	De Leon erning Principles: Homework 2
In []: !pip ins	orFlow
	stallupgrade tensorflow # Latest Tensorflow tensorflow as tf
2.12.0	fversion) # Tensorflow version pard dependencies not necessary, keeping these codes here in case of future references.
#!pip in	nstall -q -U tensorboard nstall tensorboard=2.12.0 the TensorBoard notebook extension
In [4]: #import #%load_e	datetime ext tensorboard
	das, Numpy, Keras
<pre>import n from ten from ker</pre>	pandas as pd numpy as np nsorflow.keras.models import Sequential ras.utils.vis_utils import plot_model
<pre>from ten</pre>	nsorflow.keras.layers import Dense nsorflow.keras.optimizers import SGD nsorflow.keras.losses import MeanAbsoluteError
Task Mode	
opportuni	nester I had the opportunity to take Applied Machine Learning course in which we use Deep Learning tools like PyTorch, TensorFlow (Keras), Tensorboard to create our own MLP, CNN, FCN Models for object classification and detection. We as a group, had the nity to use different optimizers, regularization techniques, and tools to create our models. Since this is a basic model, I will try to stick as basic a possible using internet sources and Applied Machine Learning coursework including my group final project work for /techniques etc.
and the m	ugh my CNN model from last semester had a similar structure using Sequential(), I found that creating a deep learning model this way makes it easier for me to understand. Since this is not a CNN model (Conv2D), I will use Dense layer which is fully connected layer most common type of layer used on MLP Models. Specifications: mensional vector.
• Final	len layer has a three dimension with bias enabled. Activation function is ReLU. I layer outputs a scalar value with sigmoid activation. Ctivation Function (Rectified Activation Function): With default values, this returns the standard ReLU activation: max(x, 0), the element-wise maximum of 0 and the input tensor.
Sigmoid	$ReLU(x) = (x)^+ = \max(0,x)$ d Activation Function Will always returns a value between 0 and 1.
Mean Ak	Sigmoid $(x) = \sigma(x) = \frac{1}{1 + e^{-x}}$ bsolute Error is the average of all absolute errors. The absolute average distance between the real data and the predicted data. In this case the MAE will be used to minimze the absolute difference between the predicted output and the output 0.30.
In [4]: # Prof ($ ext{MAE} = rac{1}{n} \sum_{i=1}^n y_i - \hat{y}_i $ J. Shanahan adviced us to RELU instead of Sigmoid for final project.
<pre># input # output # Basic</pre>	n dimensions -> 3 dimensions -> 5 t dimensions -> 1 initial learning rate from APML homework
model.ad	Sequential() dd(Dense(3, input_dim = 5, activation = 'relu')) dd(Dense(1, activation = 'sigmoid')) # Final Layer outputs a scalar value with sigmoid
model.co	<pre>ompile(loss = MeanAbsoluteError(),</pre>
	cond layer (Dense - fully connected) has 3 layers from the previous layer and 1 hidden layer -> (3x1) and 1 = 3 weights and 1 bias. Total weights -> 15 + 3 = 18 weights Total biases -> 3 + 1 = 4 biases. ams -> 18 + 4 = 22.
In [5]: model.su Model: " Layer ("sequential"
	(Dense) (None, 3) 18 1 (Dense) (None, 1) 4
Total pa Trainabl	arams: 22 le params: 0
In [7]: plot_mod Out[7]: dense_1 InputL	
	Layer output: [(None, 5)] Inse input: (None, 5)
<u> </u>	ense output: (None, 3)
<u> </u>	ise_1 input: (None, 3) ense output: (None, 1)
	X_train which is going to be an array of specified shape of (1000, 5). This will be used as the input data for the model. The y_train is going to be an array of shape of (1000, 1) filled with 0.30. This is going to be used ad the target output.
