```
In [32]:  import seaborn as sns
          from sklearn.datasets import load_breast_cancer
          import pandas as pd
          import matplotlib.pyplot as plt

          breastcancer=load_breast_cancer()

          print("feature names:", breastcancer.feature_names)
```

```
feature names: ['mean radius' 'mean texture' 'mean perimeter' 'mean area'
 'mean smoothness' 'mean compactness' 'mean concavity'
 'mean concave points' 'mean symmetry' 'mean fractal dimension'
 'radius error' 'texture error' 'perimeter error' 'area error'
 'smoothness error' 'compactness error' 'concavity error'
 'concave points error' 'symmetry error' 'fractal dimension error'
 'worst radius' 'worst texture' 'worst perimeter' 'worst area'
 'worst smoothness' 'worst compactness' 'worst concavity'
 'worst concave points' 'worst symmetry' 'worst fractal dimension']
```

```
In [45]:  df=pd.DataFrame(breastcancer.data,columns=breastcancer.feature_names)

          df['target']=breastcancer.target
          df['target_umkodiert']=df['target'].map({0:'maligne', 1:'benigne'})
```

```
In [41]:  df.describe()
```

Out[41]:

	mean radius	mean texture	mean perimeter	mean area	mean smoothness	mean compactness	co
count	569.000000	569.000000	569.000000	569.000000	569.000000	569.000000	569.
mean	14.127292	19.289649	91.969033	654.889104	0.096360	0.104341	0.
std	3.524049	4.301036	24.298981	351.914129	0.014064	0.052813	0.
min	6.981000	9.710000	43.790000	143.500000	0.052630	0.019380	0.
25%	11.700000	16.170000	75.170000	420.300000	0.086370	0.064920	0.
50%	13.370000	18.840000	86.240000	551.100000	0.095870	0.092630	0.
75%	15.780000	21.800000	104.100000	782.700000	0.105300	0.130400	0.
max	28.110000	39.280000	188.500000	2501.000000	0.163400	0.345400	0.

8 rows × 31 columns

```
In [46]:  exclude=['target', 'target_umkodiert']

          for variable in df:
              if variable not in exclude:
                  sns.boxplot(data=df,y=variable,hue='target_umkodiert',palette='Set2')
                  plt.title(f"Boxplot of {variable}")
                  plt.show()
```

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
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\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
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  positions = grouped.grouper.result_index.to_numpy(dtype=float)
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  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
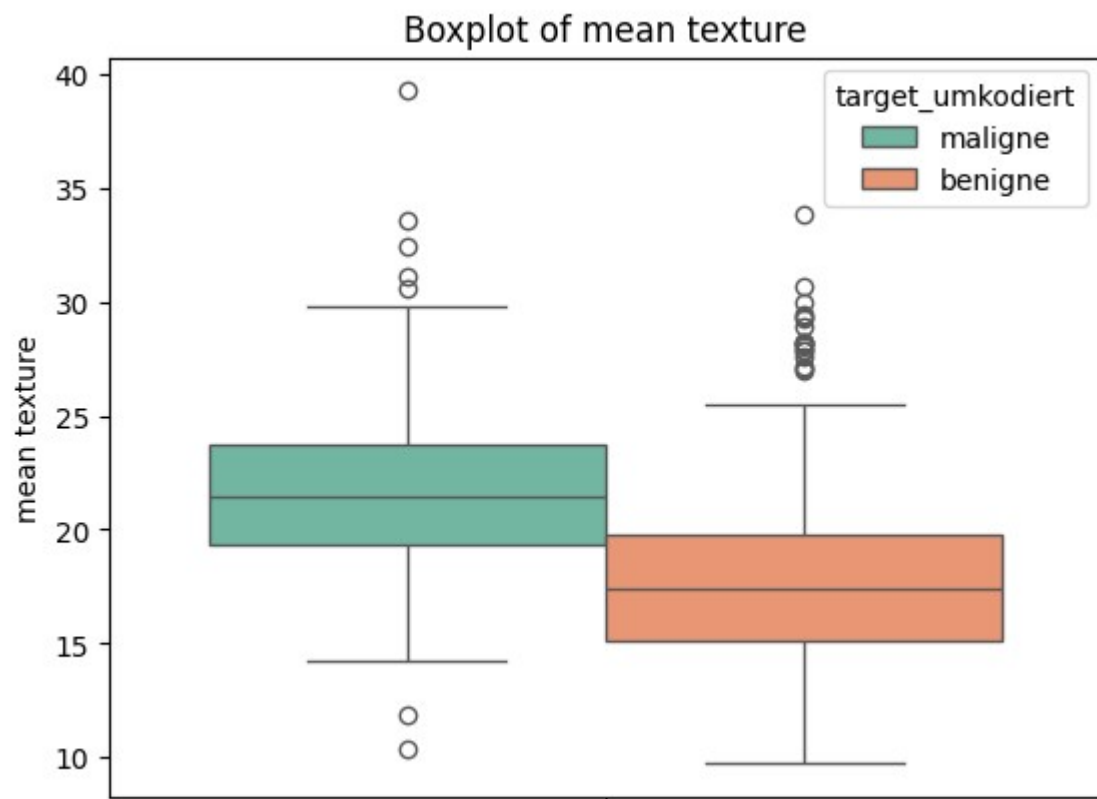

Boxplot of mean radius

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
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  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```


Boxplot of mean texture

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
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c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
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  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
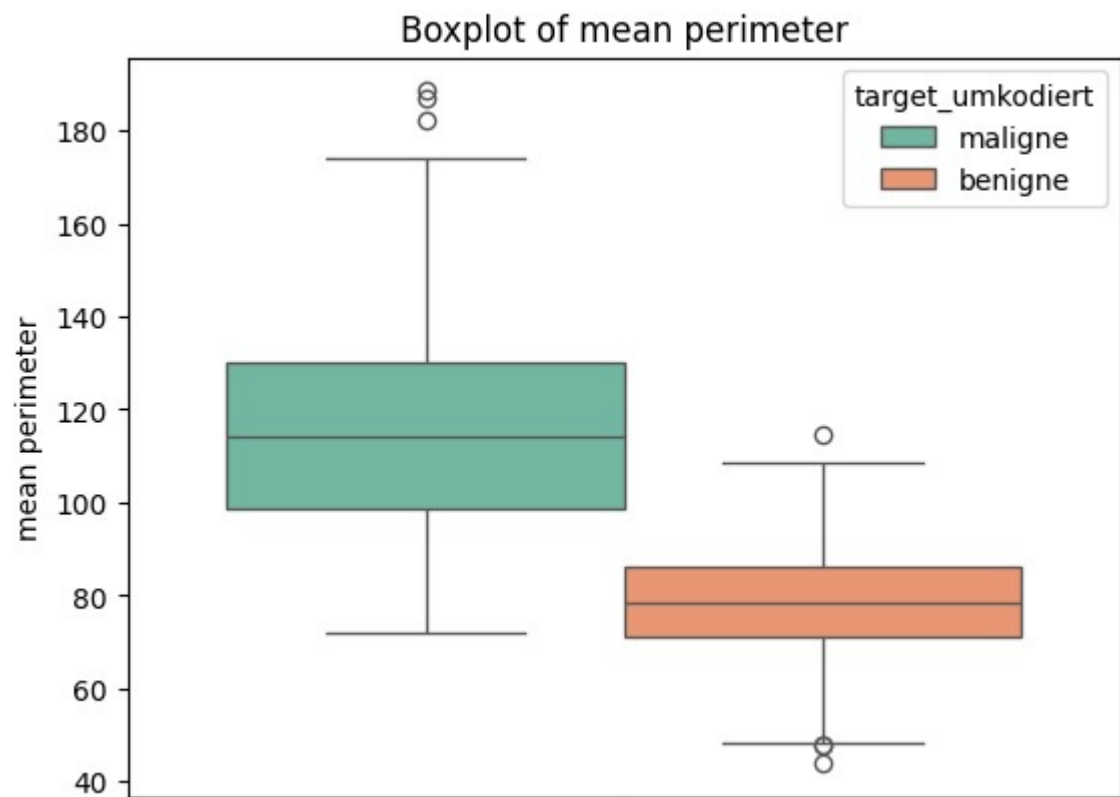

Boxplot of mean perimeter

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
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  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
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c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
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  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
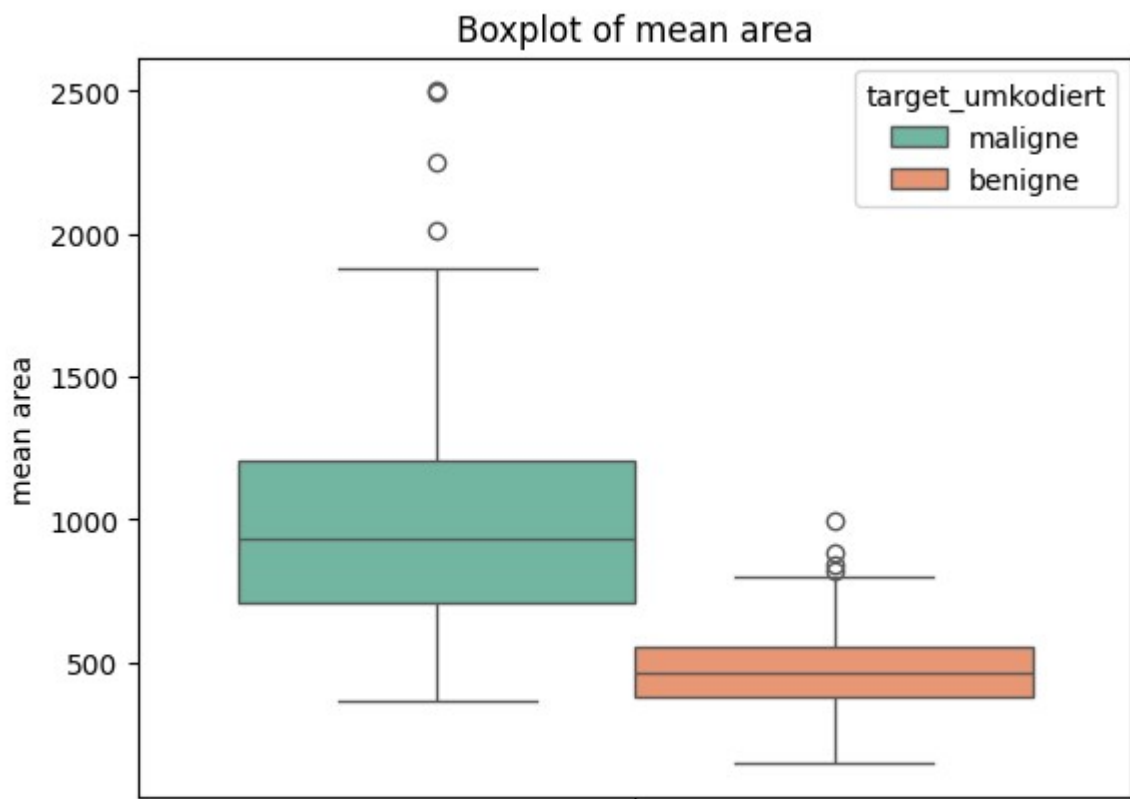

