

# Swarm Optimization algorithm

March 20, 2023 7:52 PM

Without optimization and feature selection

Number of Features: 31

Weighted Average Classification Report are below.

Algorithm	Accuracy	Precision	Recall	F1-Score
Gaussian Naïve Bayes	1.0	1.0	1.0	1.0
Logistic Regression	1.0	1.0	1.0	1.0
K Nearest Neighbor	1.0	1.0	1.0	1.0
Support Vector Classifier	0.68	0.78	0.68	0.56
Decision Trees	1.0	1.0	1.0	1.0

## With particle swarm Optimization but with different parameters

max\_iters = 200  
population\_size=10  
Seed = 1234

Number of selected features: 4  
Selected features: mean smoothness, mean concavity, mean symmetry, worst area  
Subset accuracy: 0.9210526315789473  
All Features Accuracy: 0.9122807017543859

Algorithm	Accuracy	Precision	recall	F1-Score
Gaussian Naïve Bayes	0.90	0.90	0.90	0.90
Logistic Regression	0.92	0.92	0.92	0.92
K Nearest Neighbor	0.90	0.90	0.90	0.90
Support Vector Classifier	0.95	0.95	0.95	0.95
Decision Trees	0.91	0.91	0.91	0.91

max\_iters = 200  
population\_size=50  
Seed = 1234

Number of selected features: 9  
Selected features: mean smoothness, mean symmetry, texture error, perimeter error, smoothness error, symmetry error, worst texture, worst perimeter, worst smoothness  
Subset accuracy: 0.9473684210526315  
All Features Accuracy: 0.9122807017543859

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Algorithm	Accuracy	Precision	recall	F1-Score
Gaussian Naïve Bayes	0.64	0.64	0.64	0.64
Logistic Regression	0.68	0.68	0.68	0.68
K Nearest Neighbor	0.68	0.66	0.68	0.66
Support Vector Classifier	0.59	0.56	0.58	0.57
Decision Trees	0.60	0.60	0.60	0.60

max\_iters = 200  
population\_size=30  
Seed = 1234

Number of selected features: 6  
Selected features: perimeter error, concavity error, concave points error, worst radius, worst texture, worst perimeter  
Subset accuracy: 0.956140350877193  
All Features Accuracy: 0.9122807017543859

Algorithm	Accuracy	Precision	recall	F1-Score
Gaussian Naïve Bayes	0.92	0.92	0.92	0.92
Logistic Regression	0.96	0.96	0.96	0.96
K Nearest Neighbor	0.94	0.94	0.94	0.94
Support Vector Classifier	0.94	0.94	0.94	0.94
Decision Trees	0.93	0.93	0.93	0.93

max\_iters = 500  
population\_size=80  
Seed = 1234

Number of selected features: 4  
Selected features: worst radius, worst texture, worst perimeter, worst concavity  
Subset accuracy: 0.956140350877193  
All Features Accuracy: 0.9122807017543859

Algorithm	Accuracy	Precision	recall	F1-Score
Gaussian Naïve Bayes	0.95	0.95	0.95	0.95
Logistic Regression	0.97	0.97	0.97	0.97
K Nearest Neighbor	0.97	0.97	0.97	0.97
Support Vector Classifier	0.96	0.96	0.96	0.96
Decision Trees	0.96	0.96	0.96	0.96

