

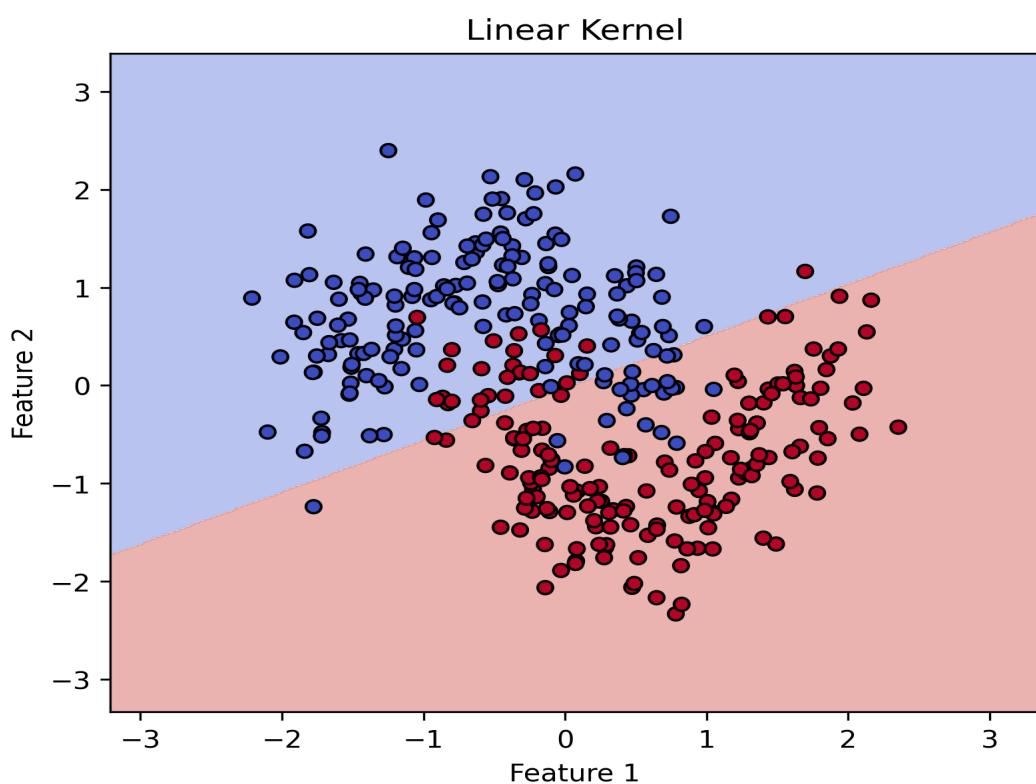
# EXPERIMENT-8 REPORT : 23/CS/072

## Model Comparison (Validation Accuracy)

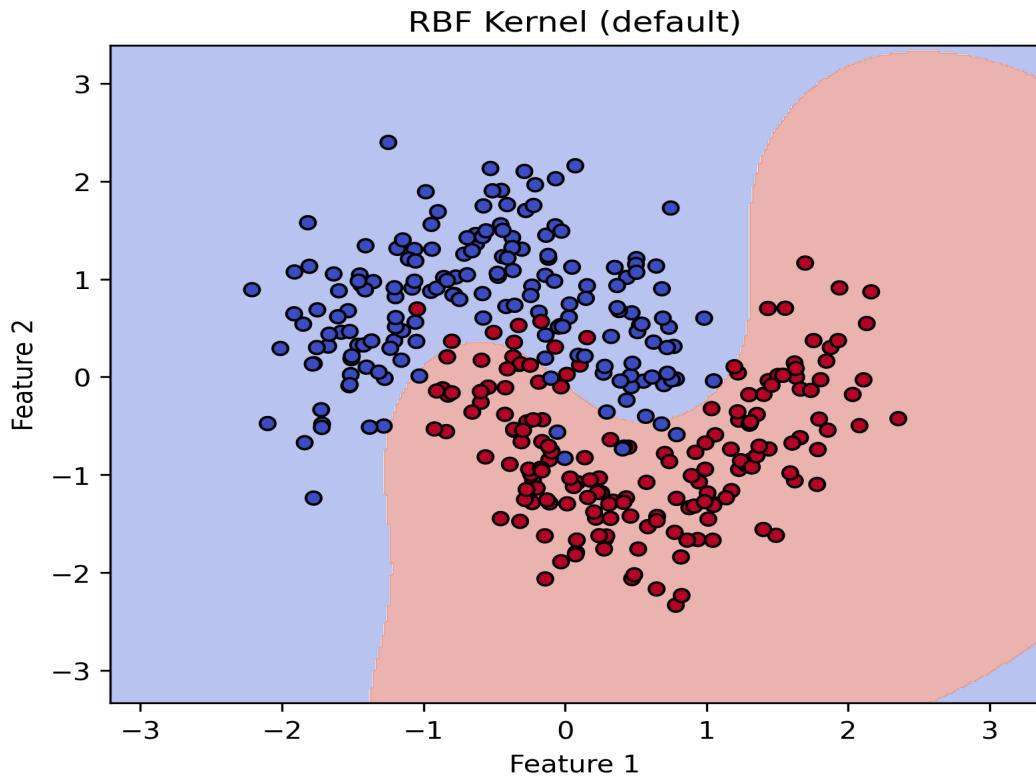
Model	Kernel	Parameters	Validation Accuracy
SVC	linear	C=1	0.83
SVC	rbf	default	0.94
SVC	poly	degree=3	0.89
GridSearchCV	rbf	{'C': 1, 'gamma': 1, 'kernel': 'rbf'}	0.951

