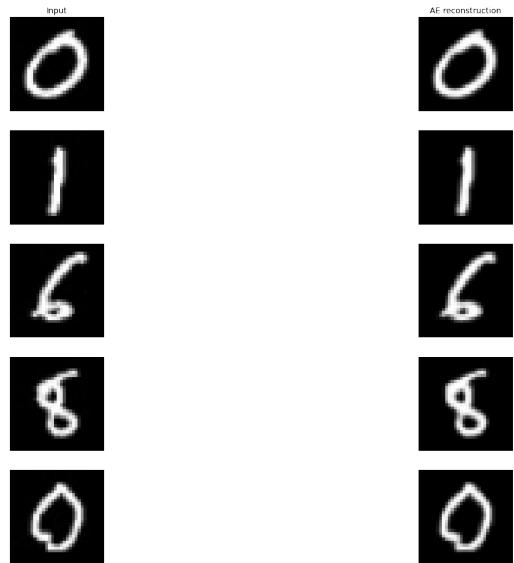
MSE between original and adversarial image: 0.0023

### 3 Auto-encoder and Variational AutoEncoder (45 points)

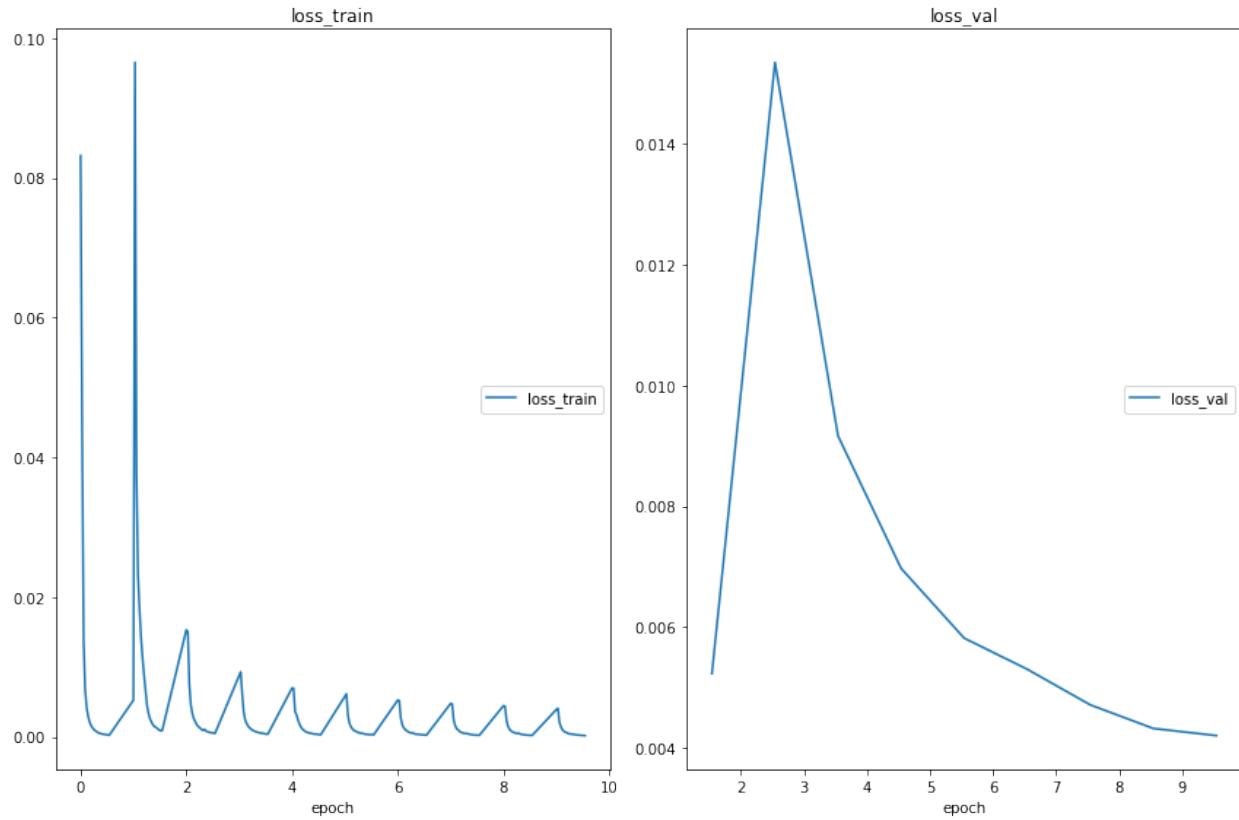
**Q3b:** Below are the training curves for training an AutoEncoder on the MNIST dataset. We resized the MNIST images to 32x32 and trained our AutoEncoder for 10 epochs.



