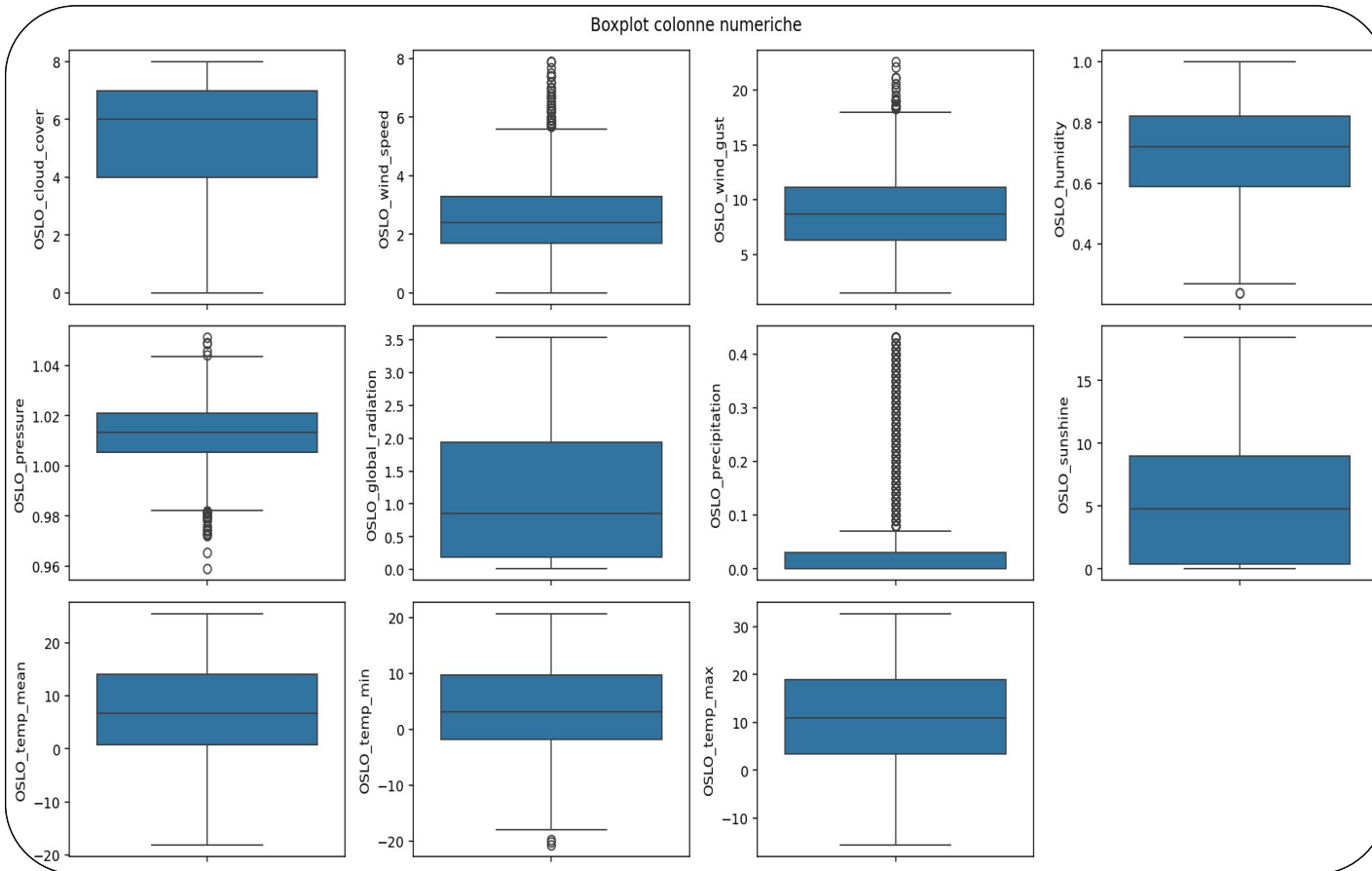


Nome feature	Descrizione	Unità di misura
_cloud_cover	Nuvolosità	okta
_wind_speed	Velocità vento	1 m/s
_wind_gust	Velocità raffiche di vento	1 m/s
_humidity	Umidità	1 %
_pressure	Pressione	1000 hPa
_global_radiation	Irraggiamento	W/m ²
_precipitation	Precipitazioni	10 mm
_sunshine	Ore di luce	0.1 h
_temp_mean	Temperatura media	°C
_temp_min	Temperatura minima	°C
_temp_max	Temperatura massima	°C

