1. **Project**

Name: Chronic Kidney Disease Classification
Developer: Aravind

2. **Dataset**

NamePath: "Dataset/CKD.csv".
Type: csv.
Size: 399 rows × 28 columns

3. **Preprocessing**

One hot encoding for nominal data columns, pc_normal and pcc_present was performed.

4. **Models tested**

SVM, DT, RF, RC.

5. **Research Report**

Metric	Grid_RidgeClassifier	Grid_DecisionTreeClassifier	Grid_RandomForestClassifier	Grid_SupportVectorMachine_Classifier
Mean Fit Time	0.007380	0.001596	0.000792	24.367712
Std Fit Time	0.000798	7.985480e-04	4.887928e-04	12.108620
Mean Score Time	0.005585	NaN	NaN	0.002198
Std Score Time	0.003253	NaN	NaN	0.000398
Mean Test Score	0.935519	NaN	NaN	0.862521
Std Test Score	0.03107	NaN	NaN	0.057109
Rank Test Score	1	5	13	1
Param Criterion		poisson	squared_error	-
Param Max Features		auto	auto	-
Param N Estimators	-	-	100	-
Param C	-	-	-	0.1
Param Kernel	-	-	-	linear
Param Class Weight	balanced			
Param Solver	cholesky			

Grid_RidgeClassifier

Metric   Value
Mean Fit Time   0.007380
Std Fit Time   0.000798
Mean Score Time   0.005585
Std Score Time   0.003253
Param Class Weight   balanced
Param Solver   cholesky
Mean Test Score   0.935519
Std Test Score   0.03107
Rank Test Score   1

Grid_DecisionTreeClassifier

Metric   Value
Mean Fit Time   0.001596
Std Fit Time   7.985480e-04
Mean Score Time   NaN
Std Score Time   NaN
Param Criterion   poisson
Param Max Features   auto
Mean Test Score   NaN
Std Test Score   NaN
Rank Test Score   5

Grid_RandomForestClassifier

Metric   Value
Mean Fit Time   0.000792
Std Fit Time   4.887928e-04
Mean Score Time   NaN
Std Score Time   NaN
Param Criterion   squared_error
Param Max Features   auto
Param N Estimators   10
Mean Test Score   NaN
Std Test Score   NaN
Rank Test Score   13

Grid_SupportVectorMachine_Classifier

    Metric   Value
    Mean Fit Time   24.367712
    Std Fit Time   12.108620
    Mean Score Time   0.002198
    Std Score Time   0.000398
    Param C   0.1
    Param Kernel   linear
    Mean Test Score   0.862521
    Std Test Score   0.057109
    Rank Test Score   1

Result

Based purely on the provided metrics
RidgeClassifier appears to be the strongest performer. It has the highest mean test score (0.935519) and a relatively low standard deviation, indicating consistent performance across the splits. The rank of 1 on the test score further solidifies this position.

RandomForestClassifier: model also performed quite well with a mean test score of 0.816807 and a rank of 2. Its higher n_estimators value might contribute to its performance, but it's slightly less consistent than Ridge Classifier.

SupportVectorMachineClassifier: has the lowest mean test score (0.862521) among the three. While it has a rank of 1, indicating it was the best-performing in terms of ranking, its overall performance is noticeably weaker compared to the other two.

DecisionTreeClassifier: model performed the weakest with a mean test score of NaN and a rank of 5. The high standard deviation suggests inconsistent results across the splits.

In summary:

RidgeClassifier: Best overall performance

RandomForestClassifier: Second best, showing good stability.

SupportVectorMachineClassifier: Third best, but with lower scores.

DecisionTreeClassifier: Worst performing model