Boxplot of mean area

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
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c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
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c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
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  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
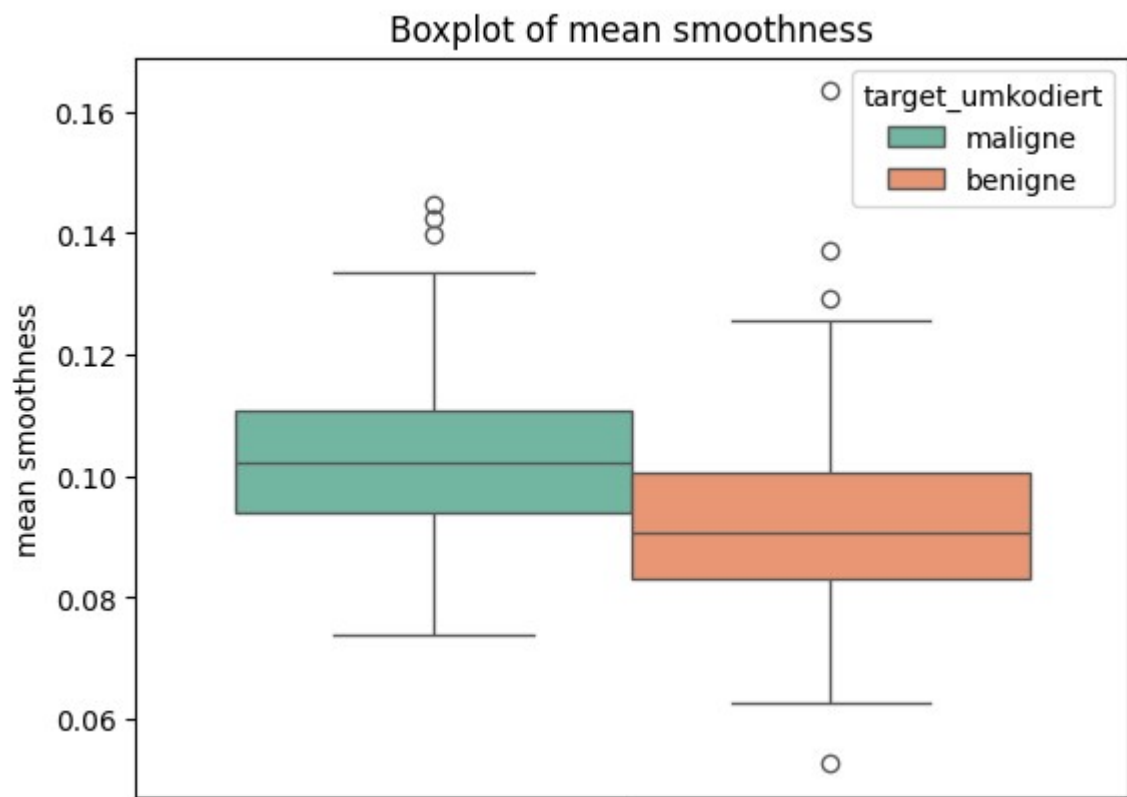

Boxplot of mean smoothness

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
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\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
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\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
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  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
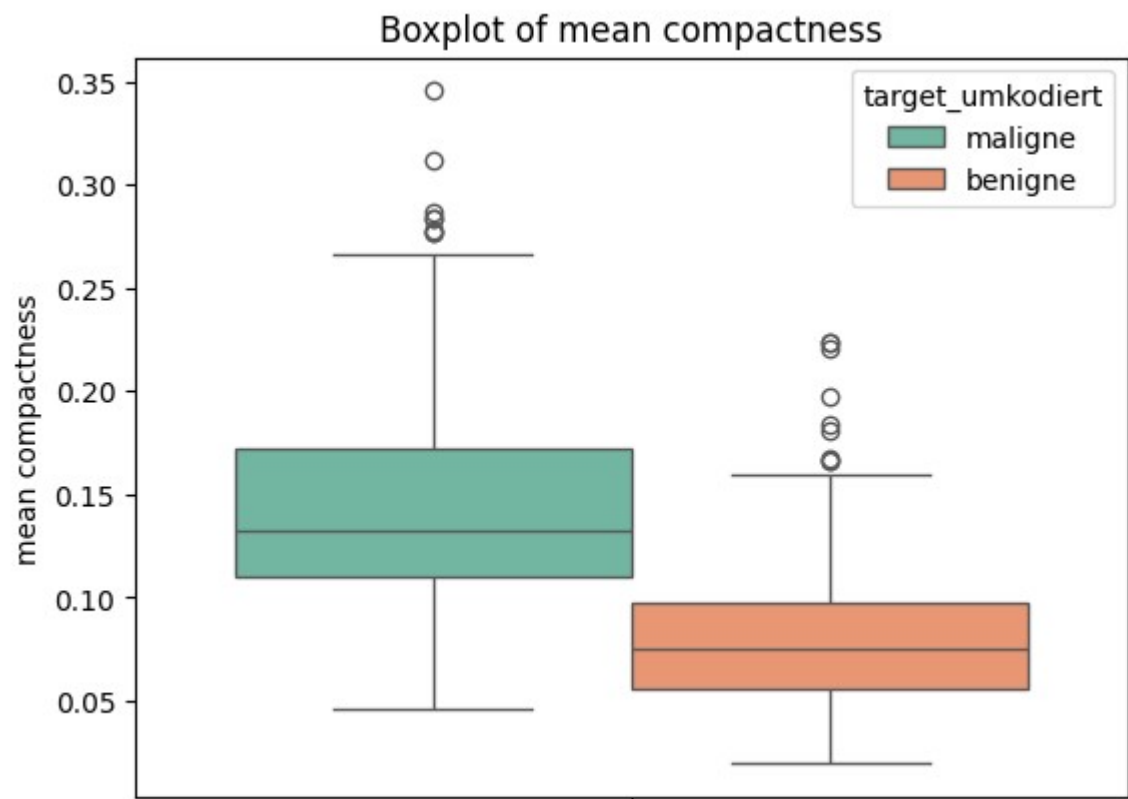

Boxplot of mean compactness

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
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c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
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\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
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  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
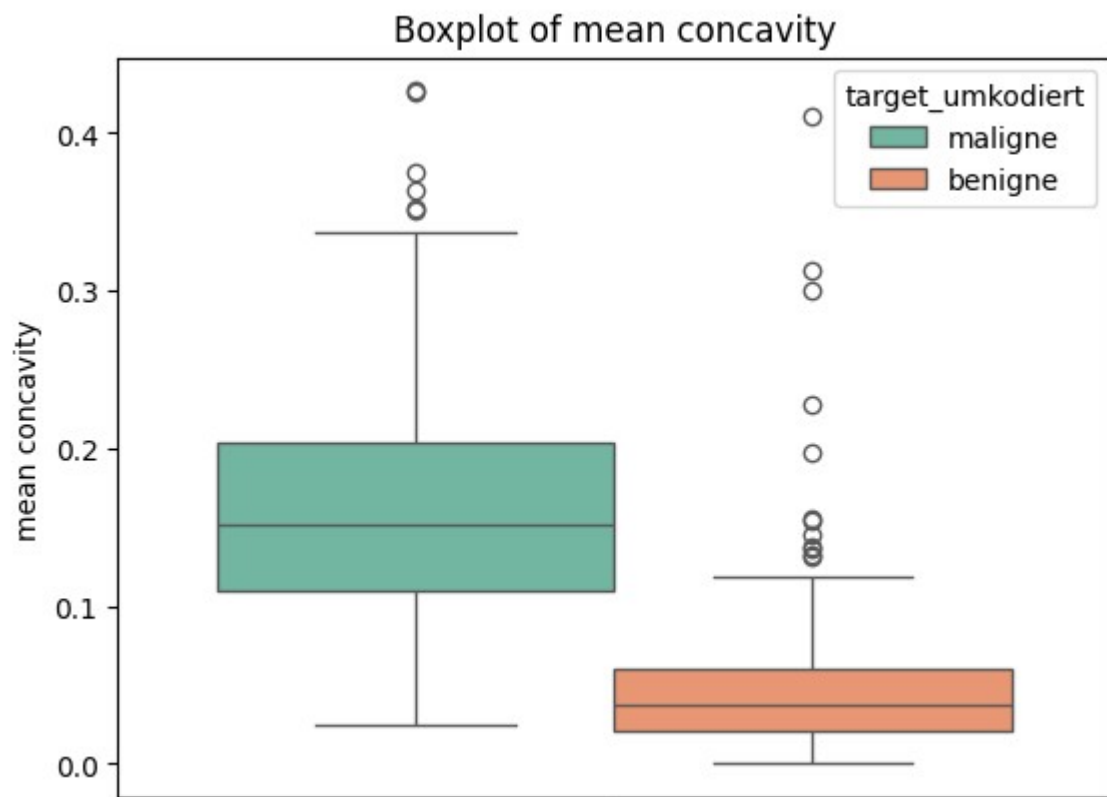

Boxplot of mean concavity

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
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\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
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\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
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c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
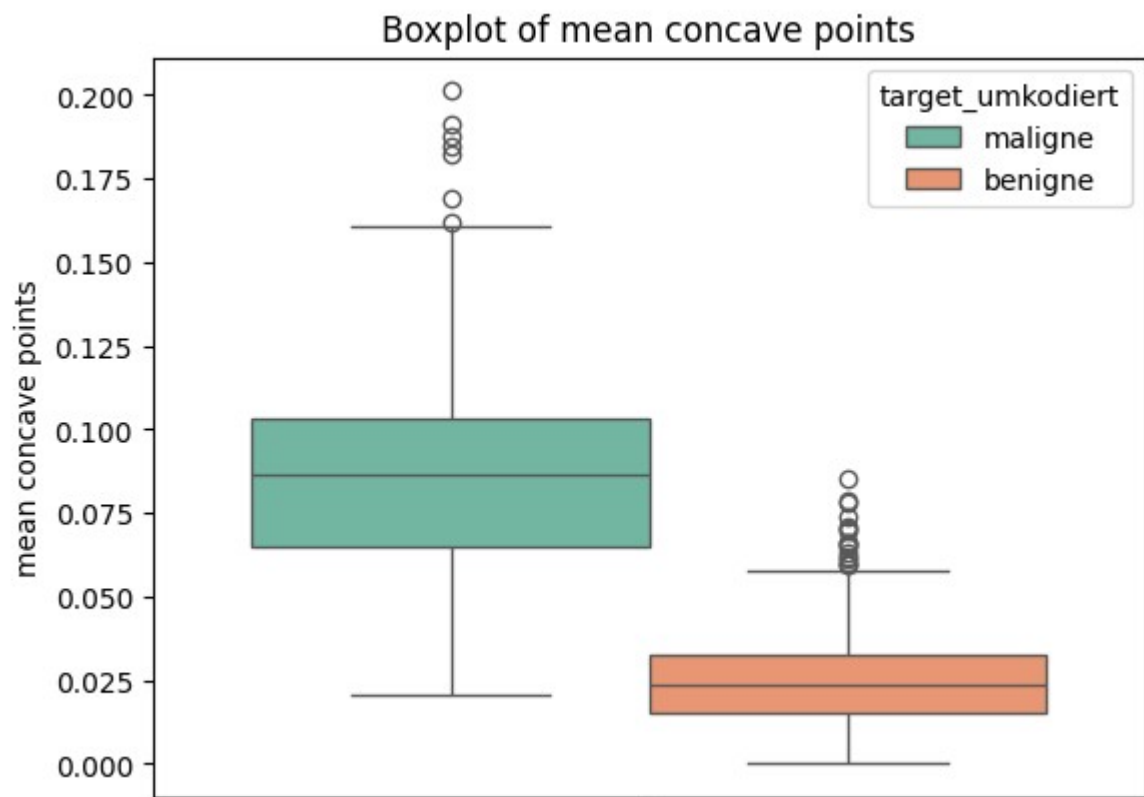