Weather dataset

Filippo Bucciarelli
Dataset reference on [Github](#)

- ➔ 3654 registrazioni giornaliere
- ➔ 18 città, 17 con classificazione
- ➔ 165 parametri meteorologici registrati (massimo 11 per città)



- null
- NaN
- duplicates

Record rimossi

```
df[df[f"{citta}_sunshine"] < 20]
df[~((df[f"{citta}_temp_min"] < 0) &
(df["MONTH"].isin([6, 7, 8])))]
```

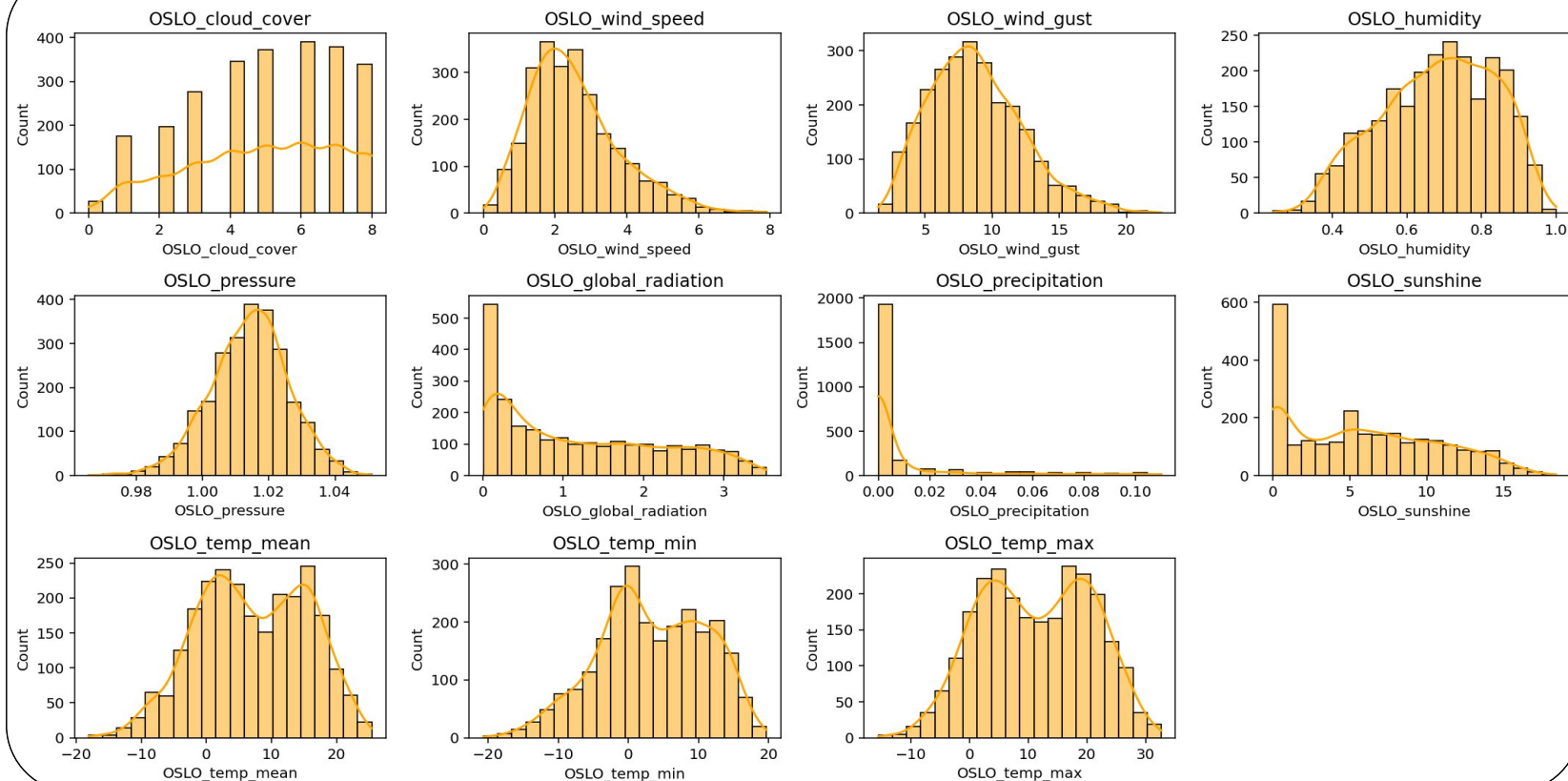
Valori errati

- wind_speed
- wind_gust
- humidity
- pressure
- precipitation

Rimozione outliers sospetti

Pre-Processing

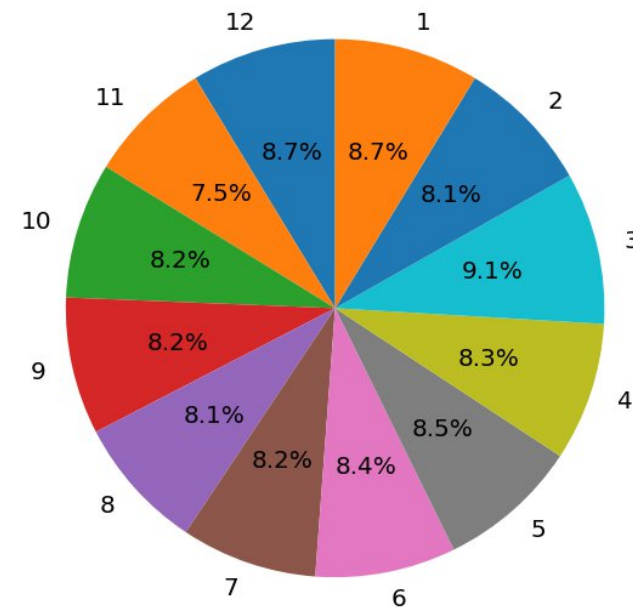
