Notebook Diff

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Base	Remote

Notebook metadata changed ☐

In [ ]:   In [1]:

```python
import tensorflow as tf
import keras
import sys
from matplotlib import pyplot
from keras.models import Sequential, load_model, Model
from tensorflow.keras.datasets import cifar10
from tensorflow.keras.utils import to_categorical
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Conv2D, Activation, BatchNormalization
from tensorflow.keras.layers import MaxPooling2D, Dropout
from tensorflow.keras.layers import Dense, Input, Conv2DTranspose
from tensorflow.keras.layers import Flatten, Add, AveragePooling2D,
    ZeroPadding2D
from tensorflow.keras.optimizers import SGD
from keras.initializers import glorot_uniform
from keras.activations import relu, softmax
from keras.callbacks import EarlyStopping, TensorBoard, ModelCheckpoint
from tensorflow.keras.utils import plot_model
from keras.utils.vis_utils import model_to_dot
from keras import backend as K
from sklearn.metrics import confusion_matrix
from matplotlib import animation, rc
import matplotlib.patches as mpatches
from IPython.display import HTML, display, clear_output, SVG
from tensorflow.keras.optimizers import Adadelta
import ipywidgets as widgets
from tensorflow.keras.applications.resnet50 import ResNet50
import random
```

Metadata changed ☐

In [ ]:   In [2]:

```python
def load_dataset():
    # load dataset
    (trainX, trainY), (testX, testY) = cifar10.load_data()
    # one hot encode target values
    trainY = to_categorical(trainY)
    testY = to_categorical(testY)
    return trainX, trainY, testX, testY
```

Metadata changed ☐

```python
def define_model():
	model = Sequential()
	model.add(Conv2D(32, (3, 3), activation='relu',
kernel_initializer='he_uniform', padding='same', input_shape=(32, 32, 3)))
	model.add(Conv2D(32, (3, 3), activation='relu',
kernel_initializer='he_uniform', padding='same'))
	model.add(MaxPooling2D((2, 2)))
	model.add(Conv2D(64, (3, 3), activation='relu',
kernel_initializer='he_uniform', padding='same'))
	model.add(Conv2D(64, (3, 3), activation='relu',
kernel_initializer='he_uniform', padding='same'))
	model.add(MaxPooling2D((2, 2)))
	model.add(Conv2D(128, (3, 3), activation='relu',
kernel_initializer='he_uniform', padding='same'))
	model.add(Conv2D(128, (3, 3), activation='relu',
kernel_initializer='he_uniform', padding='same'))
	model.add(MaxPooling2D((2, 2)))
	model.add(Flatten())
	model.add(Dense(128, activation='relu', kernel_initializer='he_uniform'))
	model.add(Dense(10, activation='softmax'))
	# compile model
	opt = SGD(lr=0.001, momentum=0.9)
	model.compile(optimizer=opt, loss='categorical_crossentropy', metrics=
['accuracy'])
	return model
```

Metadata changed

```python
def model():
    base_model = ResNet50(include_top=False, input_shape=(128, 128, 3),
    pooling='max')

    for layer in base_model.layers:
        layer.trainable = False
    model = Sequential()
    model.add(Conv2DTranspose(3, (3, 3), strides=2, padding='same',
    activation='relu', input_shape=(32,32,3)))
    model.add(BatchNormalization())
    model.add(Conv2DTranspose(3, (3, 3), strides=2, padding='same',
    activation='relu'))
    model.add(BatchNormalization())
    model.add(base_model)
    model.add(Flatten())
    model.add(Dense(1024, activation='relu'))
    model.add(Dense(512, activation='relu'))
    model.add(Dense(10, activation='softmax'))
    opt = SGD(lr=0.001, momentum=0.9)
    model.compile(optimizer=opt, loss='categorical_crossentropy', metrics=
    ['accuracy'])

    return model
```

Metadata changed

In [ ]:   In [5]:

```python
def prep_pixels(train, test):
    # convert from integers to floats
    train_norm = train.astype('float32')
    test_norm = test.astype('float32')
    # normalize to range 0-1
    train_norm = train_norm / 255.0
    test_norm = test_norm / 255.0
    # return normalized images
    return train_norm, test_norm

def preprocess_image_input(input_images):
    input_images = input_images.astype('float32')
    output_ims =
    tf.keras.applications.resnet50.preprocess_input(input_images)
    return output_ims
```

Metadata changed

In [ ]:   In [6]:

```python
x_train, y_train, x_test, y_test = load_dataset()
models = []
# x_train, x_test = prep_pixels(x_train, x_test)
x_train = preprocess_image_input(x_train)
x_test = preprocess_image_input(x_test)
excluded_data_x = []
excluded_data_y = []
def run_test_harness():
    # load dataset
    # trainX, trainY, testX, testY = load_dataset()
    # x_train, y_train, x_test, y_test = load_dataset()
    # models = []
    # x_train, x_test = prep_pixels(x_train, x_test)
    base_epochs = 1
    curr_model = 1
    for i in range(0, x_train.shape[0], 5000):
        curr_x_train = x_train[i : (i+5000)]
        curr_y_train = y_train[i : (i+5000)]
        model_i = model()
        print("Training shard: " + str(curr_model) + " out of " + str((int)
(x_train.shape[0] / 5000)))
        excluded_list = []
        excluded_list.append(random.randint(1,20))
        rand2 = random.randint(1,20)
        while rand2 == excluded_list[0]:
            rand2 = random.randint(1,20)
        excluded_list.append(rand2)

        for j in range(250, len(curr_x_train), 250):
            print("Training slice: " + str((int)(j/250)) + " out of " +
str((int)(len(curr_x_train)/250)))
            if ((int)(j/250)) in excluded_list:
                excluded_data_x.append(curr_x_train[j-250 : j])
                excluded_data_y.append(curr_y_train[j-250 : j])
                print("Data excluded for "+ str((int)(j/250)))
                continue
            slice_x = curr_x_train[0: j]
            slice_y = curr_y_train[0: j]
            epochs = base_epochs * (int)(j/250)

            model_i.fit(slice_x, slice_y, batch_size=16, epochs=epochs,
verbose=True)

        models.append(model_i)
        curr_model+=1

    return models
```

Metadata changed

Outputs changed

Output deleted

```
1  models = run_test_harness()
```

Metadata changed ☐

Outputs changed ☐

Output deleted

Downloading data from https://storage.googleapis.com/tensorflow/keras-applications/
94773248/94765736 [==============================] – 1s 0us/step
94781440/94765736 [==============================] – 1s 0us/step

Output deleted

/usr/local/lib/python3.7/dist-packages/keras/optimizer_v2/gradient_descent.py:102:
  super(SGD, self).__init__(name, **kwargs)

Output deleted

```
Training shard: 1 out of 10
Training slice: 1 out of 20
16/16 [==============================] – 11s 419ms/step – loss: 2.4425 – accuracy:
Training slice: 2 out of 20
Epoch 1/2
32/32 [==============================] – 14s 423ms/step – loss: 2.3064 – accuracy:
Epoch 2/2
32/32 [==============================] – 14s 435ms/step – loss: 2.2562 – accuracy:
Training slice: 3 out of 20
Epoch 1/3
47/47 [==============================] – 21s 439ms/step – loss: 2.1580 – accuracy:
Epoch 2/3
47/47 [==============================] – 20s 435ms/step – loss: 2.0257 – accuracy:
Epoch 3/3
47/47 [==============================] – 21s 441ms/step – loss: 1.9002 – accuracy:
Training slice: 4 out of 20
Epoch 1/4
63/63 [==============================] – 27s 424ms/step – loss: 1.8912 – accuracy:
Epoch 2/4
63/63 [==============================] – 27s 429ms/step – loss: 1.7957 – accuracy:
Epoch 3/4
63/63 [==============================] – 27s 429ms/step – loss: 1.7394 – accuracy:
Epoch 4/4
63/63 [==============================] – 27s 427ms/step – loss: 1.6591 – accuracy:
Training slice: 5 out of 20
Epoch 1/5
79/79 [==============================] – 34s 430ms/step – loss: 1.6744 – accuracy:
Epoch 2/5
79/79 [==============================] – 33s 422ms/step – loss: 1.6158 – accuracy:
Epoch 3/5
79/79 [==============================] – 33s 423ms/step – loss: 1.5645 – accuracy:
Epoch 4/5
79/79 [==============================] – 34s 429ms/step – loss: 1.5111 – accuracy:
Epoch 5/5
79/79 [==============================] – 35s 437ms/step – loss: 1.4841 – accuracy:
Training slice: 6 out of 20
Epoch 1/6
94/94 [==============================] – 41s 440ms/step – loss: 1.4889 – accuracy:
Epoch 2/6
94/94 [==============================] – 41s 438ms/step – loss: 1.4567 – accuracy:
Epoch 3/6
```

```
94/94 [==============================] – 40s 429ms/step – loss: 1.4064 – accuracy:
Epoch 4/6
94/94 [==============================] – 40s 429ms/step – loss: 1.3545 – accuracy:
Epoch 5/6
94/94 [==============================] – 40s 430ms/step – loss: 1.3218 – accuracy:
Epoch 6/6
94/94 [==============================] – 40s 429ms/step – loss: 1.3023 – accuracy:
Training slice: 7 out of 20
Data excluded for 7
Training slice: 8 out of 20
Epoch 1/8
125/125 [==============================] – 59s 453ms/step – loss: 1.3175 – accuracy
Epoch 2/8
125/125 [==============================] – 56s 450ms/step – loss: 1.2878 – accuracy
Epoch 3/8
125/125 [==============================] – 55s 436ms/step – loss: 1.2311 – accuracy
Epoch 4/8
125/125 [==============================] – 54s 434ms/step – loss: 1.2191 – accuracy
Epoch 5/8
125/125 [==============================] – 54s 434ms/step – loss: 1.1812 – accuracy
Epoch 6/8
125/125 [==============================] – 54s 434ms/step – loss: 1.1239 – accuracy
Epoch 7/8
125/125 [==============================] – 55s 440ms/step – loss: 1.0931 – accuracy
Epoch 8/8
125/125 [==============================] – 54s 436ms/step – loss: 1.0340 – accuracy
Training slice: 9 out of 20
Epoch 1/9
141/141 [==============================] – 61s 433ms/step – loss: 1.1265 – accuracy
Epoch 2/9
141/141 [==============================] – 61s 436ms/step – loss: 1.0762 – accuracy
Epoch 3/9
141/141 [==============================] – 61s 435ms/step – loss: 1.0770 – accuracy
Epoch 4/9
141/141 [==============================] – 62s 441ms/step – loss: 0.9962 – accuracy
Epoch 5/9
141/141 [==============================] – 61s 435ms/step – loss: 0.9430 – accuracy
Epoch 6/9
141/141 [==============================] – 61s 429ms/step – loss: 0.9198 – accuracy
Epoch 7/9
141/141 [==============================] – 60s 427ms/step – loss: 0.9077 – accuracy
Epoch 8/9
141/141 [==============================] – 60s 428ms/step – loss: 0.8216 – accuracy
Epoch 9/9
141/141 [==============================] – 61s 433ms/step – loss: 0.8089 – accuracy
Training slice: 10 out of 20
Epoch 1/10
157/157 [==============================] – 68s 435ms/step – loss: 0.8995 – accuracy
Epoch 2/10
157/157 [==============================] – 67s 428ms/step – loss: 0.8608 – accuracy
Epoch 3/10
157/157 [==============================] – 66s 423ms/step – loss: 0.8278 – accuracy
Epoch 4/10
157/157 [==============================] – 69s 442ms/step – loss: 0.7688 – accuracy
Epoch 5/10
157/157 [==============================] – 70s 443ms/step – loss: 0.7221 – accuracy
Epoch 6/10
```

```
157/157 [==============================] - 68s 434ms/step - loss: 0.6941 - accurac
Epoch 7/10
157/157 [==============================] - 67s 427ms/step - loss: 0.6593 - accurac
Epoch 8/10
157/157 [==============================] - 67s 430ms/step - loss: 0.6469 - accurac
Epoch 9/10
157/157 [==============================] - 69s 439ms/step - loss: 0.6395 - accurac
Epoch 10/10
157/157 [==============================] - 69s 437ms/step - loss: 0.5719 - accurac
Training slice: 11 out of 20
Epoch 1/11
172/172 [==============================] - 77s 445ms/step - loss: 0.7118 - accurac
Epoch 2/11
172/172 [==============================] - 77s 449ms/step - loss: 0.6585 - accurac
Epoch 3/11
172/172 [==============================] - 78s 455ms/step - loss: 0.5887 - accurac
Epoch 4/11
172/172 [==============================] - 76s 439ms/step - loss: 0.5723 - accurac
Epoch 5/11
172/172 [==============================] - 75s 435ms/step - loss: 0.5276 - accurac
Epoch 6/11
172/172 [==============================] - 75s 436ms/step - loss: 0.5122 - accurac
Epoch 7/11
172/172 [==============================] - 77s 446ms/step - loss: 0.4531 - accurac
Epoch 8/11
172/172 [==============================] - 78s 454ms/step - loss: 0.4488 - accurac
Epoch 9/11
172/172 [==============================] - 77s 450ms/step - loss: 0.3605 - accurac
Epoch 10/11
172/172 [==============================] - 77s 449ms/step - loss: 0.4124 - accurac
Epoch 11/11
172/172 [==============================] - 77s 450ms/step - loss: 0.3412 - accurac
Training slice: 12 out of 20
Epoch 1/12
188/188 [==============================] - 85s 452ms/step - loss: 0.5361 - accurac
Epoch 2/12
188/188 [==============================] - 84s 449ms/step - loss: 0.4677 - accurac
Epoch 3/12
188/188 [==============================] - 85s 455ms/step - loss: 0.4213 - accurac
Epoch 4/12
188/188 [==============================] - 85s 453ms/step - loss: 0.3719 - accurac
Epoch 5/12
188/188 [==============================] - 84s 448ms/step - loss: 0.3592 - accurac
Epoch 6/12
188/188 [==============================] - 85s 450ms/step - loss: 0.3226 - accurac
Epoch 7/12
188/188 [==============================] - 85s 451ms/step - loss: 0.3100 - accurac
Epoch 8/12
188/188 [==============================] - 85s 451ms/step - loss: 0.2939 - accurac
Epoch 9/12
188/188 [==============================] - 82s 437ms/step - loss: 0.3015 - accurac
Epoch 10/12
188/188 [==============================] - 84s 449ms/step - loss: 0.2284 - accurac
Epoch 11/12
188/188 [==============================] - 85s 451ms/step - loss: 0.2081 - accurac
Epoch 12/12
188/188 [==============================] - 84s 446ms/step - loss: 0.2112 - accurac
```

```
Training slice: 13 out of 20
Data excluded for 13
Training slice: 14 out of 20
Epoch 1/14
219/219 [==============================] - 97s 441ms/step - loss: 0.6307 - accuracy
Epoch 2/14
219/219 [==============================] - 97s 443ms/step - loss: 0.5072 - accuracy
Epoch 3/14
219/219 [==============================] - 98s 448ms/step - loss: 0.4446 - accuracy
Epoch 4/14
219/219 [==============================] - 97s 442ms/step - loss: 0.4070 - accuracy
Epoch 5/14
219/219 [==============================] - 97s 444ms/step - loss: 0.3553 - accuracy
Epoch 6/14
219/219 [==============================] - 98s 450ms/step - loss: 0.3090 - accuracy
Epoch 7/14
219/219 [==============================] - 97s 442ms/step - loss: 0.3085 - accuracy
Epoch 8/14
219/219 [==============================] - 99s 453ms/step - loss: 0.2339 - accuracy
Epoch 9/14
219/219 [==============================] - 98s 450ms/step - loss: 0.2574 - accuracy
Epoch 10/14
219/219 [==============================] - 105s 482ms/step - loss: 0.2124 - accura
Epoch 11/14
219/219 [==============================] - 101s 461ms/step - loss: 0.1962 - accura
Epoch 12/14
219/219 [==============================] - 104s 473ms/step - loss: 0.1651 - accura
Epoch 13/14
219/219 [==============================] - 99s 453ms/step - loss: 0.1518 - accuracy
Epoch 14/14
219/219 [==============================] - 96s 438ms/step - loss: 0.1404 - accuracy
Training slice: 15 out of 20
Epoch 1/15
235/235 [==============================] - 106s 452ms/step - loss: 0.3469 - accura
Epoch 2/15
235/235 [==============================] - 104s 444ms/step - loss: 0.2989 - accura
Epoch 3/15
235/235 [==============================] - 105s 448ms/step - loss: 0.2188 - accura
Epoch 4/15
235/235 [==============================] - 106s 452ms/step - loss: 0.1734 - accura
Epoch 5/15
235/235 [==============================] - 106s 450ms/step - loss: 0.1876 - accura
Epoch 6/15
235/235 [==============================] - 107s 453ms/step - loss: 0.1571 - accura
Epoch 7/15
235/235 [==============================] - 106s 453ms/step - loss: 0.1321 - accura
Epoch 8/15
235/235 [==============================] - 105s 449ms/step - loss: 0.1063 - accura
Epoch 9/15
235/235 [==============================] - 108s 459ms/step - loss: 0.0915 - accura
Epoch 10/15
235/235 [==============================] - 107s 456ms/step - loss: 0.0770 - accura
Epoch 11/15
235/235 [==============================] - 107s 455ms/step - loss: 0.0850 - accura
Epoch 12/15
235/235 [==============================] - 106s 453ms/step - loss: 0.0719 - accura
Epoch 13/15
```

```
235/235 [==============================] - 106s 451ms/step - loss: 0.0822 - accura
Epoch 14/15
235/235 [==============================] - 105s 447ms/step - loss: 0.0787 - accura
Epoch 15/15
235/235 [==============================] - 105s 447ms/step - loss: 0.0697 - accura
Training slice: 16 out of 20
Epoch 1/16
250/250 [==============================] - 111s 445ms/step - loss: 0.3535 - accura
Epoch 2/16
250/250 [==============================] - 108s 431ms/step - loss: 0.2549 - accura
Epoch 3/16
250/250 [==============================] - 110s 440ms/step - loss: 0.1922 - accura
Epoch 4/16
250/250 [==============================] - 113s 453ms/step - loss: 0.1659 - accura
Epoch 5/16
250/250 [==============================] - 115s 460ms/step - loss: 0.1605 - accura
Epoch 6/16
250/250 [==============================] - 116s 463ms/step - loss: 0.1251 - accura
Epoch 7/16
250/250 [==============================] - 111s 446ms/step - loss: 0.0911 - accura
Epoch 8/16
250/250 [==============================] - 112s 448ms/step - loss: 0.1018 - accura
Epoch 9/16
250/250 [==============================] - 114s 456ms/step - loss: 0.0785 - accura
Epoch 10/16
250/250 [==============================] - 112s 449ms/step - loss: 0.0742 - accura
Epoch 11/16
250/250 [==============================] - 111s 445ms/step - loss: 0.0672 - accura
Epoch 12/16
250/250 [==============================] - 111s 445ms/step - loss: 0.0613 - accura
Epoch 13/16
250/250 [==============================] - 110s 438ms/step - loss: 0.0548 - accura
Epoch 14/16
250/250 [==============================] - 109s 437ms/step - loss: 0.0379 - accura
Epoch 15/16
250/250 [==============================] - 108s 433ms/step - loss: 0.0389 - accura
Epoch 16/16
250/250 [==============================] - 110s 440ms/step - loss: 0.0431 - accura
Training slice: 17 out of 20
Epoch 1/17
209/266 [=====================>.......] - ETA: 24s - loss: 0.3192 - accuracy: 0.9
```

Output added

```
2021-12-09 10:41:56.347548: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc
2021-12-09 10:41:56.357565: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc
2021-12-09 10:41:56.358226: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc
2021-12-09 10:41:56.359554: I tensorflow/core/platform/cpu_feature_guard.cc:151] Tl
To enable them in other operations, rebuild TensorFlow with the appropriate compil
2021-12-09 10:41:56.361214: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc
2021-12-09 10:41:56.361860: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc
2021-12-09 10:41:56.362454: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc
2021-12-09 10:41:56.927882: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc
2021-12-09 10:41:56.928584: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc
2021-12-09 10:41:56.929192: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc
2021-12-09 10:41:56.929814: I tensorflow/core/common_runtime/gpu/gpu_device.cc:152
/opt/conda/lib/python3.7/site-packages/keras/optimizer_v2/gradient_descent.py:102:
  super(SGD, self).__init__(name, **kwargs)
```

