SVC Classification Report

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Introduction

This report provides the classification results for the CIFAR-10 dataset. The results are split into two sections, one detailing the performance on the first data batch, and the other considering all batches together.

Data

SVC

CIFAR-10 The Street View House Numbers

Notes

In order to keep track of my work i used .ipynb jupiter notebook. The notebook is available in the folder files. The notebook contains all the code i used to produce the results in this report. I splitted the code into sections that i used to produce the results for each section of this report. Some variables may be re-initialized in different sections. I tried to do the code as general as possible, so i can use it for all the attempts.

1 Results for Data Batch 1

This section presents the results when using only the first batch of the CIFAR-10 dataset.

GridSearchCV Results

The GridSearchCV results of the first batch of the CIFAR-10 dataset was the following: C=10 and kernel=rbf.

Model Configuration

General Parameters

Parameter	Value
Estimator	SVC()
Parameter GridSearchCV	{'C': [1, 10], 'kernel': ['linear', 'rbf']}

Selected Parameters

Parameter	Value
C	10
break_ties	False
cache_size	200
class_weight	None
coef0	0.0
decision_function_shape	'ovr'
degree	3
gamma	'scale'
kernel	'rbf'
max_iter	-1
probability	False
random_state	None
shrinking	True
tol	0.001
verbose	False

Performance Metrics

Metric	Value
Accuracy	0.4766
F1 Score (Weighted Average)	0.4762

Detailed Classification Report

Class	Precision	Recall	F1-Score	Support
0	0.54	0.56	0.55	1000
1	0.54	0.58	0.56	1000
2	0.34	0.40	0.37	1000
3	0.31	0.33	0.32	1000
4	0.42	0.39	0.40	1000
5	0.42	0.35	0.38	1000
6	0.52	0.52	0.52	1000
7	0.57	0.50	0.53	1000
8	0.58	0.64	0.61	1000
9	0.54	0.52	0.53	1000

Classification Report for Data Batch 1

2 Combined Results for All Batches

This section presents the results from the analysis of the combined data from all batches of the CIFAR-10 dataset.

GridSearchCV Results

The GridSearchCV results of all the batches of the CIFAR-10 dataset was taking too long to compute, so i used only the first 1000 samples of each batch. The GridSearchCV results of the first 1000 samples of each batch of the CIFAR-10 dataset was the following: C = 10, kernel = rbf

Model Configuration

The results of performance metrics and classification report are for the SVC model with the selected parameters from the GridSearchCV. So the SVC model which performed was selected with parameters: C = 10, kernel = rbf

Performance Metrics

Metric	Value
Accuracy	0.5687
F1 Score (Weighted Average)	0.5693

Detailed Classification Report

Class	Precision	Recall	F1-Score	Support
0	0.62	0.67	0.64	1000
1	0.65	0.67	0.66	1000
2	0.45	0.47	0.46	1000
3	0.38	0.41	0.39	1000
4	0.50	0.48	0.49	1000
5	0.50	0.47	0.48	1000
6	0.62	0.60	0.61	1000
7	0.66	0.59	0.62	1000
8	0.71	0.69	0.70	1000
9	0.62	0.63	0.63	1000

Classification Report for all Data Batches

3 Attemps For Cifar-10

I used GridSearchCV to find the best parameters for the SVC model. Using only the first batch of the CIFAR-10 dataset, i found that the best parameters are C = 10 and kernel = rbf. Using all batches of the CIFAR-10 dataset, the computation time was too long, so i used only the first 1000 samples of each batch.

4 The Street View House Numbers