In [8]: # random np.rando	learning rate, and any other number that is not related to input, output, or hidden dimensions are just picked randomly and from Applied Machine Learning coursework. m seed APML homework om.seed(0)
<pre># output X_train y_train</pre>	<pre>dimensions -> 5 t dimensions -> 1 = np.random.rand(1000, 5) # APML Homework = np.full((1000, 1), 0.30) # output of 0.30</pre>
history min_loss print('\	
<pre>print(f' Epoch 1/ 32/32 [= Epoch 2/ 32/32 [=</pre>	'Thelowest training loss after 1000 epochs is: {min_loss}') /100 =================================
Epoch 3/ 32/32 [= Epoch 4/ 32/32 [= Epoch 5/	/100 ===================================
Epoch 6/ 32/32 [= Epoch 7/ 32/32 [=	======================================
Epoch 9/ 32/32 [= Epoch 10	======================================
Epoch 11 32/32 [= Epoch 12	======================================
32/32 [= Epoch 14 32/32 [= Epoch 15	======================================
Epoch 16 32/32 [= Epoch 17	6/100 ===================================
Epoch 19 32/32 [= Epoch 20 32/32 [=	======================================
Epoch 22 32/32 [= Epoch 23	======================================
Epoch 24 32/32 [= Epoch 25 32/32 [=	======================================
Epoch 27 32/32 [= Epoch 28	======================================
Epoch 29 32/32 [= Epoch 30 32/32 [=	======================================
Epoch 32 32/32 [= Epoch 33	======================================
Epoch 34 32/32 [= Epoch 35	4/100 ===================================
Epoch 37 32/32 [= Epoch 38 32/32 [=	======================================
Epoch 40 32/32 [= Epoch 41	======================================
Epoch 42 32/32 [= Epoch 43	======================================
32/32 [= Epoch 45 32/32 [= Epoch 46	======================================
Epoch 48 32/32 [= Epoch 49	======================================
Epoch 50 32/32 [= Epoch 51	0/100 ==================================
Epoch 53 32/32 [= Epoch 54 32/32 [=	======================================
Epoch 56 32/32 [= Epoch 57	======================================
Epoch 58	======================================
Epoch 59 32/32 [=	=========] - 0s 2ms/step - loss: 0.0166
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [=	======================================
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 64 32/32 [= Epoch 64	
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 64 32/32 [= Epoch 65 32/32 [= Epoch 66 32/32 [= Epoch 67 32/32 [= Epoch 67 32/32 [= Epoch 68	
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 64 32/32 [= Epoch 65 32/32 [= Epoch 66 32/32 [= Epoch 67 32/32 [= Epoch 68 32/32 [= Epoch 69 32/32 [= Epoch 69 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [=	======================================
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 64 32/32 [= Epoch 65 32/32 [= Epoch 66 32/32 [= Epoch 67 32/32 [= Epoch 68 32/32 [= Epoch 69 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [= Epoch 71 32/32 [= Epoch 71 32/32 [= Epoch 72 32/32 [= Epoch 72 32/32 [= Epoch 73	