Output added

```
Training shard: 1 out of 10
Training slice: 1 out of 20
```
Output added
```
2021-12-09 10:42:02.231654: I tensorflow/stream_executor/cuda/cuda_dnn.cc:366] Loa
```
Output added
```
16/16 [==============================] - 6s 44ms/step - loss: 2.4098 - accuracy: 0
Training slice: 2 out of 20
Epoch 1/2
32/32 [==============================] - 1s 33ms/step - loss: 2.2000 - accuracy: 0
Epoch 2/2
32/32 [==============================] - 1s 26ms/step - loss: 2.0086 - accuracy: 0
Training slice: 3 out of 20
Data excluded for 3
Training slice: 4 out of 20
Epoch 1/4
63/63 [==============================] - 2s 30ms/step - loss: 1.9467 - accuracy: 0
Epoch 2/4
63/63 [==============================] - 2s 26ms/step - loss: 1.7973 - accuracy: 0
Epoch 3/4
63/63 [==============================] - 2s 26ms/step - loss: 1.7198 - accuracy: 0
Epoch 4/4
63/63 [==============================] - 2s 26ms/step - loss: 1.5858 - accuracy: 0
Training slice: 5 out of 20
Epoch 1/5
79/79 [==============================] - 2s 29ms/step - loss: 1.6448 - accuracy: 0
Epoch 2/5
79/79 [==============================] - 2s 26ms/step - loss: 1.5890 - accuracy: 0
Epoch 3/5
79/79 [==============================] - 2s 27ms/step - loss: 1.5281 - accuracy: 0
Epoch 4/5
79/79 [==============================] - 2s 26ms/step - loss: 1.4624 - accuracy: 0
Epoch 5/5
79/79 [==============================] - 2s 26ms/step - loss: 1.4115 - accuracy: 0
Training slice: 6 out of 20
Epoch 1/6
94/94 [==============================] - 3s 29ms/step - loss: 1.3985 - accuracy: 0
Epoch 2/6
94/94 [==============================] - 2s 26ms/step - loss: 1.3381 - accuracy: 0
Epoch 3/6
94/94 [==============================] - 2s 26ms/step - loss: 1.3051 - accuracy: 0
Epoch 4/6
94/94 [==============================] - 2s 26ms/step - loss: 1.2615 - accuracy: 0
Epoch 5/6
94/94 [==============================] - 2s 26ms/step - loss: 1.2358 - accuracy: 0
Epoch 6/6
94/94 [==============================] - 2s 26ms/step - loss: 1.1621 - accuracy: 0
Training slice: 7 out of 20
Epoch 1/7
110/110 [==============================] - 3s 28ms/step - loss: 1.2506 - accuracy:
Epoch 2/7
110/110 [==============================] - 3s 26ms/step - loss: 1.1659 - accuracy:
Epoch 3/7
110/110 [==============================] - 3s 26ms/step - loss: 1.1228 - accuracy:
Epoch 4/7
110/110 [==============================] - 3s 26ms/step - loss: 1.0753 - accuracy:
Epoch 5/7
110/110 [                              ]          2s 26ms/step    loss: 1.0224    accuracy:
```

```
110/110 [==============================] - 3s 26ms/step - loss: 1.0224 - accuracy:
Epoch 6/7
110/110 [==============================] - 3s 26ms/step - loss: 0.9790 - accuracy:
Epoch 7/7
110/110 [==============================] - 3s 26ms/step - loss: 0.9616 - accuracy:
Training slice: 8 out of 20
Epoch 1/8
125/125 [==============================] - 5s 26ms/step - loss: 1.0409 - accuracy:
Epoch 2/8
125/125 [==============================] - 3s 26ms/step - loss: 0.9848 - accuracy:
Epoch 3/8
125/125 [==============================] - 3s 26ms/step - loss: 0.8908 - accuracy:
Epoch 4/8
125/125 [==============================] - 3s 26ms/step - loss: 0.8715 - accuracy:
Epoch 5/8
125/125 [==============================] - 3s 26ms/step - loss: 0.8605 - accuracy:
Epoch 6/8
125/125 [==============================] - 3s 26ms/step - loss: 0.7911 - accuracy:
Epoch 7/8
125/125 [==============================] - 3s 26ms/step - loss: 0.7663 - accuracy:
Epoch 8/8
125/125 [==============================] - 3s 26ms/step - loss: 0.7168 - accuracy:
Training slice: 9 out of 20
Epoch 1/9
141/141 [==============================] - 4s 26ms/step - loss: 0.8450 - accuracy:
Epoch 2/9
141/141 [==============================] - 4s 26ms/step - loss: 0.7750 - accuracy:
Epoch 3/9
141/141 [==============================] - 4s 26ms/step - loss: 0.6904 - accuracy:
Epoch 4/9
141/141 [==============================] - 4s 26ms/step - loss: 0.6728 - accuracy:
Epoch 5/9
141/141 [==============================] - 4s 26ms/step - loss: 0.6550 - accuracy:

Epoch 6/9
141/141 [==============================] - 4s 26ms/step - loss: 0.5931 - accuracy:
Epoch 7/9
141/141 [==============================] - 4s 26ms/step - loss: 0.5457 - accuracy:
Epoch 8/9
141/141 [==============================] - 4s 26ms/step - loss: 0.5289 - accuracy:
Epoch 9/9
141/141 [==============================] - 4s 27ms/step - loss: 0.4559 - accuracy:
Training slice: 10 out of 20
Data excluded for 10
Training slice: 11 out of 20
Epoch 1/11
172/172 [==============================] - 5s 28ms/step - loss: 0.7619 - accuracy:
Epoch 2/11
172/172 [==============================] - 5s 26ms/step - loss: 0.6730 - accuracy:
Epoch 3/11
172/172 [==============================] - 5s 26ms/step - loss: 0.6512 - accuracy:
Epoch 4/11
172/172 [==============================] - 5s 26ms/step - loss: 0.5703 - accuracy:
Epoch 5/11
172/172 [==============================] - 5s 26ms/step - loss: 0.5235 - accuracy:
Epoch 6/11
172/172 [==============================] - 5s 26ms/step - loss: 0.4755 - accuracy:
Epoch 7/11
172/172 [                              ]      5s 27ms/step - loss: 0.4414 - accuracy:
```

```
1/2/1/2 [==============================] - 5s 2/ms/step - loss: 0.4414 - accuracy:
Epoch 8/11
172/172 [==============================] - 5s 26ms/step - loss: 0.4009 - accuracy:
Epoch 9/11
172/172 [==============================] - 4s 26ms/step - loss: 0.3584 - accuracy:
Epoch 10/11
172/172 [==============================] - 5s 26ms/step - loss: 0.3208 - accuracy:
Epoch 11/11
172/172 [==============================] - 5s 26ms/step - loss: 0.3036 - accuracy:
Training slice: 12 out of 20
Epoch 1/12
188/188 [==============================] - 5s 26ms/step - loss: 0.4718 - accuracy:
Epoch 2/12
188/188 [==============================] - 5s 26ms/step - loss: 0.4598 - accuracy:
Epoch 3/12
188/188 [==============================] - 5s 26ms/step - loss: 0.3945 - accuracy:
Epoch 4/12
188/188 [==============================] - 5s 26ms/step - loss: 0.3082 - accuracy:
Epoch 5/12
188/188 [==============================] - 5s 26ms/step - loss: 0.3298 - accuracy:
Epoch 6/12
188/188 [==============================] - 5s 26ms/step - loss: 0.2606 - accuracy:
Epoch 7/12
188/188 [==============================] - 5s 26ms/step - loss: 0.2348 - accuracy:
Epoch 8/12
188/188 [==============================] - 5s 26ms/step - loss: 0.2269 - accuracy:
Epoch 9/12
188/188 [==============================] - 5s 26ms/step - loss: 0.2067 - accuracy:
Epoch 10/12
188/188 [==============================] - 5s 27ms/step - loss: 0.1630 - accuracy:
Epoch 11/12
188/188 [==============================] - 5s 26ms/step - loss: 0.1738 - accuracy:
Epoch 12/12

188/188 [==============================] - 5s 26ms/step - loss: 0.1492 - accuracy:
Training slice: 13 out of 20
Epoch 1/13
204/204 [==============================] - 5s 27ms/step - loss: 0.4094 - accuracy:
Epoch 2/13
204/204 [==============================] - 5s 27ms/step - loss: 0.3398 - accuracy:
Epoch 3/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2799 - accuracy:
Epoch 4/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2644 - accuracy:
Epoch 5/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2007 - accuracy:
Epoch 6/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1735 - accuracy:
Epoch 7/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1618 - accuracy:
Epoch 8/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1599 - accuracy:
Epoch 9/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2811 - accuracy:
Epoch 10/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1234 - accuracy:
Epoch 11/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1174 - accuracy:
Epoch 12/13
```

```
Epoch 12/13
204/204 [==============================] - 5s 26ms/step - loss: 0.0928 - accuracy:
Epoch 13/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1105 - accuracy:
Training slice: 14 out of 20
```
Output added
```
Epoch 1/14
219/219 [==============================] - 6s 26ms/step - loss: 0.3816 - accuracy:
Epoch 2/14
219/219 [==============================] - 6s 26ms/step - loss: 0.2670 - accuracy:
Epoch 3/14
219/219 [==============================] - 6s 26ms/step - loss: 0.2103 - accuracy:
Epoch 4/14
219/219 [==============================] - 6s 26ms/step - loss: 0.1971 - accuracy:
Epoch 5/14
219/219 [==============================] - 6s 26ms/step - loss: 0.1545 - accuracy:
Epoch 6/14
219/219 [==============================] - 6s 26ms/step - loss: 0.1349 - accuracy:
Epoch 7/14
219/219 [==============================] - 6s 26ms/step - loss: 0.1250 - accuracy:
Epoch 8/14
219/219 [==============================] - 6s 26ms/step - loss: 0.0986 - accuracy:
Epoch 9/14
219/219 [==============================] - 6s 26ms/step - loss: 0.1230 - accuracy:
Epoch 10/14
219/219 [==============================] - 6s 26ms/step - loss: 0.0834 - accuracy:
Epoch 11/14
219/219 [==============================] - 6s 26ms/step - loss: 0.0893 - accuracy:
Epoch 12/14
219/219 [==============================] - 6s 26ms/step - loss: 0.0633 - accuracy:
Epoch 13/14
219/219 [==============================] - 6s 26ms/step - loss: 0.0504 - accuracy:
Epoch 14/14

219/219 [==============================] - 6s 26ms/step - loss: 0.0691 - accuracy:
Training slice: 15 out of 20
Epoch 1/15
235/235 [==============================] - 6s 27ms/step - loss: 0.2934 - accuracy:
Epoch 2/15
235/235 [==============================] - 6s 26ms/step - loss: 0.1992 - accuracy:
Epoch 3/15
235/235 [==============================] - 6s 26ms/step - loss: 0.1612 - accuracy:
Epoch 4/15
235/235 [==============================] - 6s 26ms/step - loss: 0.1241 - accuracy:
Epoch 5/15
235/235 [==============================] - 6s 26ms/step - loss: 0.1216 - accuracy:
Epoch 6/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0747 - accuracy:
Epoch 7/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0841 - accuracy:
Epoch 8/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0508 - accuracy:
Epoch 9/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0430 - accuracy:
Epoch 10/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0499 - accuracy:
Epoch 11/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0521 - accuracy:
Epoch 12/15
```

```
Epoch 12/15
235/235 [==============================] — 6s 26ms/step — loss: 0.0484 — accuracy:
Epoch 13/15
235/235 [==============================] — 6s 26ms/step — loss: 0.0314 — accuracy:
Epoch 14/15
235/235 [==============================] — 6s 26ms/step — loss: 0.0339 — accuracy:
Epoch 15/15
235/235 [==============================] — 6s 26ms/step — loss: 0.0461 — accuracy:
Training slice: 16 out of 20
Epoch 1/16
250/250 [==============================] — 6s 26ms/step — loss: 0.2907 — accuracy:
Epoch 2/16
250/250 [==============================] — 6s 26ms/step — loss: 0.2174 — accuracy:
Epoch 3/16
250/250 [==============================] — 6s 25ms/step — loss: 0.1404 — accuracy:
Epoch 4/16
250/250 [==============================] — 6s 25ms/step — loss: 0.1180 — accuracy:
Epoch 5/16
250/250 [==============================] — 6s 26ms/step — loss: 0.0941 — accuracy:
Epoch 6/16
250/250 [==============================] — 6s 25ms/step — loss: 0.0607 — accuracy:
Epoch 7/16
250/250 [==============================] — 6s 26ms/step — loss: 0.0533 — accuracy:
Epoch 8/16
250/250 [==============================] — 6s 25ms/step — loss: 0.0454 — accuracy:
Epoch 9/16
250/250 [==============================] — 6s 25ms/step — loss: 0.0533 — accuracy:
Epoch 10/16
250/250 [==============================] — 6s 26ms/step — loss: 0.0316 — accuracy:
Epoch 11/16
250/250 [==============================] — 6s 25ms/step — loss: 0.0369 — accuracy:
Epoch 12/16
250/250 [==============================] — 6s 26ms/step — loss: 0.0344 — accuracy:

Epoch 13/16
250/250 [==============================] — 6s 26ms/step — loss: 0.0302 — accuracy:
Epoch 14/16
250/250 [==============================] — 6s 26ms/step — loss: 0.0522 — accuracy:
Epoch 15/16
250/250 [==============================] — 6s 25ms/step — loss: 0.0247 — accuracy:
Epoch 16/16
250/250 [==============================] — 6s 25ms/step — loss: 0.0292 — accuracy:
Training slice: 17 out of 20
Epoch 1/17
266/266 [==============================] — 7s 26ms/step — loss: 0.2978 — accuracy:
Epoch 2/17
266/266 [==============================] — 7s 26ms/step — loss: 0.1751 — accuracy:
Epoch 3/17
266/266 [==============================] — 7s 26ms/step — loss: 0.1405 — accuracy:
Epoch 4/17
266/266 [==============================] — 7s 26ms/step — loss: 0.1157 — accuracy:
Epoch 5/17
266/266 [==============================] — 7s 26ms/step — loss: 0.0865 — accuracy:
Epoch 6/17
266/266 [==============================] — 7s 26ms/step — loss: 0.0659 — accuracy:
Epoch 7/17
266/266 [==============================] — 7s 26ms/step — loss: 0.0435 — accuracy:
Epoch 8/17
266/266 [                              ] — 7s 26ms/step — loss: 0.0367 — accuracy:
```

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266/266 [==============================] - 7s 26ms/step - loss: 0.0367 - accuracy:
Epoch 9/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0365 - accuracy:
Epoch 10/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0456 - accuracy:
Epoch 11/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0365 - accuracy:
Epoch 12/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0448 - accuracy:
Epoch 13/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0385 - accuracy:
Epoch 14/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0287 - accuracy:
Epoch 15/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0259 - accuracy:
Epoch 16/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0323 - accuracy:
Epoch 17/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0268 - accuracy:
Training slice: 18 out of 20
Epoch 1/18
282/282 [==============================] - 7s 26ms/step - loss: 0.2719 - accuracy:
Epoch 2/18
282/282 [==============================] - 7s 26ms/step - loss: 0.1570 - accuracy:
Epoch 3/18
282/282 [==============================] - 7s 26ms/step - loss: 0.1425 - accuracy:
Epoch 4/18
282/282 [==============================] - 7s 26ms/step - loss: 0.1180 - accuracy:
Epoch 5/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0820 - accuracy:
Epoch 6/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0961 - accuracy:
Epoch 7/18

282/282 [==============================] - 7s 26ms/step - loss: 0.0519 - accuracy:
Epoch 8/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0414 - accuracy:
Epoch 9/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0278 - accuracy:
Epoch 10/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0431 - accuracy:
Epoch 11/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0502 - accuracy:
Epoch 12/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0203 - accuracy:
Epoch 13/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0196 - accuracy:
Epoch 14/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0241 - accuracy:
Epoch 15/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0250 - accuracy:
Epoch 16/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0211 - accuracy:
Epoch 17/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0136 - accuracy:
Epoch 18/18
Output added
282/282 [==============================] - 7s 26ms/step - loss: 0.0590 - accuracy:
```

```
Training slice: 19 out of 20
Epoch 1/19
297/297 [==============================] - 8s 26ms/step - loss: 0.2464 - accuracy:
Epoch 2/19
297/297 [==============================] - 8s 26ms/step - loss: 0.1466 - accuracy:
Epoch 3/19
297/297 [==============================] - 8s 26ms/step - loss: 0.1082 - accuracy:
Epoch 4/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0798 - accuracy:
Epoch 5/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0501 - accuracy:
Epoch 6/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0342 - accuracy:
Epoch 7/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0360 - accuracy:
Epoch 8/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0265 - accuracy:
Epoch 9/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0190 - accuracy:
Epoch 10/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0187 - accuracy:
Epoch 11/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0143 - accuracy:
Epoch 12/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0142 - accuracy:
Epoch 13/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0193 - accuracy:
Epoch 14/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0104 - accuracy:
Epoch 15/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0185 - accuracy:
Epoch 16/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0118 - accuracy:

Epoch 17/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0088 - accuracy:
Epoch 18/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0127 - accuracy:
Epoch 19/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0056 - accuracy:
Training shard: 2 out of 10
Training slice: 1 out of 20
16/16 [==============================] - 3s 27ms/step - loss: 2.4591 - accuracy: 0
Training slice: 2 out of 20
Epoch 1/2
32/32 [==============================] - 1s 26ms/step - loss: 2.3418 - accuracy: 0
Epoch 2/2
32/32 [==============================] - 1s 26ms/step - loss: 2.2472 - accuracy: 0
Training slice: 3 out of 20
Epoch 1/3
47/47 [==============================] - 1s 26ms/step - loss: 2.1534 - accuracy: 0
Epoch 2/3
47/47 [==============================] - 1s 26ms/step - loss: 2.0537 - accuracy: 0
Epoch 3/3
47/47 [==============================] - 1s 26ms/step - loss: 1.9757 - accuracy: 0
Training slice: 4 out of 20
Data excluded for 4
Training slice: 5 out of 20
Epoch 1/5
```

```
Epoch 1/5
79/79 [==============================] - 2s 26ms/step - loss: 1.9403 - accuracy: 0
Epoch 2/5
79/79 [==============================] - 2s 26ms/step - loss: 1.7818 - accuracy: 0
Epoch 3/5
79/79 [==============================] - 2s 26ms/step - loss: 1.7504 - accuracy: 0
Epoch 4/5
79/79 [==============================] - 2s 26ms/step - loss: 1.6651 - accuracy: 0
Epoch 5/5
79/79 [==============================] - 2s 26ms/step - loss: 1.5935 - accuracy: 0
Training slice: 6 out of 20
Data excluded for 6
Training slice: 7 out of 20
Epoch 1/7
110/110 [==============================] - 3s 26ms/step - loss: 1.6351 - accuracy:
Epoch 2/7
110/110 [==============================] - 3s 26ms/step - loss: 1.6027 - accuracy:
Epoch 3/7
110/110 [==============================] - 3s 26ms/step - loss: 1.5291 - accuracy:
Epoch 4/7
110/110 [==============================] - 3s 26ms/step - loss: 1.4804 - accuracy:
Epoch 5/7
110/110 [==============================] - 3s 26ms/step - loss: 1.4516 - accuracy:
Epoch 6/7
110/110 [==============================] - 3s 26ms/step - loss: 1.3461 - accuracy:
Epoch 7/7
110/110 [==============================] - 3s 26ms/step - loss: 1.3425 - accuracy:
Training slice: 8 out of 20
Epoch 1/8
125/125 [==============================] - 5s 25ms/step - loss: 1.3426 - accuracy:
Epoch 2/8
125/125 [==============================] - 3s 25ms/step - loss: 1.3459 - accuracy:
Epoch 3/8

125/125 [==============================] - 3s 25ms/step - loss: 1.2987 - accuracy:
Epoch 4/8
125/125 [==============================] - 3s 25ms/step - loss: 1.2508 - accuracy:
Epoch 5/8
125/125 [==============================] - 3s 25ms/step - loss: 1.1984 - accuracy:
Epoch 6/8
125/125 [==============================] - 3s 25ms/step - loss: 1.1870 - accuracy:
Epoch 7/8
125/125 [==============================] - 3s 25ms/step - loss: 1.1468 - accuracy:
Epoch 8/8
125/125 [==============================] - 3s 26ms/step - loss: 1.0758 - accuracy:
Training slice: 9 out of 20
Epoch 1/9
141/141 [==============================] - 4s 26ms/step - loss: 1.1495 - accuracy:
Epoch 2/9
141/141 [==============================] - 4s 27ms/step - loss: 1.0798 - accuracy:
Epoch 3/9
141/141 [==============================] - 4s 26ms/step - loss: 1.0845 - accuracy:
Epoch 4/9
141/141 [==============================] - 4s 26ms/step - loss: 1.0448 - accuracy:
Epoch 5/9
141/141 [==============================] - 4s 26ms/step - loss: 1.0127 - accuracy:
Epoch 6/9
141/141 [==============================] - 4s 26ms/step - loss: 0.9410 - accuracy:
Epoch 7/9
```

```
Epoch 7/9
141/141 [==============================] – 4s 26ms/step – loss: 0.9105 – accuracy:
Epoch 8/9
141/141 [==============================] – 4s 26ms/step – loss: 0.8952 – accuracy:
Epoch 9/9
141/141 [==============================] – 4s 26ms/step – loss: 0.8320 – accuracy:
Training slice: 10 out of 20
Epoch 1/10
157/157 [==============================] – 4s 26ms/step – loss: 0.9245 – accuracy:
Epoch 2/10
157/157 [==============================] – 4s 26ms/step – loss: 0.9064 – accuracy:
Epoch 3/10
157/157 [==============================] – 4s 26ms/step – loss: 0.8718 – accuracy:
Epoch 4/10
157/157 [==============================] – 4s 26ms/step – loss: 0.8094 – accuracy:
Epoch 5/10
157/157 [==============================] – 4s 26ms/step – loss: 0.7419 – accuracy:
Epoch 6/10
157/157 [==============================] – 4s 26ms/step – loss: 0.7266 – accuracy:
Epoch 7/10
157/157 [==============================] – 4s 26ms/step – loss: 0.6906 – accuracy:
Epoch 8/10
157/157 [==============================] – 4s 26ms/step – loss: 0.6600 – accuracy:
Epoch 9/10
157/157 [==============================] – 4s 26ms/step – loss: 0.6696 – accuracy:
Epoch 10/10
157/157 [==============================] – 4s 26ms/step – loss: 0.5912 – accuracy:
Training slice: 11 out of 20
Epoch 1/11
172/172 [==============================] – 5s 26ms/step – loss: 0.7529 – accuracy:
Epoch 2/11
172/172 [==============================] – 5s 26ms/step – loss: 0.6977 – accuracy:
Epoch 3/11

172/172 [==============================] – 5s 26ms/step – loss: 0.6430 – accuracy:
Epoch 4/11
172/172 [==============================] – 4s 26ms/step – loss: 0.5972 – accuracy:
Epoch 5/11
172/172 [==============================] – 5s 26ms/step – loss: 0.5641 – accuracy:
Epoch 6/11
172/172 [==============================] – 4s 26ms/step – loss: 0.5311 – accuracy:
Epoch 7/11
172/172 [==============================] – 5s 27ms/step – loss: 0.5142 – accuracy:
Epoch 8/11
172/172 [==============================] – 4s 26ms/step – loss: 0.4833 – accuracy:
Epoch 9/11
172/172 [==============================] – 5s 26ms/step – loss: 0.4367 – accuracy:
Epoch 10/11
172/172 [==============================] – 4s 26ms/step – loss: 0.4439 – accuracy:
Epoch 11/11
172/172 [==============================] – 4s 26ms/step – loss: 0.4432 – accuracy:
Training slice: 12 out of 20
Epoch 1/12
188/188 [==============================] – 5s 26ms/step – loss: 0.5885 – accuracy:
Epoch 2/12
Output added
188/188 [==============================] – 5s 26ms/step – loss: 0.5082 – accuracy:
Epoch 3/12
```

```
188/188 [==============================] - 5s 27ms/step - loss: 0.4946 - accuracy:
Epoch 4/12
188/188 [==============================] - 5s 26ms/step - loss: 0.4617 - accuracy:
Epoch 5/12
188/188 [==============================] - 5s 26ms/step - loss: 0.4220 - accuracy:
Epoch 6/12
188/188 [==============================] - 5s 26ms/step - loss: 0.3566 - accuracy:
Epoch 7/12
188/188 [==============================] - 5s 26ms/step - loss: 0.3660 - accuracy:
Epoch 8/12
188/188 [==============================] - 5s 26ms/step - loss: 0.3429 - accuracy:
Epoch 9/12
188/188 [==============================] - 5s 26ms/step - loss: 0.3589 - accuracy:
Epoch 10/12
188/188 [==============================] - 5s 26ms/step - loss: 0.3065 - accuracy:
Epoch 11/12
188/188 [==============================] - 5s 26ms/step - loss: 0.2697 - accuracy:
Epoch 12/12
188/188 [==============================] - 5s 26ms/step - loss: 0.2529 - accuracy:
Training slice: 13 out of 20
Epoch 1/13
204/204 [==============================] - 5s 26ms/step - loss: 0.4744 - accuracy:
Epoch 2/13
204/204 [==============================] - 5s 26ms/step - loss: 0.4089 - accuracy:
Epoch 3/13
204/204 [==============================] - 5s 26ms/step - loss: 0.3564 - accuracy:
Epoch 4/13
204/204 [==============================] - 5s 26ms/step - loss: 0.3328 - accuracy:
Epoch 5/13
204/204 [==============================] - 5s 26ms/step - loss: 0.3849 - accuracy:
Epoch 6/13
204/204 [==============================] - 5s 26ms/step - loss: 0.3170 - accuracy:
Epoch 7/13

204/204 [==============================] - 5s 26ms/step - loss: 0.2253 - accuracy:
Epoch 8/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2244 - accuracy:
Epoch 9/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1863 - accuracy:
Epoch 10/13
204/204 [==============================] - 5s 27ms/step - loss: 0.3771 - accuracy:
Epoch 11/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2334 - accuracy:
Epoch 12/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2550 - accuracy:
Epoch 13/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2823 - accuracy:
Training slice: 14 out of 20
Epoch 1/14
219/219 [==============================] - 6s 26ms/step - loss: 0.7510 - accuracy:
Epoch 2/14
219/219 [==============================] - 6s 26ms/step - loss: 0.4048 - accuracy:
Epoch 3/14
219/219 [==============================] - 6s 26ms/step - loss: 0.3078 - accuracy:
Epoch 4/14
219/219 [==============================] - 6s 26ms/step - loss: 0.2708 - accuracy:
Epoch 5/14
219/219 [==============================] - 6s 26ms/step - loss: 0.2241 - accuracy:
Epoch 6/14
```