Boxplot of mean concave points

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
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c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
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c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
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c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
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  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
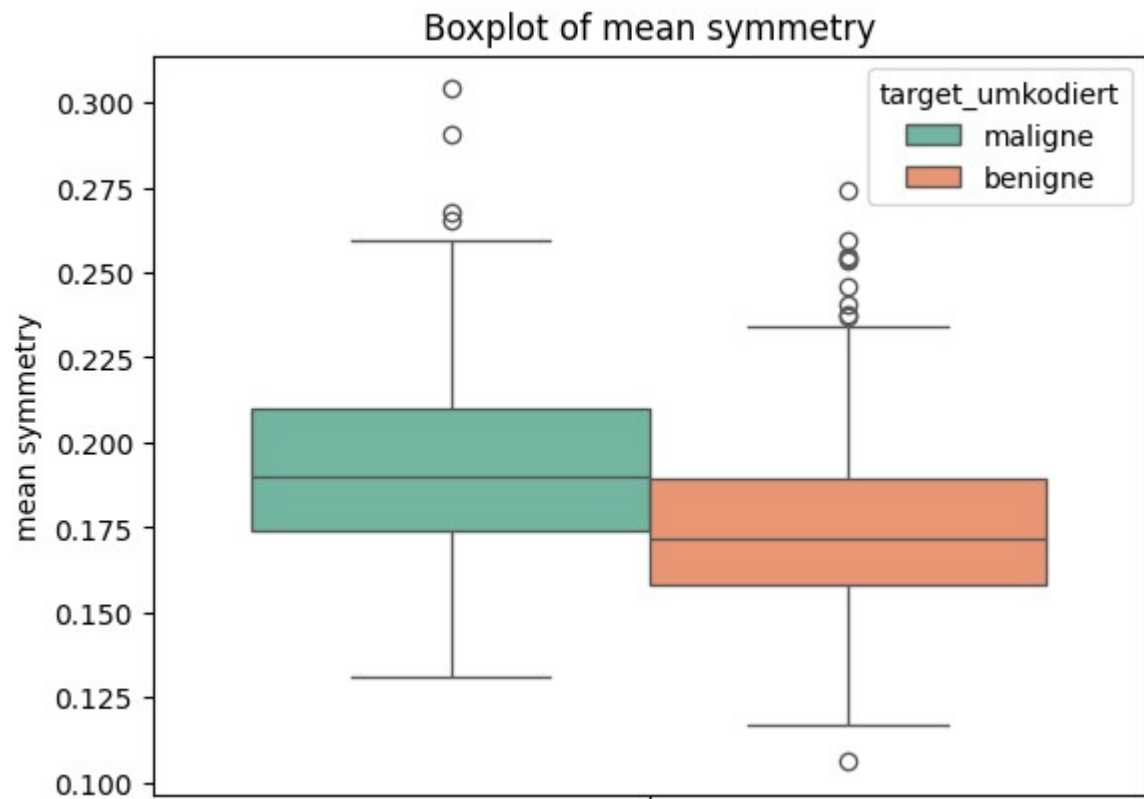

Boxplot of mean symmetry

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
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\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
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c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
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\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
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  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
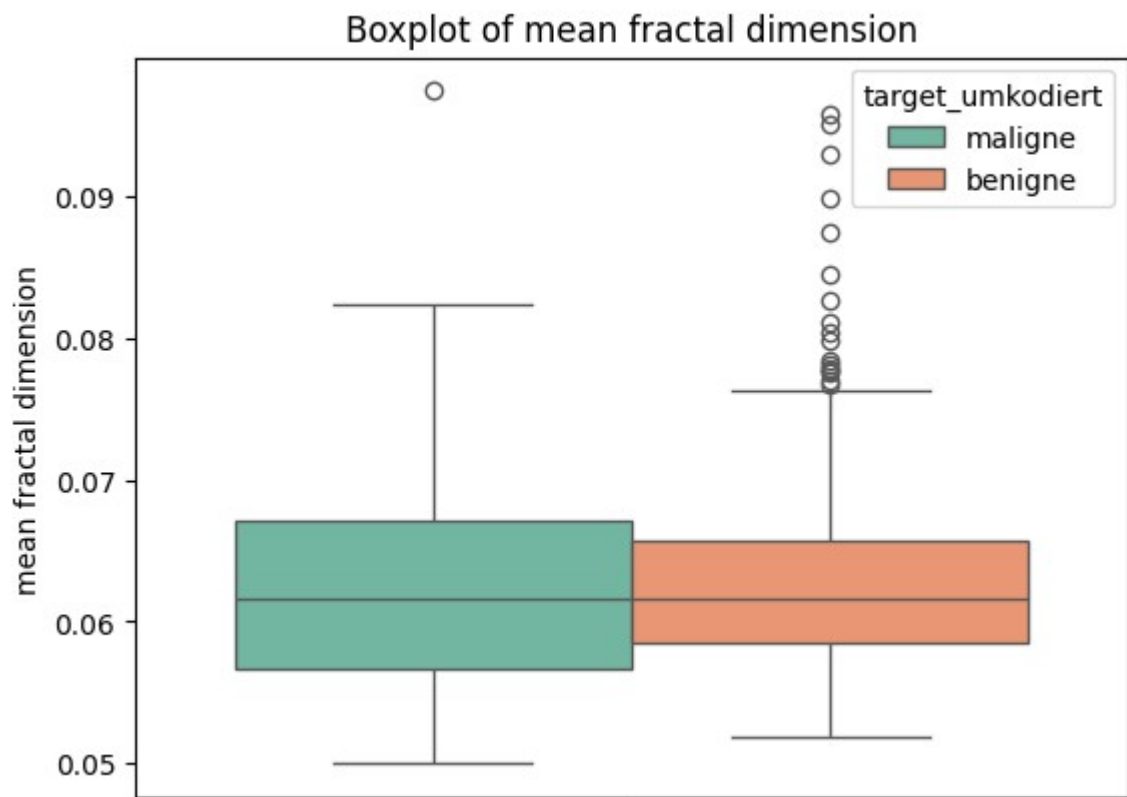

Boxplot of mean fractal dimension

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
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\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
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\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
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  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
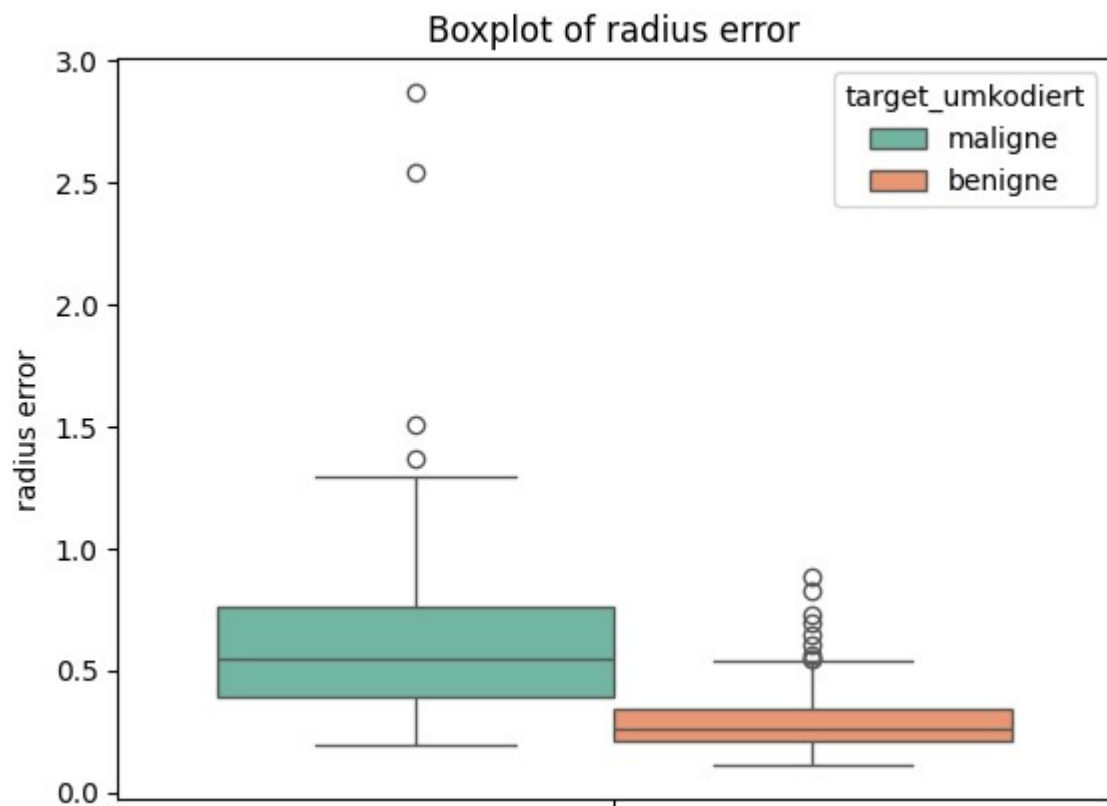

Boxplot of radius error

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
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c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
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c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
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  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
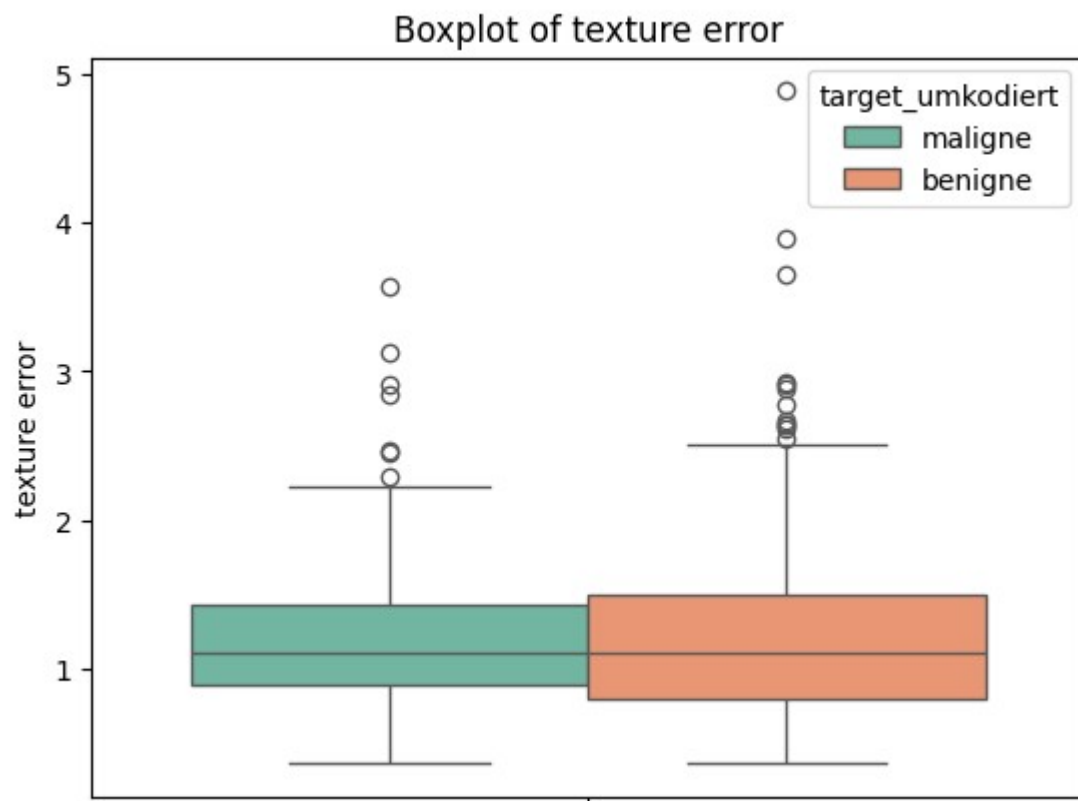

Boxplot of texture error

SVM1 - Breastcancer

file:///C:/Users/goex1/Desktop/DS%20Projekte%20f%C3%BCr%2...