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 64 32/32 [= Epoch 65 32/32 [= Epoch 66 32/32 [= Epoch 67 32/32 [= Epoch 68 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [= Epoch 70 32/32 [= Epoch 71 32/32 [= Epoch 72 32/32 [= Epoch 73 32/32 [= Epoch 74 32/32 [= Epoch 74 32/32 [= Epoch 75 32/32 [= Epoch 76	
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 64 32/32 [= Epoch 65 32/32 [= Epoch 66 32/32 [= Epoch 67 32/32 [= Epoch 69 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [= Epoch 70 32/32 [= Epoch 71 32/32 [= Epoch 72 32/32 [= Epoch 73 32/32 [= Epoch 74 32/32 [= Epoch 75 32/32 [= Epoch 76 32/32 [= Epoch 77 32/32 [= Epoch 77 32/32 [= Epoch 76 32/32 [= Epoch 77	
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 64 32/32 [= Epoch 65 32/32 [= Epoch 67 32/32 [= Epoch 69 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [= Epoch 71 32/32 [= Epoch 72 32/32 [= Epoch 73 32/32 [= Epoch 74 32/32 [= Epoch 74 32/32 [= Epoch 75 32/32 [= Epoch 76 32/32 [= Epoch 76 32/32 [= Epoch 77 32/32 [= Epoch 76 32/32 [= Epoch 76 32/32 [= Epoch 77 32/32 [= Epoch 76 32/32 [= Epoch 77 32/32 [= Epoch 77 32/32 [= Epoch 78 32/32 [= Epoch 79 32/32 [= Epoch 79 32/32 [= Epoch 80 32/32 [= Epoch 80 32/32 [= Epoch 81	
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 64 32/32 [= Epoch 65 32/32 [= Epoch 66 32/32 [= Epoch 67 32/32 [= Epoch 68 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [= Epoch 71 32/32 [= Epoch 72 32/32 [= Epoch 73 32/32 [= Epoch 74 32/32 [= Epoch 75 32/32 [= Epoch 75 32/32 [= Epoch 76 32/32 [= Epoch 76 32/32 [= Epoch 77 32/32 [= Epoch 76 32/32 [= Epoch 78 32/32 [= Epoch 80 32/32 [= Epoch 80 32/32 [= Epoch 80 32/32 [= Epoch 80 32/32 [= Epoch 81 32/32 [= Epoch 82 32/32 [= Epoch 82 32/32 [= Epoch 82 32/32 [= Epoch 84	
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 65 32/32 [= Epoch 65 32/32 [= Epoch 65 32/32 [= Epoch 67 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [= Epoch 76 32/32 [= Epoch 78 32/32 [= Epoch 81 32/32 [= Epoch 81 32/32 [= Epoch 81 32/32 [= Epoch 82 32/32 [= Epoch 82 32/32 [= Epoch 83 32/32 [= Epoch 84 32/32 [= Epoch 84 32/32 [= Epoch 85 32/32 [= Epoch 86 32/32 [=	- 3e 2m/step - 10es 0.316 - 3e 3m/step - 10es 0.316 - 3e 2m/step - 10es 0.316 - 3e 3m/step - 10es 0.318 - 3e 3m/step - 10es 0.301 - 3e 3m/step - 10es 0.305 - 3e 3m/step - 10es 0.305
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 64 32/32 [= Epoch 65 32/32 [= Epoch 66 32/32 [= Epoch 68 32/32 [= Epoch 69 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [= Epoch 70 32/32 [= Epoch 71 32/32 [= Epoch 72 32/32 [= Epoch 74 32/32 [= Epoch 74 32/32 [= Epoch 75 32/32 [= Epoch 76 32/32 [= Epoch 77 32/32 [= Epoch 76 32/32 [= Epoch 77 32/32 [= Epoch 76 32/32 [= Epoch 76 32/32 [= Epoch 76 32/32 [= Epoch 76 32/32 [= Epoch 80 32/32 [= Epoch 81 32/32 [= Epoch 82 32/32 [= Epoch 83 32/32 [= Epoch 84 32/32 [= Epoch 85 32/32 [= Epoch 87 32/	
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 64 32/32 [= Epoch 65 32/32 [= Epoch 66 32/32 [= Epoch 67 32/32 [= Epoch 67 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [= Epoch 70 32/32 [= Epoch 70 32/32 [= Epoch 71 32/32 [= Epoch 72 32/32 [= Epoch 73 32/32 [= Epoch 74 32/32 [= Epoch 74 32/32 [= Epoch 75 32/32 [= Epoch 76 32/32 [= Epoch 77 32/32 [= Epoch 78 32/32 [= Epoch 79 32/32 [= Epoch 80 32/32 [= Epoch 80 32/32 [= Epoch 81 32/32 [= Epoch 82 32/32 [= Epoch 84 32/32 [= Epoch 85 32/32 [= Epoch 86 32/32 [= Epoch 87 32/32 [= Epoch 86 32/32 [= Epoch 87 32/32 [= Epoch 86 32/32 [= Epoch 86 32/32 [= Epoch 87 32/32 [= Epoch 87 32/32 [= Epoch 86 32/32 [= Epoch 87 32/	10