```
Epoch 6/14
219/219 [==============================] – 6s 26ms/step – loss: 0.2267 – accuracy:
Epoch 7/14
219/219 [==============================] – 6s 26ms/step – loss: 0.2056 – accuracy:
Epoch 8/14
219/219 [==============================] – 6s 26ms/step – loss: 0.1905 – accuracy:
Epoch 9/14
219/219 [==============================] – 6s 26ms/step – loss: 0.1727 – accuracy:
Epoch 10/14
219/219 [==============================] – 6s 26ms/step – loss: 0.1809 – accuracy:
Epoch 11/14
219/219 [==============================] – 6s 26ms/step – loss: 0.1569 – accuracy:
Epoch 12/14
219/219 [==============================] – 6s 26ms/step – loss: 0.1402 – accuracy:
Epoch 13/14
219/219 [==============================] – 6s 27ms/step – loss: 0.1108 – accuracy:
Epoch 14/14
219/219 [==============================] – 6s 26ms/step – loss: 0.1353 – accuracy:
Training slice: 15 out of 20
Epoch 1/15
235/235 [==============================] – 6s 26ms/step – loss: 0.3528 – accuracy:
Epoch 2/15
235/235 [==============================] – 6s 26ms/step – loss: 0.2778 – accuracy:
Epoch 3/15
235/235 [==============================] – 6s 26ms/step – loss: 0.2080 – accuracy:
Epoch 4/15
235/235 [==============================] – 6s 26ms/step – loss: 0.1928 – accuracy:
Epoch 5/15
235/235 [==============================] – 6s 26ms/step – loss: 0.2035 – accuracy:
Epoch 6/15
235/235 [==============================] – 6s 26ms/step – loss: 0.1414 – accuracy:
Epoch 7/15
235/235 [==============================] – 6s 26ms/step – loss: 0.1458 – accuracy:

Epoch 8/15
235/235 [==============================] – 6s 26ms/step – loss: 0.1311 – accuracy:
Epoch 9/15
235/235 [==============================] – 6s 26ms/step – loss: 0.1191 – accuracy:
Epoch 10/15
235/235 [==============================] – 6s 26ms/step – loss: 0.1028 – accuracy:
Epoch 11/15
235/235 [==============================] – 6s 26ms/step – loss: 0.1066 – accuracy:
Epoch 12/15
235/235 [==============================] – 6s 26ms/step – loss: 0.0812 – accuracy:
Epoch 13/15
235/235 [==============================] – 6s 26ms/step – loss: 0.0670 – accuracy:
Epoch 14/15
235/235 [==============================] – 6s 26ms/step – loss: 0.0726 – accuracy:
Epoch 15/15
235/235 [==============================] – 6s 26ms/step – loss: 0.0663 – accuracy:
Training slice: 16 out of 20
Epoch 1/16
250/250 [==============================] – 6s 25ms/step – loss: 0.3090 – accuracy:
Epoch 2/16
250/250 [==============================] – 6s 26ms/step – loss: 0.2597 – accuracy:
Epoch 3/16
250/250 [==============================] – 6s 25ms/step – loss: 0.1992 – accuracy:
Epoch 4/16
250/250 [                              ]    6s 25ms/step    loss: 0.1655    accuracy:
```

```
250/250 [==============================] - 6s 25ms/step - loss: 0.1655 - accuracy:
Epoch 5/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1281 - accuracy:
Epoch 6/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1210 - accuracy:
Epoch 7/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0905 - accuracy:
Epoch 8/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1017 - accuracy:
Epoch 9/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0968 - accuracy:
Epoch 10/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0803 - accuracy:
Epoch 11/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0693 - accuracy:
Epoch 12/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0565 - accuracy:
Epoch 13/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0564 - accuracy:
Epoch 14/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0611 - accuracy:
Epoch 15/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0697 - accuracy:
Epoch 16/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0421 - accuracy:
Training slice: 17 out of 20
Epoch 1/17
266/266 [==============================] - 7s 26ms/step - loss: 0.3180 - accuracy:
Epoch 2/17
266/266 [==============================] - 7s 26ms/step - loss: 0.2437 - accuracy:
Epoch 3/17
266/266 [==============================] - 7s 26ms/step - loss: 0.1554 - accuracy:
Epoch 4/17

266/266 [==============================] - 7s 26ms/step - loss: 0.1241 - accuracy:
Epoch 5/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0995 - accuracy:
Epoch 6/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0934 - accuracy:
Epoch 7/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0687 - accuracy:
Epoch 8/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0760 - accuracy:
Epoch 9/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0701 - accuracy:
Epoch 10/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0621 - accuracy:
Epoch 11/17
```

Output added

```
266/266 [==============================] - 7s 26ms/step - loss: 0.0460 - accuracy:
Epoch 12/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0434 - accuracy:
Epoch 13/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0453 - accuracy:
Epoch 14/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0523 - accuracy:
Epoch 15/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0288 - accuracy:
```

```
Epoch 16/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0264 - accuracy:
Epoch 17/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0394 - accuracy:
Training slice: 18 out of 20
Epoch 1/18
282/282 [==============================] - 7s 26ms/step - loss: 0.2827 - accuracy:
Epoch 2/18
282/282 [==============================] - 7s 26ms/step - loss: 0.2277 - accuracy:
Epoch 3/18
282/282 [==============================] - 7s 26ms/step - loss: 0.1269 - accuracy:
Epoch 4/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0892 - accuracy:
Epoch 5/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0972 - accuracy:
Epoch 6/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0938 - accuracy:
Epoch 7/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0618 - accuracy:
Epoch 8/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0778 - accuracy:
Epoch 9/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0471 - accuracy:
Epoch 10/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0381 - accuracy:
Epoch 11/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0440 - accuracy:
Epoch 12/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0505 - accuracy:
Epoch 13/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0312 - accuracy:
Epoch 14/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0246 - accuracy:

Epoch 15/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0223 - accuracy:
Epoch 16/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0168 - accuracy:
Epoch 17/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0272 - accuracy:
Epoch 18/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0237 - accuracy:
Training slice: 19 out of 20
Epoch 1/19
297/297 [==============================] - 8s 26ms/step - loss: 0.2364 - accuracy:
Epoch 2/19
297/297 [==============================] - 8s 26ms/step - loss: 0.1799 - accuracy:
Epoch 3/19
297/297 [==============================] - 8s 26ms/step - loss: 0.1281 - accuracy:
Epoch 4/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0893 - accuracy:
Epoch 5/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0707 - accuracy:
Epoch 6/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0698 - accuracy:
Epoch 7/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0511 - accuracy:
Epoch 8/19
297/297 [                                ]        8s 26ms/step    loss: 0.0543   accuracy:
```

```
297/297 [==============================] - 8s 26ms/step - loss: 0.0548 - accuracy:
Epoch 9/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0737 - accuracy:
Epoch 10/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0419 - accuracy:
Epoch 11/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0395 - accuracy:
Epoch 12/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0293 - accuracy:
Epoch 13/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0312 - accuracy:
Epoch 14/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0391 - accuracy:
Epoch 15/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0370 - accuracy:
Epoch 16/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0281 - accuracy:
Epoch 17/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0143 - accuracy:
Epoch 18/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0315 - accuracy:
Epoch 19/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0312 - accuracy:
Training shard: 3 out of 10
Training slice: 1 out of 20
16/16 [==============================] - 3s 27ms/step - loss: 2.4559 - accuracy: 0
Training slice: 2 out of 20
Epoch 1/2
32/32 [==============================] - 1s 27ms/step - loss: 2.2839 - accuracy: 0
Epoch 2/2
32/32 [==============================] - 1s 26ms/step - loss: 2.1546 - accuracy: 0
Training slice: 3 out of 20
Epoch 1/3

47/47 [==============================] - 1s 26ms/step - loss: 2.0577 - accuracy: 0
Epoch 2/3
47/47 [==============================] - 1s 26ms/step - loss: 1.9271 - accuracy: 0
Epoch 3/3
47/47 [==============================] - 1s 26ms/step - loss: 1.8264 - accuracy: 0
Training slice: 4 out of 20
Epoch 1/4
63/63 [==============================] - 2s 26ms/step - loss: 1.8146 - accuracy: 0
Epoch 2/4
63/63 [==============================] - 2s 25ms/step - loss: 1.7273 - accuracy: 0
Epoch 3/4
63/63 [==============================] - 2s 26ms/step - loss: 1.6489 - accuracy: 0
Epoch 4/4
63/63 [==============================] - 2s 26ms/step - loss: 1.5800 - accuracy: 0
Training slice: 5 out of 20
Epoch 1/5
79/79 [==============================] - 2s 26ms/step - loss: 1.6219 - accuracy: 0
Epoch 2/5
79/79 [==============================] - 2s 26ms/step - loss: 1.5537 - accuracy: 0
Epoch 3/5
79/79 [==============================] - 2s 26ms/step - loss: 1.4948 - accuracy: 0
Epoch 4/5
79/79 [==============================] - 2s 26ms/step - loss: 1.4214 - accuracy: 0
Epoch 5/5
79/79 [                              ]     2s 26ms/step   loss: 1.3617   accuracy: 0
```

```
79/79 [==============================] - 2s 26ms/step - loss: 1.3617 - accuracy: 0
Training slice: 6 out of 20
Data excluded for 6
Training slice: 7 out of 20
Data excluded for 7
Training slice: 8 out of 20
Epoch 1/8
125/125 [==============================] - 5s 26ms/step - loss: 1.5135 - accuracy:
Epoch 2/8
125/125 [==============================] - 3s 25ms/step - loss: 1.4252 - accuracy:
Epoch 3/8
125/125 [==============================] - 3s 25ms/step - loss: 1.3640 - accuracy:
Epoch 4/8
125/125 [==============================] - 3s 26ms/step - loss: 1.3029 - accuracy:
Epoch 5/8
125/125 [==============================] - 3s 26ms/step - loss: 1.3022 - accuracy:
Epoch 6/8
125/125 [==============================] - 3s 25ms/step - loss: 1.2117 - accuracy:
Epoch 7/8
125/125 [==============================] - 3s 26ms/step - loss: 1.1379 - accuracy:
Epoch 8/8
125/125 [==============================] - 3s 25ms/step - loss: 1.1079 - accuracy:
Training slice: 9 out of 20
Epoch 1/9
141/141 [==============================] - 4s 26ms/step - loss: 1.1500 - accuracy:
Epoch 2/9
141/141 [==============================] - 4s 26ms/step - loss: 1.0772 - accuracy:
Epoch 3/9
141/141 [==============================] - 4s 26ms/step - loss: 1.0276 - accuracy:
Epoch 4/9
141/141 [==============================] - 4s 26ms/step - loss: 1.0620 - accuracy:
Epoch 5/9
141/141 [==============================] - 4s 26ms/step - loss: 0.9632 - accuracy:

Epoch 6/9
141/141 [==============================] - 4s 26ms/step - loss: 0.9410 - accuracy:
Epoch 7/9
141/141 [==============================] - 4s 26ms/step - loss: 0.8616 - accuracy:
Epoch 8/9
141/141 [==============================] - 4s 26ms/step - loss: 0.8147 - accuracy:
Epoch 9/9
141/141 [==============================] - 4s 26ms/step - loss: 0.8170 - accuracy:
Training slice: 10 out of 20
Epoch 1/10
157/157 [==============================] - 4s 26ms/step - loss: 0.8853 - accuracy:
Epoch 2/10
```
Output added
```
157/157 [==============================] - 4s 26ms/step - loss: 0.8588 - accuracy:
Epoch 3/10
157/157 [==============================] - 4s 26ms/step - loss: 0.7915 - accuracy:
Epoch 4/10
157/157 [==============================] - 4s 26ms/step - loss: 0.7783 - accuracy:
Epoch 5/10
157/157 [==============================] - 4s 26ms/step - loss: 0.6589 - accuracy:
Epoch 6/10
157/157 [==============================] - 4s 26ms/step - loss: 0.6501 - accuracy:
Epoch 7/10
157/157 [==============================] - 4s 26ms/step - loss: 0.6459 - accuracy:
```

```
Epoch 8/10
157/157 [==============================] - 4s 26ms/step - loss: 0.5847 - accuracy:
Epoch 9/10
157/157 [==============================] - 4s 26ms/step - loss: 0.5673 - accuracy:
Epoch 10/10
157/157 [==============================] - 4s 26ms/step - loss: 0.5035 - accuracy:
Training slice: 11 out of 20
Epoch 1/11
172/172 [==============================] - 4s 26ms/step - loss: 0.6361 - accuracy:
Epoch 2/11
172/172 [==============================] - 5s 26ms/step - loss: 0.6084 - accuracy:
Epoch 3/11
172/172 [==============================] - 5s 27ms/step - loss: 0.5633 - accuracy:
Epoch 4/11
172/172 [==============================] - 4s 26ms/step - loss: 0.4825 - accuracy:
Epoch 5/11
172/172 [==============================] - 4s 26ms/step - loss: 0.4678 - accuracy:
Epoch 6/11
172/172 [==============================] - 4s 26ms/step - loss: 0.4023 - accuracy:
Epoch 7/11
172/172 [==============================] - 4s 26ms/step - loss: 0.3876 - accuracy:
Epoch 8/11
172/172 [==============================] - 4s 26ms/step - loss: 0.3887 - accuracy:
Epoch 9/11
172/172 [==============================] - 4s 26ms/step - loss: 0.3438 - accuracy:
Epoch 10/11
172/172 [==============================] - 4s 26ms/step - loss: 0.3052 - accuracy:
Epoch 11/11
172/172 [==============================] - 4s 26ms/step - loss: 0.2721 - accuracy:
Training slice: 12 out of 20
Epoch 1/12
188/188 [==============================] - 5s 26ms/step - loss: 0.4866 - accuracy:
Epoch 2/12

188/188 [==============================] - 5s 26ms/step - loss: 0.4248 - accuracy:
Epoch 3/12
188/188 [==============================] - 5s 26ms/step - loss: 0.4013 - accuracy:
Epoch 4/12
188/188 [==============================] - 5s 26ms/step - loss: 0.3325 - accuracy:
Epoch 5/12
188/188 [==============================] - 5s 26ms/step - loss: 0.3152 - accuracy:
Epoch 6/12
188/188 [==============================] - 5s 26ms/step - loss: 0.2732 - accuracy:
Epoch 7/12
188/188 [==============================] - 5s 26ms/step - loss: 0.2463 - accuracy:
Epoch 8/12
188/188 [==============================] - 5s 26ms/step - loss: 0.2221 - accuracy:
Epoch 9/12
188/188 [==============================] - 5s 26ms/step - loss: 0.2032 - accuracy:
Epoch 10/12
188/188 [==============================] - 5s 26ms/step - loss: 0.1942 - accuracy:
Epoch 11/12
188/188 [==============================] - 5s 26ms/step - loss: 0.1520 - accuracy:
Epoch 12/12
188/188 [==============================] - 5s 26ms/step - loss: 0.1468 - accuracy:
Training slice: 13 out of 20
Epoch 1/13
204/204 [==============================] - 5s 26ms/step - loss: 0.4059 - accuracy:
Epoch 2/13
```

```
Epoch 2/13
204/204 [==============================] - 5s 26ms/step - loss: 0.3704 - accuracy:
Epoch 3/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2986 - accuracy:
Epoch 4/13
204/204 [==============================] - 5s 26ms/step - loss: 0.3371 - accuracy:
Epoch 5/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2993 - accuracy:
Epoch 6/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2066 - accuracy:
Epoch 7/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2117 - accuracy:
Epoch 8/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1848 - accuracy:
Epoch 9/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1941 - accuracy:
Epoch 10/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1298 - accuracy:
Epoch 11/13
204/204 [==============================] - 5s 26ms/step - loss: 0.0933 - accuracy:
Epoch 12/13
204/204 [==============================] - 5s 26ms/step - loss: 0.0838 - accuracy:
Epoch 13/13
204/204 [==============================] - 5s 26ms/step - loss: 0.0765 - accuracy:
Training slice: 14 out of 20
Epoch 1/14
219/219 [==============================] - 6s 26ms/step - loss: 0.3756 - accuracy:
Epoch 2/14
219/219 [==============================] - 6s 26ms/step - loss: 0.3458 - accuracy:
Epoch 3/14
219/219 [==============================] - 6s 26ms/step - loss: 0.3071 - accuracy:
Epoch 4/14
219/219 [==============================] - 6s 26ms/step - loss: 0.2169 - accuracy:

Epoch 5/14
219/219 [==============================] - 6s 26ms/step - loss: 0.1878 - accuracy:
Epoch 6/14
219/219 [==============================] - 6s 26ms/step - loss: 0.1689 - accuracy:
Epoch 7/14
219/219 [==============================] - 6s 26ms/step - loss: 0.1468 - accuracy:
Epoch 8/14
219/219 [==============================] - 6s 26ms/step - loss: 0.1238 - accuracy:
Epoch 9/14
219/219 [==============================] - 6s 26ms/step - loss: 0.0996 - accuracy:
Epoch 10/14
219/219 [==============================] - 6s 26ms/step - loss: 0.0850 - accuracy:
Epoch 11/14
219/219 [==============================] - 6s 26ms/step - loss: 0.0907 - accuracy:
Epoch 12/14
219/219 [==============================] - 6s 26ms/step - loss: 0.0594 - accuracy:
Epoch 13/14
219/219 [==============================] - 6s 26ms/step - loss: 0.0477 - accuracy:
Epoch 14/14
219/219 [==============================] - 6s 26ms/step - loss: 0.0450 - accuracy:
Training slice: 15 out of 20
Epoch 1/15
235/235 [==============================] - 6s 26ms/step - loss: 0.3824 - accuracy:
Epoch 2/15
235/235 [                                ]       6s 26ms/step  loss: 0.3842   accuracy:
```

```
235/235 [==============================] - 6s 26ms/step - loss: 0.2842 - accuracy:
Epoch 3/15
235/235 [==============================] - 6s 26ms/step - loss: 0.2350 - accuracy:
Epoch 4/15
235/235 [==============================] - 6s 26ms/step - loss: 0.1586 - accuracy:
Epoch 5/15
235/235 [==============================] - 6s 26ms/step - loss: 0.1266 - accuracy:
Epoch 6/15
235/235 [==============================] - 6s 26ms/step - loss: 0.1333 - accuracy:
Epoch 7/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0971 - accuracy:
Epoch 8/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0943 - accuracy:
Epoch 9/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0710 - accuracy:
Epoch 10/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0452 - accuracy:
Epoch 11/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0443 - accuracy:
Epoch 12/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0482 - accuracy:
Epoch 13/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0383 - accuracy:
Epoch 14/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0288 - accuracy:
Epoch 15/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0203 - accuracy:
Training slice: 16 out of 20
Epoch 1/16
250/250 [==============================] - 6s 25ms/step - loss: 0.3297 - accuracy:
Epoch 2/16
250/250 [==============================] - 6s 25ms/step - loss: 0.2461 - accuracy:
Epoch 3/16

250/250 [==============================] - 6s 25ms/step - loss: 0.1800 - accuracy:
Epoch 4/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1322 - accuracy:
Epoch 5/16
250/250 [==============================] - 6s 26ms/step - loss: 0.0964 - accuracy:
Epoch 6/16
```

Output added

```
250/250 [==============================] - 6s 25ms/step - loss: 0.0931 - accuracy:
Epoch 7/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0705 - accuracy:
Epoch 8/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0494 - accuracy:
Epoch 9/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0652 - accuracy:
Epoch 10/16
250/250 [==============================] - 6s 26ms/step - loss: 0.0446 - accuracy:
Epoch 11/16
250/250 [==============================] - 6s 26ms/step - loss: 0.0300 - accuracy:
Epoch 12/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0385 - accuracy:
Epoch 13/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0236 - accuracy:
Epoch 14/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0304 - accuracy:
```

```
Epoch 15/16
250/250 [==============================] - 6s 26ms/step - loss: 0.0185 - accuracy:
Epoch 16/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0207 - accuracy:
Training slice: 17 out of 20
Epoch 1/17
266/266 [==============================] - 7s 26ms/step - loss: 0.3397 - accuracy:
Epoch 2/17
266/266 [==============================] - 7s 26ms/step - loss: 0.2471 - accuracy:
Epoch 3/17
266/266 [==============================] - 7s 26ms/step - loss: 0.1760 - accuracy:
Epoch 4/17
266/266 [==============================] - 7s 26ms/step - loss: 0.1379 - accuracy:
Epoch 5/17
266/266 [==============================] - 7s 26ms/step - loss: 0.1016 - accuracy:
Epoch 6/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0846 - accuracy:
Epoch 7/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0683 - accuracy:
Epoch 8/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0490 - accuracy:
Epoch 9/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0466 - accuracy:
Epoch 10/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0427 - accuracy:
Epoch 11/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0343 - accuracy:
Epoch 12/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0321 - accuracy:
Epoch 13/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0309 - accuracy:
Epoch 14/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0113 - accuracy:

Epoch 15/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0182 - accuracy:
Epoch 16/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0189 - accuracy:
Epoch 17/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0132 - accuracy:
Training slice: 18 out of 20
Epoch 1/18
282/282 [==============================] - 7s 26ms/step - loss: 0.3249 - accuracy:
Epoch 2/18
282/282 [==============================] - 7s 26ms/step - loss: 0.2021 - accuracy:
Epoch 3/18
282/282 [==============================] - 7s 26ms/step - loss: 0.1435 - accuracy:
Epoch 4/18
282/282 [==============================] - 7s 26ms/step - loss: 0.1225 - accuracy:
Epoch 5/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0711 - accuracy:
Epoch 6/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0883 - accuracy:
Epoch 7/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0679 - accuracy:
Epoch 8/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0522 - accuracy:
Epoch 9/18
282/282 [                              ] - 7s 26ms/step - loss: 0.0242 - accuracy:
```

```
282/282 [==============================] - 7s 26ms/step - loss: 0.0342 - accuracy:
Epoch 10/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0338 - accuracy:
Epoch 11/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0255 - accuracy:
Epoch 12/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0251 - accuracy:
Epoch 13/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0190 - accuracy:
Epoch 14/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0145 - accuracy:
Epoch 15/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0139 - accuracy:
Epoch 16/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0223 - accuracy:
Epoch 17/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0544 - accuracy:
Epoch 18/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0238 - accuracy:
Training slice: 19 out of 20
Epoch 1/19
297/297 [==============================] - 8s 26ms/step - loss: 0.2568 - accuracy:
Epoch 2/19
297/297 [==============================] - 8s 26ms/step - loss: 0.1867 - accuracy:
Epoch 3/19
297/297 [==============================] - 8s 26ms/step - loss: 0.1290 - accuracy:
Epoch 4/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0806 - accuracy:
Epoch 5/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0948 - accuracy:
Epoch 6/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0745 - accuracy:
Epoch 7/19

297/297 [==============================] - 8s 26ms/step - loss: 0.0413 - accuracy:
Epoch 8/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0528 - accuracy:
Epoch 9/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0254 - accuracy:
Epoch 10/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0333 - accuracy:
Epoch 11/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0400 - accuracy:
Epoch 12/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0181 - accuracy:
Epoch 13/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0204 - accuracy:
Epoch 14/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0115 - accuracy:
Epoch 15/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0157 - accuracy:
Epoch 16/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0174 - accuracy:
Epoch 17/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0127 - accuracy:
Epoch 18/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0172 - accuracy:
Epoch 19/19
297/297 [                              ]         - 8s 26ms/step - loss: 0.0181 - accuracy:
```