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
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c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
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  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
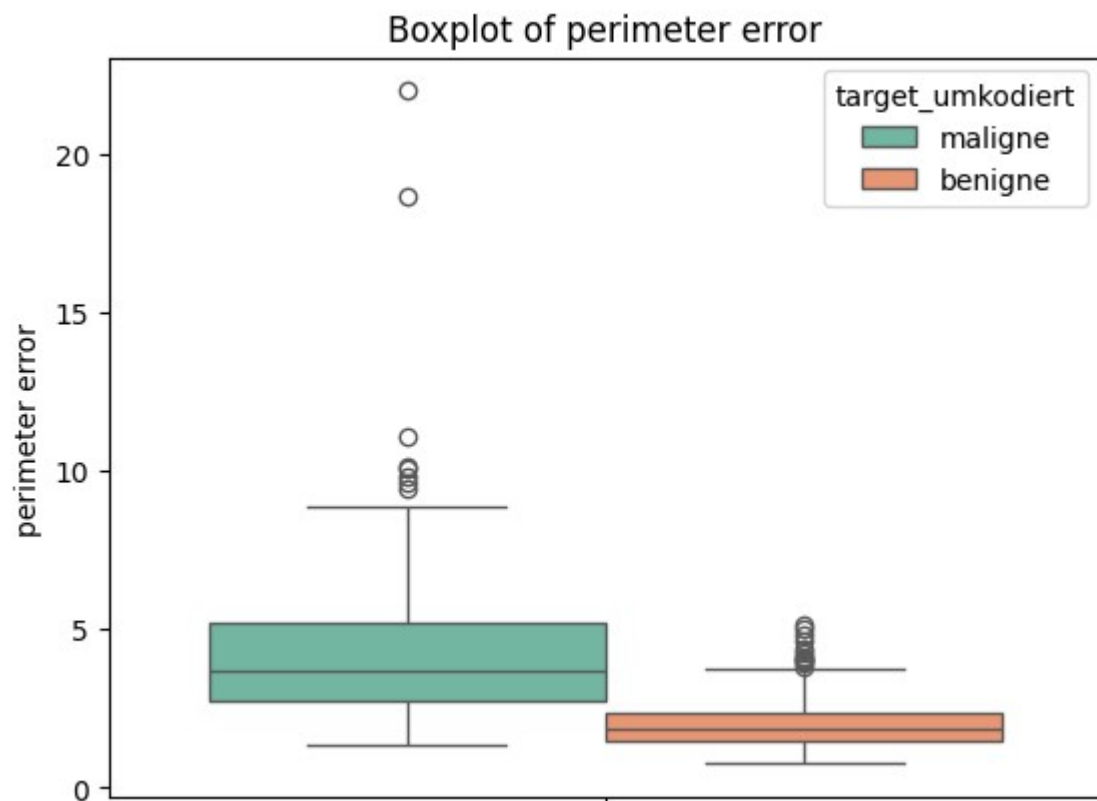

Boxplot of perimeter error

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
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  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
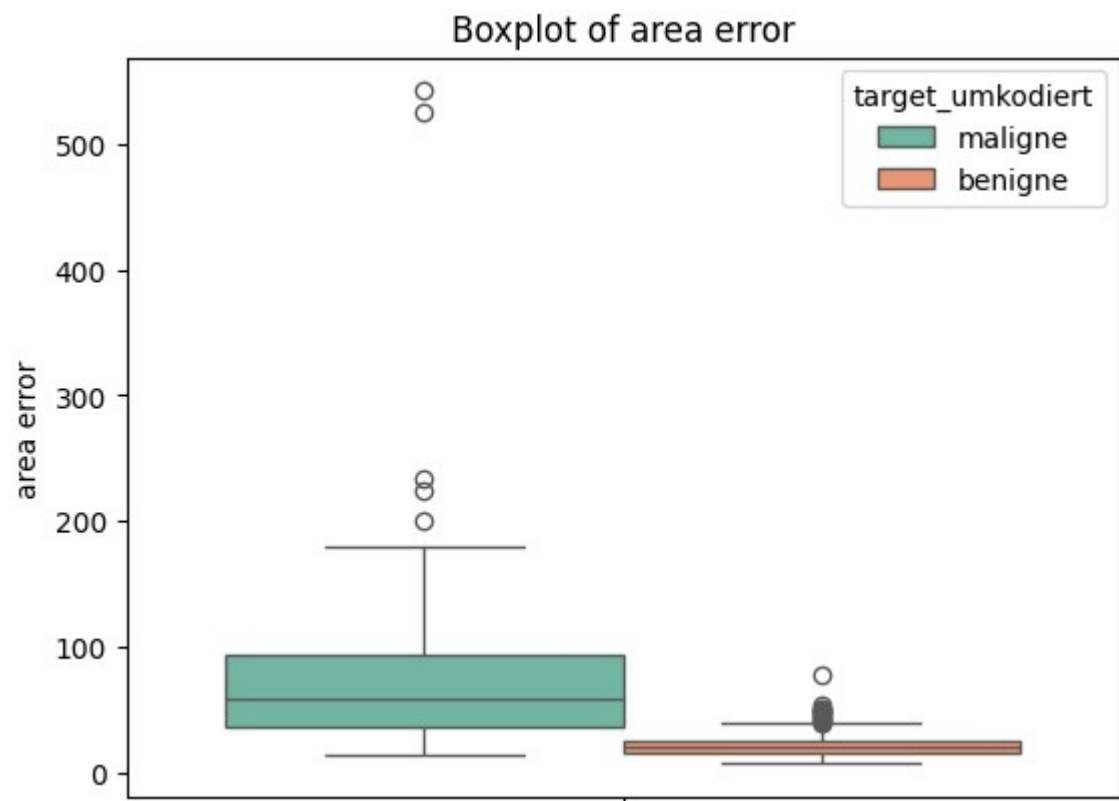

Boxplot of area error

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
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\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
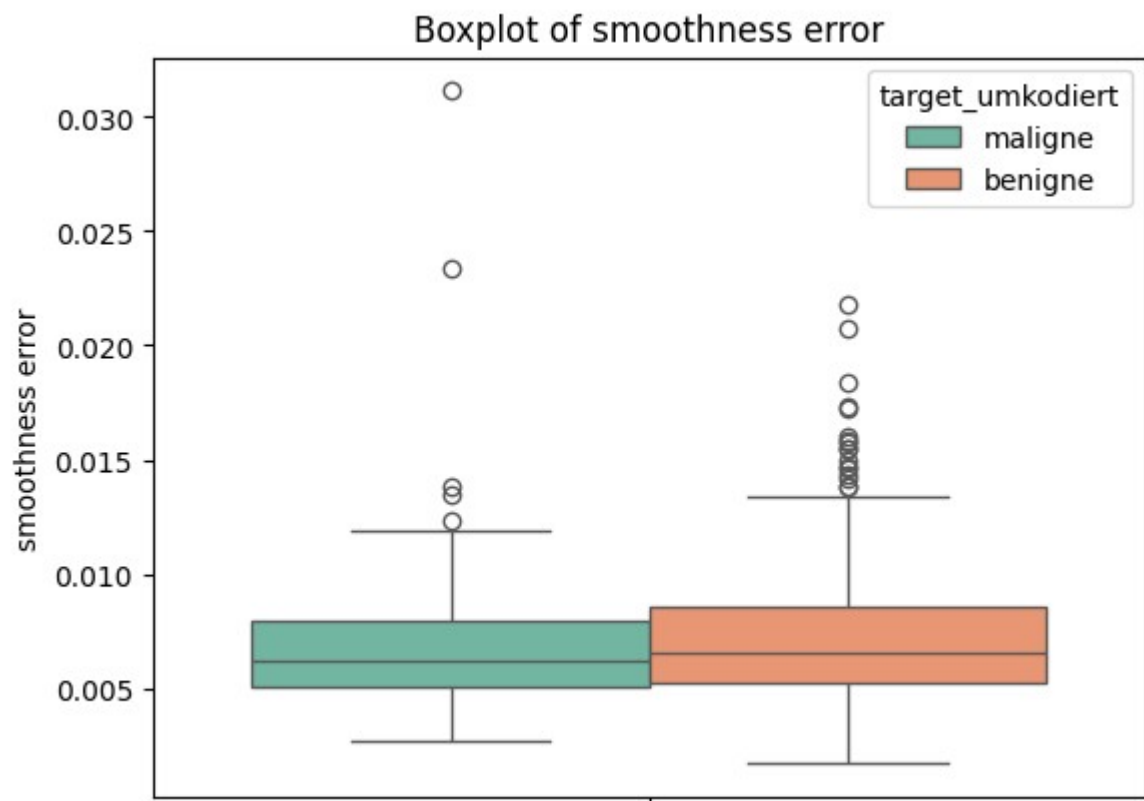