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 65 32/32 [= Epoch 66 32/32 [= Epoch 66 32/32 [= Epoch 67 32/32 [= Epoch 69 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [= Epoch 70 32/32 [= Epoch 71 32/32 [= Epoch 72 32/32 [= Epoch 73 32/32 [= Epoch 74 32/32 [= Epoch 74 32/32 [= Epoch 75 32/32 [= Epoch 76 32/32 [= Epoch 77 32/32 [= Epoch 76 32/32 [= Epoch 77 32/32 [= Epoch 78 32/32 [= Epoch 79 32/32 [= Epoch 80 32/32 [= Epoch 81 32/32 [= Epoch 81 32/32 [= Epoch 82 32/32 [= Epoch 84 32/32 [= Epoch 84 32/32 [= Epoch 85 32/32 [= Epoch 86 32/32 [= Epoch 87 32/32 [= Epoch 87 32/32 [= Epoch 87 32/32 [= Epoch 88 32/32 [= Epoch 87 32/32 [= Epoch 90 32/32 [= Epoch 91 32/32 [= Epoch 94	
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 64 32/32 [= Epoch 65 32/32 [= Epoch 66 32/32 [= Epoch 67 32/32 [= Epoch 67 32/32 [= Epoch 67 32/32 [= Epoch 70 32/32 [= Epoch 71 32/32 [= Epoch 71 32/32 [= Epoch 72 32/32 [= Epoch 73 32/32 [= Epoch 74 32/32 [= Epoch 75 32/32 [= Epoch 76 32/32 [= Epoch 76 32/32 [= Epoch 77 32/32 [= Epoch 76 32/32 [= Epoch 77 32/32 [= Epoch 78 32/32 [= Epoch 79 32/32 [= Epoch 80 32/32 [= Epoch 81 32/32 [= Epoch 81 32/32 [= Epoch 84 32/32 [= Epoch 84 32/32 [= Epoch 85 32/32 [= Epoch 85 32/32 [= Epoch 86 32/32 [= Epoch 87 32/32 [= Epoch 88 32/32 [= Epoch 89 32/32 [= Epoch 89 32/32 [= Epoch 89 32/32 [= Epoch 89 32/32 [= Epoch 91 32/32 [= Epoch 92 32/32 [= Epoch 95 32/32 [= Epoch 95 32/32 [= Epoch 97 32/	
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 64 32/32 [= Epoch 66 32/32 [= Epoch 66 32/32 [= Epoch 67 32/32 [= Epoch 69 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [= Epoch 80 32/32 [= Epoch 80 32/32 [= Epoch 81 32/32 [= Epoch 82 32/32 [= Epoch 83 32/32 [= Epoch 84 32/32 [= Epoch 84 32/32 [= Epoch 84 32/32 [= Epoch 86 32/32 [= Epoch 87 32/32 [= Epoch 91 32/32 [= Epoch 91 32/32 [= Epoch 92 32/32 [= Epoch 91 32/32 [= Epoch 91 32/32 [= Epoch 92 32/32 [= Epoch 91 32/	1
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 64 32/32 [= Epoch 65 32/32 [= Epoch 66 32/32 [= Epoch 66 32/32 [= Epoch 67 32/32 [= Epoch 69 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [= Epoch 70 32/32 [= Epoch 71 32/32 [= Epoch 72 32/32 [= Epoch 73 32/32 [= Epoch 74 32/32 [= Epoch 75 32/32 [= Epoch 76 32/32 [= Epoch 76 32/32 [= Epoch 77 32/32 [= Epoch 77 32/32 [= Epoch 78 32/32 [= Epoch 79 32/32 [= Epoch 80 32/32 [= Epoch 81 32/32 [= Epoch 82 32/32 [= Epoch 84 32/32 [= Epoch 84 32/32 [= Epoch 84 32/32 [= Epoch 84 32/32 [= Epoch 85 32/32 [= Epoch 86 32/32 [= Epoch 87 32/32 [= Epoch 90 32/	1.