```
297/297 [==============================] - 8s 26ms/step - loss: 0.0181 - accuracy:
Training shard: 4 out of 10
Training slice: 1 out of 20
16/16 [==============================] - 3s 27ms/step - loss: 2.4002 - accuracy: 0
Training slice: 2 out of 20
Epoch 1/2
32/32 [==============================] - 1s 26ms/step - loss: 2.3110 - accuracy: 0
Epoch 2/2
32/32 [==============================] - 1s 26ms/step - loss: 2.2034 - accuracy: 0
Training slice: 3 out of 20
Epoch 1/3
47/47 [==============================] - 1s 26ms/step - loss: 2.1178 - accuracy: 0
Epoch 2/3
47/47 [==============================] - 1s 26ms/step - loss: 1.9662 - accuracy: 0
Epoch 3/3
47/47 [==============================] - 1s 26ms/step - loss: 1.8690 - accuracy: 0
Training slice: 4 out of 20
Epoch 1/4
63/63 [==============================] - 2s 26ms/step - loss: 1.8080 - accuracy: 0
Epoch 2/4
63/63 [==============================] - 2s 26ms/step - loss: 1.6840 - accuracy: 0
Epoch 3/4
63/63 [==============================] - 2s 26ms/step - loss: 1.6197 - accuracy: 0
Epoch 4/4
63/63 [==============================] - 2s 26ms/step - loss: 1.5286 - accuracy: 0
Training slice: 5 out of 20
Epoch 1/5
79/79 [==============================] - 2s 26ms/step - loss: 1.5400 - accuracy: 0
Epoch 2/5
79/79 [==============================] - 2s 26ms/step - loss: 1.5742 - accuracy: 0
Epoch 3/5
79/79 [==============================] - 2s 27ms/step - loss: 1.4289 - accuracy: 0
Epoch 4/5
```

Output added

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79/79 [==============================] - 2s 26ms/step - loss: 1.3386 - accuracy: 0
Epoch 5/5
79/79 [==============================] - 2s 26ms/step - loss: 1.3098 - accuracy: 0
Training slice: 6 out of 20
Epoch 1/6
94/94 [==============================] - 2s 26ms/step - loss: 1.3190 - accuracy: 0
Epoch 2/6
94/94 [==============================] - 2s 26ms/step - loss: 1.2365 - accuracy: 0
Epoch 3/6
94/94 [==============================] - 2s 26ms/step - loss: 1.1807 - accuracy: 0
Epoch 4/6
94/94 [==============================] - 2s 26ms/step - loss: 1.1302 - accuracy: 0
Epoch 5/6
94/94 [==============================] - 2s 26ms/step - loss: 1.0561 - accuracy: 0
Epoch 6/6
94/94 [==============================] - 2s 26ms/step - loss: 0.9783 - accuracy: 0
Training slice: 7 out of 20
Epoch 1/7
110/110 [==============================] - 3s 26ms/step - loss: 1.0587 - accuracy:
Epoch 2/7
110/110 [==============================] - 3s 26ms/step - loss: 1.0080 - accuracy:
Epoch 3/7
110/110 [==============================] - 3s 26ms/step - loss: 0.9686 - accuracy:
```

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Epoch 4/7
110/110 [==============================] – 3s 26ms/step – loss: 0.9033 – accuracy:
Epoch 5/7
110/110 [==============================] – 3s 26ms/step – loss: 0.8310 – accuracy:
Epoch 6/7
110/110 [==============================] – 3s 26ms/step – loss: 0.7985 – accuracy:
Epoch 7/7
110/110 [==============================] – 3s 26ms/step – loss: 0.7614 – accuracy:
Training slice: 8 out of 20
Epoch 1/8
125/125 [==============================] – 5s 25ms/step – loss: 0.8967 – accuracy:
Epoch 2/8
125/125 [==============================] – 3s 26ms/step – loss: 0.8064 – accuracy:
Epoch 3/8
125/125 [==============================] – 3s 25ms/step – loss: 0.7348 – accuracy:
Epoch 4/8
125/125 [==============================] – 3s 25ms/step – loss: 0.6862 – accuracy:
Epoch 5/8
125/125 [==============================] – 3s 25ms/step – loss: 0.6396 – accuracy:
Epoch 6/8
125/125 [==============================] – 3s 25ms/step – loss: 0.5639 – accuracy:
125/125 [==============================] – 3s 25ms/step – loss: 0.5294 – accuracy:
Epoch 8/8
125/125 [==============================] – 3s 26ms/step – loss: 0.5226 – accuracy:
Training slice: 9 out of 20
Data excluded for 9
Training slice: 10 out of 20
Data excluded for 10
Training slice: 11 out of 20
Epoch 1/11
172/172 [==============================] – 5s 26ms/step – loss: 0.8823 – accuracy:
Epoch 2/11

172/172 [==============================] – 5s 27ms/step – loss: 0.7855 – accuracy:
Epoch 3/11
172/172 [==============================] – 4s 26ms/step – loss: 0.7035 – accuracy:
Epoch 4/11
172/172 [==============================] – 4s 26ms/step – loss: 0.6593 – accuracy:
Epoch 5/11
172/172 [==============================] – 4s 26ms/step – loss: 0.5837 – accuracy:
Epoch 6/11
172/172 [==============================] – 4s 26ms/step – loss: 0.5511 – accuracy:
Epoch 7/11
172/172 [==============================] – 4s 26ms/step – loss: 0.5164 – accuracy:
Epoch 8/11
172/172 [==============================] – 4s 26ms/step – loss: 0.4562 – accuracy:
Epoch 9/11
172/172 [==============================] – 5s 26ms/step – loss: 0.4056 – accuracy:
Epoch 10/11
172/172 [==============================] – 4s 26ms/step – loss: 0.3948 – accuracy:
Epoch 11/11
172/172 [==============================] – 4s 26ms/step – loss: 0.3513 – accuracy:
Training slice: 12 out of 20
Epoch 1/12
188/188 [==============================] – 5s 26ms/step – loss: 0.4958 – accuracy:
Epoch 2/12
188/188 [==============================] – 5s 26ms/step – loss: 0.4486 – accuracy:
```

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Epoch 3/12
188/188 [==============================] - 5s 26ms/step - loss: 0.3974 - accuracy:
Epoch 4/12
188/188 [==============================] - 5s 26ms/step - loss: 0.3425 - accuracy:
Epoch 5/12
188/188 [==============================] - 5s 26ms/step - loss: 0.3041 - accuracy:
Epoch 6/12
188/188 [==============================] - 5s 26ms/step - loss: 0.2721 - accuracy:
Epoch 7/12
188/188 [==============================] - 5s 26ms/step - loss: 0.2355 - accuracy:
Epoch 8/12
188/188 [==============================] - 5s 26ms/step - loss: 0.2243 - accuracy:
Epoch 9/12
188/188 [==============================] - 5s 26ms/step - loss: 0.1944 - accuracy:
Epoch 10/12
188/188 [==============================] - 5s 26ms/step - loss: 0.1900 - accuracy:
Epoch 11/12
188/188 [==============================] - 5s 26ms/step - loss: 0.1675 - accuracy:
Epoch 12/12
188/188 [==============================] - 5s 26ms/step - loss: 0.1573 - accuracy:
Training slice: 13 out of 20
Epoch 1/13
204/204 [==============================] - 5s 26ms/step - loss: 0.3532 - accuracy:
Epoch 2/13
204/204 [==============================] - 5s 26ms/step - loss: 0.3956 - accuracy:
Epoch 3/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2851 - accuracy:
Epoch 4/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2879 - accuracy:
Epoch 5/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2154 - accuracy:
Epoch 6/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1648 - accuracy:

Epoch 7/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1436 - accuracy:
Epoch 8/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1151 - accuracy:
Epoch 9/13
204/204 [==============================] - 5s 26ms/step - loss: 0.0903 - accuracy:
Epoch 10/13
204/204 [==============================] - 5s 26ms/step - loss: 0.0783 - accuracy:
Epoch 11/13
204/204 [==============================] - 5s 26ms/step - loss: 0.0609 - accuracy:
Epoch 12/13
204/204 [==============================] - 5s 26ms/step - loss: 0.0734 - accuracy:
Epoch 13/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1091 - accuracy:
Training slice: 14 out of 20
Epoch 1/14
219/219 [==============================] - 6s 26ms/step - loss: 0.4627 - accuracy:
Epoch 2/14
219/219 [==============================] - 6s 26ms/step - loss: 0.2663 - accuracy:
Epoch 3/14
219/219 [==============================] - 6s 26ms/step - loss: 0.2231 - accuracy:
Epoch 4/14
219/219 [==============================] - 6s 26ms/step - loss: 0.1744 - accuracy:
Epoch 5/14
219/219 [                                ] - 6s 26ms/step - loss: 0.1458 - accuracy:
```

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219/219 [==============================] - 6s 26ms/step - loss: 0.1458 - accuracy:
Epoch 6/14
219/219 [==============================] - 6s 26ms/step - loss: 0.1162 - accuracy:
Epoch 7/14
219/219 [==============================] - 6s 26ms/step - loss: 0.1150 - accuracy:
Epoch 8/14
219/219 [==============================] - 6s 26ms/step - loss: 0.0776 - accuracy:
Epoch 9/14
219/219 [==============================] - 6s 26ms/step - loss: 0.0530 - accuracy:
Epoch 10/14
219/219 [==============================] - 6s 26ms/step - loss: 0.0615 - accuracy:
Epoch 11/14
219/219 [==============================] - 6s 26ms/step - loss: 0.0581 - accuracy:
Epoch 12/14
219/219 [==============================] - 6s 26ms/step - loss: 0.0500 - accuracy:
Epoch 13/14
219/219 [==============================] - 6s 26ms/step - loss: 0.0405 - accuracy:
Epoch 14/14
219/219 [==============================] - 6s 26ms/step - loss: 0.0291 - accuracy:
Training slice: 15 out of 20
Epoch 1/15
235/235 [==============================] - 6s 26ms/step - loss: 0.2951 - accuracy:
Epoch 2/15
235/235 [==============================] - 6s 26ms/step - loss: 0.1752 - accuracy:
Epoch 3/15
235/235 [==============================] - 6s 26ms/step - loss: 0.1508 - accuracy:
Epoch 4/15
235/235 [==============================] - 6s 26ms/step - loss: 0.1033 - accuracy:
Epoch 5/15
235/235 [==============================] - 6s 26ms/step - loss: 0.1017 - accuracy:
Epoch 6/15
```

Output added

```
235/235 [==============================] - 6s 26ms/step - loss: 0.0878 - accuracy:
Epoch 7/15
235/235 [==============================] - 6s 26ms/step - loss: 0.1027 - accuracy:
Epoch 8/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0532 - accuracy:
Epoch 9/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0429 - accuracy:
Epoch 10/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0358 - accuracy:
Epoch 11/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0313 - accuracy:
Epoch 12/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0316 - accuracy:
Epoch 13/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0297 - accuracy:
Epoch 14/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0207 - accuracy:
Epoch 15/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0227 - accuracy:
Training slice: 16 out of 20
Epoch 1/16
250/250 [==============================] - 6s 25ms/step - loss: 0.2807 - accuracy:
Epoch 2/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1774 - accuracy:
```

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Epoch 3/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1352 - accuracy:
Epoch 4/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1002 - accuracy:
Epoch 5/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1092 - accuracy:
Epoch 6/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0651 - accuracy:
Epoch 7/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0501 - accuracy:
Epoch 8/16
250/250 [==============================] - 6s 26ms/step - loss: 0.0330 - accuracy:
Epoch 9/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0392 - accuracy:
Epoch 10/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0241 - accuracy:
Epoch 11/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0260 - accuracy:
Epoch 12/16
250/250 [==============================] - 6s 26ms/step - loss: 0.0201 - accuracy:
Epoch 13/16
250/250 [==============================] - 6s 26ms/step - loss: 0.0287 - accuracy:
Epoch 14/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0151 - accuracy:
Epoch 15/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0174 - accuracy:
Epoch 16/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0126 - accuracy:
Training slice: 17 out of 20
Epoch 1/17
266/266 [==============================] - 7s 26ms/step - loss: 0.2795 - accuracy:
Epoch 2/17
266/266 [==============================] - 7s 26ms/step - loss: 0.2017 - accuracy:

Epoch 3/17
266/266 [==============================] - 7s 26ms/step - loss: 0.1432 - accuracy:
Epoch 4/17
266/266 [==============================] - 7s 26ms/step - loss: 0.1244 - accuracy:
Epoch 5/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0839 - accuracy:
Epoch 6/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0508 - accuracy:
Epoch 7/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0367 - accuracy:
Epoch 8/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0249 - accuracy:
Epoch 9/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0303 - accuracy:
Epoch 10/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0169 - accuracy:
Epoch 11/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0130 - accuracy:
Epoch 12/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0146 - accuracy:
Epoch 13/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0169 - accuracy:
Epoch 14/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0118 - accuracy:
Epoch 15/17
```

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Epoch 15/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0082 - accuracy:
Epoch 16/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0121 - accuracy:
Epoch 17/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0102 - accuracy:
Training slice: 18 out of 20
Epoch 1/18
282/282 [==============================] - 7s 26ms/step - loss: 0.2574 - accuracy:
Epoch 2/18
282/282 [==============================] - 7s 26ms/step - loss: 0.1807 - accuracy:
Epoch 3/18
282/282 [==============================] - 7s 26ms/step - loss: 0.1110 - accuracy:
Epoch 4/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0809 - accuracy:
Epoch 5/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0907 - accuracy:
Epoch 6/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0511 - accuracy:
Epoch 7/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0320 - accuracy:
Epoch 8/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0203 - accuracy:
Epoch 9/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0196 - accuracy:
Epoch 10/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0178 - accuracy:
Epoch 11/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0097 - accuracy:
Epoch 12/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0105 - accuracy:
Epoch 13/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0124 - accuracy:

Epoch 14/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0225 - accuracy:
Epoch 15/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0193 - accuracy:
Epoch 16/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0194 - accuracy:
Epoch 17/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0104 - accuracy:
Epoch 18/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0120 - accuracy:
Training slice: 19 out of 20
Epoch 1/19
297/297 [==============================] - 8s 26ms/step - loss: 0.2648 - accuracy:
Epoch 2/19
297/297 [==============================] - 8s 26ms/step - loss: 0.1465 - accuracy:
Epoch 3/19
297/297 [==============================] - 8s 26ms/step - loss: 0.1191 - accuracy:
Epoch 4/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0763 - accuracy:
Epoch 5/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0396 - accuracy:
Epoch 6/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0442 - accuracy:
Epoch 7/19
297/297 [                              ] - 8s 26ms/step - loss: 0.0105 - accuracy:
```

```
297/297 [==============================] - 8s 26ms/step - loss: 0.0195 - accuracy:
Epoch 8/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0133 - accuracy:
Epoch 9/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0130 - accuracy:
Epoch 10/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0138 - accuracy:
Epoch 11/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0126 - accuracy:
Epoch 12/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0222 - accuracy:
Epoch 13/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0088 - accuracy:
Epoch 14/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0069 - accuracy:
Epoch 15/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0081 - accuracy:
Epoch 16/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0079 - accuracy:
Epoch 17/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0042 - accuracy:
Epoch 18/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0069 - accuracy:
Epoch 19/19
```

Output added

```
297/297 [==============================] - 8s 26ms/step - loss: 0.0113 - accuracy:
Training shard: 5 out of 10
Training slice: 1 out of 20
16/16 [==============================] - 3s 26ms/step - loss: 2.3892 - accuracy: 0
Training slice: 2 out of 20
Epoch 1/2
32/32 [==============================] - 1s 26ms/step - loss: 2.2752 - accuracy: 0
Epoch 2/2

32/32 [==============================] - 1s 25ms/step - loss: 2.1357 - accuracy: 0
Training slice: 3 out of 20
Epoch 1/3
47/47 [==============================] - 1s 26ms/step - loss: 2.0518 - accuracy: 0
Epoch 2/3
47/47 [==============================] - 1s 25ms/step - loss: 1.9551 - accuracy: 0
Epoch 3/3
47/47 [==============================] - 1s 26ms/step - loss: 1.8495 - accuracy: 0
Training slice: 4 out of 20
Epoch 1/4
63/63 [==============================] - 2s 25ms/step - loss: 1.8135 - accuracy: 0
Epoch 2/4
63/63 [==============================] - 2s 26ms/step - loss: 1.7499 - accuracy: 0
Epoch 3/4
63/63 [==============================] - 2s 25ms/step - loss: 1.7085 - accuracy: 0
Epoch 4/4
63/63 [==============================] - 2s 25ms/step - loss: 1.6275 - accuracy: 0
Training slice: 5 out of 20
Epoch 1/5
79/79 [==============================] - 2s 26ms/step - loss: 1.6457 - accuracy: 0
Epoch 2/5
79/79 [==============================] - 2s 25ms/step - loss: 1.5981 - accuracy: 0
Epoch 3/5
79/79 [==============================] - 2s 26ms/step - loss: 1.5294 - accuracy: 0
Epoch 4/5
```

```
Epoch 4/5
79/79 [==============================] - 2s 26ms/step - loss: 1.4856 - accuracy: 0
Epoch 5/5
79/79 [==============================] - 2s 26ms/step - loss: 1.4623 - accuracy: 0
Training slice: 6 out of 20
Epoch 1/6
94/94 [==============================] - 2s 26ms/step - loss: 1.4721 - accuracy: 0
Epoch 2/6
94/94 [==============================] - 2s 26ms/step - loss: 1.4121 - accuracy: 0
Epoch 3/6
94/94 [==============================] - 2s 25ms/step - loss: 1.3885 - accuracy: 0
Epoch 4/6
94/94 [==============================] - 2s 26ms/step - loss: 1.3337 - accuracy: 0
Epoch 5/6
94/94 [==============================] - 2s 26ms/step - loss: 1.2835 - accuracy: 0
Epoch 6/6
94/94 [==============================] - 2s 26ms/step - loss: 1.2795 - accuracy: 0
Training slice: 7 out of 20
Epoch 1/7
110/110 [==============================] - 3s 26ms/step - loss: 1.3102 - accuracy:
Epoch 2/7
110/110 [==============================] - 3s 26ms/step - loss: 1.2672 - accuracy:
Epoch 3/7
110/110 [==============================] - 3s 26ms/step - loss: 1.2039 - accuracy:
Epoch 4/7
110/110 [==============================] - 3s 25ms/step - loss: 1.1694 - accuracy:
Epoch 5/7
110/110 [==============================] - 3s 25ms/step - loss: 1.1123 - accuracy:
Epoch 6/7
110/110 [==============================] - 3s 25ms/step - loss: 1.1157 - accuracy:
Epoch 7/7
110/110 [==============================] - 3s 25ms/step - loss: 1.0632 - accuracy:
Training slice: 8 out of 20

Epoch 1/8
125/125 [==============================] - 5s 25ms/step - loss: 1.1278 - accuracy:
Epoch 2/8
125/125 [==============================] - 3s 25ms/step - loss: 1.0774 - accuracy:
Epoch 3/8
125/125 [==============================] - 3s 25ms/step - loss: 1.0394 - accuracy:
Epoch 4/8
125/125 [==============================] - 3s 25ms/step - loss: 1.0242 - accuracy:
Epoch 5/8
125/125 [==============================] - 3s 25ms/step - loss: 0.9981 - accuracy:
Epoch 6/8
125/125 [==============================] - 3s 25ms/step - loss: 0.9467 - accuracy:
Epoch 7/8
125/125 [==============================] - 3s 25ms/step - loss: 0.8796 - accuracy:
Epoch 8/8
125/125 [==============================] - 3s 25ms/step - loss: 0.8475 - accuracy:
Training slice: 9 out of 20
Epoch 1/9
141/141 [==============================] - 4s 26ms/step - loss: 0.9453 - accuracy:
Epoch 2/9
141/141 [==============================] - 4s 26ms/step - loss: 0.9022 - accuracy:
Epoch 3/9
141/141 [==============================] - 4s 26ms/step - loss: 0.8557 - accuracy:
Epoch 4/9
141/141 [
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141/141 [==============================] - 4s 26ms/step - loss: 0.8170 - accuracy:
Epoch 5/9
141/141 [==============================] - 4s 26ms/step - loss: 0.7691 - accuracy:
Epoch 6/9
141/141 [==============================] - 4s 26ms/step - loss: 0.7673 - accuracy:
Epoch 7/9
141/141 [==============================] - 4s 26ms/step - loss: 0.6950 - accuracy:
Epoch 8/9
141/141 [==============================] - 4s 26ms/step - loss: 0.6798 - accuracy:
Epoch 9/9
141/141 [==============================] - 4s 26ms/step - loss: 0.6405 - accuracy:
Training slice: 10 out of 20
Epoch 1/10
157/157 [==============================] - 4s 26ms/step - loss: 0.7735 - accuracy:
Epoch 2/10
157/157 [==============================] - 4s 26ms/step - loss: 0.7674 - accuracy:
Epoch 3/10
157/157 [==============================] - 4s 26ms/step - loss: 0.6738 - accuracy:
Epoch 4/10
157/157 [==============================] - 4s 26ms/step - loss: 0.6665 - accuracy:
Epoch 5/10
157/157 [==============================] - 4s 25ms/step - loss: 0.6469 - accuracy:
Epoch 6/10
157/157 [==============================] - 4s 26ms/step - loss: 0.5887 - accuracy:
Epoch 7/10
157/157 [==============================] - 4s 26ms/step - loss: 0.5263 - accuracy:
Epoch 8/10
157/157 [==============================] - 4s 25ms/step - loss: 0.5312 - accuracy:
Epoch 9/10
157/157 [==============================] - 4s 25ms/step - loss: 0.4550 - accuracy:
Epoch 10/10
157/157 [==============================] - 4s 25ms/step - loss: 0.4448 - accuracy:
Training slice: 11 out of 20

Data excluded for 11
Training slice: 12 out of 20
Data excluded for 12
Training slice: 13 out of 20
Epoch 1/13
204/204 [==============================] - 5s 26ms/step - loss: 0.8748 - accuracy:
Epoch 2/13
204/204 [==============================] - 5s 26ms/step - loss: 0.7904 - accuracy:
Epoch 3/13
204/204 [==============================] - 5s 26ms/step - loss: 0.7739 - accuracy:
Epoch 4/13
204/204 [==============================] - 5s 26ms/step - loss: 0.6969 - accuracy:
Epoch 5/13
204/204 [==============================] - 5s 26ms/step - loss: 0.6443 - accuracy:
Epoch 6/13
204/204 [==============================] - 5s 25ms/step - loss: 0.6166 - accuracy:
Epoch 7/13
204/204 [==============================] - 5s 25ms/step - loss: 0.5497 - accuracy:
Epoch 8/13
204/204 [==============================] - 5s 26ms/step - loss: 0.5055 - accuracy:
Epoch 9/13
204/204 [==============================] - 5s 26ms/step - loss: 0.4786 - accuracy:
Epoch 10/13
204/204 [==============================] - 5s 26ms/step - loss: 0.4183 - accuracy:
Epoch 11/13
```

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Epoch 11/13
204/204 [==============================] – 5s 25ms/step – loss: 0.4209 – accuracy:
Epoch 12/13
204/204 [==============================] – 5s 25ms/step – loss: 0.3959 – accuracy:
Epoch 13/13
204/204 [==============================] – 5s 26ms/step – loss: 0.3563 – accuracy:
Training slice: 14 out of 20
Epoch 1/14
219/219 [==============================] – 6s 26ms/step – loss: 0.5920 – accuracy:
Epoch 2/14
219/219 [==============================] – 6s 26ms/step – loss: 0.4853 – accuracy:
Epoch 3/14
219/219 [==============================] – 6s 26ms/step – loss: 0.4596 – accuracy:
Epoch 4/14
219/219 [==============================] – 6s 26ms/step – loss: 0.3449 – accuracy:
Epoch 5/14
219/219 [==============================] – 6s 25ms/step – loss: 0.3523 – accuracy:
Epoch 6/14
219/219 [==============================] – 6s 25ms/step – loss: 0.2803 – accuracy:
Epoch 7/14
219/219 [==============================] – 6s 25ms/step – loss: 0.2744 – accuracy:
Epoch 8/14
219/219 [==============================] – 6s 25ms/step – loss: 0.2463 – accuracy:
Epoch 9/14
```

Output added

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219/219 [==============================] – 6s 26ms/step – loss: 0.2493 – accuracy:
Epoch 10/14
219/219 [==============================] – 6s 25ms/step – loss: 0.2439 – accuracy:
Epoch 11/14
219/219 [==============================] – 6s 25ms/step – loss: 0.2150 – accuracy:
Epoch 12/14
219/219 [==============================] – 6s 26ms/step – loss: 0.1792 – accuracy:
Epoch 13/14