## Decision Boundary Plots

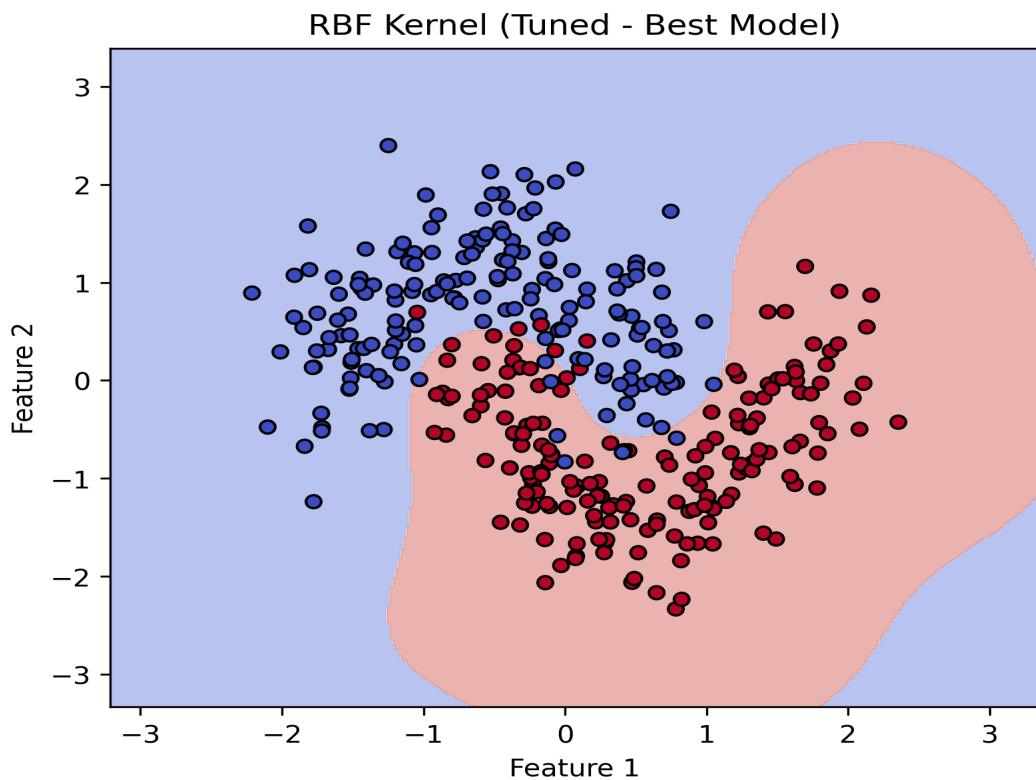
### LINEAR BOUNDARY



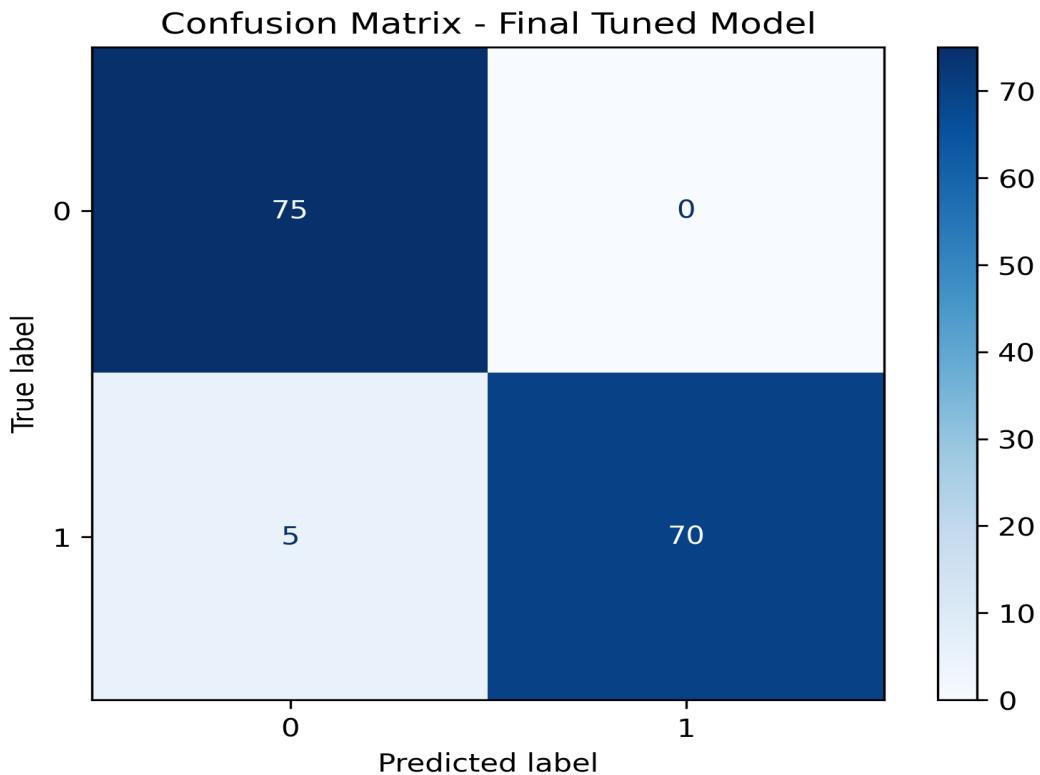
### RBF BOUNDARY



**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.