Boxplot of smoothness error

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
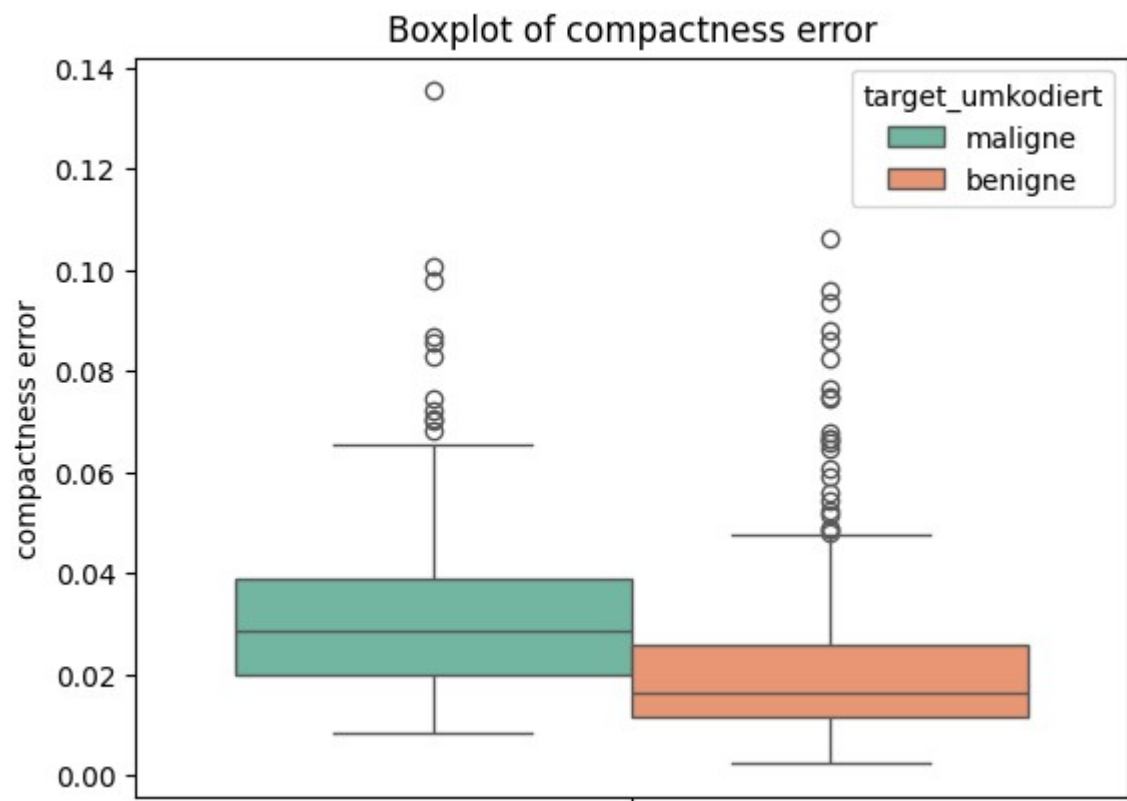

Boxplot of compactness error

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
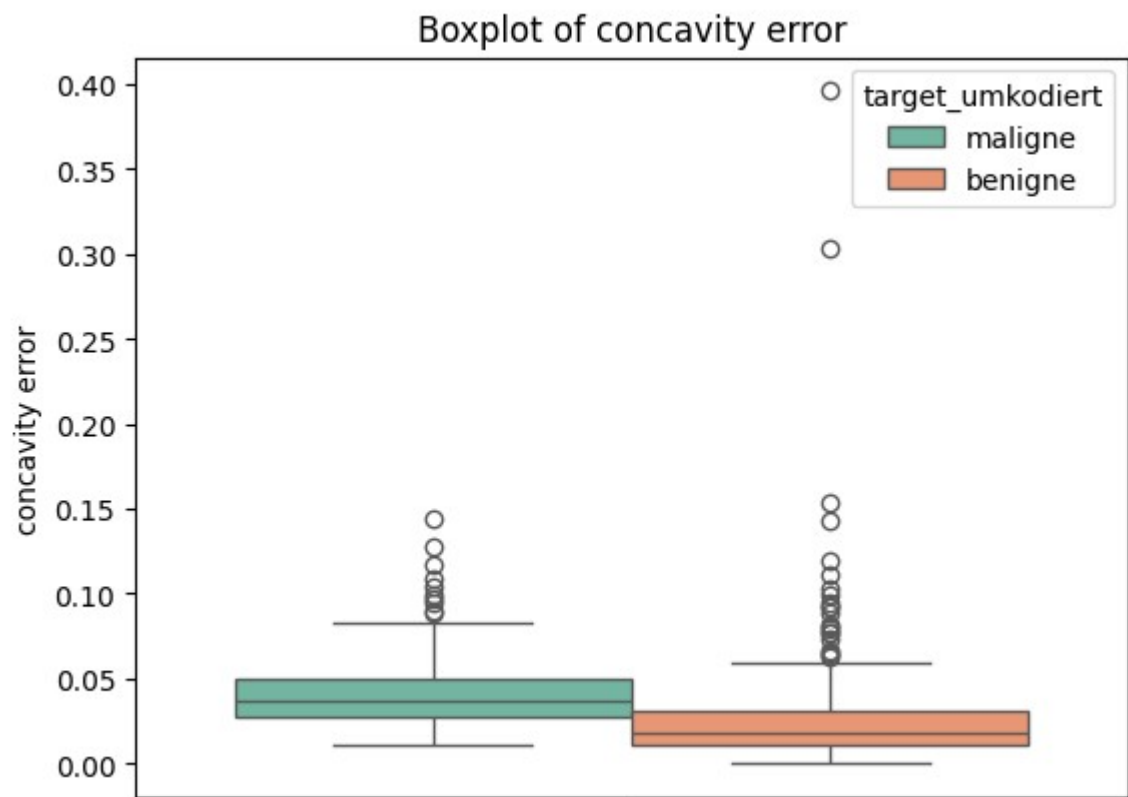

Boxplot of concavity error

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
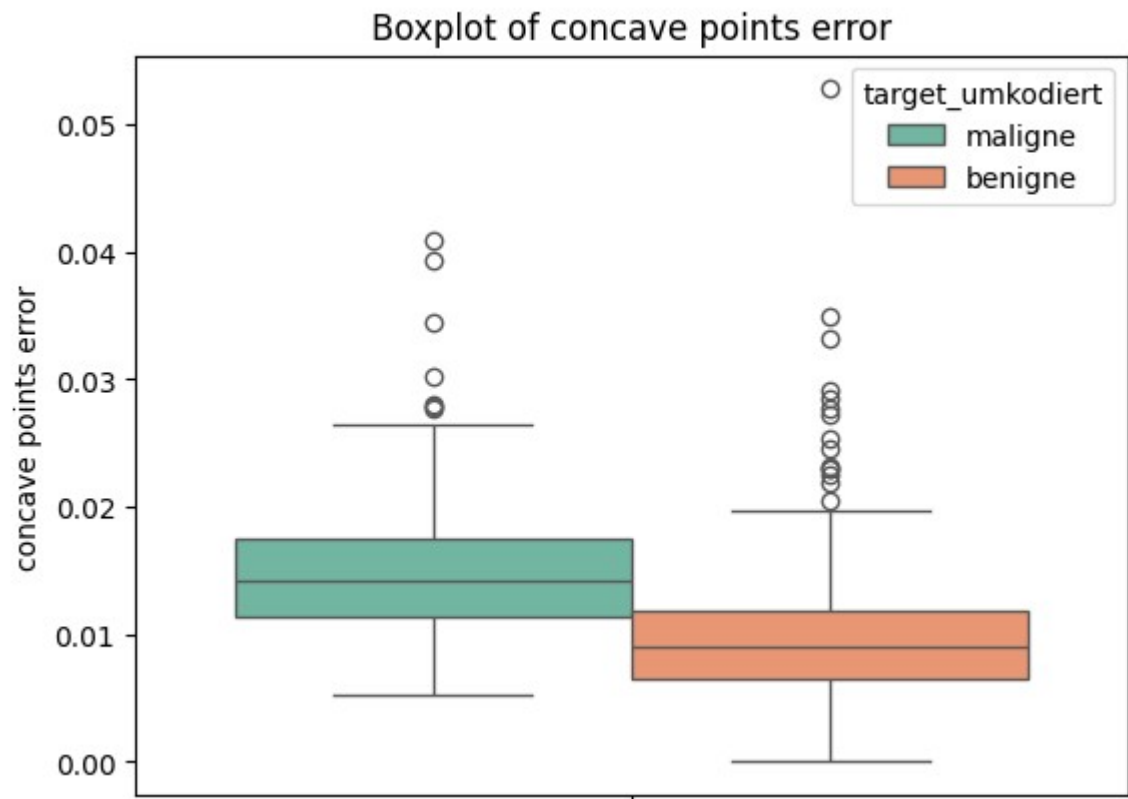

Boxplot of concave points error

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
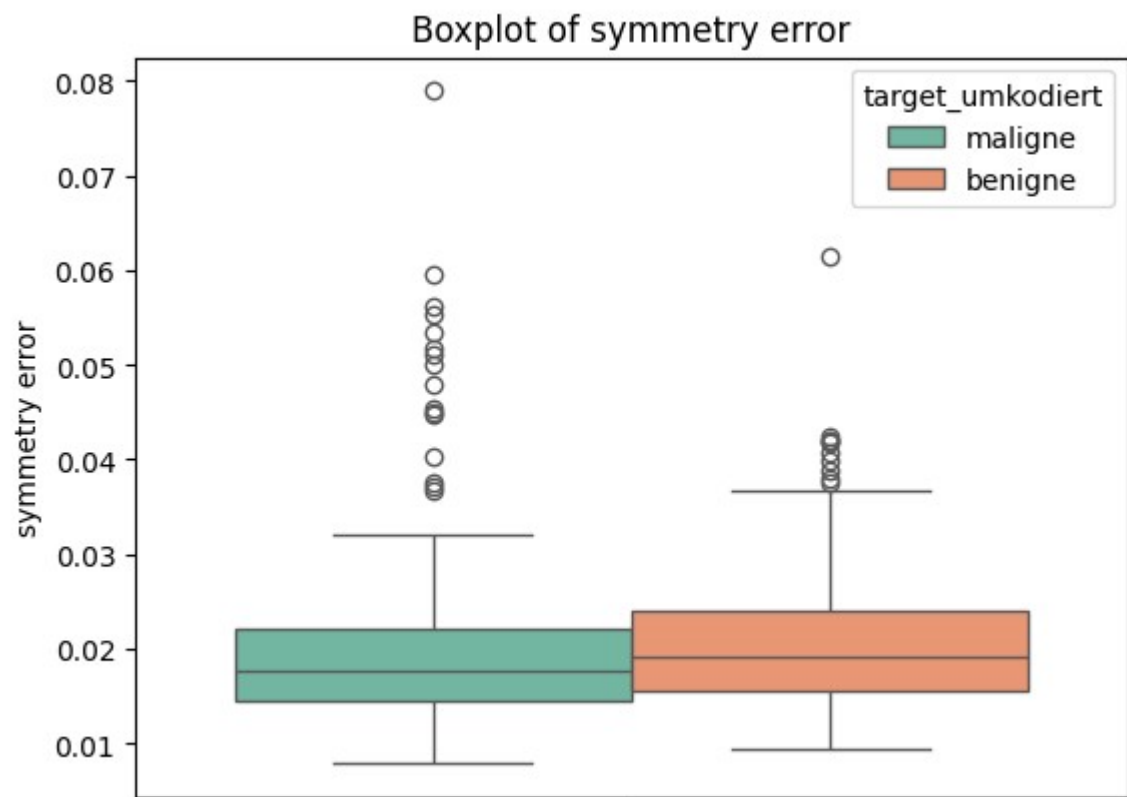

