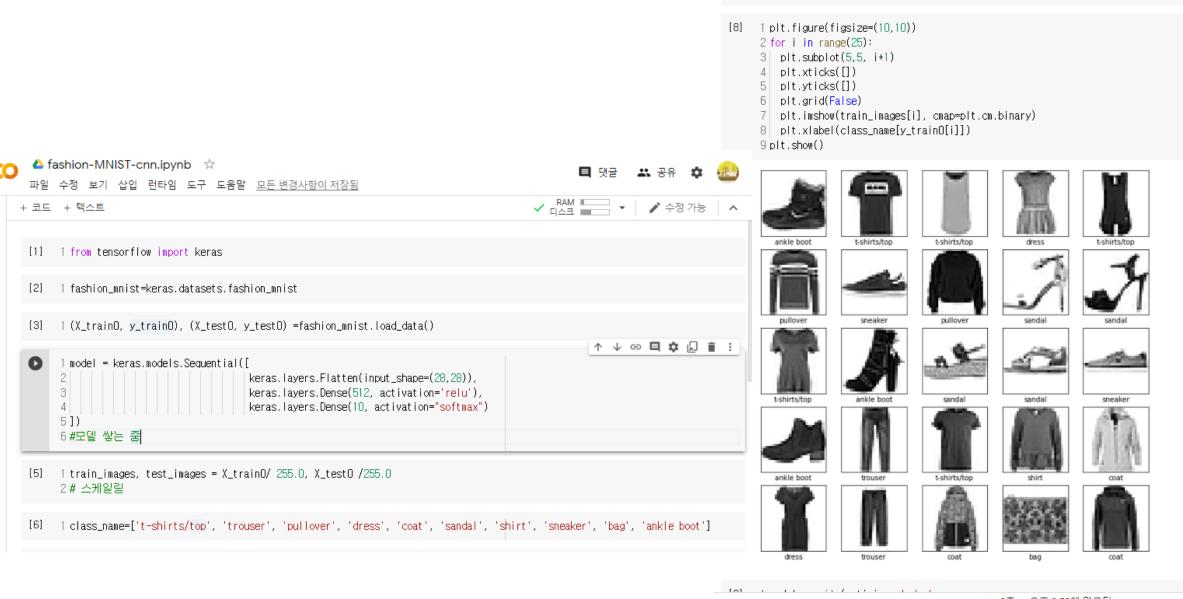
TensorFlow-Keras 딥러닝

CNN: Fashion-Mnist

- TensorFlow의 합성곱 신경망(convolutional neural network, CNN)을 활용한 Deep Learning
- 이미지 데이터 세트를 로드하고 전처리 하여 딥러닝
- 합성곱 레이어층 만들기
- •모델 구조 출력
- •모델 컴파일
- 모델 훈련·학습
- •모델 평가



[7] 1 import matplotlib.pylab as plt

```
1 model.compile(optimizer='adam',
         loss='sparse_categorical_crossentropy',
         metrics=['accuracy'],
                                          Q
                                          <>
  1 model.fit(train_images, y_train0, epochs=10)
  2 #5번 학습
                                          r→ Epoch 1/10
  Epoch 2/10
  1875/1875 [============== ] - 7s 4ms/step - loss: 0.3570 - accuracy: 0.8694
  Epoch 3/10
  Epoch 4/10
  Epoch 5/10
  Epoch 6/10
  Epoch 7/10
  Epoch 8/10
  Epoch 9/10
  Epoch 10/10
  <tensorflow.python.keras.callbacks.History at 0x7fec43bb74d0>
[11] 1 model.summary()
  Model: "sequential"
  Laver (type)
              Output Shape
                        Param #
  _____
  flatten (Flatten)
              (None, 784)
                        Π
  dense (Dense)
              (None, 512)
                        401920
  dense_1 (Dense)
              (None, 10)
                        5130
  _____
  Total params: 407,050
  Trainable params: 407,050
  Non-trainable params: 0
```

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```
+ 코드 + 텍스트
     Total params: 407.050
[11] Trainable params: 407,050
     Non-trainable params: 0
                                                                                        1 V G E 🛱
     1 loss, accuracy = model.evaluate(test_images, y_test0)
     [13] 1 import numpy as np
[14] | 1 predictions=model.predict(test_images)
      1 predictions[20]
 array([6.8089319e-03, 5.9788485e-06, 9.9217165e-01, 1.0066461e-06,
           6.1119534e-04, 3.8438115e-09, 3.9289283e-04, 3.8214625e-06,
           1.7889206e-06, 2.7068063e-06], dtype=float32)
[17] 1 np.argmax(predictions[20]) # array 내에서 최대값
     2
[19] | 1 plt.figure()
      2 plt.imshow(test_images[20])
      3 plt.colorbar()
      4 plt.grid(False)
      5 plt.show()
     10
     15
     20 -
               10
                                        V 0초 오후 3:53에 완료됨
```