219/219 [==============================] – 6s 26ms/step – loss: 0.1840 – accuracy:
Epoch 14/14
219/219 [==============================] – 6s 26ms/step – loss: 0.1839 – accuracy:
Training slice: 15 out of 20
Epoch 1/15
235/235 [==============================] – 6s 26ms/step – loss: 0.3418 – accuracy:
Epoch 2/15
235/235 [==============================] – 6s 26ms/step – loss: 0.3015 – accuracy:
Epoch 3/15
235/235 [==============================] – 6s 26ms/step – loss: 0.2566 – accuracy:
Epoch 4/15
235/235 [==============================] – 6s 26ms/step – loss: 0.2340 – accuracy:
Epoch 5/15
235/235 [==============================] – 6s 26ms/step – loss: 0.1977 – accuracy:
Epoch 6/15
235/235 [==============================] – 6s 26ms/step – loss: 0.1700 – accuracy:
Epoch 7/15
235/235 [==============================] – 6s 26ms/step – loss: 0.1724 – accuracy:
Epoch 8/15
235/235 [==============================] – 6s 26ms/step – loss: 0.1400 – accuracy:
Epoch 9/15
235/235 [==============================] – 6s 26ms/step – loss: 0.1416 – accuracy:
Epoch 10/15
235/235 [==============================] – 6s 26ms/step – loss: 0.1346 – accuracy:
Epoch 11/15
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Epoch 11/15
235/235 [==============================] - 6s 25ms/step - loss: 0.1174 - accuracy:
Epoch 12/15
235/235 [==============================] - 6s 26ms/step - loss: 0.1287 - accuracy:
Epoch 13/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0959 - accuracy:
Epoch 14/15
235/235 [==============================] - 6s 26ms/step - loss: 0.1017 - accuracy:
Epoch 15/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0861 - accuracy:
Training slice: 16 out of 20
Epoch 1/16
250/250 [==============================] - 6s 26ms/step - loss: 0.3414 - accuracy:
Epoch 2/16
250/250 [==============================] - 6s 26ms/step - loss: 0.2500 - accuracy:
Epoch 3/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1869 - accuracy:
Epoch 4/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1607 - accuracy:
Epoch 5/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1642 - accuracy:
Epoch 6/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1214 - accuracy:
Epoch 7/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0907 - accuracy:
Epoch 8/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1134 - accuracy:
Epoch 9/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0808 - accuracy:
Epoch 10/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0652 - accuracy:
Epoch 11/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0614 - accuracy:

Epoch 12/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0619 - accuracy:
Epoch 13/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0738 - accuracy:
Epoch 14/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0582 - accuracy:
Epoch 15/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0545 - accuracy:
Epoch 16/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0342 - accuracy:
Training slice: 17 out of 20
Epoch 1/17
266/266 [==============================] - 7s 25ms/step - loss: 0.3525 - accuracy:
Epoch 2/17
266/266 [==============================] - 7s 26ms/step - loss: 0.2406 - accuracy:
Epoch 3/17
266/266 [==============================] - 7s 26ms/step - loss: 0.1875 - accuracy:
Epoch 4/17
266/266 [==============================] - 7s 26ms/step - loss: 0.1894 - accuracy:
Epoch 5/17
266/266 [==============================] - 7s 26ms/step - loss: 0.1401 - accuracy:
Epoch 6/17
266/266 [==============================] - 7s 26ms/step - loss: 0.1146 - accuracy:
Epoch 7/17
266/266 [                              ] - 7s 26ms/step - loss: 0.0822 - accuracy:
```

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266/266 [==============================] - 7s 26ms/step - loss: 0.0832 - accuracy:
Epoch 8/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0892 - accuracy:
Epoch 9/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0639 - accuracy:
Epoch 10/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0673 - accuracy:
Epoch 11/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0482 - accuracy:
Epoch 12/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0487 - accuracy:
Epoch 13/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0646 - accuracy:
Epoch 14/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0618 - accuracy:
Epoch 15/17
266/266 [==============================] - 7s 25ms/step - loss: 0.1126 - accuracy:
Epoch 16/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0490 - accuracy:
Epoch 17/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0374 - accuracy:
Training slice: 18 out of 20
Epoch 1/18
282/282 [==============================] - 7s 26ms/step - loss: 0.2995 - accuracy:
Epoch 2/18
282/282 [==============================] - 7s 25ms/step - loss: 0.2295 - accuracy:
Epoch 3/18
282/282 [==============================] - 7s 26ms/step - loss: 0.1739 - accuracy:
Epoch 4/18
282/282 [==============================] - 7s 26ms/step - loss: 0.1640 - accuracy:
Epoch 5/18
282/282 [==============================] - 7s 26ms/step - loss: 0.1245 - accuracy:
Epoch 6/18

282/282 [==============================] - 7s 25ms/step - loss: 0.1003 - accuracy:
Epoch 7/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0745 - accuracy:
Epoch 8/18
282/282 [==============================] - 7s 25ms/step - loss: 0.1021 - accuracy:
Epoch 9/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0684 - accuracy:
Epoch 10/18
282/282 [==============================] - 7s 25ms/step - loss: 0.1685 - accuracy:
Epoch 11/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0540 - accuracy:
Epoch 12/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0537 - accuracy:
Epoch 13/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0458 - accuracy:
Epoch 14/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0293 - accuracy:
Epoch 15/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0332 - accuracy:
Epoch 16/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0385 - accuracy:
Epoch 17/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0238 - accuracy:
Epoch 18/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0514 - accuracy:
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282/282 [==============================] - 7s 25ms/step - loss: 0.0514 - accuracy:
Training slice: 19 out of 20
Epoch 1/19
297/297 [==============================] - 8s 25ms/step - loss: 0.2696 - accuracy:
Epoch 2/19
297/297 [==============================] - 8s 25ms/step - loss: 0.1611 - accuracy:
Epoch 3/19
297/297 [==============================] - 8s 25ms/step - loss: 0.1254 - accuracy:
Epoch 4/19
297/297 [==============================] - 8s 26ms/step - loss: 0.1217 - accuracy:
Epoch 5/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0783 - accuracy:
Epoch 6/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0787 - accuracy:
Epoch 7/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0653 - accuracy:
Epoch 8/19
Output added
297/297 [==============================] - 7s 25ms/step - loss: 0.0551 - accuracy:
Epoch 9/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0418 - accuracy:
Epoch 10/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0464 - accuracy:
Epoch 11/19
297/297 [==============================] - 7s 25ms/step - loss: 0.0355 - accuracy:
Epoch 12/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0305 - accuracy:
Epoch 13/19
297/297 [==============================] - 7s 25ms/step - loss: 0.0466 - accuracy:
Epoch 14/19
297/297 [==============================] - 7s 25ms/step - loss: 0.0316 - accuracy:
Epoch 15/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0215 - accuracy:

Epoch 16/19
297/297 [==============================] - 7s 25ms/step - loss: 0.0158 - accuracy:
Epoch 17/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0214 - accuracy:
Epoch 18/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0147 - accuracy:
Epoch 19/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0097 - accuracy:
Training shard: 6 out of 10
Training slice: 1 out of 20
16/16 [==============================] - 3s 27ms/step - loss: 2.4133 - accuracy: 0
Training slice: 2 out of 20
Epoch 1/2
32/32 [==============================] - 1s 25ms/step - loss: 2.3607 - accuracy: 0
Epoch 2/2
32/32 [==============================] - 1s 25ms/step - loss: 2.2313 - accuracy: 0
Training slice: 3 out of 20
Epoch 1/3
47/47 [==============================] - 1s 25ms/step - loss: 2.0913 - accuracy: 0
Epoch 2/3
47/47 [==============================] - 1s 25ms/step - loss: 2.0266 - accuracy: 0
Epoch 3/3
47/47 [==============================] - 1s 25ms/step - loss: 1.9124 - accuracy: 0
Training slice: 4 out of 20
Epoch 1/4
```

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Epoch 1/4
63/63 [==============================] - 2s 25ms/step - loss: 1.8589 - accuracy: 0
Epoch 2/4
63/63 [==============================] - 2s 26ms/step - loss: 1.7983 - accuracy: 0
Epoch 3/4
63/63 [==============================] - 2s 25ms/step - loss: 1.6982 - accuracy: 0
Epoch 4/4
63/63 [==============================] - 2s 26ms/step - loss: 1.6615 - accuracy: 0
Training slice: 5 out of 20
Epoch 1/5
79/79 [==============================] - 2s 25ms/step - loss: 1.6460 - accuracy: 0
Epoch 2/5
79/79 [==============================] - 2s 25ms/step - loss: 1.6018 - accuracy: 0
Epoch 3/5
79/79 [==============================] - 2s 25ms/step - loss: 1.5623 - accuracy: 0
Epoch 4/5
79/79 [==============================] - 2s 25ms/step - loss: 1.5271 - accuracy: 0
Epoch 5/5
79/79 [==============================] - 2s 25ms/step - loss: 1.4718 - accuracy: 0
Training slice: 6 out of 20
Epoch 1/6
94/94 [==============================] - 2s 26ms/step - loss: 1.4202 - accuracy: 0
Epoch 2/6
94/94 [==============================] - 2s 25ms/step - loss: 1.4103 - accuracy: 0
Epoch 3/6
94/94 [==============================] - 2s 25ms/step - loss: 1.3377 - accuracy: 0
Epoch 4/6
94/94 [==============================] - 2s 25ms/step - loss: 1.2945 - accuracy: 0
Epoch 5/6
94/94 [==============================] - 2s 25ms/step - loss: 1.2513 - accuracy: 0
Epoch 6/6
94/94 [==============================] - 2s 25ms/step - loss: 1.2201 - accuracy: 0
Training slice: 7 out of 20

Epoch 1/7
110/110 [==============================] - 3s 25ms/step - loss: 1.2657 - accuracy:
Epoch 2/7
110/110 [==============================] - 3s 25ms/step - loss: 1.2449 - accuracy:
Epoch 3/7
110/110 [==============================] - 3s 25ms/step - loss: 1.1842 - accuracy:
Epoch 4/7
110/110 [==============================] - 3s 26ms/step - loss: 1.1423 - accuracy:
Epoch 5/7
110/110 [==============================] - 3s 25ms/step - loss: 1.0867 - accuracy:
Epoch 6/7
110/110 [==============================] - 3s 25ms/step - loss: 1.0562 - accuracy:
Epoch 7/7
110/110 [==============================] - 3s 25ms/step - loss: 1.0219 - accuracy:
Training slice: 8 out of 20
Epoch 1/8
125/125 [==============================] - 5s 25ms/step - loss: 1.0942 - accuracy:
Epoch 2/8
125/125 [==============================] - 3s 25ms/step - loss: 1.0280 - accuracy:
Epoch 3/8
125/125 [==============================] - 3s 25ms/step - loss: 1.0023 - accuracy:
Epoch 4/8
125/125 [==============================] - 3s 25ms/step - loss: 0.9482 - accuracy:
Epoch 5/8
125/125 [                              ]                  - loss: 0.9178 - accuracy:
```

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125/125 [==============================] - 3s 25ms/step - loss: 0.9178 - accuracy:
Epoch 6/8
125/125 [==============================] - 3s 25ms/step - loss: 0.8942 - accuracy:
Epoch 7/8
125/125 [==============================] - 3s 25ms/step - loss: 0.8298 - accuracy:
Epoch 8/8
125/125 [==============================] - 3s 25ms/step - loss: 0.8060 - accuracy:
Training slice: 9 out of 20
Epoch 1/9
141/141 [==============================] - 4s 25ms/step - loss: 0.9165 - accuracy:
Epoch 2/9
141/141 [==============================] - 4s 26ms/step - loss: 0.8548 - accuracy:
Epoch 3/9
141/141 [==============================] - 4s 25ms/step - loss: 0.8239 - accuracy:
Epoch 4/9
141/141 [==============================] - 4s 25ms/step - loss: 0.7933 - accuracy:
Epoch 5/9
141/141 [==============================] - 4s 25ms/step - loss: 0.7555 - accuracy:
Epoch 6/9
141/141 [==============================] - 4s 25ms/step - loss: 0.7132 - accuracy:
Epoch 7/9
141/141 [==============================] - 4s 25ms/step - loss: 0.6606 - accuracy:
Epoch 8/9
141/141 [==============================] - 4s 26ms/step - loss: 0.6522 - accuracy:
Epoch 9/9
141/141 [==============================] - 4s 25ms/step - loss: 0.6351 - accuracy:
Training slice: 10 out of 20
Epoch 1/10
157/157 [==============================] - 4s 26ms/step - loss: 0.7582 - accuracy:
Epoch 2/10
157/157 [==============================] - 4s 25ms/step - loss: 0.6947 - accuracy:
Epoch 3/10
157/157 [==============================] - 4s 25ms/step - loss: 0.6585 - accuracy:

Epoch 4/10
157/157 [==============================] - 4s 26ms/step - loss: 0.5995 - accuracy:
Epoch 5/10
157/157 [==============================] - 4s 25ms/step - loss: 0.5863 - accuracy:
Epoch 6/10
157/157 [==============================] - 4s 25ms/step - loss: 0.5657 - accuracy:
Epoch 7/10
157/157 [==============================] - 4s 26ms/step - loss: 0.5137 - accuracy:
Epoch 8/10
157/157 [==============================] - 4s 25ms/step - loss: 0.5217 - accuracy:
Epoch 9/10
157/157 [==============================] - 4s 25ms/step - loss: 0.4657 - accuracy:
Epoch 10/10
157/157 [==============================] - 4s 25ms/step - loss: 0.4265 - accuracy:
Training slice: 11 out of 20
Epoch 1/11
172/172 [==============================] - 4s 25ms/step - loss: 0.5840 - accuracy:
Epoch 2/11
172/172 [==============================] - 4s 26ms/step - loss: 0.5403 - accuracy:
Epoch 3/11
172/172 [==============================] - 4s 26ms/step - loss: 0.5085 - accuracy:
Epoch 4/11
172/172 [==============================] - 4s 25ms/step - loss: 0.4243 - accuracy:
Epoch 5/11
172/172 [                              ]          - 4s 25ms/step - loss: 0.3916 - accuracy:
```

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172/172 [==============================] - 4s 25ms/step - loss: 0.3916 - accuracy:
Epoch 6/11
172/172 [==============================] - 4s 25ms/step - loss: 0.3691 - accuracy:
Epoch 7/11
172/172 [==============================] - 4s 25ms/step - loss: 0.3308 - accuracy:
Epoch 8/11
172/172 [==============================] - 4s 25ms/step - loss: 0.3307 - accuracy:
Epoch 9/11
172/172 [==============================] - 4s 25ms/step - loss: 0.2665 - accuracy:
Epoch 10/11
172/172 [==============================] - 4s 25ms/step - loss: 0.2762 - accuracy:
Epoch 11/11
172/172 [==============================] - 4s 25ms/step - loss: 0.2300 - accuracy:
Training slice: 12 out of 20
Epoch 1/12
Output added
188/188 [==============================] - 5s 25ms/step - loss: 0.4108 - accuracy:
Epoch 2/12
188/188 [==============================] - 5s 25ms/step - loss: 0.3896 - accuracy:
Epoch 3/12
188/188 [==============================] - 5s 25ms/step - loss: 0.3408 - accuracy:
Epoch 4/12
188/188 [==============================] - 5s 25ms/step - loss: 0.3383 - accuracy:
Epoch 5/12
188/188 [==============================] - 5s 26ms/step - loss: 0.2710 - accuracy:
Epoch 6/12
188/188 [==============================] - 5s 26ms/step - loss: 0.2273 - accuracy:
Epoch 7/12
188/188 [==============================] - 5s 25ms/step - loss: 0.2384 - accuracy:
Epoch 8/12
188/188 [==============================] - 5s 25ms/step - loss: 0.2043 - accuracy:
Epoch 9/12
188/188 [==============================] - 5s 25ms/step - loss: 0.1616 - accuracy:

Epoch 10/12
188/188 [==============================] - 5s 25ms/step - loss: 0.1979 - accuracy:
Epoch 11/12
188/188 [==============================] - 5s 25ms/step - loss: 0.1617 - accuracy:
Epoch 12/12
188/188 [==============================] - 5s 25ms/step - loss: 0.1453 - accuracy:
Training slice: 13 out of 20
Data excluded for 13
Training slice: 14 out of 20
Epoch 1/14
219/219 [==============================] - 6s 25ms/step - loss: 0.5666 - accuracy:
Epoch 2/14
219/219 [==============================] - 6s 25ms/step - loss: 0.4411 - accuracy:
Epoch 3/14
219/219 [==============================] - 6s 25ms/step - loss: 0.4098 - accuracy:
Epoch 4/14
219/219 [==============================] - 6s 25ms/step - loss: 0.3388 - accuracy:
Epoch 5/14
219/219 [==============================] - 6s 25ms/step - loss: 0.2892 - accuracy:
Epoch 6/14
219/219 [==============================] - 6s 25ms/step - loss: 0.2672 - accuracy:
Epoch 7/14
219/219 [==============================] - 6s 25ms/step - loss: 0.2553 - accuracy:
Epoch 8/14
219/219 [                                                   ]    6s 25ms/step    loss: 0.2170    accuracy:
```

```
219/219 [==============================] - 6s 25ms/step - loss: 0.2179 - accuracy:
Epoch 9/14
219/219 [==============================] - 6s 25ms/step - loss: 0.1772 - accuracy:
Epoch 10/14
219/219 [==============================] - 6s 25ms/step - loss: 0.1530 - accuracy:
Epoch 11/14
219/219 [==============================] - 6s 25ms/step - loss: 0.1455 - accuracy:
Epoch 12/14
219/219 [==============================] - 6s 25ms/step - loss: 0.1330 - accuracy:
Epoch 13/14
219/219 [==============================] - 6s 25ms/step - loss: 0.1070 - accuracy:
Epoch 14/14
219/219 [==============================] - 6s 25ms/step - loss: 0.0979 - accuracy:
Training slice: 15 out of 20
Epoch 1/15
235/235 [==============================] - 6s 25ms/step - loss: 0.3582 - accuracy:
Epoch 2/15
235/235 [==============================] - 6s 25ms/step - loss: 0.2752 - accuracy:
Epoch 3/15
235/235 [==============================] - 6s 25ms/step - loss: 0.2470 - accuracy:
Epoch 4/15
235/235 [==============================] - 6s 25ms/step - loss: 0.2515 - accuracy:
Epoch 5/15
235/235 [==============================] - 6s 26ms/step - loss: 0.1642 - accuracy:
Epoch 6/15
235/235 [==============================] - 6s 25ms/step - loss: 0.1517 - accuracy:
Epoch 7/15
235/235 [==============================] - 6s 25ms/step - loss: 0.1648 - accuracy:
Epoch 8/15
235/235 [==============================] - 6s 25ms/step - loss: 0.1220 - accuracy:
Epoch 9/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0907 - accuracy:
Epoch 10/15

235/235 [==============================] - 6s 25ms/step - loss: 0.0727 - accuracy:
Epoch 11/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0805 - accuracy:
Epoch 12/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0791 - accuracy:
Epoch 13/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0663 - accuracy:
Epoch 14/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0466 - accuracy:
Epoch 15/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0607 - accuracy:
Training slice: 16 out of 20
Epoch 1/16
250/250 [==============================] - 6s 25ms/step - loss: 0.3204 - accuracy:
Epoch 2/16
250/250 [==============================] - 6s 25ms/step - loss: 0.2457 - accuracy:
Epoch 3/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1935 - accuracy:
Epoch 4/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1521 - accuracy:
Epoch 5/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1189 - accuracy:
Epoch 6/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0891 - accuracy:
Epoch 7/16
```

```
Epoch 7/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0780 - accuracy:
Epoch 8/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0627 - accuracy:
Epoch 9/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0548 - accuracy:
Epoch 10/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0435 - accuracy:
Epoch 11/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0397 - accuracy:
Epoch 12/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0447 - accuracy:
Epoch 13/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0312 - accuracy:
Epoch 14/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0488 - accuracy:
Epoch 15/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0439 - accuracy:
Epoch 16/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0318 - accuracy:
Training slice: 17 out of 20
Epoch 1/17
266/266 [==============================] - 7s 25ms/step - loss: 0.3257 - accuracy:
Epoch 2/17
266/266 [==============================] - 7s 25ms/step - loss: 0.2313 - accuracy:
Epoch 3/17
266/266 [==============================] - 7s 25ms/step - loss: 0.1630 - accuracy:
Epoch 4/17
266/266 [==============================] - 7s 25ms/step - loss: 0.1263 - accuracy:
Epoch 5/17
266/266 [==============================] - 7s 26ms/step - loss: 0.1257 - accuracy:
Epoch 6/17
266/266 [==============================] - 7s 25ms/step - loss: 0.1232 - accuracy:

Epoch 7/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0663 - accuracy:
Epoch 8/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0631 - accuracy:
Epoch 9/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0444 - accuracy:
Epoch 10/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0545 - accuracy:
Epoch 11/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0312 - accuracy:
Epoch 12/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0418 - accuracy:
Epoch 13/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0284 - accuracy:
Epoch 14/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0653 - accuracy:
Epoch 15/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0276 - accuracy:
Epoch 16/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0169 - accuracy:
Epoch 17/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0239 - accuracy:
Training slice: 18 out of 20
Data excluded for 18
Training slice: 19 out of 20
```

```
Training slice: 19 out of 20
Epoch 1/19
297/297 [==============================] - 7s 25ms/step - loss: 0.4235 - accuracy:
Epoch 2/19
297/297 [==============================] - 8s 25ms/step - loss: 0.3070 - accuracy:
Epoch 3/19
297/297 [==============================] - 7s 25ms/step - loss: 0.2402 - accuracy:
Epoch 4/19
297/297 [==============================] - 7s 25ms/step - loss: 0.1646 - accuracy:
Epoch 5/19
```
Output added
```
297/297 [==============================] - 7s 25ms/step - loss: 0.1398 - accuracy:
Epoch 6/19
297/297 [==============================] - 7s 25ms/step - loss: 0.1161 - accuracy:
Epoch 7/19
297/297 [==============================] - 7s 25ms/step - loss: 0.0809 - accuracy:
Epoch 8/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0970 - accuracy:
Epoch 9/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0679 - accuracy:
Epoch 10/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0504 - accuracy:
Epoch 11/19
297/297 [==============================] - 7s 25ms/step - loss: 0.0445 - accuracy:
Epoch 12/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0322 - accuracy:
Epoch 13/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0320 - accuracy:
Epoch 14/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0397 - accuracy:
Epoch 15/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0194 - accuracy:
Epoch 16/19

297/297 [==============================] - 8s 25ms/step - loss: 0.0148 - accuracy:
Epoch 17/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0254 - accuracy:
Epoch 18/19
297/297 [==============================] - 7s 25ms/step - loss: 0.0227 - accuracy:
Epoch 19/19
297/297 [==============================] - 7s 25ms/step - loss: 0.0247 - accuracy:
Training shard: 7 out of 10
Training slice: 1 out of 20
16/16 [==============================] - 3s 26ms/step - loss: 2.5149 - accuracy: 0
Training slice: 2 out of 20
Epoch 1/2
32/32 [==============================] - 1s 25ms/step - loss: 2.2892 - accuracy: 0
Epoch 2/2
32/32 [==============================] - 1s 25ms/step - loss: 2.0952 - accuracy: 0
Training slice: 3 out of 20
Epoch 1/3
47/47 [==============================] - 1s 26ms/step - loss: 1.9926 - accuracy: 0
Epoch 2/3
47/47 [==============================] - 1s 26ms/step - loss: 1.8194 - accuracy: 0
Epoch 3/3
47/47 [==============================] - 1s 26ms/step - loss: 1.7115 - accuracy: 0
Training slice: 4 out of 20
Epoch 1/4
```