Boxplot of symmetry error

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
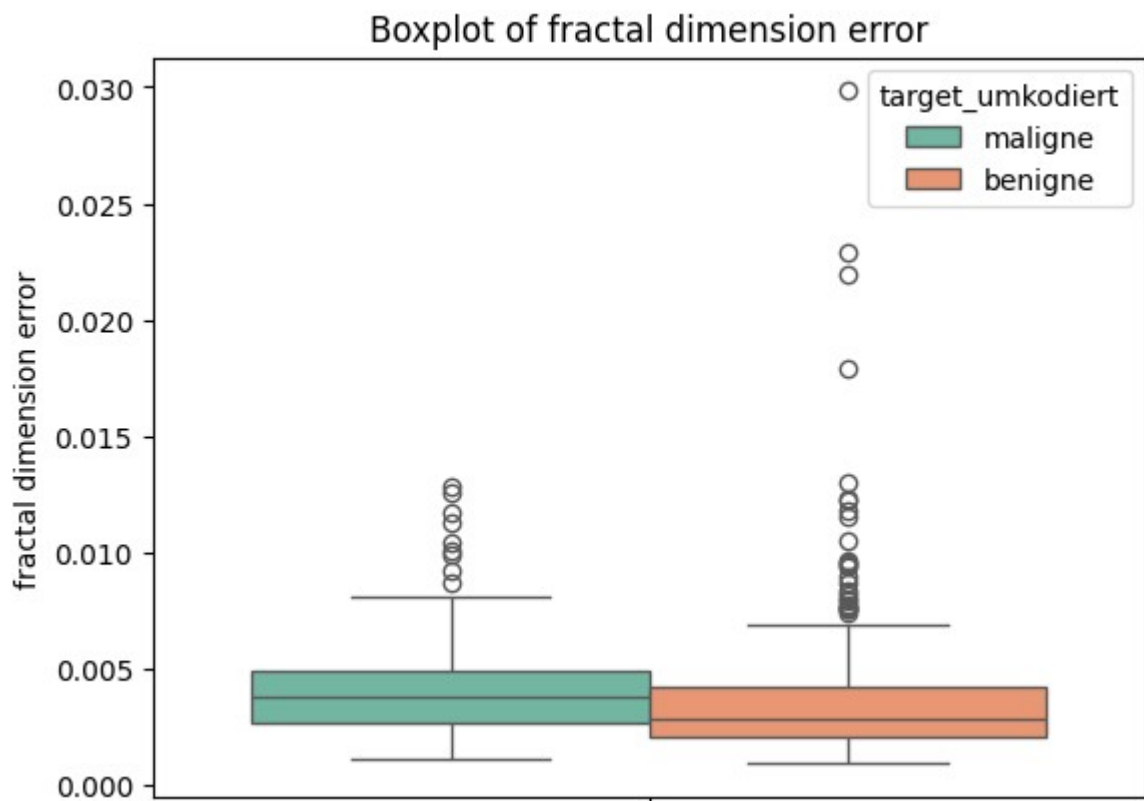

Boxplot of fractal dimension error

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
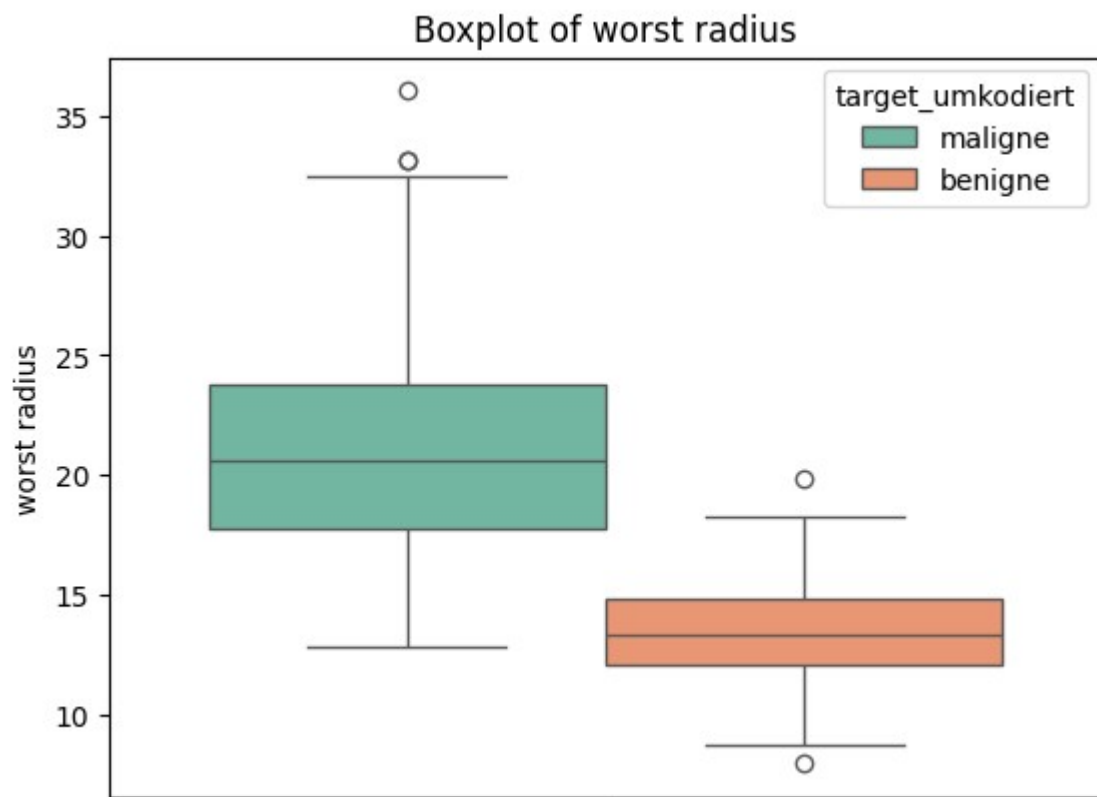

Boxplot of worst radius

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
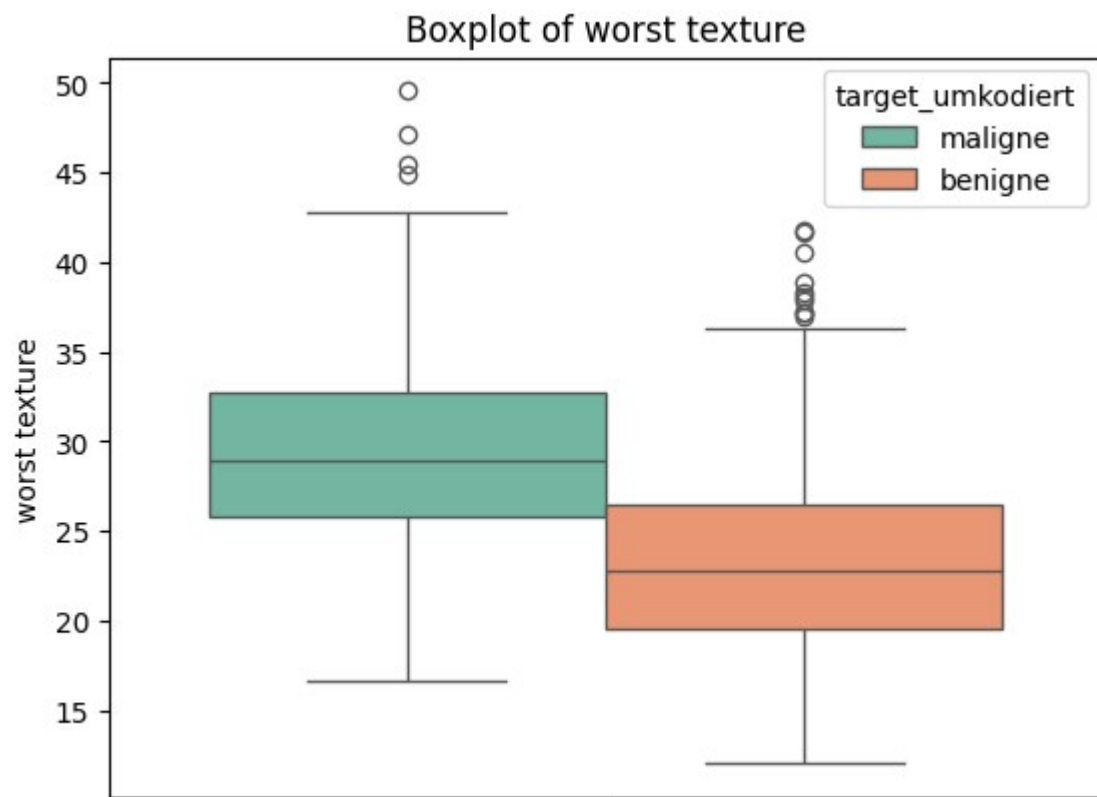

Boxplot of worst texture

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
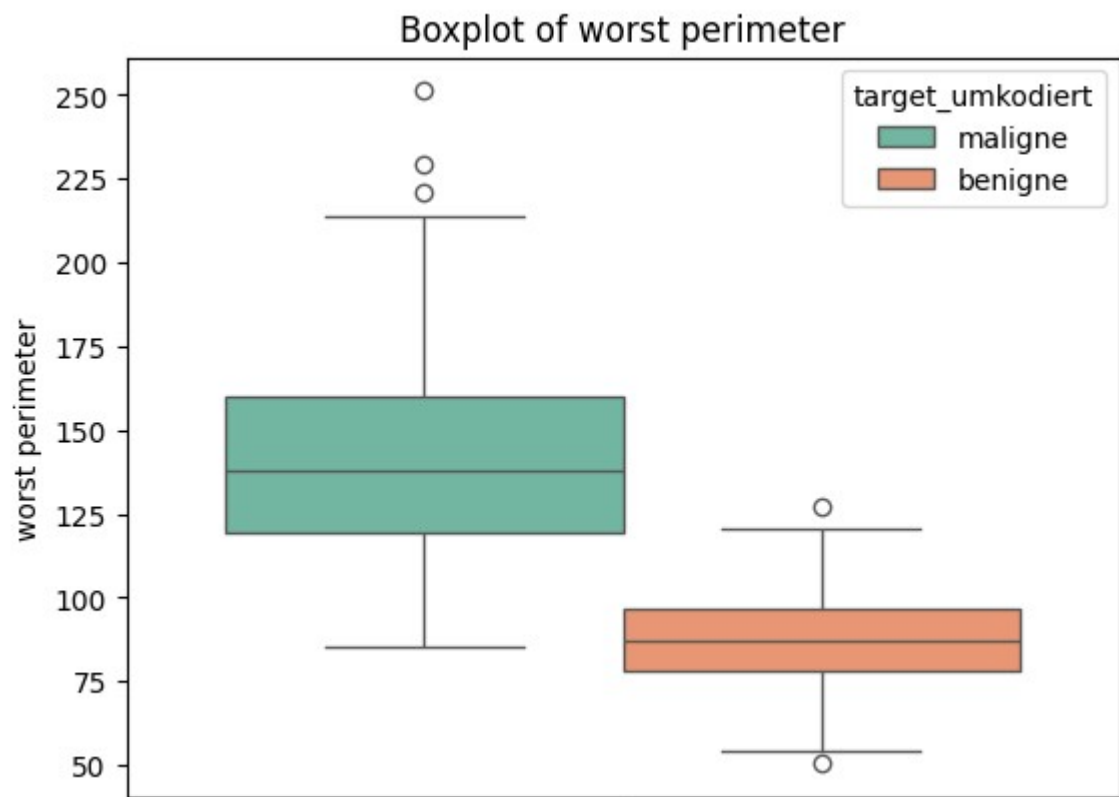

