EXPERIMENT 8 REPORT

SVM and Kernel Trick

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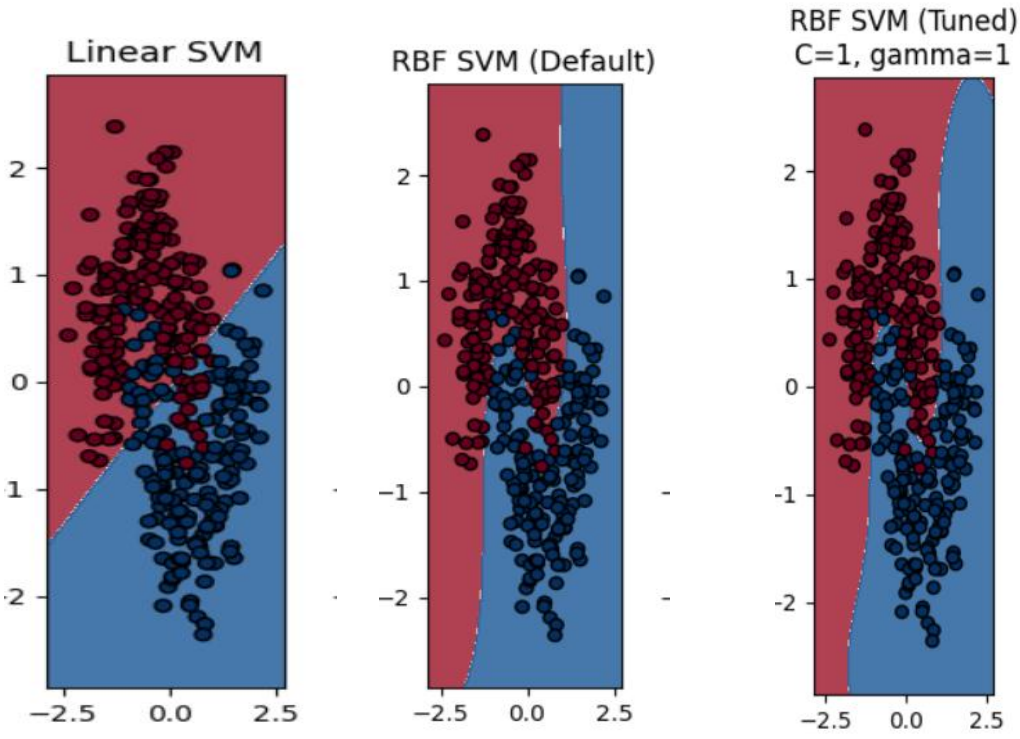
Model Comparison: A table showing the Validation Accuracy for the four models:

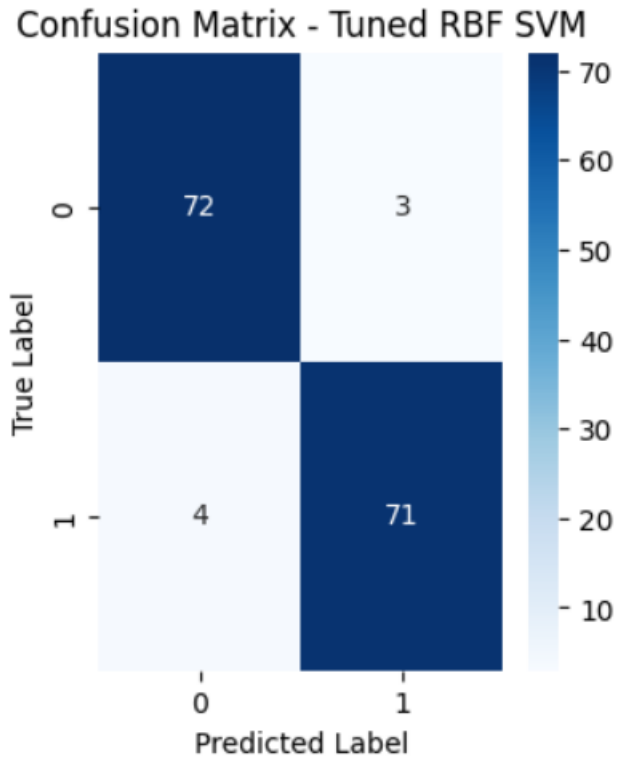
Model	Kernel	Parameters	Validation Accuracy
SVC	Linear	C=1	0.84
SVC	RBF	Default	0.9467
SVC	Poly	Degree=3	0.84
GridSearchCV	RBF	{'C': 1, 'gamma': 1, 'kernel': RBF}	0.9543

Decision Boundary Plots:

Linear Boundary: **RBF Boundary:** **Best Boundary:**



Confusion Matrix:



Conclusion:

Linear SVM failed because the 'moons' dataset is non-linearly separable - a straight line can't divide the classes accurately.

RBF Kernel succeeded because it can model curved, non-linear boundaries.

GridSearchCV best parameters: {'C': 1, 'gamma': 1, 'kernel': 'rbf'}

Effect of high gamma (e.g., 1000): The model overfits and the boundary becomes too wiggly.

Effect of low C (e.g., 0.01): The model underfits, resulting in smoother but inaccurate boundaries.