Selected Ai 2

Assignment2 Report

Prepared by

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-Often times it is not ideal with regard to providing sample lables in machine learning and deep learning. The process of assigning lables to samples usually costs a lot of effort and is expensive, so in order to solve this problem, active learning has developed several methods that will help in selecting samples of interest to query it is lables , this method has proven truly effective and is often superior to passive learning.

- Datasets

1- Minst Fashion Dataset

2- CIFAR-10 Dataset

3- Imbalanced Minst Fashion Dataset

- AL Strategies

1- Random Sampling

2- Margin sampling

3- Entropy sampling

4- Uncertainty sampling (Least Confidence Sampling)

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- Models

Active & Passive Learning Model Arc

Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 30, 30, 32)	896
batch_normalization (BatchNormalization)	(None, 30, 30, 32)	128
conv2d_1 (Conv2D)	(None, 28, 28, 32)	9,248
batch_normalization_1 (BatchNormalization)	(None, 28, 28, 32)	128
max_pooling2d (MaxPooling2D)	(None, 14, 14, 32)	0
dropout (Dropout)	(None, 14, 14, 32)	0
conv2d_2 (Conv2D)	(None, 12, 12, 64)	18,496
batch_normalization_2 (BatchNormalization)	(None, 12, 12, 64)	256
conv2d_3 (Conv2D)	(None, 10, 10, 64)	36,928
batch_normalization_3 (BatchNormalization)	(None, 10, 10, 64)	256
dropout_1 (Dropout)	(None, 10, 10, 64)	0
flatten (Flatten)	(None, 6400)	0
dense (Dense)	(None, 512)	3,277,312
batch_normalization_4 (BatchNormalization)	(None, 512)	2,048
dropout_2 (Dropout)	(None, 512)	0
dense_1 (Dense)	(None, 10)	5,130

Total params: 3,350,826 (12.78 MB)

Trainable params: 3,349,418 (12.78 MB)

Non-trainable params: 1,408 (5.50 KB)

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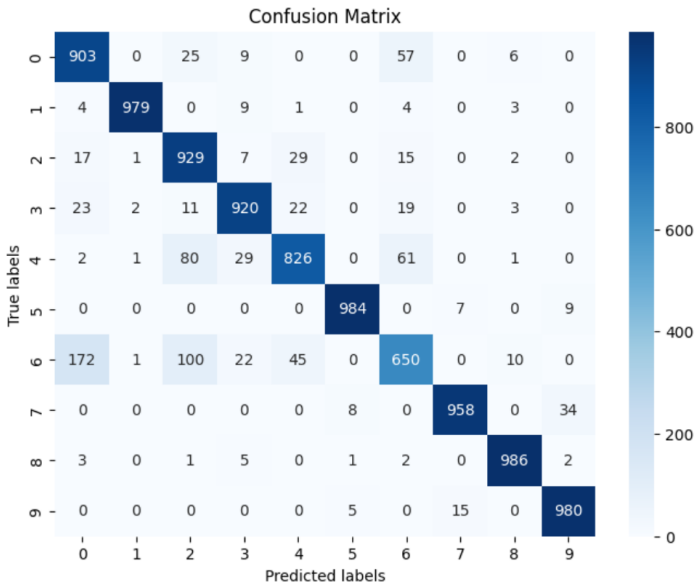
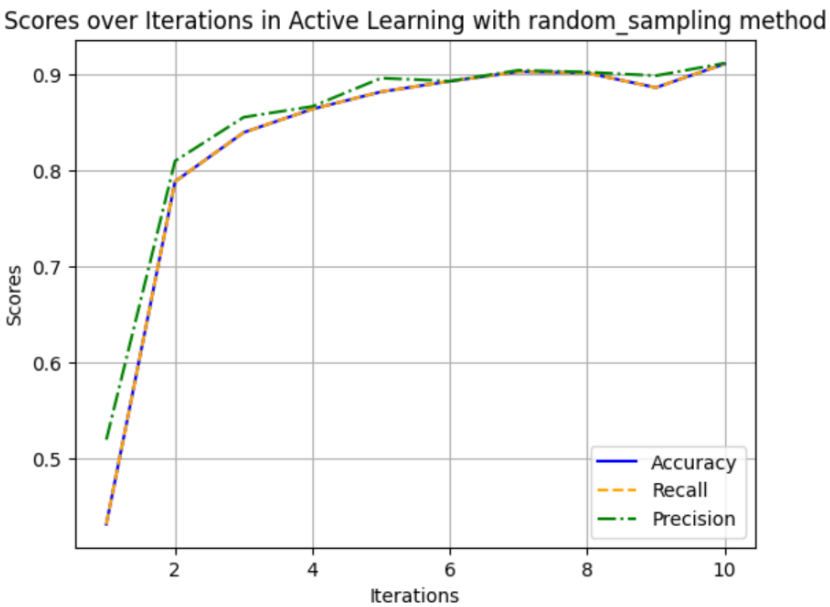
- Evaluation