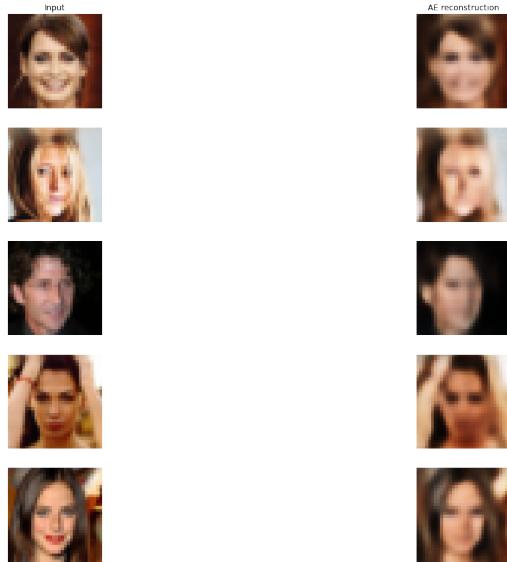
The reconstructions obtained from our model are as follows:



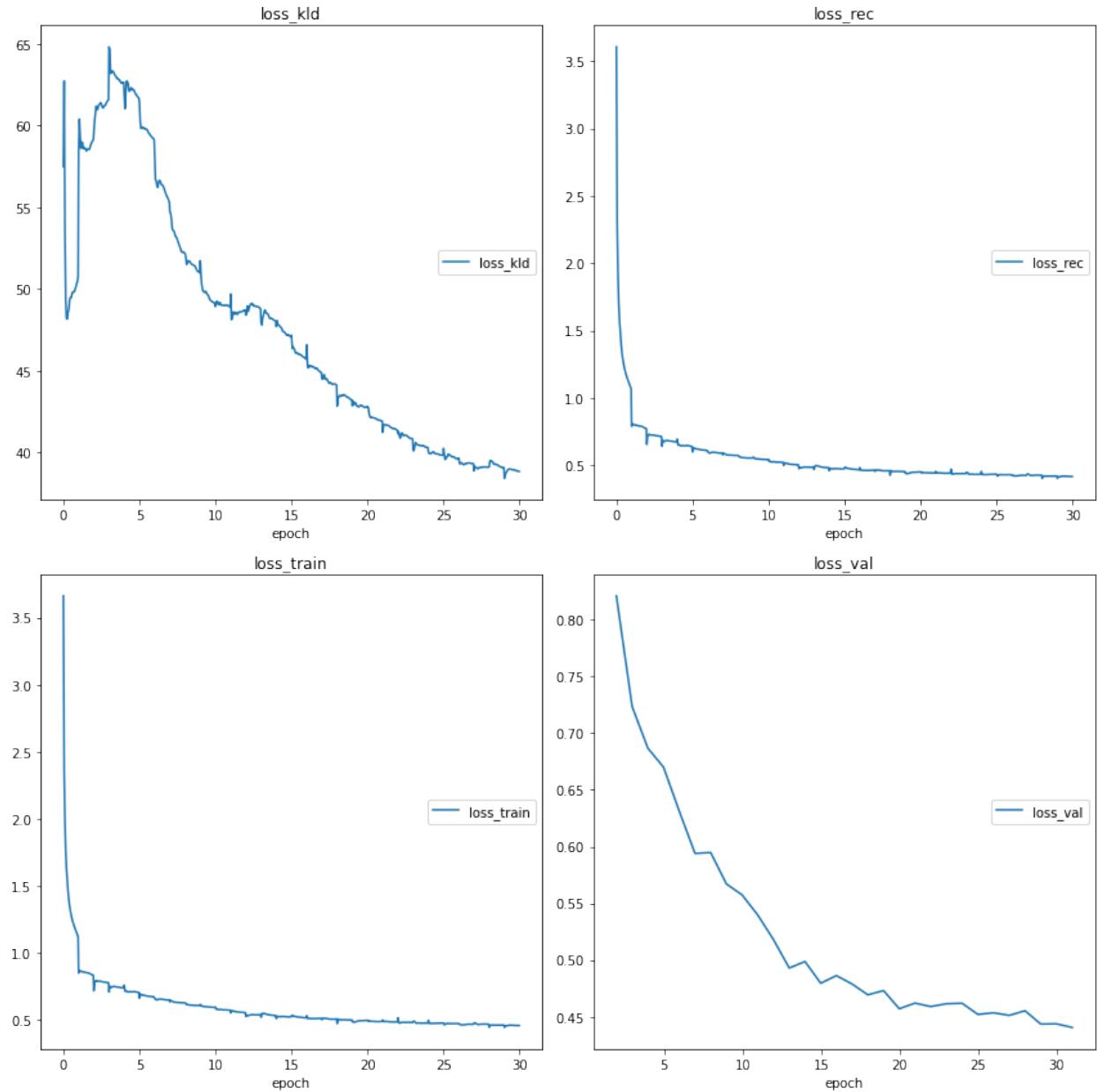
**Q3c:** Below are the training curves for training the AutoEncoder on the CelebA-HQ dataset. Similar to Q3b, we resize the images to 32x32 and train for 10 epochs.



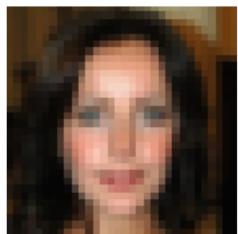
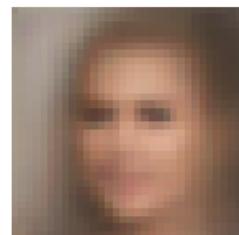
And, the reconstructions obtained from our model on CelebA-HQ are as follows:



**Q3c:** Below are the training curves for training the Variational-AutoEncoder on the CelebA-HQ dataset. Similar to Q3c, we resize the images to 32x32 and train for 30 epochs.



The Reconstructions are as follows:



Randomly drawn samples:

