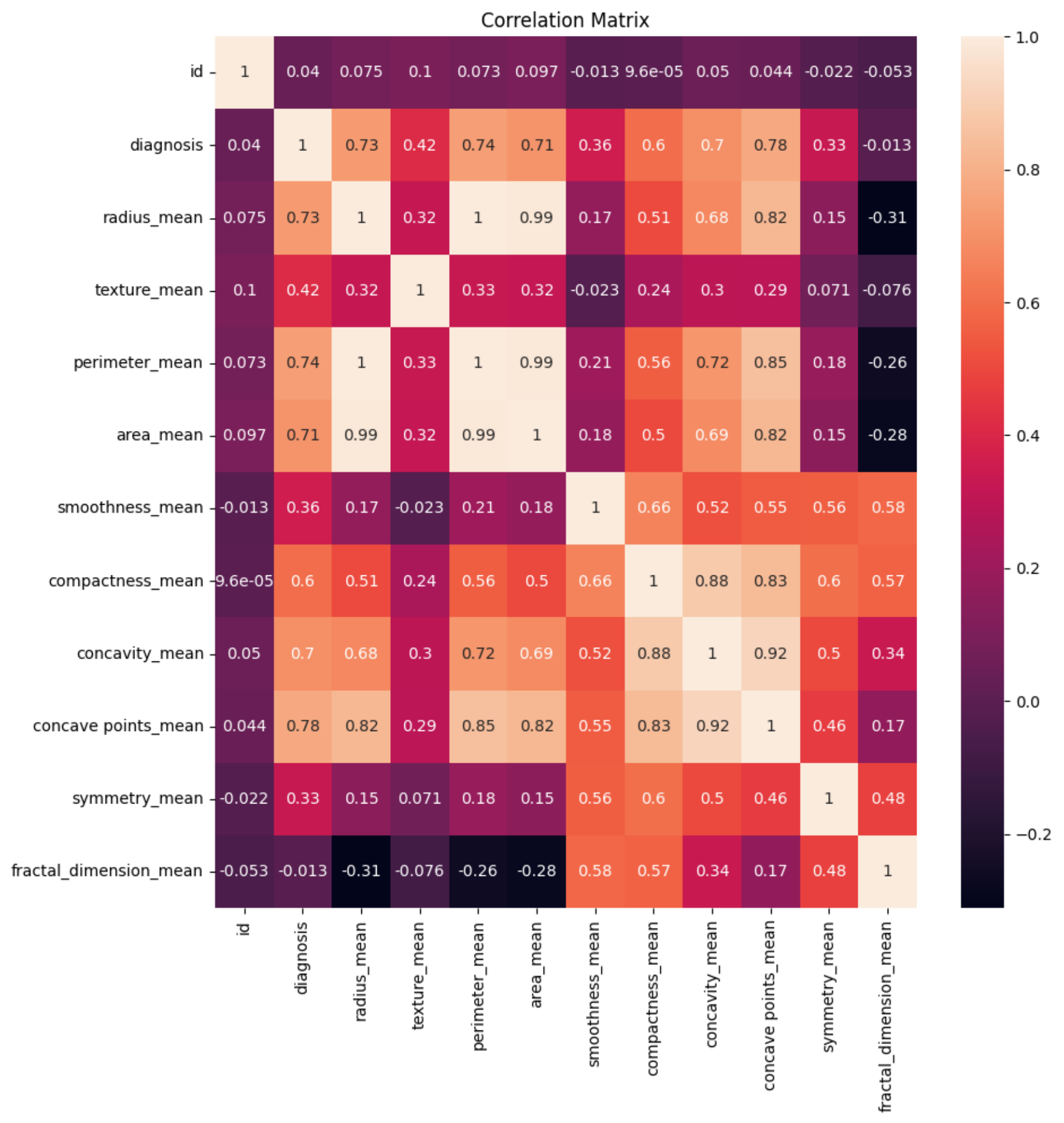
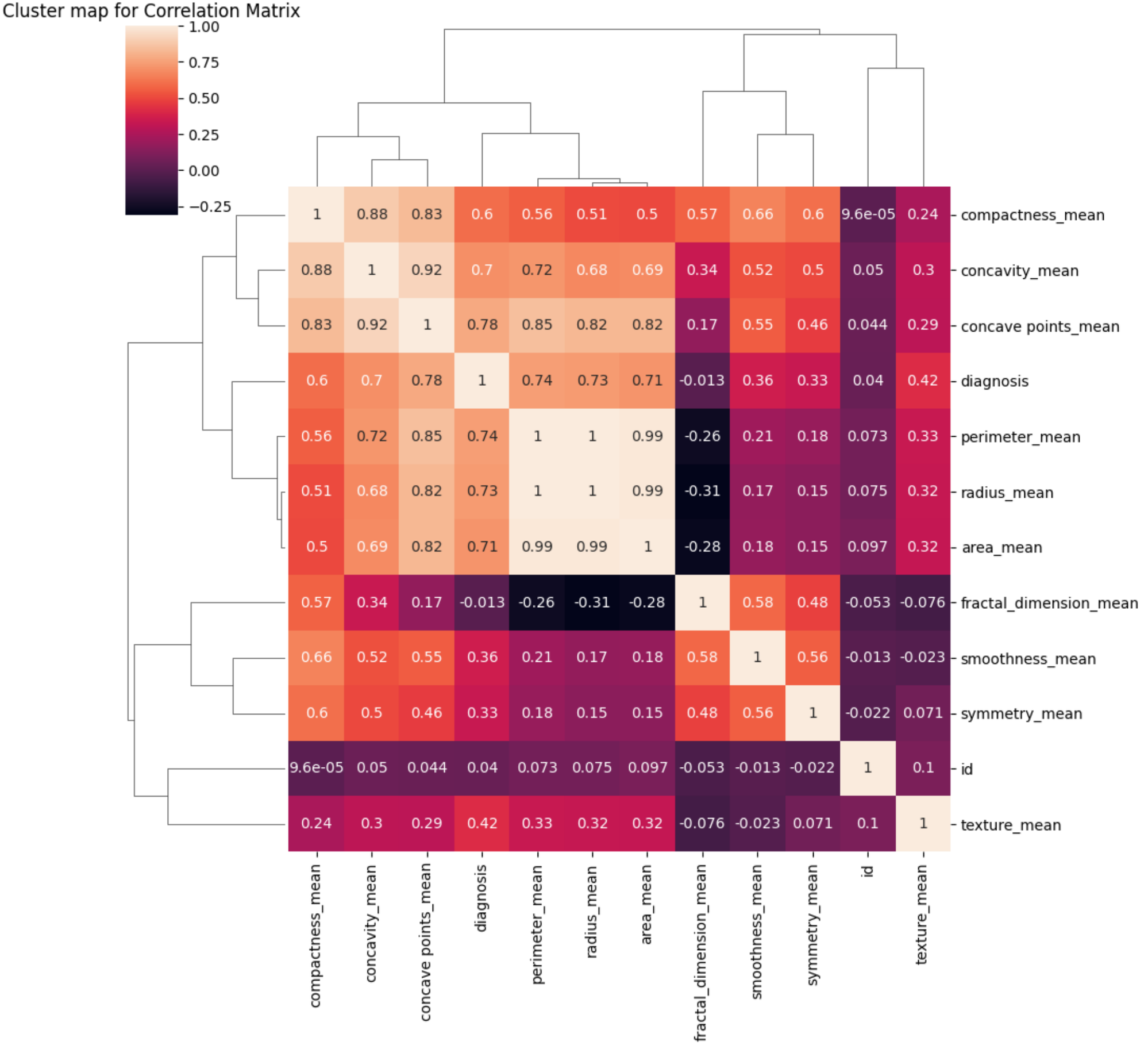
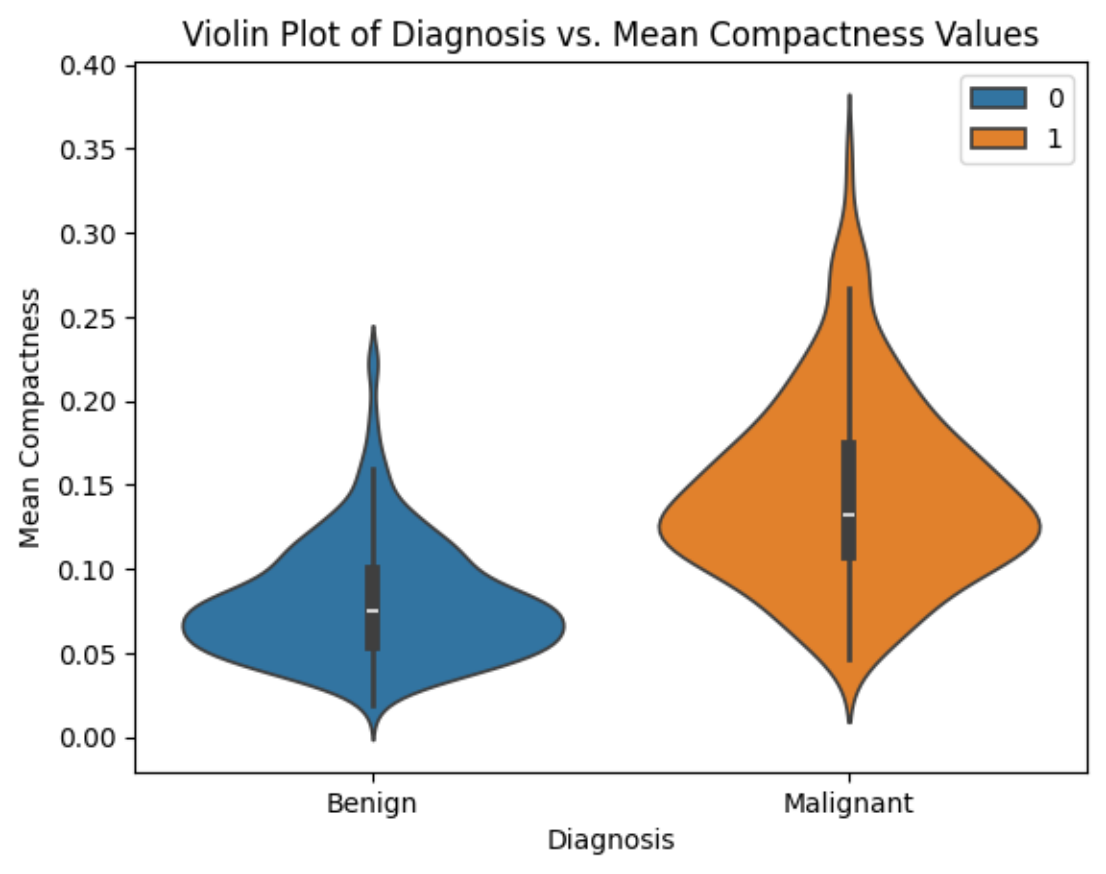
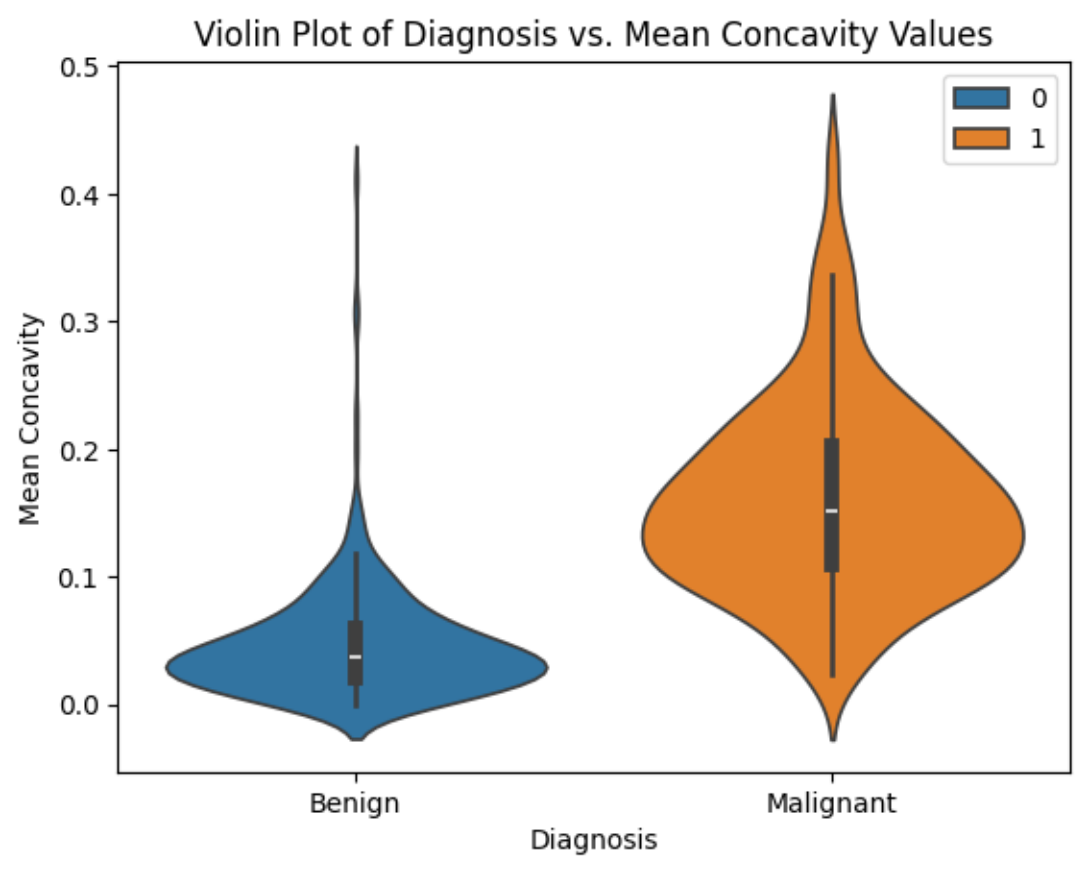
```
row information: RangeIndex(start=0, stop=569, step=1)
col information: Index(['id', 'diagnosis', 'radius_mean', 'texture_mean', 'perimeter_mean',
       'area_mean', 'smoothness_mean', 'compactness_mean', 'concavity_mean',
       'concave points_mean', 'symmetry_mean', 'fractal_dimension_mean'],
      dtype='object')
```

