3/11/2020 OneNote

Training Binary Classifiers

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<u>Lets</u> simplify to only detecting 1 digit -> <u>Example: T detect Number 9 (Like a 9 detector tools)</u> This tools is capable to detect just 2 classes -> Whether its 9 or not 9.

To start

Now, create a target vector for binary classifiers.

```
#Try to predict some_digit = 9 using SGD (Stochastic Gradient Descent)
y_train = y_train.astype(np.int8)
y_test = y_test.astype(np.int8)

y_train_9 = (y_train == 9)
y_test_9 = (y_test == 9)
```

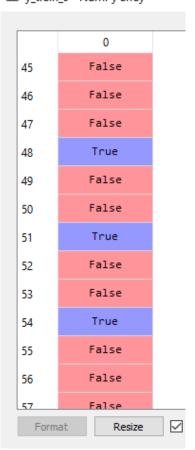
#Create a Boolean from labelled data.

```
y_train = y_train.astype(np.int8)
y_test = y_test.astype(np.int8)

y_train_9 = (y_train == 9)
y_test_9 = (y_test == 9)
```

Result:

y_train_9 - NumPy array



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Strat with SGD (Stochastic Gradient Descent)

SGD - Good for handling large datasets efficiently. It also deals with training instances independently one at a time. Good for online learning.

Create SGD Classifier:

```
from sklearn.linear_model import SGDClassifier
 sgd_clf = SGDClassifier(random_state=42)
 sgd_clf.fit(X_train, y_train_9)
 print(sgd_clf.predict([some_digit]))
sgd_clf = SGDClassifier(random_state=42)
sgd_clf.fit(X_train, y_train_9)
#Now can use the SGD to detect the image of number 9
print(sgd_clf.predict([some_digit]))
Result:
[True] -> It can detect out picture is truly 9!
```