1- Minst Fashion Dataset

Precision: 0.91
Recall: 0.91
F1-score: 0.91

1.1- Random Sampling





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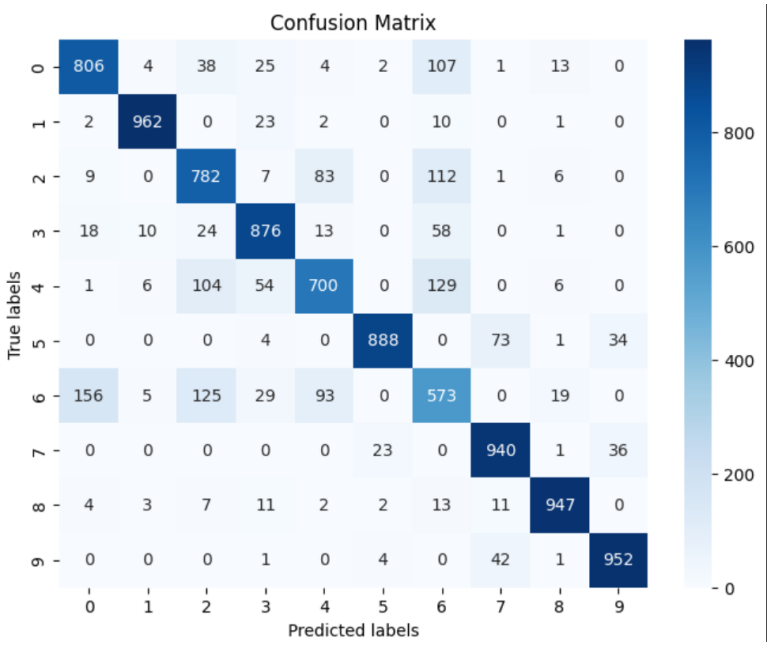
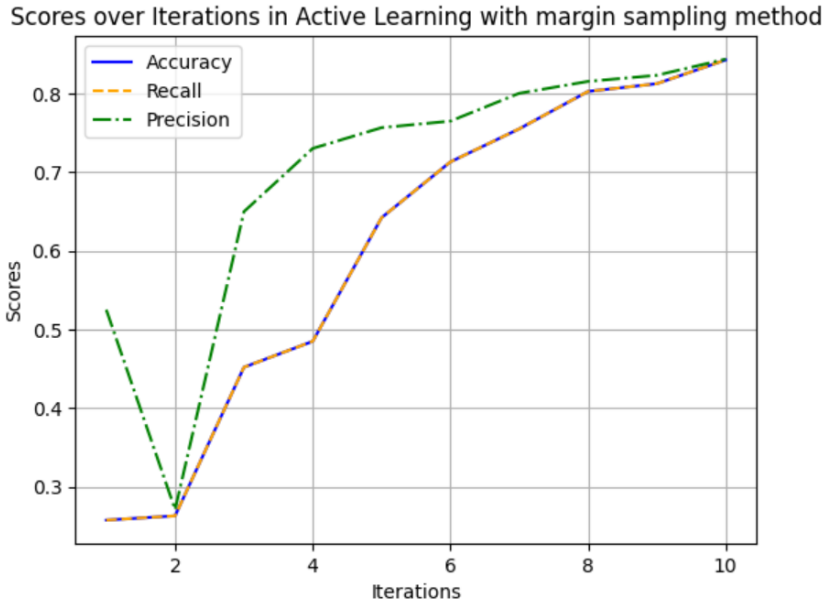
- Evaluation