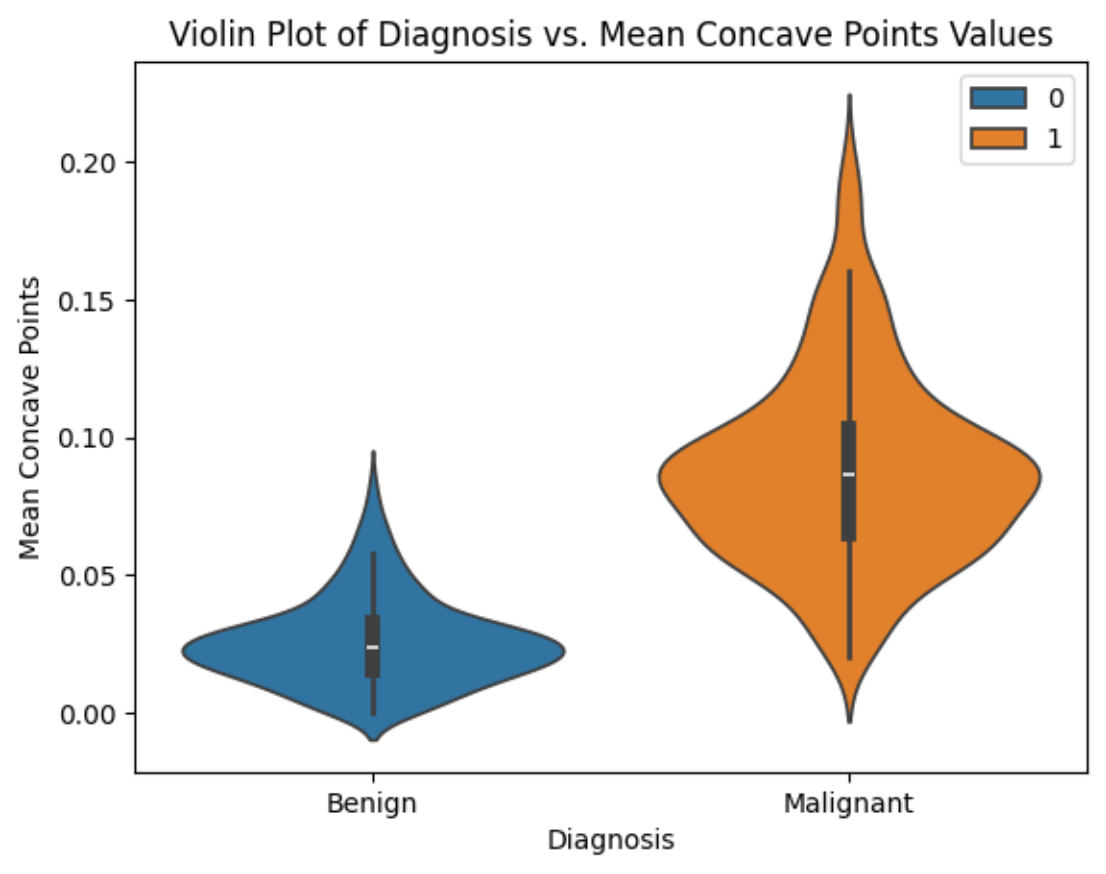
	id	diagnosis	radius_mean	texture_mean	perimeter_mean	area_mean	smoothness_mean	compactness_mean	concavity_mean	concave points_mean	symmetry_mean	fractal_dimension_mean
count	5.690000e+02	569.000000	569.000000	569.000000	569.000000	569.000000	569.000000	569.000000	569.000000	569.000000	569.000000	569.000000
mean	3.037183e+07	0.372583	14.127292	19.289649	91.969033	654.889104	0.096360	0.104341	0.088799	0.048919	0.181162	0.062798
std	1.250206e+08	0.483918	3.524049	4.301036	24.298981	351.914129	0.014064	0.052813	0.079720	0.038803	0.027414	0.007060
min	8.670000e+03	0.000000	6.981000	9.710000	43.790000	143.500000	0.052630	0.019380	0.000000	0.000000	0.106000	0.049960
25%	8.692180e+05	0.000000	11.700000	16.170000	75.170000	420.300000	0.086370	0.064920	0.029560	0.020310	0.161900	0.057700
50%	9.060240e+05	0.000000	13.370000	18.840000	86.240000	551.100000	0.095870	0.092630	0.061540	0.033500	0.179200	0.061540
75%	8.813129e+06	1.000000	15.780000	21.800000	104.100000	782.700000	0.105300	0.130400	0.130700	0.074000	0.195700	0.066120
max	9.113205e+08	1.000000	28.110000	39.280000	188.500000	2501.000000	0.163400	0.345400	0.426800	0.201200	0.304000	0.097440