```
63/63 [==============================] - 2s 25ms/step - loss: 1.7027 - accuracy: 0
Epoch 2/4
63/63 [==============================] - 2s 25ms/step - loss: 1.6482 - accuracy: 0
Epoch 3/4
63/63 [==============================] - 2s 25ms/step - loss: 1.5691 - accuracy: 0
Epoch 4/4
63/63 [==============================] - 2s 25ms/step - loss: 1.5173 - accuracy: 0
Training slice: 5 out of 20
Epoch 1/5
79/79 [==============================] - 2s 25ms/step - loss: 1.5207 - accuracy: 0
Epoch 2/5
79/79 [==============================] - 2s 25ms/step - loss: 1.4886 - accuracy: 0
Epoch 3/5
79/79 [==============================] - 2s 25ms/step - loss: 1.4229 - accuracy: 0
Epoch 4/5
79/79 [==============================] - 2s 25ms/step - loss: 1.3576 - accuracy: 0
Epoch 5/5
79/79 [==============================] - 2s 25ms/step - loss: 1.3146 - accuracy: 0
Training slice: 6 out of 20
Epoch 1/6
94/94 [==============================] - 2s 26ms/step - loss: 1.3678 - accuracy: 0
Epoch 2/6
94/94 [==============================] - 2s 25ms/step - loss: 1.2337 - accuracy: 0
Epoch 3/6
94/94 [==============================] - 2s 25ms/step - loss: 1.2065 - accuracy: 0
Epoch 4/6
94/94 [==============================] - 2s 25ms/step - loss: 1.1422 - accuracy: 0
Epoch 5/6
94/94 [==============================] - 2s 25ms/step - loss: 1.0891 - accuracy: 0
Epoch 6/6
94/94 [==============================] - 2s 25ms/step - loss: 1.0472 - accuracy: 0
Training slice: 7 out of 20
Epoch 1/7

110/110 [==============================] - 3s 26ms/step - loss: 1.1212 - accuracy:
Epoch 2/7
110/110 [==============================] - 3s 25ms/step - loss: 1.0855 - accuracy:
Epoch 3/7
110/110 [==============================] - 3s 25ms/step - loss: 0.9951 - accuracy:
Epoch 4/7
110/110 [==============================] - 3s 25ms/step - loss: 0.9662 - accuracy:
Epoch 5/7
110/110 [==============================] - 3s 25ms/step - loss: 0.9160 - accuracy:
Epoch 6/7
110/110 [==============================] - 3s 25ms/step - loss: 0.8590 - accuracy:
Epoch 7/7
110/110 [==============================] - 3s 25ms/step - loss: 0.8343 - accuracy:
Training slice: 8 out of 20
Data excluded for 8
Training slice: 9 out of 20
Data excluded for 9
Training slice: 10 out of 20
Epoch 1/10
157/157 [==============================] - 4s 25ms/step - loss: 1.1402 - accuracy:
Epoch 2/10
157/157 [==============================] - 4s 25ms/step - loss: 1.0661 - accuracy:
Epoch 3/10
157/157 [==============================] - 4s 26ms/step - loss: 0.9917 - accuracy:
Epoch 4/10
```

```
Epoch 4/10
157/157 [==============================] – 4s 25ms/step – loss: 0.9306 – accuracy:
Epoch 5/10
157/157 [==============================] – 4s 25ms/step – loss: 0.8750 – accuracy:
Epoch 6/10
157/157 [==============================] – 4s 25ms/step – loss: 0.8227 – accuracy:
Epoch 7/10
157/157 [==============================] – 4s 25ms/step – loss: 0.7775 – accuracy:
Epoch 8/10
157/157 [==============================] – 4s 25ms/step – loss: 0.7209 – accuracy:
Epoch 9/10
157/157 [==============================] – 4s 25ms/step – loss: 0.6919 – accuracy:
Epoch 10/10
157/157 [==============================] – 4s 25ms/step – loss: 0.6389 – accuracy:
Training slice: 11 out of 20
Epoch 1/11
172/172 [==============================] – 4s 25ms/step – loss: 0.7521 – accuracy:
Epoch 2/11
172/172 [==============================] – 4s 25ms/step – loss: 0.6661 – accuracy:
Epoch 3/11
172/172 [==============================] – 4s 25ms/step – loss: 0.6182 – accuracy:
Epoch 4/11
172/172 [==============================] – 4s 25ms/step – loss: 0.5495 – accuracy:
Epoch 5/11
172/172 [==============================] – 4s 25ms/step – loss: 0.5431 – accuracy:
Epoch 6/11
172/172 [==============================] – 4s 25ms/step – loss: 0.4550 – accuracy:
Epoch 7/11
172/172 [==============================] – 4s 25ms/step – loss: 0.4423 – accuracy:
Epoch 8/11
172/172 [==============================] – 4s 25ms/step – loss: 0.4022 – accuracy:
Epoch 9/11
172/172 [==============================] – 4s 26ms/step – loss: 0.4064 – accuracy:

Epoch 10/11
172/172 [==============================] – 4s 25ms/step – loss: 0.3265 – accuracy:
Epoch 11/11
172/172 [==============================] – 4s 25ms/step – loss: 0.2935 – accuracy:
Training slice: 12 out of 20
Epoch 1/12
188/188 [==============================] – 5s 25ms/step – loss: 0.5358 – accuracy:
Epoch 2/12
188/188 [==============================] – 5s 25ms/step – loss: 0.4549 – accuracy:
Epoch 3/12
188/188 [==============================] – 5s 25ms/step – loss: 0.4246 – accuracy:
Epoch 4/12
188/188 [==============================] – 5s 26ms/step – loss: 0.3740 – accuracy:
Epoch 5/12
188/188 [==============================] – 5s 26ms/step – loss: 0.3163 – accuracy:
Epoch 6/12
188/188 [==============================] – 5s 25ms/step – loss: 0.3143 – accuracy:
Epoch 7/12
188/188 [==============================] – 5s 25ms/step – loss: 0.2584 – accuracy:
Epoch 8/12
188/188 [==============================] – 5s 25ms/step – loss: 0.2456 – accuracy:
Epoch 9/12
188/188 [==============================] – 5s 25ms/step – loss: 0.2059 – accuracy:
Epoch 10/12
188/188 [                                ]      5s 25ms/step   loss: 0.1926   accuracy:
```

```
188/188 [==============================] - 5s 25ms/step - loss: 0.1926 - accuracy:
Epoch 11/12
188/188 [==============================] - 5s 25ms/step - loss: 0.1757 - accuracy:
Epoch 12/12
188/188 [==============================] - 5s 26ms/step - loss: 0.1657 - accuracy:
Training slice: 13 out of 20
Epoch 1/13
204/204 [==============================] - 5s 25ms/step - loss: 0.3649 - accuracy:
Epoch 2/13
```
Output added
```
204/204 [==============================] - 5s 25ms/step - loss: 0.2805 - accuracy:
Epoch 3/13
204/204 [==============================] - 5s 25ms/step - loss: 0.4070 - accuracy:
Epoch 4/13
204/204 [==============================] - 5s 25ms/step - loss: 0.2492 - accuracy:
Epoch 5/13
204/204 [==============================] - 5s 25ms/step - loss: 0.2869 - accuracy:
Epoch 6/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2094 - accuracy:
Epoch 7/13
204/204 [==============================] - 5s 25ms/step - loss: 0.1927 - accuracy:
Epoch 8/13
204/204 [==============================] - 5s 25ms/step - loss: 0.1242 - accuracy:
Epoch 9/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2020 - accuracy:
Epoch 10/13
204/204 [==============================] - 5s 25ms/step - loss: 0.1164 - accuracy:
Epoch 11/13
204/204 [==============================] - 5s 26ms/step - loss: 0.0919 - accuracy:
Epoch 12/13
204/204 [==============================] - 5s 25ms/step - loss: 0.0909 - accuracy:
Epoch 13/13
204/204 [==============================] - 5s 25ms/step - loss: 0.0659 - accuracy:

Training slice: 14 out of 20
Epoch 1/14
219/219 [==============================] - 6s 25ms/step - loss: 0.3562 - accuracy:
Epoch 2/14
219/219 [==============================] - 6s 25ms/step - loss: 0.2748 - accuracy:
Epoch 3/14
219/219 [==============================] - 6s 25ms/step - loss: 0.2255 - accuracy:
Epoch 4/14
219/219 [==============================] - 6s 25ms/step - loss: 0.1786 - accuracy:
Epoch 5/14
219/219 [==============================] - 5s 25ms/step - loss: 0.1749 - accuracy:
Epoch 6/14
219/219 [==============================] - 6s 25ms/step - loss: 0.1390 - accuracy:
Epoch 7/14
219/219 [==============================] - 5s 25ms/step - loss: 0.1194 - accuracy:
Epoch 8/14
219/219 [==============================] - 6s 25ms/step - loss: 0.0763 - accuracy:
Epoch 9/14
219/219 [==============================] - 6s 25ms/step - loss: 0.0655 - accuracy:
Epoch 10/14
219/219 [==============================] - 6s 25ms/step - loss: 0.0830 - accuracy:
Epoch 11/14
219/219 [==============================] - 6s 25ms/step - loss: 0.0578 - accuracy:
Epoch 12/14
219/219 [                              ]                6s 26ms/step    loss: 0.0486   accuracy:
```

```
219/219 [==============================] - 6s 26ms/step - loss: 0.0496 - accuracy:
Epoch 13/14
219/219 [==============================] - 6s 25ms/step - loss: 0.0426 - accuracy:
Epoch 14/14
219/219 [==============================] - 6s 25ms/step - loss: 0.0635 - accuracy:
Training slice: 15 out of 20
Epoch 1/15
235/235 [==============================] - 6s 25ms/step - loss: 0.3707 - accuracy:
Epoch 2/15
235/235 [==============================] - 6s 25ms/step - loss: 0.2641 - accuracy:
Epoch 3/15
235/235 [==============================] - 6s 25ms/step - loss: 0.2016 - accuracy:
Epoch 4/15
235/235 [==============================] - 6s 25ms/step - loss: 0.1669 - accuracy:
Epoch 5/15
235/235 [==============================] - 6s 25ms/step - loss: 0.1397 - accuracy:
Epoch 6/15
235/235 [==============================] - 6s 25ms/step - loss: 0.1043 - accuracy:
Epoch 7/15
235/235 [==============================] - 6s 25ms/step - loss: 0.1045 - accuracy:
Epoch 8/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0947 - accuracy:
Epoch 9/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0956 - accuracy:
Epoch 10/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0559 - accuracy:
Epoch 11/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0549 - accuracy:
Epoch 12/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0388 - accuracy:
Epoch 13/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0296 - accuracy:
Epoch 14/15

235/235 [==============================] - 6s 25ms/step - loss: 0.0367 - accuracy:
Epoch 15/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0214 - accuracy:
Training slice: 16 out of 20
Epoch 1/16
250/250 [==============================] - 8s 25ms/step - loss: 0.3243 - accuracy:
Epoch 2/16
250/250 [==============================] - 6s 25ms/step - loss: 0.2299 - accuracy:
Epoch 3/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1979 - accuracy:
Epoch 4/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1664 - accuracy:
Epoch 5/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1438 - accuracy:
Epoch 6/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0945 - accuracy:
Epoch 7/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0678 - accuracy:
Epoch 8/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0463 - accuracy:
Epoch 9/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0439 - accuracy:
Epoch 10/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0524 - accuracy:
Epoch 11/16
```

```
Epoch 11/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0453 - accuracy:
Epoch 12/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0336 - accuracy:
Epoch 13/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0281 - accuracy:
Epoch 14/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0230 - accuracy:
Epoch 15/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0209 - accuracy:
Epoch 16/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0104 - accuracy:
Training slice: 17 out of 20
Epoch 1/17
266/266 [==============================] - 7s 25ms/step - loss: 0.2891 - accuracy:
Epoch 2/17
266/266 [==============================] - 7s 25ms/step - loss: 0.1823 - accuracy:
Epoch 3/17
266/266 [==============================] - 7s 25ms/step - loss: 0.1360 - accuracy:
Epoch 4/17
266/266 [==============================] - 7s 25ms/step - loss: 0.1056 - accuracy:
Epoch 5/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0787 - accuracy:
Epoch 6/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0530 - accuracy:
Epoch 7/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0393 - accuracy:
Epoch 8/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0457 - accuracy:
Epoch 9/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0335 - accuracy:
Epoch 10/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0313 - accuracy:

Epoch 11/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0295 - accuracy:
Epoch 12/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0145 - accuracy:
Epoch 13/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0093 - accuracy:
Epoch 14/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0091 - accuracy:
Epoch 15/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0090 - accuracy:
Epoch 16/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0352 - accuracy:
Epoch 17/17
266/266 [==============================] - 7s 25ms/step - loss: 0.0153 - accuracy:
Training slice: 18 out of 20
Epoch 1/18
282/282 [==============================] - 7s 25ms/step - loss: 0.2945 - accuracy:
Epoch 2/18
282/282 [==============================] - 7s 25ms/step - loss: 0.2135 - accuracy:
Epoch 3/18
282/282 [==============================] - 7s 25ms/step - loss: 0.1716 - accuracy:
Epoch 4/18
282/282 [==============================] - 7s 25ms/step - loss: 0.1144 - accuracy:
Epoch 5/18
282/282 [                              ]   7s 25ms/step   loss: 0.1101   accuracy:
```

```
282/282 [==============================] - 7s 25ms/step - loss: 0.1101 - accuracy:
Epoch 6/18
```
Output added
```
282/282 [==============================] - 7s 25ms/step - loss: 0.0782 - accuracy:
Epoch 7/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0600 - accuracy:
Epoch 8/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0464 - accuracy:
Epoch 9/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0378 - accuracy:
Epoch 10/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0303 - accuracy:
Epoch 11/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0224 - accuracy:
Epoch 12/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0351 - accuracy:
Epoch 13/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0168 - accuracy:
Epoch 14/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0132 - accuracy:
Epoch 15/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0099 - accuracy:
Epoch 16/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0204 - accuracy:
Epoch 17/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0128 - accuracy:
Epoch 18/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0096 - accuracy:
Training slice: 19 out of 20
Epoch 1/19
297/297 [==============================] - 8s 25ms/step - loss: 0.3028 - accuracy:
Epoch 2/19
297/297 [==============================] - 8s 25ms/step - loss: 0.1801 - accuracy:

Epoch 3/19
297/297 [==============================] - 7s 25ms/step - loss: 0.1146 - accuracy:
Epoch 4/19
297/297 [==============================] - 7s 25ms/step - loss: 0.0848 - accuracy:
Epoch 5/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0713 - accuracy:
Epoch 6/19
297/297 [==============================] - 7s 25ms/step - loss: 0.0526 - accuracy:
Epoch 7/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0359 - accuracy:
Epoch 8/19
297/297 [==============================] - 7s 25ms/step - loss: 0.0292 - accuracy:
Epoch 9/19
297/297 [==============================] - 7s 25ms/step - loss: 0.0184 - accuracy:
Epoch 10/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0213 - accuracy:
Epoch 11/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0249 - accuracy:
Epoch 12/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0193 - accuracy:
Epoch 13/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0170 - accuracy:
Epoch 14/19
297/297 [==============================] - 8s 25ms/step - loss: 0.0118 - accuracy:
Epoch 15/19
```

```
Epoch 15/19
297/297 [==============================] – 8s 25ms/step – loss: 0.0294 – accuracy:
Epoch 16/19
297/297 [==============================] – 8s 26ms/step – loss: 0.0178 – accuracy:
Epoch 17/19
297/297 [==============================] – 7s 25ms/step – loss: 0.0074 – accuracy:
Epoch 18/19
297/297 [==============================] – 7s 25ms/step – loss: 0.0071 – accuracy:
Epoch 19/19
297/297 [==============================] – 7s 25ms/step – loss: 0.0051 – accuracy:
Training shard: 8 out of 10
Training slice: 1 out of 20
16/16 [==============================] – 3s 27ms/step – loss: 2.4213 – accuracy: 0
Training slice: 2 out of 20
Epoch 1/2
32/32 [==============================] – 1s 26ms/step – loss: 2.3769 – accuracy: 0
Epoch 2/2
32/32 [==============================] – 1s 25ms/step – loss: 2.2337 – accuracy: 0
Training slice: 3 out of 20
Epoch 1/3
47/47 [==============================] – 1s 25ms/step – loss: 2.1021 – accuracy: 0
Epoch 2/3
47/47 [==============================] – 1s 25ms/step – loss: 1.9875 – accuracy: 0
Epoch 3/3
47/47 [==============================] – 1s 25ms/step – loss: 1.8877 – accuracy: 0
Training slice: 4 out of 20
Data excluded for 4
Training slice: 5 out of 20
Data excluded for 5
Training slice: 6 out of 20
Epoch 1/6
94/94 [==============================] – 2s 25ms/step – loss: 1.8849 – accuracy: 0
Epoch 2/6

94/94 [==============================] – 2s 25ms/step – loss: 1.7990 – accuracy: 0
Epoch 3/6
94/94 [==============================] – 2s 25ms/step – loss: 1.7015 – accuracy: 0
Epoch 4/6
94/94 [==============================] – 2s 25ms/step – loss: 1.6730 – accuracy: 0
Epoch 5/6
94/94 [==============================] – 2s 25ms/step – loss: 1.5990 – accuracy: 0
Epoch 6/6
94/94 [==============================] – 2s 26ms/step – loss: 1.5651 – accuracy: 0
Training slice: 7 out of 20
Epoch 1/7
110/110 [==============================] – 3s 25ms/step – loss: 1.5339 – accuracy:
Epoch 2/7
110/110 [==============================] – 3s 25ms/step – loss: 1.4583 – accuracy:
Epoch 3/7
110/110 [==============================] – 3s 25ms/step – loss: 1.4273 – accuracy:
Epoch 4/7
110/110 [==============================] – 3s 25ms/step – loss: 1.3811 – accuracy:
Epoch 5/7
110/110 [==============================] – 3s 25ms/step – loss: 1.3286 – accuracy:
Epoch 6/7
110/110 [==============================] – 3s 25ms/step – loss: 1.2927 – accuracy:
Epoch 7/7
110/110 [==============================] – 3s 25ms/step – loss: 1.2505 – accuracy:
Training slice: 8 out of 20
```

```
Training slice: 8 out of 20
Epoch 1/8
125/125 [==============================] - 5s 25ms/step - loss: 1.3156 - accuracy:
Epoch 2/8
125/125 [==============================] - 3s 25ms/step - loss: 1.2574 - accuracy:
Epoch 3/8
125/125 [==============================] - 3s 25ms/step - loss: 1.2187 - accuracy:
Epoch 4/8
125/125 [==============================] - 3s 25ms/step - loss: 1.2042 - accuracy:
Epoch 5/8
125/125 [==============================] - 3s 25ms/step - loss: 1.1575 - accuracy:
Epoch 6/8
125/125 [==============================] - 3s 25ms/step - loss: 1.1116 - accuracy:
Epoch 7/8
125/125 [==============================] - 3s 25ms/step - loss: 1.0897 - accuracy:
Epoch 8/8
125/125 [==============================] - 3s 25ms/step - loss: 1.0333 - accuracy:
Training slice: 9 out of 20
Epoch 1/9
141/141 [==============================] - 4s 26ms/step - loss: 1.0885 - accuracy:
Epoch 2/9
141/141 [==============================] - 4s 25ms/step - loss: 1.0306 - accuracy:
Epoch 3/9
141/141 [==============================] - 4s 25ms/step - loss: 0.9849 - accuracy:
Epoch 4/9
141/141 [==============================] - 4s 25ms/step - loss: 0.9384 - accuracy:
Epoch 5/9
141/141 [==============================] - 4s 25ms/step - loss: 0.9014 - accuracy:
Epoch 6/9
141/141 [==============================] - 4s 25ms/step - loss: 0.8948 - accuracy:
Epoch 7/9
141/141 [==============================] - 4s 25ms/step - loss: 0.8585 - accuracy:
Epoch 8/9

141/141 [==============================] - 4s 25ms/step - loss: 0.8065 - accuracy:
Epoch 9/9
141/141 [==============================] - 4s 26ms/step - loss: 0.7942 - accuracy:
Training slice: 10 out of 20
Epoch 1/10
157/157 [==============================] - 4s 25ms/step - loss: 0.8565 - accuracy:
Epoch 2/10
157/157 [==============================] - 4s 25ms/step - loss: 0.7995 - accuracy:
Epoch 3/10
157/157 [==============================] - 4s 25ms/step - loss: 0.7627 - accuracy:
Epoch 4/10
157/157 [==============================] - 4s 26ms/step - loss: 0.7413 - accuracy:
Epoch 5/10
157/157 [==============================] - 4s 25ms/step - loss: 0.7134 - accuracy:
Epoch 6/10
157/157 [==============================] - 4s 25ms/step - loss: 0.6597 - accuracy:
Epoch 7/10
157/157 [==============================] - 4s 25ms/step - loss: 0.6345 - accuracy:
Epoch 8/10
157/157 [==============================] - 4s 26ms/step - loss: 0.6059 - accuracy:
Epoch 9/10
157/157 [==============================] - 4s 25ms/step - loss: 0.5485 - accuracy:
Epoch 10/10
157/157 [==============================] - 4s 25ms/step - loss: 0.4972 - accuracy:
```

Output added

```
Training slice: 11 out of 20
Epoch 1/11
172/172 [==============================] – 4s 25ms/step – loss: 0.6642 – accuracy:
Epoch 2/11
172/172 [==============================] – 4s 25ms/step – loss: 0.6095 – accuracy:
Epoch 3/11
172/172 [==============================] – 4s 25ms/step – loss: 0.5638 – accuracy:
Epoch 4/11
172/172 [==============================] – 4s 25ms/step – loss: 0.5047 – accuracy:
Epoch 5/11
172/172 [==============================] – 4s 25ms/step – loss: 0.4794 – accuracy:
Epoch 6/11
172/172 [==============================] – 4s 25ms/step – loss: 0.4467 – accuracy:
Epoch 7/11
172/172 [==============================] – 4s 25ms/step – loss: 0.4080 – accuracy:
Epoch 8/11
172/172 [==============================] – 4s 25ms/step – loss: 0.3826 – accuracy:
Epoch 9/11
172/172 [==============================] – 4s 25ms/step – loss: 0.3602 – accuracy:
Epoch 10/11
172/172 [==============================] – 4s 25ms/step – loss: 0.3405 – accuracy:
Epoch 11/11
172/172 [==============================] – 4s 25ms/step – loss: 0.3297 – accuracy:
Training slice: 12 out of 20
Epoch 1/12
188/188 [==============================] – 5s 26ms/step – loss: 0.4792 – accuracy:
Epoch 2/12
188/188 [==============================] – 5s 25ms/step – loss: 0.4567 – accuracy:
Epoch 3/12
188/188 [==============================] – 5s 25ms/step – loss: 0.4082 – accuracy:
Epoch 4/12
188/188 [==============================] – 5s 25ms/step – loss: 0.3440 – accuracy:

Epoch 5/12
188/188 [==============================] – 5s 26ms/step – loss: 0.3205 – accuracy:
Epoch 6/12
188/188 [==============================] – 5s 26ms/step – loss: 0.3319 – accuracy:
Epoch 7/12
188/188 [==============================] – 5s 26ms/step – loss: 0.2875 – accuracy:
Epoch 8/12
188/188 [==============================] – 5s 26ms/step – loss: 0.2323 – accuracy:
Epoch 9/12
188/188 [==============================] – 5s 25ms/step – loss: 0.2171 – accuracy:
Epoch 10/12
188/188 [==============================] – 5s 26ms/step – loss: 0.2299 – accuracy:
Epoch 11/12
188/188 [==============================] – 5s 26ms/step – loss: 0.1956 – accuracy:
Epoch 12/12
188/188 [==============================] – 5s 27ms/step – loss: 0.1473 – accuracy:
Training slice: 13 out of 20
Epoch 1/13
204/204 [==============================] – 5s 27ms/step – loss: 0.4004 – accuracy:
Epoch 2/13
204/204 [==============================] – 5s 27ms/step – loss: 0.3401 – accuracy:
Epoch 3/13
204/204 [==============================] – 6s 27ms/step – loss: 0.3443 – accuracy:
Epoch 4/13
204/204 [                              ]            5s 27ms/step  loss: 0.2922  accuracy:
```