1- Minst Fashion Dataset

Precision: 0.843
Recall: 0.842
F1-score: 0.842

1.2- Margin Sampling





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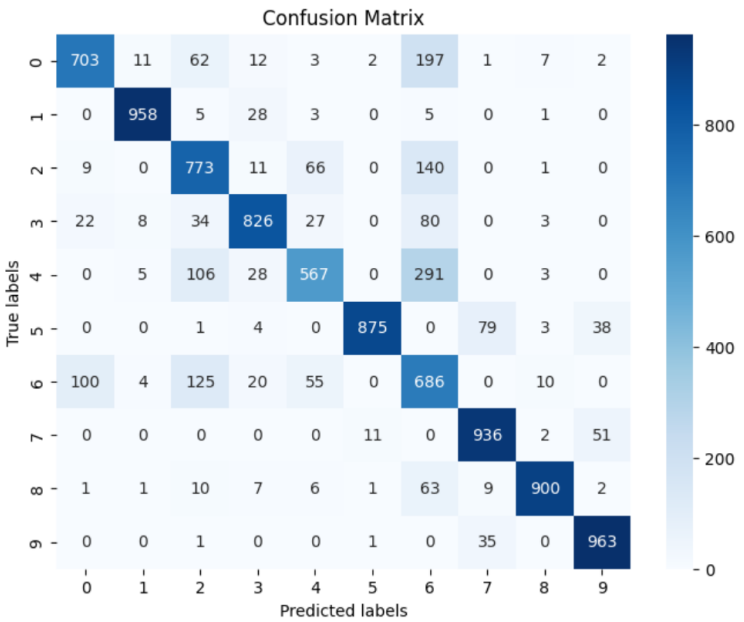
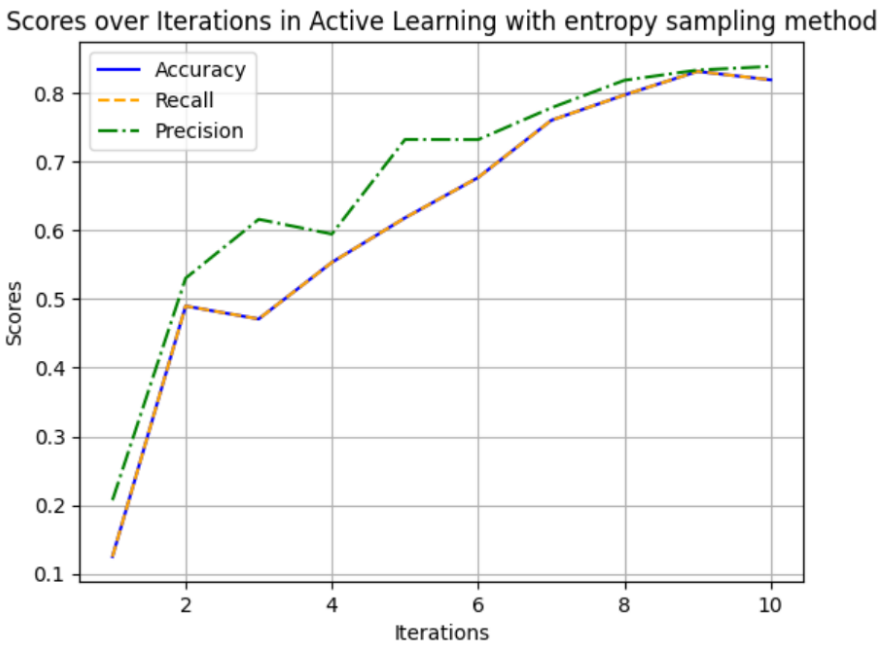
- Evaluation

1- Minst Fashion Dataset

Precision: 0.838
Recall: 0.818
F1-score 0.823

1.3- Entropy Sampling





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- Evaluation

1- Minst Fashion Dataset

Precision: 0.823
Recall: 0.810
F1-score: 0.809

1.4- Uncertainty sampling