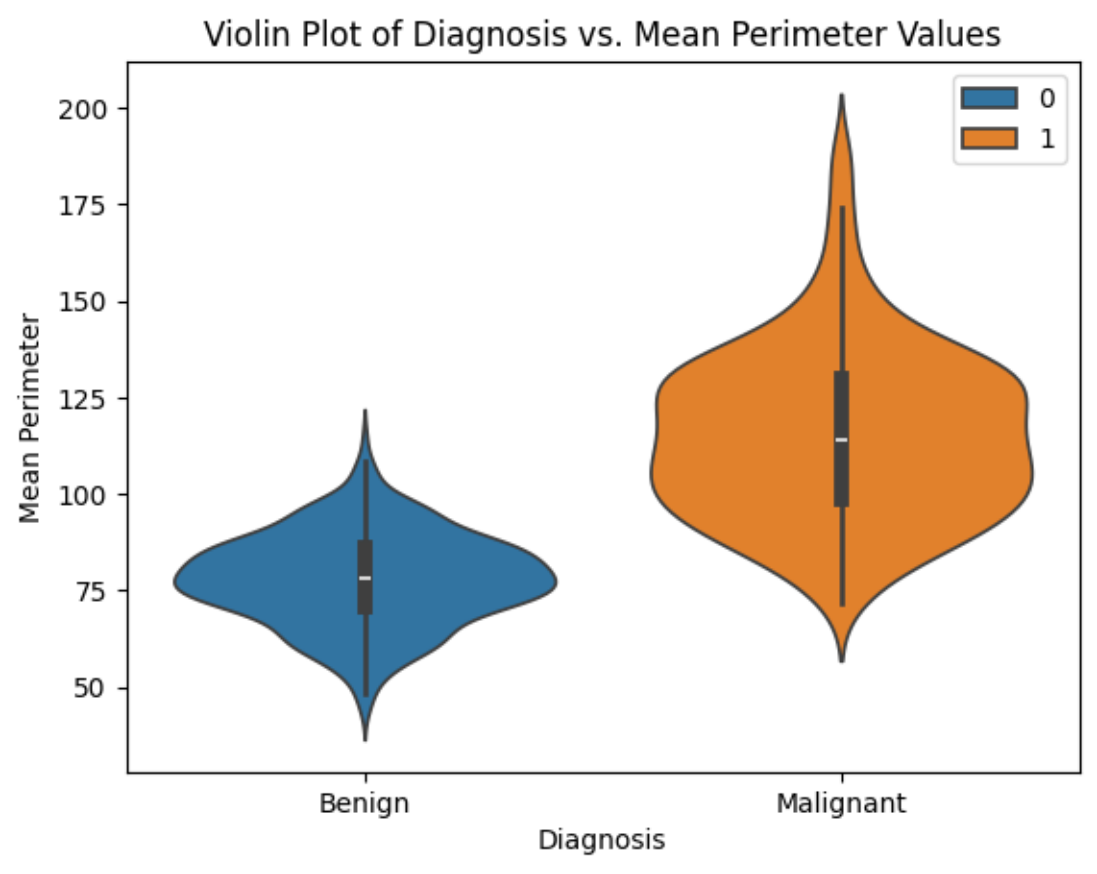

Correlation Matrix
id 1 0.04 0.075 0.1 0.073 0.097 -0.013 9.6e-05 0.05 0.044 -0.022 -0.053
diagnosis 0.04 1 0.73 0.42 0.74 0.71 0.36 0.6 0.7 0.78 0.33 -0.013
radius_mean 0.075 0.73 1 0.32 1 0.99 0.17 0.51 0.68 0.82 0.15 -0.31
texture_mean 0.1 0.42 0.32 1 0.33 0.32 -0.023 0.24 0.3 0.29 0.071 -0.076
perimeter_mean 0.073 0.74 1 0.33 1 0.99 0.21 0.56 0.72 0.85 0.18 -0.26
area_mean 0.097 0.71 0.99 0.32 0.99 1 0.18 0.5 0.69 0.82 0.15 -0.28
smoothness_mean -0.013 0.36 0.17 -0.023 0.21 0.18 1 0.66 0.52 0.55 0.56 0.58
compactness_mean -9.6e-05 0.6 0.51 0.24 0.56 0.5 0.66 1 0.88 0.83 0.6 0.57
concavity_mean 0.05 0.7 0.68 0.3 0.72 0.69 0.52 0.88 1 0.92 0.5 0.34