```
204/204 [==============================] - 5s 27ms/step - loss: 0.2932 - accuracy:
Epoch 5/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2523 - accuracy:
Epoch 6/13
204/204 [==============================] - 5s 27ms/step - loss: 0.2512 - accuracy:
Epoch 7/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1873 - accuracy:
Epoch 8/13
204/204 [==============================] - 5s 27ms/step - loss: 0.1870 - accuracy:
Epoch 9/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1786 - accuracy:
Epoch 10/13
204/204 [==============================] - 5s 27ms/step - loss: 0.1416 - accuracy:
Epoch 11/13
204/204 [==============================] - 5s 26ms/step - loss: 0.0980 - accuracy:
Epoch 12/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1426 - accuracy:
Epoch 13/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1013 - accuracy:
Training slice: 14 out of 20
Epoch 1/14
219/219 [==============================] - 6s 27ms/step - loss: 0.3461 - accuracy:
Epoch 2/14
219/219 [==============================] - 6s 26ms/step - loss: 0.2761 - accuracy:
Epoch 3/14
219/219 [==============================] - 6s 26ms/step - loss: 0.2331 - accuracy:
Epoch 4/14
219/219 [==============================] - 6s 27ms/step - loss: 0.1985 - accuracy:
Epoch 5/14
219/219 [==============================] - 6s 26ms/step - loss: 0.1750 - accuracy:
Epoch 6/14
219/219 [==============================] - 6s 26ms/step - loss: 0.1305 - accuracy:
Epoch 7/14

219/219 [==============================] - 6s 26ms/step - loss: 0.1530 - accuracy:
Epoch 8/14
219/219 [==============================] - 6s 26ms/step - loss: 0.1419 - accuracy:
Epoch 9/14
235/235 [==============================] - 6s 26ms/step - loss: 0.0698 - accuracy:
Epoch 11/15
235/235 [==============================] - 6s 25ms/step - loss: 0.1072 - accuracy:
Epoch 12/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0539 - accuracy:
Epoch 13/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0493 - accuracy:
Epoch 14/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0340 - accuracy:
Epoch 15/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0384 - accuracy:
Training slice: 16 out of 20
Epoch 1/16
250/250 [==============================] - 6s 25ms/step - loss: 0.2883 - accuracy:
Epoch 2/16
250/250 [==============================] - 6s 25ms/step - loss: 0.2309 - accuracy:
Epoch 3/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1739 - accuracy:
Epoch 4/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1378 - accuracy:
Epoch 5/16
```

```
Epoch 5/16
250/250 [==============================] – 6s 25ms/step – loss: 0.1498 – accuracy:
Epoch 6/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0934 – accuracy:
Epoch 7/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0818 – accuracy:
Epoch 8/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0668 – accuracy:
Epoch 9/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0712 – accuracy:
Epoch 10/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0486 – accuracy:
Epoch 11/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0466 – accuracy:
Epoch 12/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0347 – accuracy:
Epoch 13/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0366 – accuracy:
Epoch 14/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0214 – accuracy:
Epoch 15/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0205 – accuracy:
Epoch 16/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0221 – accuracy:
Training slice: 17 out of 20
Epoch 1/17
266/266 [==============================] – 7s 25ms/step – loss: 0.2864 – accuracy:
Epoch 2/17
266/266 [==============================] – 7s 26ms/step – loss: 0.2548 – accuracy:
Epoch 3/17
266/266 [==============================] – 7s 25ms/step – loss: 0.1901 – accuracy:
Epoch 4/17
266/266 [==============================] – 7s 25ms/step – loss: 0.1460 – accuracy:

Epoch 5/17
266/266 [==============================] – 7s 25ms/step – loss: 0.1087 – accuracy:
Epoch 6/17
266/266 [==============================] – 7s 25ms/step – loss: 0.0993 – accuracy:
Epoch 7/17
266/266 [==============================] – 7s 25ms/step – loss: 0.0590 – accuracy:
Epoch 8/17
266/266 [==============================] – 7s 25ms/step – loss: 0.0561 – accuracy:
Epoch 9/17
 23/266 [=>............................] – ETA: 6s – loss: 0.0383 – accuracy: 0.98
```

Output added

```
IOPub message rate exceeded.
The notebook server will temporarily stop sending output
to the client in order to avoid crashing it.
To change this limit, set the config variable
`--NotebookApp.iopub_msg_rate_limit`.

Current values:
NotebookApp.iopub_msg_rate_limit=1000.0 (msgs/sec)
NotebookApp.rate_limit_window=3.0 (secs)
```

Output added

```
282/282 [==============================] – 7s 25ms/step – loss: 0.0113 – accuracy:
Training slice: 19 out of 20
```

```
Training slice: 19 out of 20
Epoch 1/19
297/297 [==============================] – 7s 25ms/step – loss: 0.2646 – accuracy:
Epoch 2/19
297/297 [==============================] – 8s 25ms/step – loss: 0.1971 – accuracy:
Epoch 3/19
297/297 [==============================] – 8s 26ms/step – loss: 0.1586 – accuracy:
Epoch 4/19
297/297 [==============================] – 8s 26ms/step – loss: 0.1301 – accuracy:
Epoch 5/19
297/297 [==============================] – 8s 25ms/step – loss: 0.0901 – accuracy:
Epoch 6/19
297/297 [==============================] – 7s 25ms/step – loss: 0.0730 – accuracy:
Epoch 7/19
297/297 [==============================] – 8s 25ms/step – loss: 0.0524 – accuracy:
Epoch 8/19
297/297 [==============================] – 8s 25ms/step – loss: 0.0635 – accuracy:
Epoch 9/19
297/297 [==============================] – 7s 25ms/step – loss: 0.0356 – accuracy:
Epoch 10/19
297/297 [==============================] – 7s 25ms/step – loss: 0.0310 – accuracy:
Epoch 11/19
297/297 [==============================] – 8s 25ms/step – loss: 0.0255 – accuracy:
Epoch 12/19
297/297 [==============================] – 8s 25ms/step – loss: 0.0204 – accuracy:
Epoch 13/19
297/297 [==============================] – 8s 25ms/step – loss: 0.0203 – accuracy:
Epoch 14/19
297/297 [==============================] – 8s 26ms/step – loss: 0.0170 – accuracy:
Epoch 15/19
297/297 [==============================] – 8s 26ms/step – loss: 0.0111 – accuracy:
Epoch 16/19
297/297 [==============================] – 8s 25ms/step – loss: 0.0136 – accuracy:
Epoch 17/19
297/297 [==============================] – 8s 26ms/step – loss: 0.0237 – accuracy:
Epoch 18/19
297/297 [==============================] – 8s 26ms/step – loss: 0.0191 – accuracy:
Epoch 19/19
297/297 [==============================] – 8s 26ms/step – loss: 0.0076 – accuracy:
Training shard: 9 out of 10
Training slice: 1 out of 20
16/16 [==============================] – 3s 27ms/step – loss: 2.3803 – accuracy: 0
Training slice: 2 out of 20
Epoch 1/2
32/32 [==============================] – 1s 26ms/step – loss: 2.3453 – accuracy: 0
Epoch 2/2
32/32 [==============================] – 1s 26ms/step – loss: 2.2705 – accuracy: 0
Training slice: 3 out of 20
Epoch 1/3
47/47 [==============================] – 1s 26ms/step – loss: 2.1459 – accuracy: 0
Epoch 2/3
47/47 [==============================] – 1s 26ms/step – loss: 2.0316 – accuracy: 0
Epoch 3/3
47/47 [==============================] – 1s 26ms/step – loss: 1.9510 – accuracy: 0
Training slice: 4 out of 20
Epoch 1/4
63/63 [==============================] – 2s 26ms/step – loss: 1.9392 – accuracy: 0
Epoch 2/4
63/63 [                              ]          2s 25ms/step   loss: 1.8144   accuracy: 0
```

```
63/63 [==============================] – 2s 25ms/step – loss: 1.8144 – accuracy: 0
Epoch 3/4
63/63 [==============================] – 2s 26ms/step – loss: 1.7733 – accuracy: 0
Epoch 4/4
63/63 [==============================] – 2s 25ms/step – loss: 1.7382 – accuracy: 0
Training slice: 5 out of 20
Epoch 1/5
79/79 [==============================] – 2s 25ms/step – loss: 1.7089 – accuracy: 0
Epoch 2/5
79/79 [==============================] – 2s 26ms/step – loss: 1.7113 – accuracy: 0
Epoch 3/5
79/79 [==============================] – 2s 26ms/step – loss: 1.5922 – accuracy: 0
Epoch 4/5
79/79 [==============================] – 2s 26ms/step – loss: 1.6177 – accuracy: 0
Epoch 5/5
79/79 [==============================] – 2s 26ms/step – loss: 1.4792 – accuracy: 0
Training slice: 6 out of 20
Epoch 1/6
94/94 [==============================] – 2s 26ms/step – loss: 1.4836 – accuracy: 0
Epoch 2/6
94/94 [==============================] – 2s 26ms/step – loss: 1.4471 – accuracy: 0
Epoch 3/6
94/94 [==============================] – 2s 26ms/step – loss: 1.4033 – accuracy: 0
Epoch 4/6
94/94 [==============================] – 2s 26ms/step – loss: 1.3646 – accuracy: 0
Epoch 5/6
94/94 [==============================] – 2s 26ms/step – loss: 1.3278 – accuracy: 0
Epoch 6/6
94/94 [==============================] – 2s 26ms/step – loss: 1.2797 – accuracy: 0
Training slice: 7 out of 20
Epoch 1/7
110/110 [==============================] – 3s 26ms/step – loss: 1.3250 – accuracy:
Epoch 2/7

110/110 [==============================] – 3s 26ms/step – loss: 1.2443 – accuracy:
Epoch 3/7
110/110 [==============================] – 3s 26ms/step – loss: 1.2261 – accuracy:
Epoch 4/7
110/110 [==============================] – 3s 26ms/step – loss: 1.1877 – accuracy:
Epoch 5/7
110/110 [==============================] – 3s 26ms/step – loss: 1.1419 – accuracy:
Epoch 6/7
110/110 [==============================] – 3s 26ms/step – loss: 1.0811 – accuracy:
Epoch 7/7
110/110 [==============================] – 3s 26ms/step – loss: 1.0593 – accuracy:
Training slice: 8 out of 20
Epoch 1/8
125/125 [==============================] – 5s 25ms/step – loss: 1.0809 – accuracy:
Epoch 2/8
125/125 [==============================] – 3s 25ms/step – loss: 1.0803 – accuracy:
Epoch 3/8
125/125 [==============================] – 3s 25ms/step – loss: 1.0589 – accuracy:
Epoch 4/8
125/125 [==============================] – 3s 25ms/step – loss: 0.9841 – accuracy:
Epoch 5/8
125/125 [==============================] – 3s 26ms/step – loss: 0.9466 – accuracy:
Epoch 6/8
125/125 [==============================] – 3s 25ms/step – loss: 0.8790 – accuracy:
Epoch 7/8
```

```
Epoch 7/8
125/125 [==============================] – 3s 25ms/step – loss: 0.8876 – accuracy:
Epoch 8/8
125/125 [==============================] – 3s 25ms/step – loss: 0.8183 – accuracy:
Training slice: 9 out of 20
Epoch 1/9
141/141 [==============================] – 4s 26ms/step – loss: 0.8985 – accuracy:
Epoch 2/9
141/141 [==============================] – 4s 25ms/step – loss: 0.8927 – accuracy:
Epoch 3/9
141/141 [==============================] – 4s 26ms/step – loss: 0.8228 – accuracy:
Epoch 4/9
141/141 [==============================] – 4s 26ms/step – loss: 0.7908 – accuracy:
Epoch 5/9
141/141 [==============================] – 4s 26ms/step – loss: 0.7485 – accuracy:
Epoch 6/9
141/141 [==============================] – 4s 26ms/step – loss: 0.6976 – accuracy:
Epoch 7/9
141/141 [==============================] – 4s 25ms/step – loss: 0.7083 – accuracy:
Epoch 8/9
141/141 [==============================] – 4s 26ms/step – loss: 0.6518 – accuracy:
Epoch 9/9
141/141 [==============================] – 4s 26ms/step – loss: 0.6018 – accuracy:
Training slice: 10 out of 20
Epoch 1/10
157/157 [==============================] – 4s 26ms/step – loss: 0.7460 – accuracy:
Epoch 2/10
157/157 [==============================] – 4s 26ms/step – loss: 0.6942 – accuracy:
Epoch 3/10
157/157 [==============================] – 4s 26ms/step – loss: 0.6727 – accuracy:
Epoch 4/10
157/157 [==============================] – 4s 26ms/step – loss: 0.6252 – accuracy:
Epoch 5/10

157/157 [==============================] – 4s 26ms/step – loss: 0.5796 – accuracy:
Epoch 6/10
157/157 [==============================] – 4s 26ms/step – loss: 0.5257 – accuracy:
Epoch 7/10
157/157 [==============================] – 4s 26ms/step – loss: 0.5027 – accuracy:
Epoch 8/10
157/157 [==============================] – 4s 26ms/step – loss: 0.4840 – accuracy:
Epoch 9/10
157/157 [==============================] – 4s 25ms/step – loss: 0.4362 – accuracy:
Epoch 10/10
157/157 [==============================] – 4s 26ms/step – loss: 0.4581 – accuracy:
Training slice: 11 out of 20
Epoch 1/11
172/172 [==============================] – 4s 26ms/step – loss: 0.6560 – accuracy:
Epoch 2/11
172/172 [==============================] – 4s 26ms/step – loss: 0.5575 – accuracy:
Epoch 3/11
172/172 [==============================] – 4s 26ms/step – loss: 0.5030 – accuracy:
Epoch 4/11
```
Output added
```
172/172 [==============================] – 5s 26ms/step – loss: 0.4397 – accuracy:
Epoch 5/11
172/172 [==============================] – 4s 26ms/step – loss: 0.4204 – accuracy:
Epoch 6/11
```

```
172/172 [==============================] - 4s 26ms/step - loss: 0.4068 - accuracy:
Epoch 7/11
172/172 [==============================] - 4s 26ms/step - loss: 0.3803 - accuracy:
Epoch 8/11
172/172 [==============================] - 4s 26ms/step - loss: 0.3242 - accuracy:
Epoch 9/11
172/172 [==============================] - 4s 26ms/step - loss: 0.2985 - accuracy:
Epoch 10/11
172/172 [==============================] - 4s 25ms/step - loss: 0.2714 - accuracy:
Epoch 11/11
172/172 [==============================] - 4s 26ms/step - loss: 0.2775 - accuracy:
Training slice: 12 out of 20
Data excluded for 12
Training slice: 13 out of 20
Epoch 1/13
204/204 [==============================] - 5s 26ms/step - loss: 0.6042 - accuracy:
Epoch 2/13
204/204 [==============================] - 5s 26ms/step - loss: 0.5741 - accuracy:
Epoch 3/13
204/204 [==============================] - 5s 26ms/step - loss: 0.4752 - accuracy:
Epoch 4/13
204/204 [==============================] - 5s 26ms/step - loss: 0.4102 - accuracy:
Epoch 5/13
204/204 [==============================] - 5s 26ms/step - loss: 0.4605 - accuracy:
Epoch 6/13
204/204 [==============================] - 5s 26ms/step - loss: 0.3760 - accuracy:
Epoch 7/13
204/204 [==============================] - 5s 26ms/step - loss: 0.3305 - accuracy:
Epoch 8/13
204/204 [==============================] - 5s 26ms/step - loss: 0.3102 - accuracy:
Epoch 9/13
204/204 [==============================] - 5s 26ms/step - loss: 0.3022 - accuracy:
Epoch 10/13

204/204 [==============================] - 5s 26ms/step - loss: 0.2915 - accuracy:
Epoch 11/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2748 - accuracy:
Epoch 12/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2720 - accuracy:
Epoch 13/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1965 - accuracy:
Training slice: 14 out of 20
Epoch 1/14
219/219 [==============================] - 6s 26ms/step - loss: 0.4167 - accuracy:
Epoch 2/14
219/219 [==============================] - 6s 26ms/step - loss: 0.3339 - accuracy:
Epoch 3/14
219/219 [==============================] - 6s 26ms/step - loss: 0.2786 - accuracy:
Epoch 4/14
219/219 [==============================] - 6s 25ms/step - loss: 0.2448 - accuracy:
Epoch 5/14
219/219 [==============================] - 6s 25ms/step - loss: 0.2270 - accuracy:
Epoch 6/14
219/219 [==============================] - 6s 25ms/step - loss: 0.2317 - accuracy:
Epoch 7/14
219/219 [==============================] - 6s 25ms/step - loss: 0.1858 - accuracy:
Epoch 8/14
219/219 [==============================] - 6s 25ms/step - loss: 0.1311 - accuracy:
Epoch 9/14
```

```
Epoch 9/14
219/219 [==============================] - 6s 25ms/step - loss: 0.1421 - accuracy:
Epoch 10/14
219/219 [==============================] - 6s 26ms/step - loss: 0.1274 - accuracy:
Epoch 11/14
219/219 [==============================] - 6s 26ms/step - loss: 0.1632 - accuracy:
Epoch 12/14
219/219 [==============================] - 6s 26ms/step - loss: 0.1238 - accuracy:
Epoch 13/14
219/219 [==============================] - 6s 26ms/step - loss: 0.1126 - accuracy:
Epoch 14/14
219/219 [==============================] - 6s 25ms/step - loss: 0.0923 - accuracy:
Training slice: 15 out of 20
Epoch 1/15
235/235 [==============================] - 6s 26ms/step - loss: 0.3604 - accuracy:
Epoch 2/15
235/235 [==============================] - 6s 25ms/step - loss: 0.2850 - accuracy:
Epoch 3/15
235/235 [==============================] - 6s 25ms/step - loss: 0.2208 - accuracy:
Epoch 4/15
235/235 [==============================] - 6s 26ms/step - loss: 0.1746 - accuracy:
Epoch 5/15
235/235 [==============================] - 6s 26ms/step - loss: 0.1437 - accuracy:
Epoch 6/15
235/235 [==============================] - 6s 25ms/step - loss: 0.1305 - accuracy:
Epoch 7/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0938 - accuracy:
Epoch 8/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0890 - accuracy:
Epoch 9/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0697 - accuracy:
Epoch 10/15
235/235 [==============================] - 6s 26ms/step - loss: 0.0778 - accuracy:

Epoch 11/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0724 - accuracy:
Epoch 12/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0584 - accuracy:
Epoch 13/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0929 - accuracy:
Epoch 14/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0531 - accuracy:
Epoch 15/15
235/235 [==============================] - 6s 25ms/step - loss: 0.0594 - accuracy:
Training slice: 16 out of 20
Epoch 1/16
250/250 [==============================] - 6s 25ms/step - loss: 0.2846 - accuracy:
Epoch 2/16
250/250 [==============================] - 6s 25ms/step - loss: 0.2383 - accuracy:
Epoch 3/16
250/250 [==============================] - 6s 25ms/step - loss: 0.2319 - accuracy:
Epoch 4/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1708 - accuracy:
Epoch 5/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1060 - accuracy:
Epoch 6/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0862 - accuracy:
Epoch 7/16
250/250 [                              ] - 6s 25ms/step - loss: 0.0676 - accuracy:
```

```
250/250 [==============================] – 6s 25ms/step – loss: 0.0676 – accuracy:
Epoch 8/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0680 – accuracy:
Epoch 9/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0543 – accuracy:
Epoch 10/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0670 – accuracy:
Epoch 11/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0703 – accuracy:
Epoch 12/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0440 – accuracy:
Epoch 13/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0323 – accuracy:
Epoch 14/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0341 – accuracy:
Epoch 15/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0493 – accuracy:
Epoch 16/16
250/250 [==============================] – 6s 25ms/step – loss: 0.0278 – accuracy:
Training slice: 17 out of 20
Epoch 1/17
266/266 [==============================] – 7s 25ms/step – loss: 0.3372 – accuracy:
Epoch 2/17
266/266 [==============================] – 7s 26ms/step – loss: 0.2021 – accuracy:
Epoch 3/17
266/266 [==============================] – 7s 25ms/step – loss: 0.1553 – accuracy:
Epoch 4/17
266/266 [==============================] – 7s 25ms/step – loss: 0.1273 – accuracy:
Epoch 5/17
266/266 [==============================] – 7s 25ms/step – loss: 0.1267 – accuracy:
Epoch 6/17
266/266 [==============================] – 7s 26ms/step – loss: 0.0942 – accuracy:
Epoch 7/17

266/266 [==============================] – 7s 25ms/step – loss: 0.0752 – accuracy:
Epoch 8/17
266/266 [==============================] – 7s 26ms/step – loss: 0.0629 – accuracy:
Epoch 9/17
266/266 [==============================] – 7s 25ms/step – loss: 0.0554 – accuracy:
Epoch 10/17
266/266 [==============================] – 7s 26ms/step – loss: 0.0412 – accuracy:
Epoch 11/17
266/266 [==============================] – 7s 25ms/step – loss: 0.0349 – accuracy:
Epoch 12/17
266/266 [==============================] – 7s 25ms/step – loss: 0.0345 – accuracy:
Epoch 13/17
Output added
266/266 [==============================] – 7s 25ms/step – loss: 0.0335 – accuracy:
Epoch 14/17
266/266 [==============================] – 7s 25ms/step – loss: 0.0272 – accuracy:
Epoch 15/17
266/266 [==============================] – 7s 26ms/step – loss: 0.0417 – accuracy:
Epoch 16/17
266/266 [==============================] – 7s 25ms/step – loss: 0.0293 – accuracy:
Epoch 17/17
266/266 [==============================] – 7s 26ms/step – loss: 0.0154 – accuracy:
Training slice: 18 out of 20
Epoch 1/18
```

```
282/282 [==============================] - 7s 25ms/step - loss: 0.2783 - accuracy:
Epoch 2/18
282/282 [==============================] - 7s 25ms/step - loss: 0.1872 - accuracy:
Epoch 3/18
282/282 [==============================] - 7s 25ms/step - loss: 0.1278 - accuracy:
Epoch 4/18
282/282 [==============================] - 7s 26ms/step - loss: 0.1019 - accuracy:
Epoch 5/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0933 - accuracy:
Epoch 6/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0539 - accuracy:
Epoch 7/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0510 - accuracy:
Epoch 8/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0467 - accuracy:
Epoch 9/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0432 - accuracy:
Epoch 10/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0306 - accuracy:
Epoch 11/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0199 - accuracy:
Epoch 12/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0165 - accuracy:
Epoch 13/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0273 - accuracy:
Epoch 14/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0258 - accuracy:
Epoch 15/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0195 - accuracy:
Epoch 16/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0122 - accuracy:
Epoch 17/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0255 - accuracy:

Epoch 18/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0302 - accuracy:
Training slice: 19 out of 20
Data excluded for 19
Training shard: 10 out of 10
Training slice: 1 out of 20
16/16 [==============================] - 4s 27ms/step - loss: 2.4304 - accuracy: 0
Training slice: 2 out of 20
Data excluded for 2
Training slice: 3 out of 20
Epoch 1/3
47/47 [==============================] - 1s 26ms/step - loss: 2.2477 - accuracy: 0
Epoch 2/3
47/47 [==============================] - 1s 25ms/step - loss: 2.0281 - accuracy: 0
Epoch 3/3
47/47 [==============================] - 1s 26ms/step - loss: 1.8927 - accuracy: 0
Training slice: 4 out of 20
Data excluded for 4
Training slice: 5 out of 20
Epoch 1/5
79/79 [==============================] - 2s 25ms/step - loss: 1.8834 - accuracy: 0
Epoch 2/5
79/79 [==============================] - 2s 25ms/step - loss: 1.8386 - accuracy: 0
Epoch 3/5
79/79 [                              ]    2s 25ms/step   loss: 1.6964   accuracy: 0
```

