

# Assignment-5: SVM

Name- Aritra Ray

Roll No.- 21IM10008

## #Support Vector Classifier

Classification report for SVC with linear kernel:

	precision	recall	f1-score	support
0	0.91	0.96	0.94	175
1	0.96	0.99	0.98	234
2	0.89	0.89	0.89	219
3	0.84	0.88	0.86	207
4	0.90	0.94	0.92	217
5	0.89	0.84	0.87	179
6	0.90	0.93	0.91	178
7	0.89	0.86	0.88	205
8	0.89	0.83	0.86	192
9	0.89	0.84	0.86	194
accuracy		0.90		2000
macro avg	0.90	0.90	0.90	2000
weighted avg	0.90	0.90	0.90	2000

**Classification report for SVC with poly kernel:**

	precision	recall	f1-score	support
0	0.95	0.96	0.95	175
1	0.91	0.99	0.95	234
2	0.95	0.92	0.94	219
3	0.93	0.93	0.93	207
4	0.94	0.95	0.94	217
5	0.93	0.96	0.94	179
6	0.94	0.95	0.95	178
7	0.92	0.90	0.91	205
8	0.94	0.88	0.91	192
9	0.93	0.91	0.92	194
accuracy		0.93		2000
macro avg	0.93	0.93	0.93	2000
weighted avg	0.93	0.93	0.93	2000

**Classification report for SVC with rbf kernel:**

	precision	recall	f1-score	support
0	0.96	0.99	0.97	175
1	0.97	0.99	0.98	234
2	0.95	0.96	0.95	219
3	0.92	0.92	0.92	207
4	0.95	0.95	0.95	217
5	0.95	0.93	0.94	179

6	0.94	0.96	0.95	178
7	0.93	0.91	0.92	205
8	0.95	0.92	0.93	192
9	0.93	0.91	0.92	194

accuracy			0.94	2000
macro avg	0.94	0.94	0.94	2000
weighted avg	0.94	0.94	0.94	2000

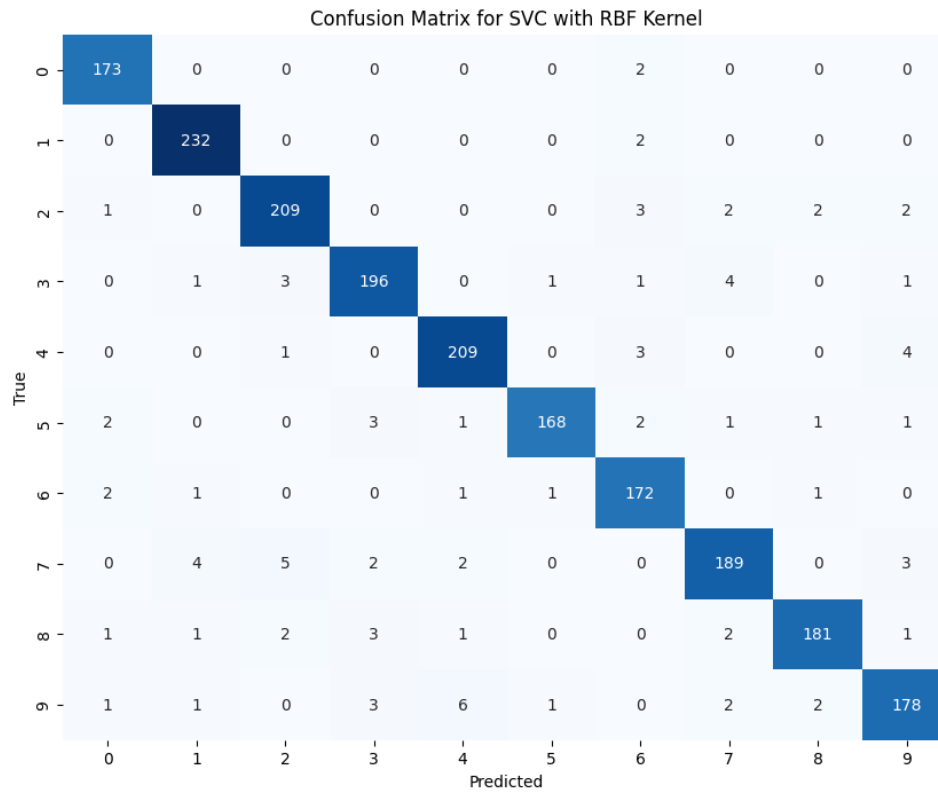
- Best hyperparameters from GridSearchCV: {'C': 100, 'gamma': 0.01}
- Best hyperparameters from RandomizedSearchCV: {'gamma': 0.01, 'C': 100}