concave points_mean 0.044 0.78 0.82 0.29 0.85 0.82 0.55 0.83 0.92 1 0.46 0.17
symmetry_mean -0.022 0.33 0.15 0.071 0.18 0.15 0.56 0.6 0.5 0.46 1 0.48
fractal_dimension_mean -0.053 -0.013 -0.31 -0.076 -0.26 -0.28 0.58 0.57 0.34 0.17 0.48 1
id
diagnosis
radius_mean
texture_mean
perimeter_mean
area_mean
smoothness_mean
compactness_mean
concavity_mean
concave points_mean
symmetry_mean
fractal_dimension_mean
1.0
0.8
0.6
0.4
0.2
0.0
−0.2

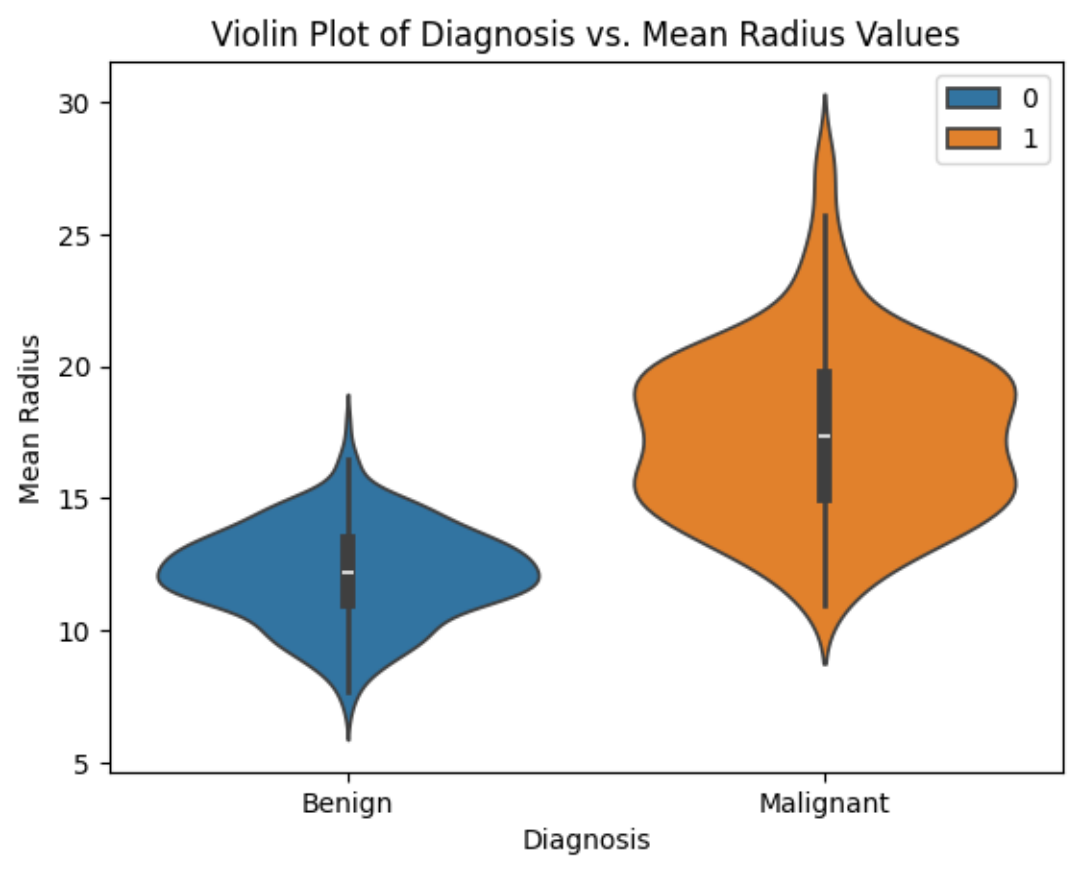

Cluster map for Correlation Matrix
1.00
0.75
0.50
0.25
0.00
−0.25
compactness_mean
concavity_mean
concave points_mean
diagnosis
perimeter_mean
radius_mean
area_mean
fractal_dimension_mean
smoothness_mean
symmetry_mean
id
texture_mean

