Student ID: ky523

Mark Scheme						
Section	**Question**	**Mark Breakdown**	**Marks**		**Marker Comments**	**Question Statement**
			Got	**Max**		
1 - VAE	1.1a	Module - Layers - MLP	6	6		Implement a VAE - fill the blanks of nn.Module class + specify sensible hyp.param
		Module - Layers - CNN (subsume mlp)	3	3		
		Module - Layers - BatchNorm / Dropout etc	1	1		
		Module - Encode - Basics	3	3		
		Module - Encode - LogVar instead of Var	1	1		
		Module - Reparam - Correctly Sampling	2	2		
		Module - Forward	2	2		
		HypParam - Sensible (beta in next part)	2	2		
		Qualitative	5	5		
	1.1b	Loss with Reco and correct KL	1	1		Choose a suitable loss and describe your choice of RECO term
		Loss with correct Reco and beta	1	1		
			1	3		
		Discussion of reco term - need to mention rescaling inputs/outputs appropriately			Correct loss with suitable reco kl, and beta terms; it would be better to state the normalization for input/ output images to [0, 1] so that we can use BCE loss.	
	1.2a	Plots showing train and test lost terms	3	3	Nice figures!	Results - Plot losses, investigate effect of beta
	1.2b	Reconstructions of test set images and a few samples	1	1		Show reconstructions of test set, and samples
		Each bullet point addressed	3	3	It would be better to state as KL divergence should increase and KL loss (-D_KL) is decreasing :)	Discuss (inc. posterior collapse), visulize reconstructions
		Qualitative	2	2		
	1.3a	Explain presence / absence of clusters	2	2	Clearly description with effect of kl, beta and perplexity, well done!	Perform T-SNE on learned representations. Discuss the results - effects of beta, clustering, outliers, boundaries, relability of T-SNE
		Explain effect of KL and Beta on Disentangling clusters	3	3	Outliers are well-explained. It would be great if you give more observation on the boundaries cases, e.g., if they don't have a typical look of their class	
		Explain outliers / boundaries between clusters	0	1		
		Reflect on reliability of conclusions from T-SNE; second mark for additional plots	1	1		
	1.3b	Perform at least one interpolation	2	2	Well done!	Interpolate between classes in latent space. Discuss: qualitative character of interp, relevance to T-SNE plot
		Discuss obervation from interpolation	1	1		
		Relate interpolation to T-SNE	1	1		
						Part Total 47 /50
2 - GAN	2.1a	HypParam - Sensible	2	2		Implement a GAN starting with the DCGAN architecture.
		Module - Generator-constructor + forward	3	3		
		Module - Discriminator-constructor + forward	3	3		
	2.1b	Train - Discriminator	6	6		
		Train - Generator	6	6	Efficient implementation of a GAN; Clear discussion on hyperparams	
	2.1c	note: please feel free to interpolate scores	8	10	The generated images are greyish	Visualise the generated images
						See Ref Samples
	2.1d	Detail 3 engineering features introduced. e.g. batchnorm, label smoothing, ReLU, #layers	4	4		Discuss your final architecture along with the experiments which led to it.
		Qualitative	6	6	Several techniques are investigated with deep insights of the choice. Well done	
	2.2	G and D loss plot - remove mark if no legend	1	1	Clear description of loss plots. It would be better if you provide comparison with theoretical expectation.	Plot the generator and discriminator loss curves - discuss whether sensible/expected
		Comparision between plots and theoretical optimum/zero sum game	3	4		
		Description of mode collapse	1	1	Well done!	Provide a discussion on whether you noticed any mode collapse, what this behaviour may have

	2.3	Qualitative. note: If the students states that mode collapse was not a problem check the generated images to make sure that this is the case. If mode collapse was an issue yet nothiing was done to combat it remove 2 marks	4	4		been attributed to and explain what you did in order to combat it if it was a problem. If you didn't experience mode collapse still detail methods to combat it.	Part Total 47 /50
	Penalty Marks	Transformations etc. not provided below		-1			
		Models do not load properly		-1			
		Model provided is poor compared to claimed results (VAE and GAN)		-1			
				-1			
Student ID: ky523		GAN Exceeds maximum parameter count		-1			CW Total 94 /100