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 63 32/32 [= Epoch 63 32/32 [= Epoch 64 32/32 [= Epoch 65 32/32 [= Epoch 67 32/32 [= Epoch 68 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [= Epoch 71 32/32 [= Epoch 72 32/32 [= Epoch 73 32/32 [= Epoch 73 32/32 [= Epoch 73 32/32 [= Epoch 76 32/32 [= Epoch 76 32/32 [= Epoch 76 32/32 [= Epoch 77 32/32 [= Epoch 78 32/32 [= Epoch 79 32/32 [= Epoch 80 32/32 [= Epoch 81 32/32 [= Epoch 84 32/32 [= Epoch 87 32/32 [= Epoch 88 32/32 [= Epoch 89 32/32 [= Epoch 89 32/32 [= Epoch 89 32/32 [= Epoch 91 32/32 [= Epoch 91 32/32 [= Epoch 92 32/32 [= Epoch 91 32/32 [= Epoch 92 32/32 [= Epoch 93 32/32 [= Epoch 94 32/32 [= Epoch 96 32/32 [= Epoch 97 32/	1
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 64 32/32 [= Epoch 66 32/32 [= Epoch 66 32/32 [= Epoch 67 32/32 [= Epoch 69 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [= Epoch 80 32/	1
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 65 32/32 [= Epoch 66 32/32 [= Epoch 66 32/32 [= Epoch 68 32/32 [= Epoch 68 32/32 [= Epoch 70 32/32 [= Epoch 70 32/32 [= Epoch 70 32/32 [= Epoch 71 32/32 [= Epoch 72 32/32 [= Epoch 73 32/32 [= Epoch 74 32/32 [= Epoch 74 32/32 [= Epoch 76 32/32 [= Epoch 77 32/32 [= Epoch 78 32/32 [= Epoch 78 32/32 [= Epoch 79 32/32 [= Epoch 79 32/32 [= Epoch 80 32/32 [= Epoch 81 32/32 [= Epoch 82 32/32 [= Epoch 83 32/32 [= Epoch 84 32/32 [= Epoch 85 32/32 [= Epoch 85 32/32 [= Epoch 86 32/32 [= Epoch 87 32/32 [= Epoch 88 32/32 [= Epoch 89 32/32 [= Epoch 91 32/32 [= Epoch 91 32/32 [= Epoch 92 32/32 [= Epoch 94 32/32 [= Epoch 97 32/	
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 64 32/32 [= Epoch 65 32/32 [= Epoch 66 32/32 [= Epoch 66 32/32 [= Epoch 67 32/32 [= Epoch 70 32/32 [= Epoch 70 32/32 [= Epoch 71 32/32 [= Epoch 71 32/32 [= Epoch 72 32/32 [= Epoch 73 32/32 [= Epoch 74 32/32 [= Epoch 75 32/32 [= Epoch 76 32/32 [= Epoch 77 32/32 [= Epoch 78 32/32 [= Epoch 79 32/32 [= Epoch 79 32/32 [= Epoch 80 32/32 [= Epoch 81 32/32 [= Epoch 82 32/32 [= Epoch 84 32/32 [= Epoch 84 32/32 [= Epoch 86 32/32 [= Epoch 87 32/32 [= Epoch 97 32/	1
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 61 32/32 [= Epoch 64 32/32 [= Epoch 66 32/32 [= Epoch 66 32/32 [= Epoch 68 32/32 [= Epoch 68 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [= Epoch 70 32/32 [= Epoch 70 32/32 [= Epoch 71 32/32 [= Epoch 73 32/32 [= Epoch 73 32/32 [= Epoch 73 32/32 [= Epoch 75 32/32 [= Epoch 75 32/32 [= Epoch 76 32/32 [= Epoch 77 32/32 [= Epoch 78 32/32 [= Epoch 78 32/32 [= Epoch 78 32/32 [= Epoch 80 32/32 [= Epoch 90 32/32 [= Epoch 90 32/32 [= Epoch 91 32/32 [= Epoch 91 32/32 [= Epoch 93 32/32 [= Epoch 94 32/32 [= Epoch 94 32/32 [= Epoch 96 32/32 [= Epoch 97 32/32 [= Epoch 98 32/	1
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 63 32/32 [= Epoch 65 532/32 [= Epoch 65 532/32 [= Epoch 67 32/32 [= Epoch 67 32/32 [= Epoch 68 32/32 [= Epoch 70 32/32 [= Epoch 80 32/32 [= Epoch 80 32/32 [= Epoch 81 3	Part Part
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 63 32/32 [= Epoch 63 32/32 [= Epoch 65 32/32 [= Epoch 65 32/32 [= Epoch 67 32/32 [= Epoch 67 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [= Epoch 71 32/32 [= Epoch 71 32/32 [= Epoch 73 32/32 [= Epoch 74 32/32 [= Epoch 74 32/32 [= Epoch 76 32/32 [= Epoch 78 32/32 [= Epoch 80 32/	