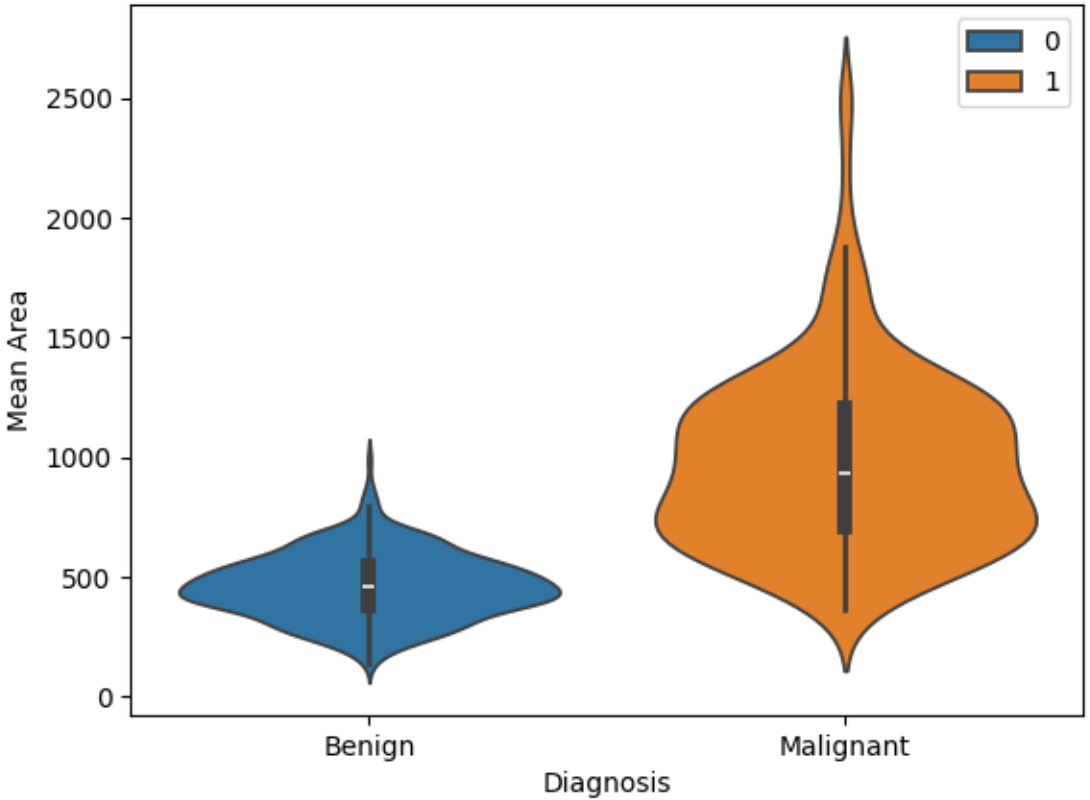

Violin Plot of Diagnosis vs. Mean Compactness Values
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
Mean Compactness
0
1
Benign
Malignant
Diagnosis