#### Classification report for SVC with best hyperparameters from GridSearchCV:

	precision	recall	f1-score	support
0	0.96	0.99	0.97	175
1	0.97	0.99	0.98	234
2	0.95	0.95	0.95	219
3	0.95	0.95	0.95	207
4	0.95	0.96	0.96	217
5	0.98	0.94	0.96	179
6	0.93	0.97	0.95	178
7	0.94	0.92	0.93	205
8	0.97	0.94	0.96	192
9	0.94	0.92	0.93	194

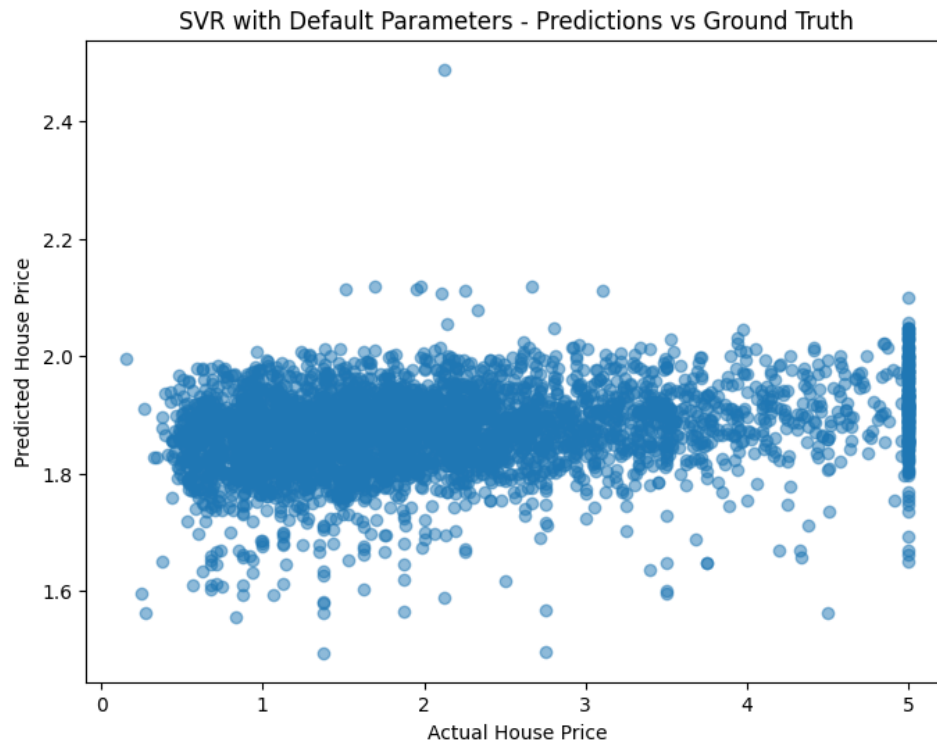
accuracy			0.95	2000
macro avg	0.95	0.95	0.95	2000

weighted avg    0.95    0.95    0.95    2000



## #Support Vector Regression

Mean Squared Error (Default Parameters): 1.3922086000291185



### Results:

- Best Epsilon Parameter: 1.0
- Mean Squared Error (Best Hyperparameter): 1.3558710340977345