```
79/79 [==============================] - 2s 25ms/step - loss: 1.6964 - accuracy: 0
Epoch 4/5
79/79 [==============================] - 2s 25ms/step - loss: 1.5941 - accuracy: 0
Epoch 5/5
79/79 [==============================] - 2s 26ms/step - loss: 1.5346 - accuracy: 0
Training slice: 6 out of 20
Epoch 1/6
94/94 [==============================] - 2s 25ms/step - loss: 1.5181 - accuracy: 0
Epoch 2/6
94/94 [==============================] - 2s 25ms/step - loss: 1.4303 - accuracy: 0
Epoch 3/6
94/94 [==============================] - 2s 25ms/step - loss: 1.4046 - accuracy: 0
Epoch 4/6
94/94 [==============================] - 2s 25ms/step - loss: 1.3476 - accuracy: 0
Epoch 5/6
94/94 [==============================] - 2s 25ms/step - loss: 1.2789 - accuracy: 0
Epoch 6/6
94/94 [==============================] - 2s 25ms/step - loss: 1.2283 - accuracy: 0
Training slice: 7 out of 20
Epoch 1/7
110/110 [==============================] - 3s 26ms/step - loss: 1.2791 - accuracy:
Epoch 2/7
110/110 [==============================] - 3s 26ms/step - loss: 1.1941 - accuracy:
Epoch 3/7
110/110 [==============================] - 3s 26ms/step - loss: 1.1821 - accuracy:
Epoch 4/7
110/110 [==============================] - 3s 26ms/step - loss: 1.1025 - accuracy:
Epoch 5/7
110/110 [==============================] - 3s 26ms/step - loss: 1.0600 - accuracy:
Epoch 6/7
110/110 [==============================] - 3s 26ms/step - loss: 1.0465 - accuracy:
Epoch 7/7
110/110 [==============================] - 3s 25ms/step - loss: 0.9764 - accuracy:

Training slice: 8 out of 20
Epoch 1/8
125/125 [==============================] - 5s 25ms/step - loss: 1.0777 - accuracy:
Epoch 2/8
125/125 [==============================] - 3s 25ms/step - loss: 0.9795 - accuracy:
Epoch 3/8
125/125 [==============================] - 3s 25ms/step - loss: 0.9472 - accuracy:
Epoch 4/8
125/125 [==============================] - 3s 25ms/step - loss: 0.9375 - accuracy:
Epoch 5/8
125/125 [==============================] - 3s 25ms/step - loss: 0.8851 - accuracy:
Epoch 6/8
125/125 [==============================] - 3s 25ms/step - loss: 0.8253 - accuracy:
Epoch 7/8
125/125 [==============================] - 3s 25ms/step - loss: 0.7906 - accuracy:
Epoch 8/8
125/125 [==============================] - 3s 25ms/step - loss: 0.7435 - accuracy:
Training slice: 9 out of 20
Epoch 1/9
141/141 [==============================] - 4s 25ms/step - loss: 0.8694 - accuracy:
Epoch 2/9
141/141 [==============================] - 4s 26ms/step - loss: 0.7930 - accuracy:
Epoch 3/9
141/141 [==============================] - 4s 25ms/step - loss: 0.7736 - accuracy:
Epoch 4/9
```

```
Epoch 4/9
141/141 [==============================] – 4s 25ms/step – loss: 0.7184 – accuracy:
Epoch 5/9
141/141 [==============================] – 4s 25ms/step – loss: 0.6618 – accuracy:
Epoch 6/9
141/141 [==============================] – 4s 25ms/step – loss: 0.6367 – accuracy:
Epoch 7/9
141/141 [==============================] – 4s 26ms/step – loss: 0.5728 – accuracy:
Epoch 8/9
141/141 [==============================] – 4s 26ms/step – loss: 0.5428 – accuracy:
Epoch 9/9
141/141 [==============================] – 4s 25ms/step – loss: 0.5695 – accuracy:
Training slice: 10 out of 20
Epoch 1/10
157/157 [==============================] – 4s 25ms/step – loss: 0.7199 – accuracy:
Epoch 2/10
157/157 [==============================] – 4s 26ms/step – loss: 0.6796 – accuracy:
Epoch 3/10
157/157 [==============================] – 4s 25ms/step – loss: 0.5814 – accuracy:
Epoch 4/10
157/157 [==============================] – 4s 25ms/step – loss: 0.5365 – accuracy:
Epoch 5/10
157/157 [==============================] – 4s 26ms/step – loss: 0.4839 – accuracy:
Epoch 6/10
157/157 [==============================] – 4s 25ms/step – loss: 0.4667 – accuracy:
Epoch 7/10
157/157 [==============================] – 4s 26ms/step – loss: 0.4546 – accuracy:
Epoch 8/10
157/157 [==============================] – 4s 26ms/step – loss: 0.4094 – accuracy:
Epoch 9/10
157/157 [==============================] – 4s 25ms/step – loss: 0.3952 – accuracy:
Epoch 10/10
157/157 [==============================] – 4s 25ms/step – loss: 0.3724 – accuracy:

Training slice: 11 out of 20
Epoch 1/11
172/172 [==============================] – 4s 25ms/step – loss: 0.5730 – accuracy:
Epoch 2/11
172/172 [==============================] – 4s 25ms/step – loss: 0.5306 – accuracy:
Epoch 3/11
172/172 [==============================] – 4s 26ms/step – loss: 0.4723 – accuracy:
Epoch 4/11
172/172 [==============================] – 4s 26ms/step – loss: 0.4205 – accuracy:
Epoch 5/11
172/172 [==============================] – 4s 26ms/step – loss: 0.3675 – accuracy:
Epoch 6/11
```
Output added
```
172/172 [==============================] – 4s 26ms/step – loss: 0.3060 – accuracy:
Epoch 7/11
172/172 [==============================] – 4s 26ms/step – loss: 0.2911 – accuracy:
Epoch 8/11
172/172 [==============================] – 4s 26ms/step – loss: 0.2906 – accuracy:
Epoch 9/11
172/172 [==============================] – 4s 25ms/step – loss: 0.2547 – accuracy:
Epoch 10/11
172/172 [==============================] – 4s 25ms/step – loss: 0.2483 – accuracy:
Epoch 11/11
172/172 [==============================] – 4s 25ms/step – loss: 0.2038 – accuracy:
```

```
Training slice: 12 out of 20
Epoch 1/12
188/188 [==============================] - 5s 25ms/step - loss: 0.4665 - accuracy:
Epoch 2/12
188/188 [==============================] - 5s 25ms/step - loss: 0.3649 - accuracy:
Epoch 3/12
188/188 [==============================] - 5s 25ms/step - loss: 0.3337 - accuracy:
Epoch 4/12
188/188 [==============================] - 5s 26ms/step - loss: 0.2831 - accuracy:
Epoch 5/12
188/188 [==============================] - 5s 25ms/step - loss: 0.2545 - accuracy:
Epoch 6/12
188/188 [==============================] - 5s 25ms/step - loss: 0.2602 - accuracy:
Epoch 7/12
188/188 [==============================] - 5s 25ms/step - loss: 0.1996 - accuracy:
Epoch 8/12
188/188 [==============================] - 5s 25ms/step - loss: 0.1942 - accuracy:
Epoch 9/12
188/188 [==============================] - 5s 25ms/step - loss: 0.1743 - accuracy:
Epoch 10/12
188/188 [==============================] - 5s 25ms/step - loss: 0.1544 - accuracy:
Epoch 11/12
188/188 [==============================] - 5s 26ms/step - loss: 0.1358 - accuracy:
Epoch 12/12
188/188 [==============================] - 5s 25ms/step - loss: 0.1157 - accuracy:
Training slice: 13 out of 20
Epoch 1/13
204/204 [==============================] - 5s 25ms/step - loss: 0.4225 - accuracy:
Epoch 2/13
204/204 [==============================] - 5s 25ms/step - loss: 0.3480 - accuracy:
Epoch 3/13
204/204 [==============================] - 5s 25ms/step - loss: 0.2655 - accuracy:
Epoch 4/13

204/204 [==============================] - 5s 25ms/step - loss: 0.2376 - accuracy:
Epoch 5/13
204/204 [==============================] - 5s 26ms/step - loss: 0.2085 - accuracy:
Epoch 6/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1648 - accuracy:
Epoch 7/13
204/204 [==============================] - 5s 25ms/step - loss: 0.1781 - accuracy:
Epoch 8/13
204/204 [==============================] - 5s 26ms/step - loss: 0.1310 - accuracy:
Epoch 9/13
204/204 [==============================] - 5s 26ms/step - loss: 0.0979 - accuracy:
Epoch 10/13
204/204 [==============================] - 5s 25ms/step - loss: 0.1051 - accuracy:
Epoch 11/13
204/204 [==============================] - 5s 25ms/step - loss: 0.1230 - accuracy:
Epoch 12/13
204/204 [==============================] - 5s 25ms/step - loss: 0.1215 - accuracy:
Epoch 13/13
204/204 [==============================] - 5s 25ms/step - loss: 0.0826 - accuracy:
Training slice: 14 out of 20
Epoch 1/14
219/219 [==============================] - 6s 25ms/step - loss: 0.3515 - accuracy:
Epoch 2/14
219/219 [==============================] - 6s 25ms/step - loss: 0.2991 - accuracy:
Epoch 3/14
```

```
Epoch 3/14
219/219 [==============================] – 6s 25ms/step – loss: 0.2279 – accuracy:
Epoch 4/14
219/219 [==============================] – 6s 25ms/step – loss: 0.2022 – accuracy:
Epoch 5/14
219/219 [==============================] – 6s 26ms/step – loss: 0.1712 – accuracy:
Epoch 6/14
219/219 [==============================] – 6s 26ms/step – loss: 0.1364 – accuracy:
Epoch 7/14
219/219 [==============================] – 6s 25ms/step – loss: 0.1205 – accuracy:
Epoch 8/14
219/219 [==============================] – 6s 25ms/step – loss: 0.1169 – accuracy:
Epoch 9/14
219/219 [==============================] – 6s 25ms/step – loss: 0.0907 – accuracy:
Epoch 10/14
219/219 [==============================] – 6s 25ms/step – loss: 0.0876 – accuracy:
Epoch 11/14
219/219 [==============================] – 6s 26ms/step – loss: 0.0876 – accuracy:
Epoch 12/14
219/219 [==============================] – 6s 26ms/step – loss: 0.0627 – accuracy:
Epoch 13/14
219/219 [==============================] – 6s 25ms/step – loss: 0.0521 – accuracy:
Epoch 14/14
219/219 [==============================] – 6s 25ms/step – loss: 0.0815 – accuracy:
Training slice: 15 out of 20
Epoch 1/15
235/235 [==============================] – 6s 25ms/step – loss: 0.3455 – accuracy:
Epoch 2/15
235/235 [==============================] – 6s 26ms/step – loss: 0.2509 – accuracy:
Epoch 3/15
235/235 [==============================] – 6s 25ms/step – loss: 0.2051 – accuracy:
Epoch 4/15
235/235 [==============================] – 6s 25ms/step – loss: 0.1530 – accuracy:

Epoch 5/15
235/235 [==============================] – 6s 25ms/step – loss: 0.1496 – accuracy:
Epoch 6/15
235/235 [==============================] – 6s 25ms/step – loss: 0.1019 – accuracy:
Epoch 7/15
235/235 [==============================] – 6s 26ms/step – loss: 0.0911 – accuracy:
Epoch 8/15
235/235 [==============================] – 6s 26ms/step – loss: 0.0674 – accuracy:
Epoch 9/15
235/235 [==============================] – 6s 25ms/step – loss: 0.0778 – accuracy:
Epoch 10/15
235/235 [==============================] – 6s 26ms/step – loss: 0.0473 – accuracy:
Epoch 11/15
235/235 [==============================] – 6s 25ms/step – loss: 0.0417 – accuracy:
Epoch 12/15
235/235 [==============================] – 6s 25ms/step – loss: 0.0350 – accuracy:
Epoch 13/15
235/235 [==============================] – 6s 26ms/step – loss: 0.0415 – accuracy:
Epoch 14/15
235/235 [==============================] – 6s 26ms/step – loss: 0.0435 – accuracy:
Epoch 15/15
235/235 [==============================] – 6s 25ms/step – loss: 0.0352 – accuracy:
Training slice: 16 out of 20
Epoch 1/16
250/250 [                              ]   6s 25ms/step   loss: 0.2806   accuracy:
```

```
250/250 [==============================] - 6s 25ms/step - loss: 0.2896 - accuracy:
Epoch 2/16
250/250 [==============================] - 6s 25ms/step - loss: 0.2068 - accuracy:
Epoch 3/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1475 - accuracy:
Epoch 4/16
250/250 [==============================] - 6s 25ms/step - loss: 0.1521 - accuracy:
Epoch 5/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0973 - accuracy:
Epoch 6/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0709 - accuracy:
Epoch 7/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0546 - accuracy:
Epoch 8/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0665 - accuracy:
Epoch 9/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0389 - accuracy:
Epoch 10/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0312 - accuracy:
Epoch 11/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0315 - accuracy:
Epoch 12/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0326 - accuracy:
Epoch 13/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0261 - accuracy:
Epoch 14/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0330 - accuracy:
Epoch 15/16
250/250 [==============================] - 6s 25ms/step - loss: 0.0178 - accuracy:
Epoch 16/16
250/250 [==============================] - 6s 26ms/step - loss: 0.0145 - accuracy:
Training slice: 17 out of 20
Epoch 1/17

266/266 [==============================] - 7s 26ms/step - loss: 0.2692 - accuracy:
Epoch 2/17
266/266 [==============================] - 7s 26ms/step - loss: 0.1962 - accuracy:
Epoch 3/17
266/266 [==============================] - 7s 26ms/step - loss: 0.1319 - accuracy:
Epoch 4/17
```
Output added
```
266/266 [==============================] - 7s 26ms/step - loss: 0.0944 - accuracy:
Epoch 5/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0844 - accuracy:
Epoch 6/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0742 - accuracy:
Epoch 7/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0495 - accuracy:
Epoch 8/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0334 - accuracy:
Epoch 9/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0293 - accuracy:
Epoch 10/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0331 - accuracy:
Epoch 11/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0280 - accuracy:
Epoch 12/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0238 - accuracy:
```

```
Epoch 13/17
266/266 [==============================] - 7s 27ms/step - loss: 0.0286 - accuracy:
Epoch 14/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0257 - accuracy:
Epoch 15/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0181 - accuracy:
Epoch 16/17
266/266 [==============================] - 7s 26ms/step - loss: 0.0118 - accuracy:
Epoch 17/17
266/266 [==============================] - 7s 27ms/step - loss: 0.0194 - accuracy:
Training slice: 18 out of 20
Epoch 1/18
282/282 [==============================] - 7s 26ms/step - loss: 0.2885 - accuracy:
Epoch 2/18
282/282 [==============================] - 7s 26ms/step - loss: 0.2256 - accuracy:
Epoch 3/18
282/282 [==============================] - 7s 26ms/step - loss: 0.1522 - accuracy:
Epoch 4/18
282/282 [==============================] - 7s 26ms/step - loss: 0.1107 - accuracy:
Epoch 5/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0755 - accuracy:
Epoch 6/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0823 - accuracy:
Epoch 7/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0770 - accuracy:
Epoch 8/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0467 - accuracy:
Epoch 9/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0316 - accuracy:
Epoch 10/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0213 - accuracy:
Epoch 11/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0221 - accuracy:

Epoch 12/18
282/282 [==============================] - 7s 25ms/step - loss: 0.0337 - accuracy:
Epoch 13/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0270 - accuracy:
Epoch 14/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0174 - accuracy:
Epoch 15/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0424 - accuracy:
Epoch 16/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0153 - accuracy:
Epoch 17/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0105 - accuracy:
Epoch 18/18
282/282 [==============================] - 7s 26ms/step - loss: 0.0162 - accuracy:
Training slice: 19 out of 20
Epoch 1/19
297/297 [==============================] - 8s 26ms/step - loss: 0.3161 - accuracy:
Epoch 2/19
297/297 [==============================] - 8s 25ms/step - loss: 0.1927 - accuracy:
Epoch 3/19
297/297 [==============================] - 8s 26ms/step - loss: 0.1270 - accuracy:
Epoch 4/19
297/297 [==============================] - 8s 26ms/step - loss: 0.0902 - accuracy:
Epoch 5/19
297/297 [                              ]   -   8s 26ms/step  -  loss: 0.0782  -  accuracy:
```

```
297/297 [==============================] – 8s 26ms/step – loss: 0.0783 – accuracy:
Epoch 6/19
297/297 [==============================] – 8s 26ms/step – loss: 0.0817 – accuracy:
Epoch 7/19
297/297 [==============================] – 8s 25ms/step – loss: 0.0562 – accuracy:
Epoch 8/19
297/297 [==============================] – 8s 25ms/step – loss: 0.0493 – accuracy:
Epoch 9/19
297/297 [==============================] – 8s 26ms/step – loss: 0.0320 – accuracy:
Epoch 10/19
297/297 [==============================] – 8s 26ms/step – loss: 0.0254 – accuracy:
Epoch 11/19
297/297 [==============================] – 8s 25ms/step – loss: 0.0276 – accuracy:
Epoch 12/19
297/297 [==============================] – 8s 26ms/step – loss: 0.0167 – accuracy:
Epoch 13/19
297/297 [==============================] – 8s 26ms/step – loss: 0.0182 – accuracy:
Epoch 14/19
297/297 [==============================] – 8s 26ms/step – loss: 0.0112 – accuracy:
Epoch 15/19
297/297 [==============================] – 8s 25ms/step – loss: 0.0097 – accuracy:
Epoch 16/19
297/297 [==============================] – 8s 26ms/step – loss: 0.0116 – accuracy:
Epoch 17/19
297/297 [==============================] – 8s 26ms/step – loss: 0.0108 – accuracy:
Epoch 18/19
297/297 [==============================] – 8s 26ms/step – loss: 0.0098 – accuracy:
Epoch 19/19
297/297 [==============================] – 8s 25ms/step – loss: 0.0124 – accuracy:
```

In [9]:

```python
import numpy as np
```

In [ ]:   In [10]:

```python
models = np.asarray(models)
```

Metadata changed

In [ ]:   In [11]:

```python
with open('models.npy', 'wb') as f:
    np.save(f, models)
```

Metadata changed

Outputs changed

Output added

```
2021-12-09 13:17:40.732044: W tensorflow/python/util/util.cc:368] Sets are not cur
```

Output added

```
INFO:tensorflow:Assets written to: ram://c1abc3bf-7597-4a9d-af91-d6fc5ff1cab2/asset
```

Output added

```
/opt/conda/lib/python3.7/site-packages/keras/engine/functional.py:1410: CustomMask
  layer_config = serialize_layer_fn(layer)
/opt/conda/lib/python3.7/site-packages/keras/saving/saved_model/layer_serializatio
  return generic_utils.serialize_keras_object(obj)
```

Output added

```
INFO:tensorflow:Assets written to: ram://8190ac65-ff29-420f-8e17-71809c1709b9/asse
```

Output added

```
/opt/conda/lib/python3.7/site-packages/keras/engine/functional.py:1410: CustomMask
  layer_config = serialize_layer_fn(layer)
/opt/conda/lib/python3.7/site-packages/keras/saving/saved_model/layer_serializatio
  return generic_utils.serialize_keras_object(obj)
```

Output added

```
INFO:tensorflow:Assets written to: ram://58e6e159-6859-40cc-8eba-e55d31752e3f/asse
```

Output added

```
/opt/conda/lib/python3.7/site-packages/keras/engine/functional.py:1410: CustomMask
  layer_config = serialize_layer_fn(layer)
/opt/conda/lib/python3.7/site-packages/keras/saving/saved_model/layer_serializatio
  return generic_utils.serialize_keras_object(obj)
```

Output added

```
INFO:tensorflow:Assets written to: ram://128c2f3d-ea8c-4b4d-a2bb-ed75476b8513/asse
```

Output added

```
/opt/conda/lib/python3.7/site-packages/keras/engine/functional.py:1410: CustomMask
  layer_config = serialize_layer_fn(layer)
/opt/conda/lib/python3.7/site-packages/keras/saving/saved_model/layer_serializatio
  return generic_utils.serialize_keras_object(obj)
```

Output added

```
INFO:tensorflow:Assets written to: ram://ae3afac6-0cf8-4144-ad46-839e9186e461/asse
```

Output added

```
/opt/conda/lib/python3.7/site-packages/keras/engine/functional.py:1410: CustomMask
  layer_config = serialize_layer_fn(layer)
/opt/conda/lib/python3.7/site-packages/keras/saving/saved_model/layer_serializatio
  return generic_utils.serialize_keras_object(obj)
```

Output added

```
INFO:tensorflow:Assets written to: ram://8fb55be2-a7cd-4756-b240-43de9d271827/asse
```

Output added

```
/opt/conda/lib/python3.7/site-packages/keras/engine/functional.py:1410: CustomMask
  layer_config = serialize_layer_fn(layer)
```

Output added

```
INFO:tensorflow:Assets written to: ram://793e210e-361f-4b62-85d6-951f5be51ca1/asse
```

Output added

```
/opt/conda/lib/python3.7/site-packages/keras/saving/saved_model/layer_serializatio
  return generic_utils.serialize_keras_object(obj)
/opt/conda/lib/python3.7/site-packages/keras/engine/functional.py:1410: CustomMask
  layer_config = serialize_layer_fn(layer)
/opt/conda/lib/python3.7/site-packages/keras/saving/saved_model/layer_serializatio
  return generic_utils.serialize_keras_object(obj)
```

Output added

```
INFO:tensorflow:Assets written to: ram://955fd9d6-34b4-4e33-a352-9e1041f30a0d/asse
```

Output added

```
/opt/conda/lib/python3.7/site-packages/keras/engine/functional.py:1410: CustomMask\
  layer_config = serialize_layer_fn(layer)
/opt/conda/lib/python3.7/site-packages/keras/saving/saved_model/layer_serializatio|
  return generic_utils.serialize_keras_object(obj)
```

Output added

```
INFO:tensorflow:Assets written to: ram://a84cf5e2-2b43-4624-9044-81e19a7e9dba/asse
```

Output added

```
/opt/conda/lib/python3.7/site-packages/keras/engine/functional.py:1410: CustomMask\
  layer_config = serialize_layer_fn(layer)
/opt/conda/lib/python3.7/site-packages/keras/saving/saved_model/layer_serializatio|
  return generic_utils.serialize_keras_object(obj)
```

Output added

```
INFO:tensorflow:Assets written to: ram://714a5427-1e53-4feb-9e0f-d460df421c02/asse
```

Output added

```
/opt/conda/lib/python3.7/site-packages/keras/engine/functional.py:1410: CustomMask\
  layer_config = serialize_layer_fn(layer)
/opt/conda/lib/python3.7/site-packages/keras/saving/saved_model/layer_serializatio|
  return generic_utils.serialize_keras_object(obj)
```

In [ ]:   In [12]:

```python
1  with open('models.npy', 'rb') as f:
2      a = np.load(f)
```

Metadata changed

Outputs changed

Output added

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
/tmp/ipykernel_5917/2829536453.py in <module>
      1 with open('models.npy', 'rb') as f:
----> 2     a = np.load(f)

/opt/conda/lib/python3.7/site-packages/numpy/lib/npyio.py in load(file, mmap_mode,
    438             else:
    439                 return format.read_array(fid, allow_pickle=allow_pickle,
--> 440                                          pickle_kwargs=pickle_kwargs)
    441         else:
    442             # Try a pickle

/opt/conda/lib/python3.7/site-packages/numpy/lib/format.py in read_array(fp, allow_
    725         # The array contained Python objects. We need to unpickle the data
    726         if not allow_pickle:
--> 727             raise ValueError("Object arrays cannot be loaded when "
    728                              "allow_pickle=False")
    729         if pickle_kwargs is None:

ValueError: Object arrays cannot be loaded when allow_pickle=False
```

In [ ]:   In [ ]:

```
1  !mkdir -p saved_model
2  models.save('saved_model/my_models')
```

Metadata changed

```
1  !mkdir -p saved_model
2  models.save('saved_model/my_models')
```

Metadata changed