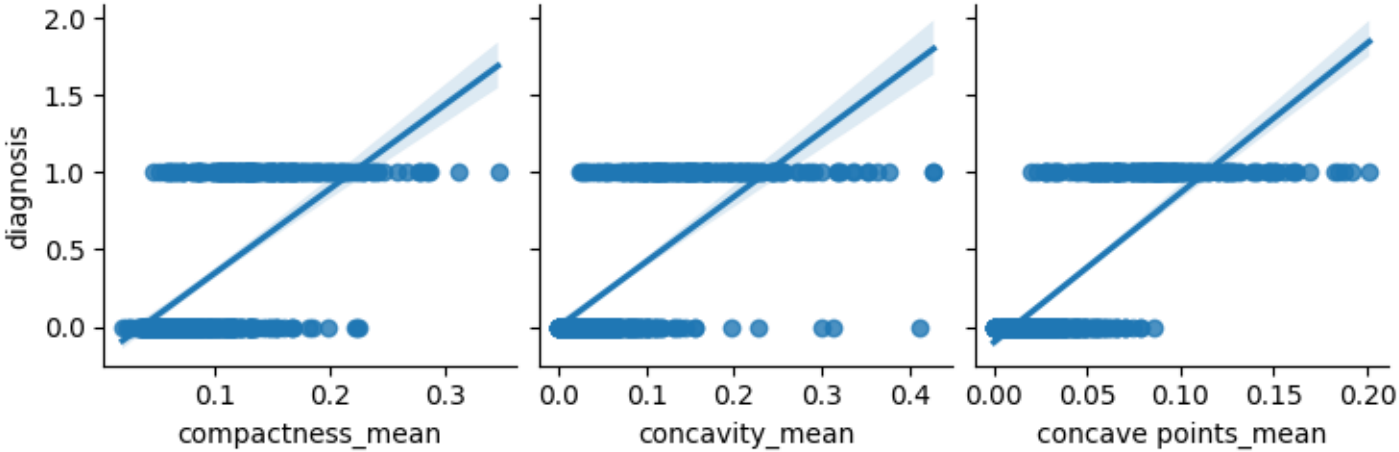

Violin Plot of Diagnosis vs. Mean Concavity Values
0
1
0.5
0.4
0.3
0.2
0.1
0.0
Mean Concavity
Benign
Malignant
Diagnosis

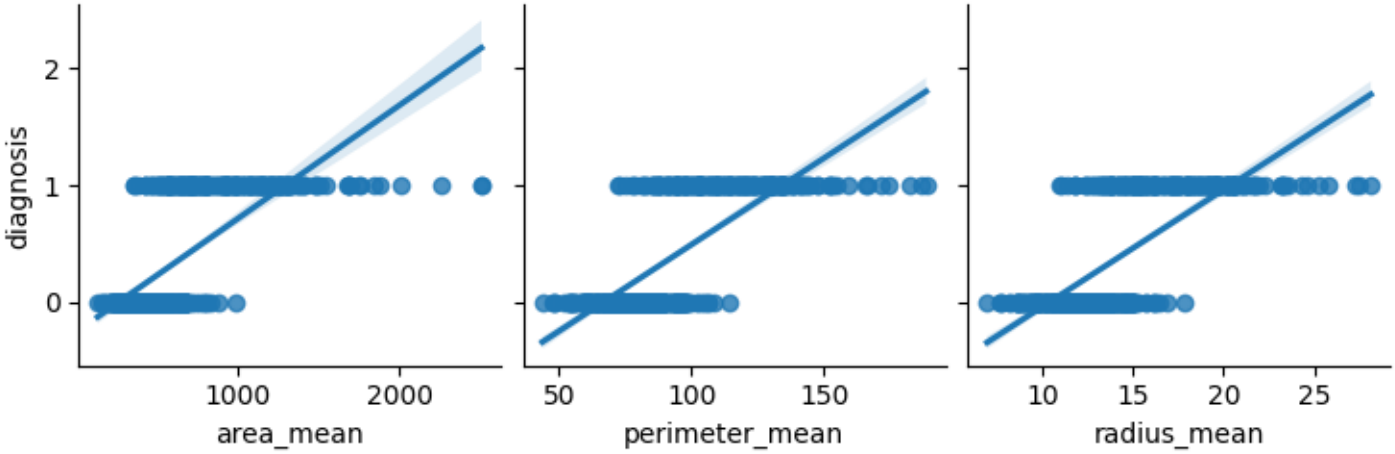

Violin Plot of Diagnosis vs. Mean Concave Points Values
0
1
0.20
0.15
0.10
0.05
0.00
Mean Concave Points
Benign
Malignant
Diagnosis


Violin Plot of Diagnosis vs. Mean Perimeter Values
0
1
200
175
150
125
100
75
50
Mean Perimeter
Benign
Malignant
Diagnosis


Violin Plot of Diagnosis vs. Mean Radius Values
0
1
30
25
20
15
10
5
Mean Radius
Benign
Malignant
Diagnosis


Violin Plot of Diagnosis vs. Mean Area Values
0
1
2500
2000
1500
1000
500
0
Mean Area
Benign
Malignant
Diagnosis


diagnosis
2.0
1.5
1.0
0.5
0.0
0.1
0.2
0.3
compactness_mean
0.0
0.1
0.2
0.3
0.4
concavity_mean
0.00
0.05
0.10
0.15
0.20
concave points_mean


diagnosis
2
1
0
1000
2000
area_mean
50
100
150
perimeter_mean
10
15
20
25
radius_mean

```
Mean squared error: 0.08494739844208647
R-squared: 0.6383962036838009
b0 (model intercept)              = -1.3346645166241813
b1 (coeff for compactness)        = 0.4225071269807399
b2 (coeff for concavity)          = 0.6485696045302635
b3 (coeff for concave points)= 8.470875669627944
b4 (coeff for perimeter)          = -0.05294643956330038
b5 (coeff for radius)             = 0.4769109453062004
b6 (coeff for area)               = -0.0010274395335266862
```