Boxplot of worst perimeter

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
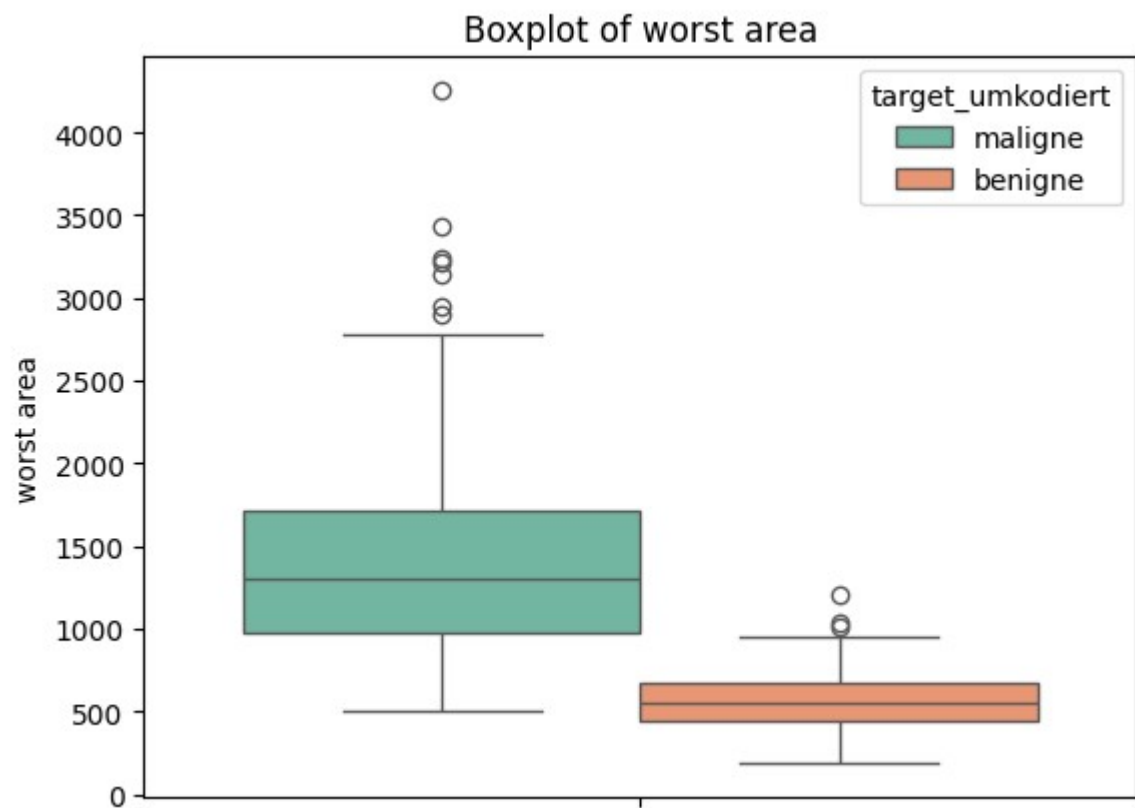

Boxplot of worst area

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
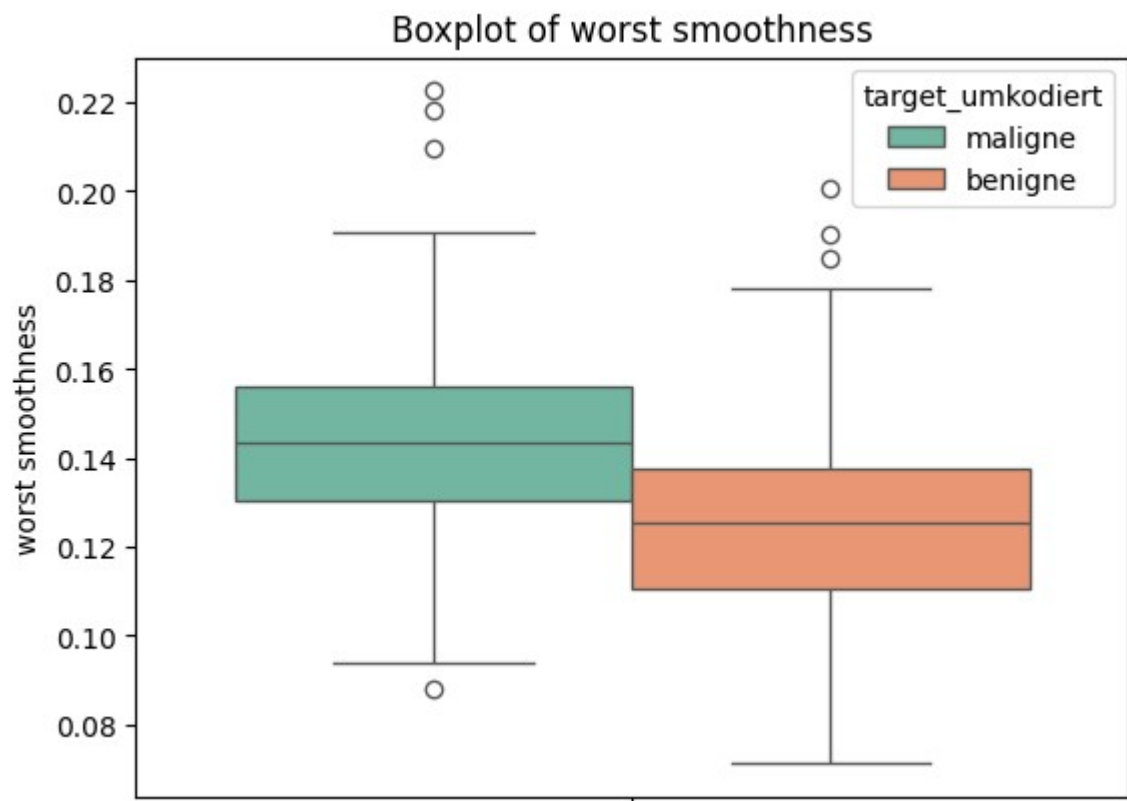

Boxplot of worst smoothness

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
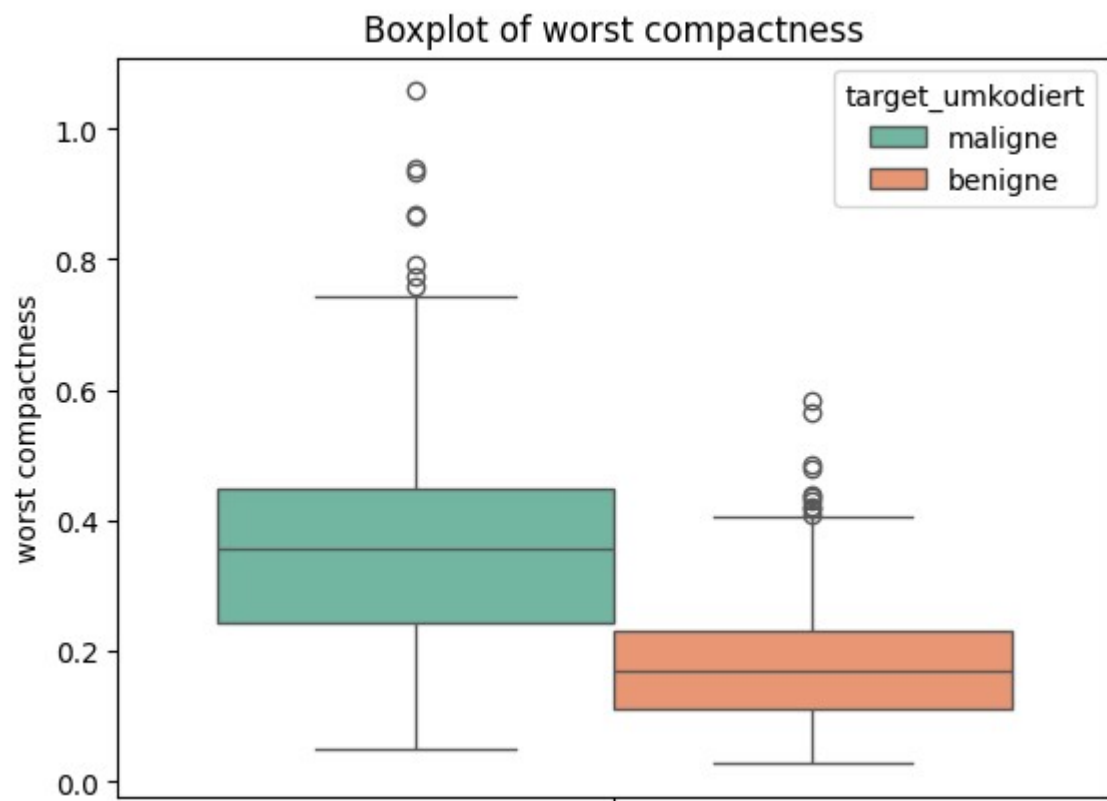

Boxplot of worst compactness

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
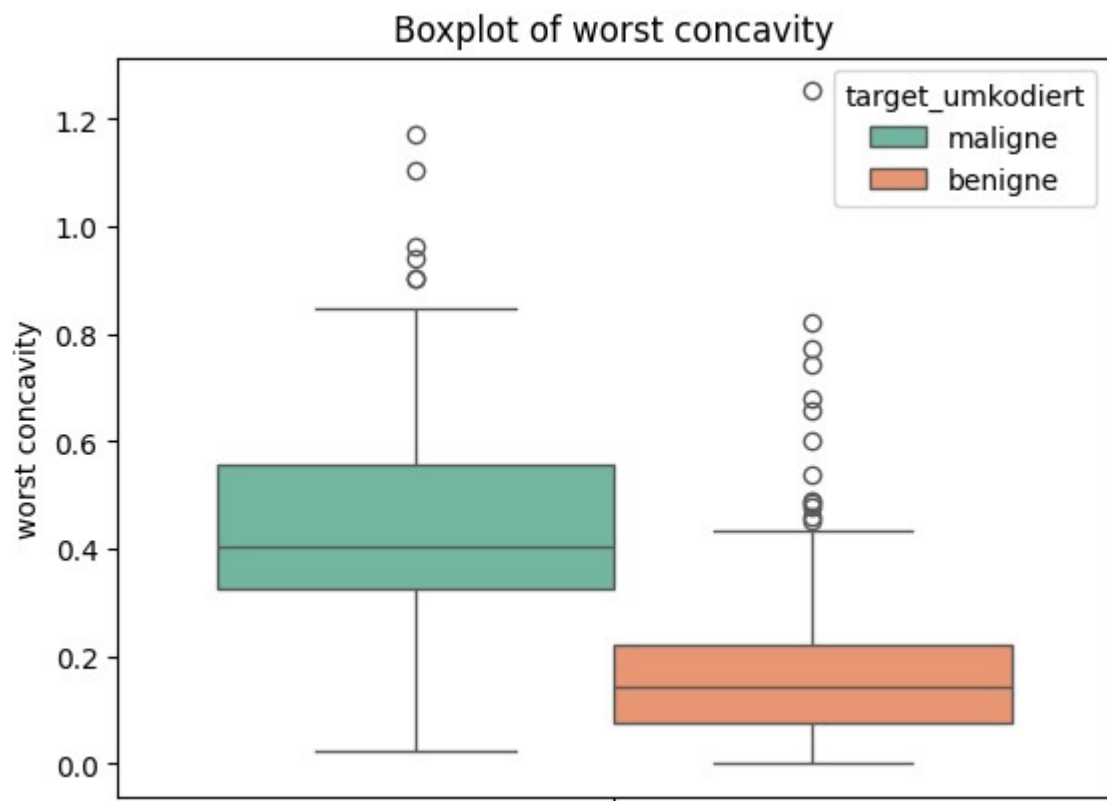