Epoch 59 32/32 [= Epoch 61 32/32 [= Epoch 61 32/32 [= Epoch 63 32/32 [= Epoch 63 32/32 [= Epoch 63 32/32 [= Epoch 66 32/32 [= Epoch 68 32/32 [= Epoch 68 32/32 [= Epoch 70 32/32 [= Epoch 80 32/32 [= Epoch 81 32/32 [= Epoch 81 32/32 [= Epoch 81 32/32 [= Epoch 83 32/32 [= Epoch 84 32/32 [= Epoch 85 32/32 [= Epoch 85 32/32 [= Epoch 87 32/32 [= Epoch 90 40 32/32 [= Epoch 90 40 40 40 40 40 40	Column
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 64 32/32 [= Epoch 66 32/32 [= Epoch 66 32/32 [= Epoch 68 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [= Epoch 71 32/32 [= Epoch 73 32/32 [= Epoch 73 32/32 [= Epoch 73 32/32 [= Epoch 74 32/32 [= Epoch 75 32/32 [= Epoch 76 32/32 [= Epoch 76 32/32 [= Epoch 77 32/32 [= Epoch 78 32/32 [= Epoch 78 32/32 [= Epoch 79 32/32 [= Epoch 78 32/32 [= Epoch 78 32/32 [= Epoch 78 32/32 [= Epoch 78 32/32 [= Epoch 80 32/32 [= Epoch 80 32/32 [= Epoch 81 32/32 [= Epoch 83 32/32 [= Epoch 83 32/32 [= Epoch 84 32/32 [= Epoch 85 32/32 [= Epoch 85 32/32 [= Epoch 87 32/32 [= Epoch 89 32/32 [= Epoch 90 32/32 [= Epoch 90 32/32 [= Epoch 91 32/32 [= Epoch 92 32/32 [= Epoch 92 32/32 [= Epoch 94 32/32 [= Epoch 94 32/32 [= Epoch 96 32/32 [= Epoch 97 32/32 [= Epoch 90 32/32 [= Epoch 91 32/32 [= Epoch 92 32/32 [= Epoch 92 32/32 [= Epoch 93 32/32 [= Epoch 94 32/32 [= Epoch 96 32/32 [= Epoch 97 32/32 [= Epoch 97 32/32 [= Epoch 96 32/32 [= Epoch 97 32/	
Epoch 59 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 64 32/32 [= Epoch 64 32/32 [= Epoch 65 32/32 [= Epoch 66 32/32 [= Epoch 67 32/32 [= Epoch 69 32/32 [= Epoch 79 32/32 [= Epoch 81 32/32 [= Epoch 83 32/32 [= Epoch 83 32/32 [= Epoch 83 32/32 [= Epoch 84 32/32 [= Epoch 85 32/32 [= Epoch 86 32/32 [= Epoch 86 32/32 [= Epoch 87 32/32 [= Epoch 88 32/32 [= Epoch 88 32/32 [= Epoch 88 32/32 [= Epoch 89 32/32 [= Epoch 89 32/32 [= Epoch 90 32/32 [= Epoch 90 32/32 [= Epoch 90 32/32 [= Epoch 96 32/	Part Part
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 63 32/32 [= Epoch 67 32/32 [= Epoch 67 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [= Epoch 70 32/32 [= Epoch 71 32/32 [= Epoch 72 32/32 [= Epoch 73 32/32 [= Epoch 74 32/32 [= Epoch 74 32/32 [= Epoch 77 32/32 [= Epoch 79 32/32 [= Epoch 79 32/32 [= Epoch 79 32/32 [= Epoch 83 32/32 [= Epoch 84 32/32 [= Epoch 85 32/32 [= Epoch 86 32/32 [= Epoch 87 32/32 [= Epoch 89 32/32 [= Epoch 90 32/	A
Epoch 59 32/32 [= Epoch 61 32/32 [= Epoch 62 32/32 [= Epoch 63 32/32 [= Epoch 64 32/32 [= Epoch 65 32/32 [= Epoch 63 32/32 [= Epoch 68 32/32 [= Epoch 68 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [= Epoch 80 32/32 [= Epoch 90 32/	See
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 63 32/32 [= Epoch 64 32/32 [= Epoch 65 32/32 [= Epoch 68 32/32 [= Epoch 68 32/32 [= Epoch 70 32/32 [= Epoch 71 32/32 [= Epoch 72 32/32 [= Epoch 73 32/32 [= Epoch 74 32/32 [= Epoch 74 32/32 [= Epoch 74 32/32 [= Epoch 77 32/32 [= Epoch 77 32/32 [= Epoch 77 32/32 [= Epoch 78 32/32 [= Epoch 79 32/32 [= Epoch 80 32/32 [= Epoch 90 32/	
Epoch 59 32/32 [= Epoch 60 32/32 [= Epoch 61 32/32 [= Epoch 63 32/32 [= Epoch 63 32/32 [= Epoch 63 32/32 [= Epoch 66 32/32 [= Epoch 66 32/32 [= Epoch 67 32/32 [= Epoch 69 32/32 [= Epoch 70 32/32 [= Epoch 70 32/32 [= Epoch 73 32/32 [= Epoch 76 32/32 [= Epoch 76 32/32 [= Epoch 76 32/32 [= Epoch 78 32/32 [= Epoch 79 32/32 [= Epoch 80 32/	
## Epoch 59 32/32 [=	