PS C:\Users\Aniket\OneDrive\Desktop\marvellousinfo\Assignments\Assignment_34> & C:/Users/Aniket/AppData/Local/Programs/Python/Python313/python.exe c:/Users/Aniket/OneDrive/Desktop/marvellousinfo/Assignments/Assignment_34/BreastCance.py

	mean radius	mean texture	mean perimeter	...	worst concave points	worst symmetry	worst fractal dimension
0	17.99	10.38	122.80	...	0.2654	0.4601	0.11890
1	20.57	17.77	132.90	...	0.1860	0.2750	0.08902
2	19.69	21.25	130.00	...	0.2430	0.3613	0.08758
3	11.42	20.38	77.58	...	0.2575	0.6638	0.17300
4	20.29	14.34	135.10	...	0.1625	0.2364	0.07678
..	...	...	...	...	...	...	...
564	21.56	22.39	142.00	...	0.2216	0.2060	0.07115
565	20.13	28.25	131.20	...	0.1628	0.2572	0.06637
566	16.60	28.08	108.30	...	0.1418	0.2218	0.07820
567	20.60	29.33	140.10	...	0.2650	0.4087	0.12400
568	7.76	24.54	47.92	...	0.0000	0.2871	0.07039

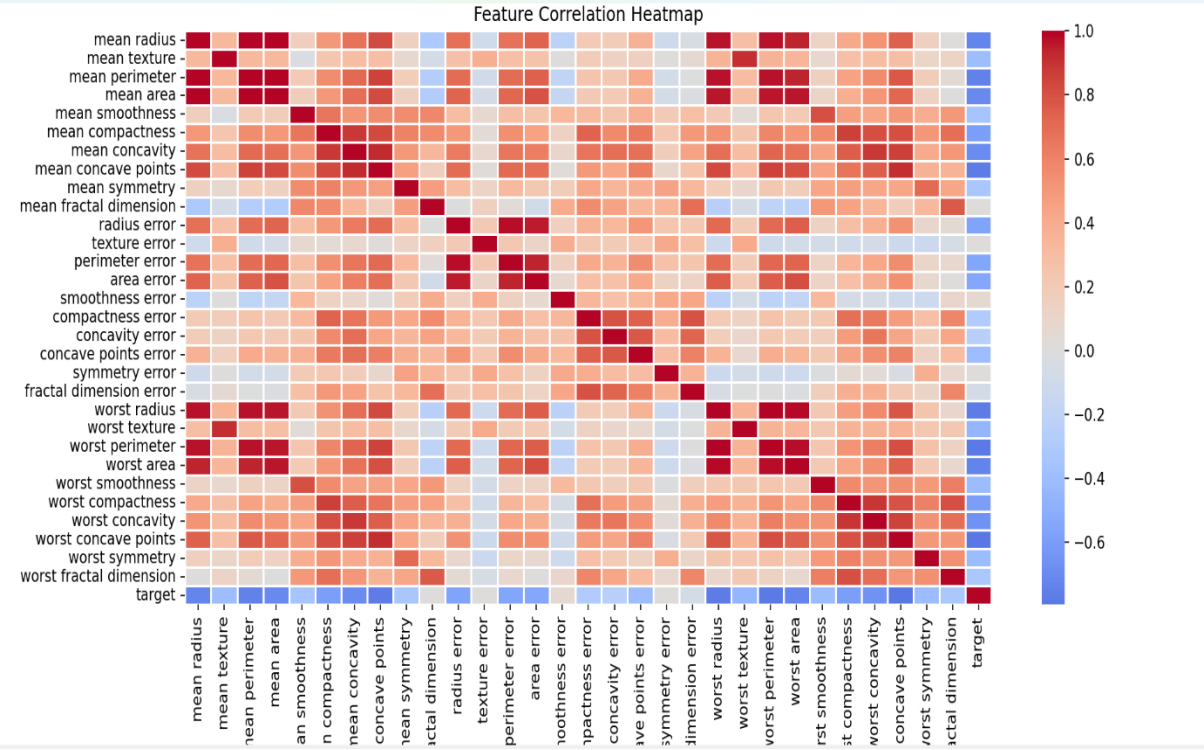
[569 rows x 30 columns]

statestical summery of data :

	mean radius	mean texture	mean perimeter	...	worst symmetry	worst fractal dimension	target
count	569.000000	569.000000	569.000000	...	569.000000	569.000000	569.000000
mean	14.127292	19.289649	91.969033	...	0.290076	0.083946	0.627417
std	3.524049	4.301036	24.298981	...	0.061867	0.018061	0.483918
min	6.981000	9.710000	43.790000	...	0.156500	0.055040	0.000000
25%	11.700000	16.170000	75.170000	...	0.250400	0.071460	0.000000
50%	13.370000	18.840000	86.240000	...	0.282200	0.080040	1.000000
75%	15.780000	21.800000	104.100000	...	0.317900	0.092080	1.000000
max	28.110000	39.280000	188.500000	...	0.663800	0.207500	1.000000

[8 rows x 31 columns]

Feature Correlation on heatmap:



now feature correlation with targets

we will show with only top 10 feature :

Top 10 features correlated with target:

smoothness error 0.067016

mean fractal dimension 0.012838

texture error 0.008303

symmetry error 0.006522

fractal dimension error -0.077972

concavity error -0.253730

compactness error -0.292999

worst fractal dimension -0.323872

mean symmetry -0.330499

mean smoothness -0.358560

Name: target, dtype: float64

After scaling: X_scaled shape = (569, 30) y shape = (569,)

model build on training set

model build on testing set

Accuracy: 98.24561403508771

Confusion Matrix:

[[41 1]

[1 71]]

Classification Report:

	precision	recall	f1-score	support
0	0.98	0.98	0.98	42
1	0.99	0.99	0.99	72
accuracy			0.98	114
macro avg	0.98	0.98	0.98	114
weighted avg	0.98	0.98	0.98	114

THE END OF PROGRAM (BREAST CANCER CASE STUDY)

Conclusion

- The classification model built on the Breast Cancer dataset performs **very well** with almost **perfect accuracy**.
- The results indicate that the model can be **reliably used for breast cancer tumor classification** (malignant vs benign).
- Only **2 out of 114 predictions were wrong**, showing strong generalization ability.
- With such high performance, this model can be an excellent starting point for medical diagnostic support systems, though real-world deployment should include further validation on unseen clinical data.