Boxplot of worst concavity

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
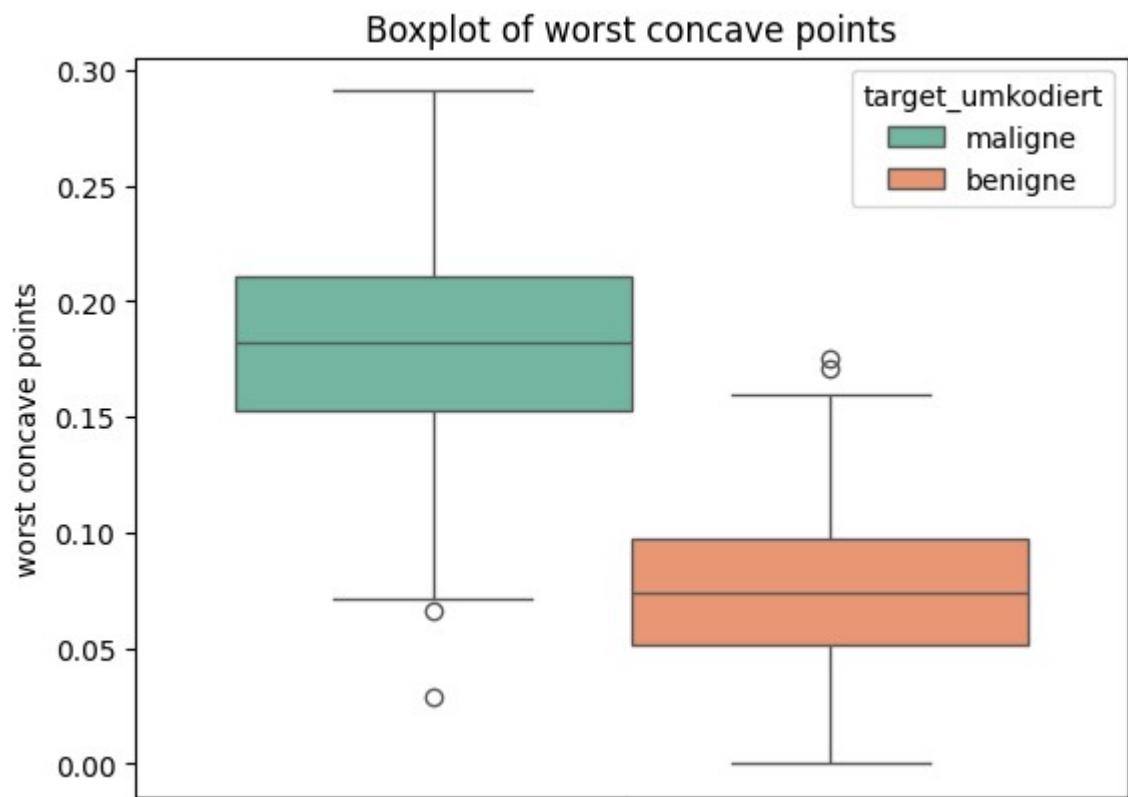

Boxplot of worst concave points

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
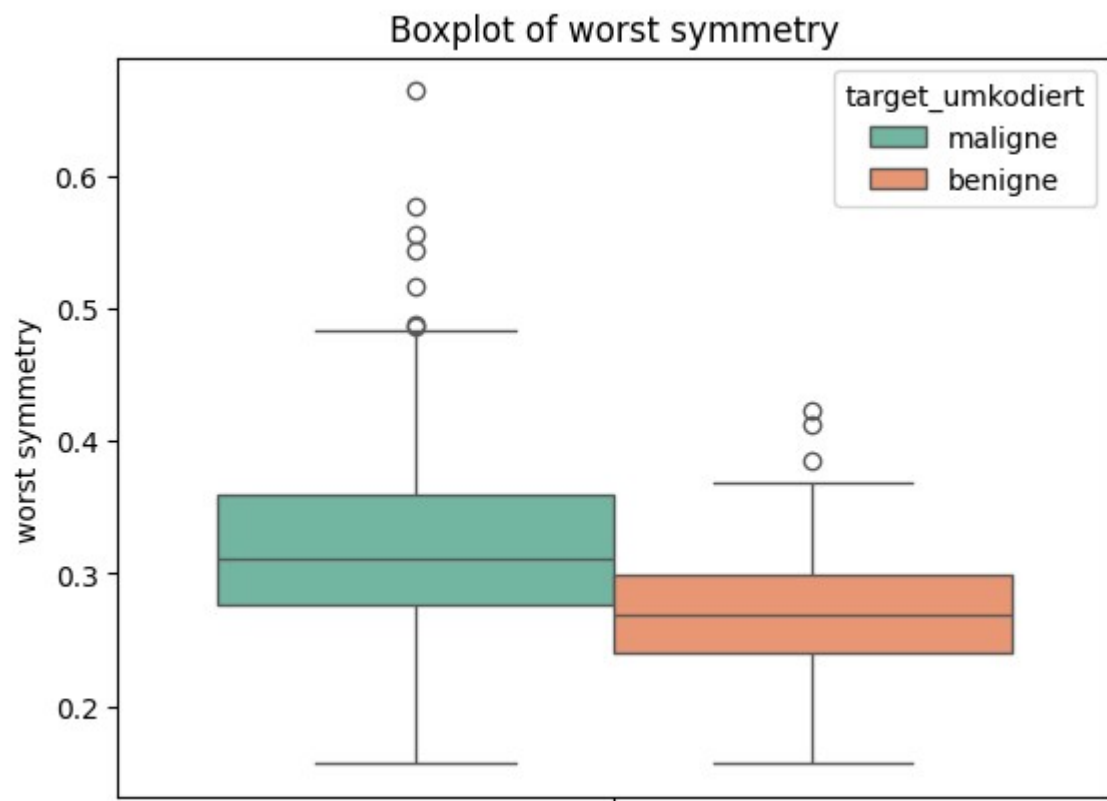

Boxplot of worst symmetry

```
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\_base.py:949: FutureWarning: When grouping with a length-1 list-like, you will n
eed to pass a length-1 tuple to get_group in a future version of pandas. Pass `(n
ame,)` instead of `name` to silence this warning.
  data_subset = grouped_data.get_group(pd_key)
c:\Users\goex1\AppData\Local\Programs\Python\Python313\Lib\site-packages\seaborn
\categorical.py:640: FutureWarning: SeriesGroupBy.grouper is deprecated and will
be removed in a future version of pandas.
  positions = grouped.grouper.result_index.to_numpy(dtype=float)
```
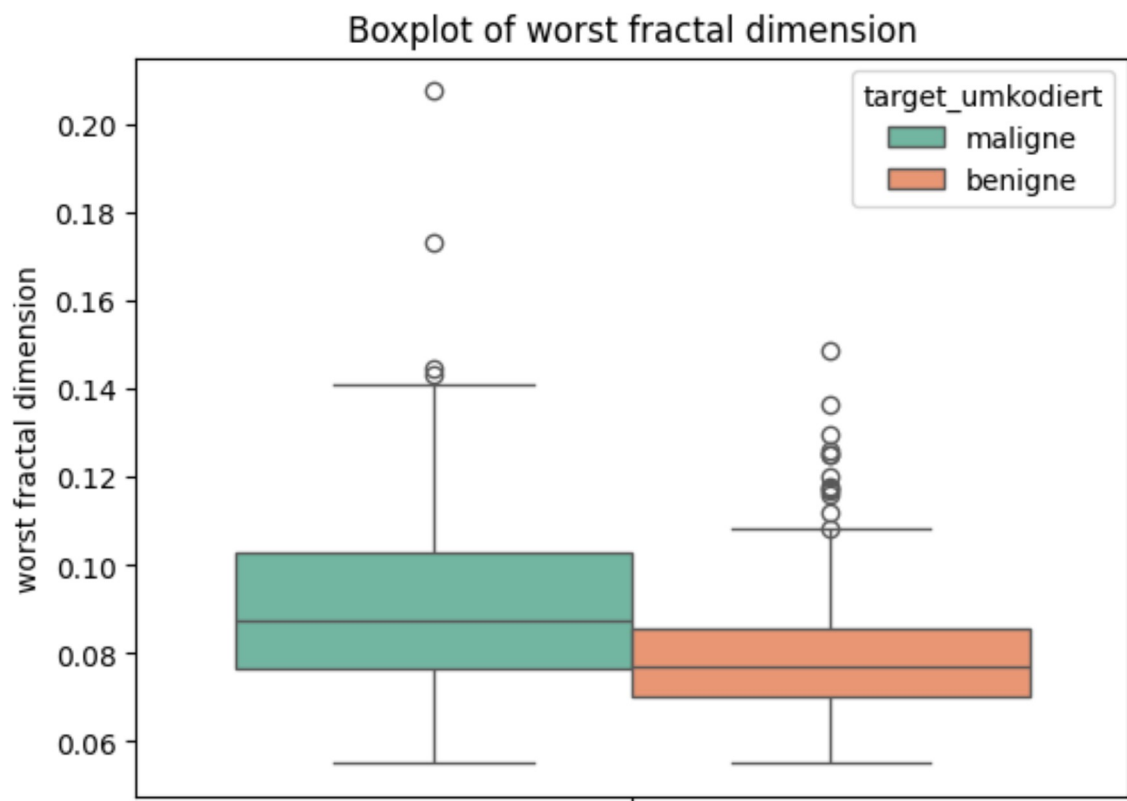

Preprocessing train test split and standardscaler

```
In [49]:  X=df.drop(['target', 'target_umkodiert'],axis=1)
          y=df['target']

          from sklearn.model_selection import train_test_split

          X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_
```

```
In [50]:  from sklearn.preprocessing import StandardScaler

          scaler=StandardScaler()

          X_train_scaled=scaler.fit_transform(X_train)
```

```
X_test_scaled=scaler.fit_transform(X_test)
```

In [51]:
```python
from sklearn.svm import SVC

SVMModel=SVC(kernel='rbf',C=1, gamma='scale', random_state=42)
SVMModel.fit(X_train_scaled,y_train)
```

Out[51]:
```
▼          SVC          ⓘ ⓘ

SVC(C=1, random_state=42)
```

In [53]:
```python
# Genauigkeit auf Trainings- und Testdaten
train_acc = SVMModel.score(X_train_scaled, y_train)
test_acc = SVMModel.score(X_test_scaled, y_test)

print(f"Train Accuracy: {train_acc:.3f}")
print(f"Test Accuracy: {test_acc:.3f}")
```

```
Train Accuracy: 0.989
Test Accuracy: 0.982
```

In [56]:
```python
from sklearn.metrics import classification_report, confusion_matrix

y_pred = SVMModel.predict(X_test_scaled)

print(classification_report(y_test, y_pred))
print(confusion_matrix(y_test, y_pred))
```

```
              precision    recall  f1-score   support

           0       1.00      0.95      0.98        43
           1       0.97      1.00      0.99        71

    accuracy                           0.98       114
   macro avg       0.99      0.98      0.98       114
weighted avg       0.98      0.98      0.98       114

[[41  2]
 [ 0 71]]
```