Distribuzione valori feature



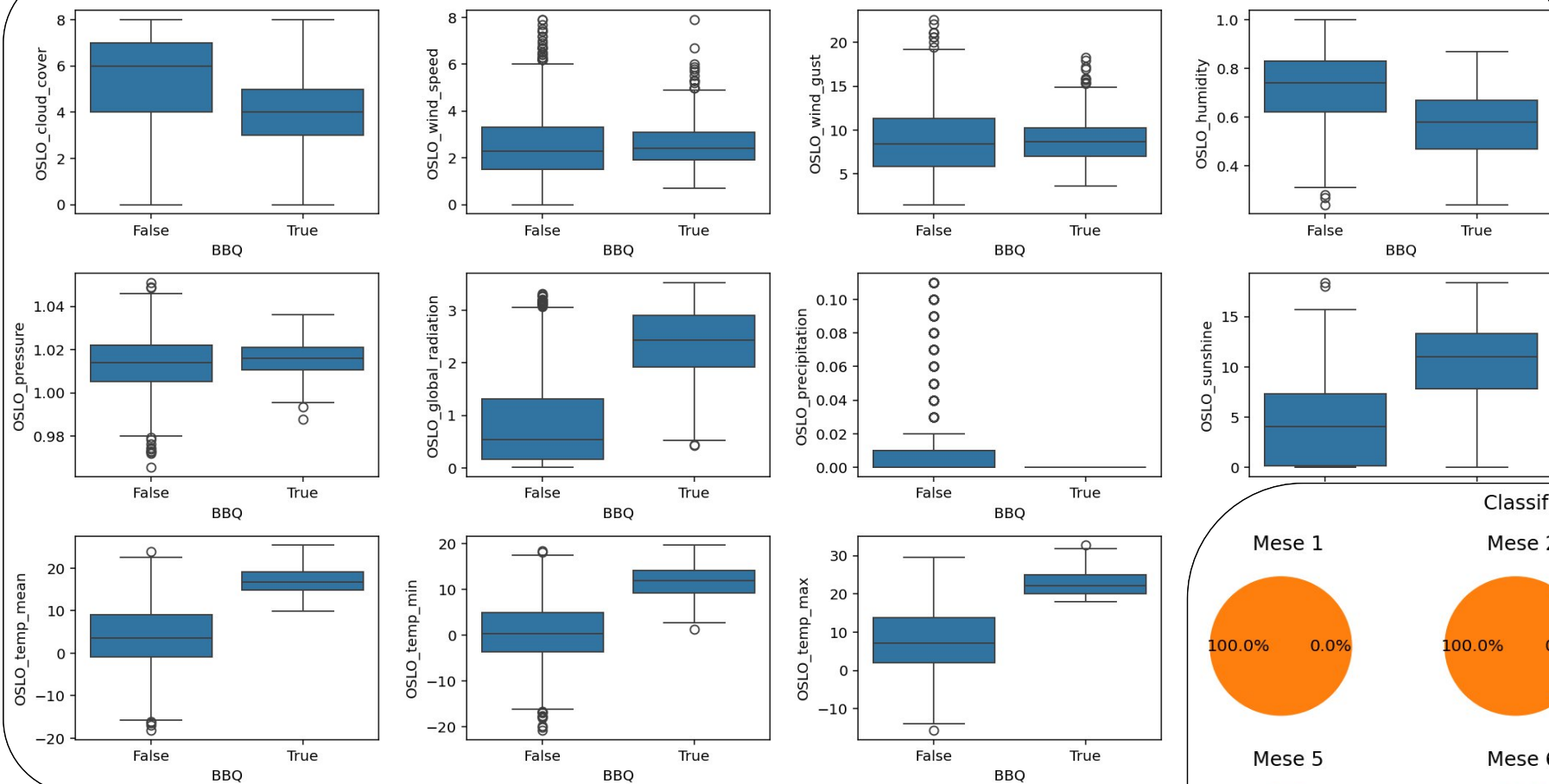
EDA

Distribuzione valori

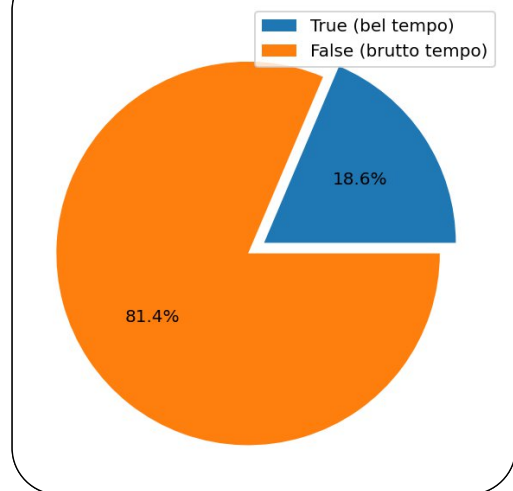
Distribuzione mensile delle registrazioni



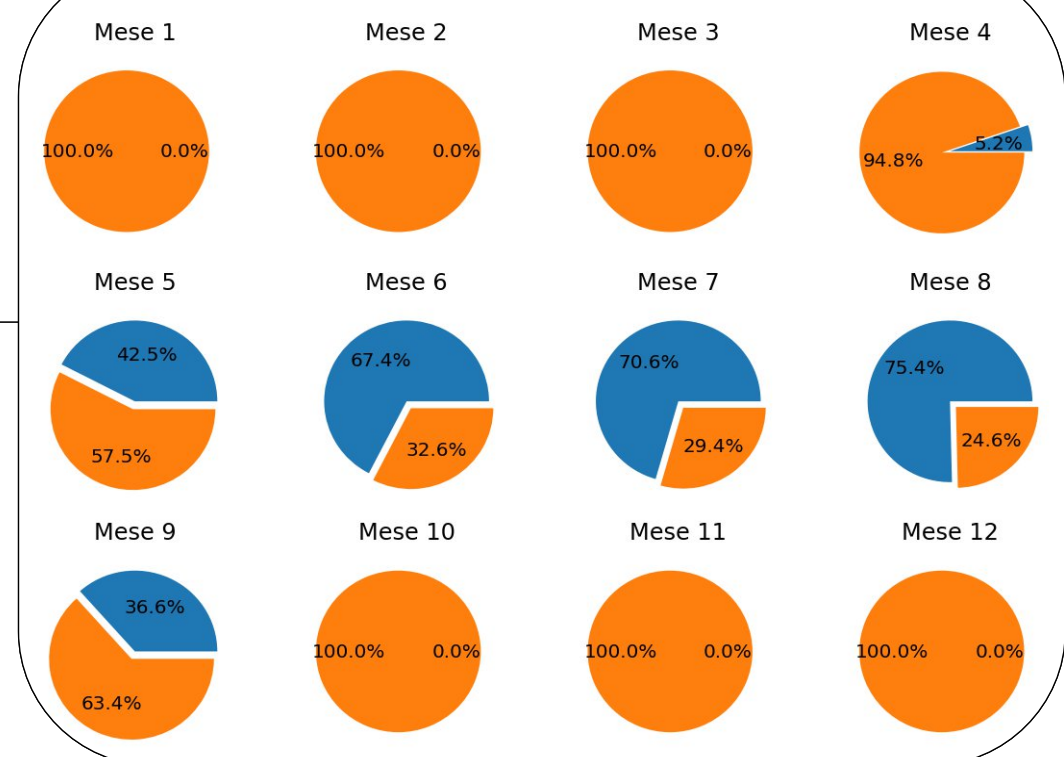
Condizioni meteo rispetto alle feature



Distribuzione delle classi



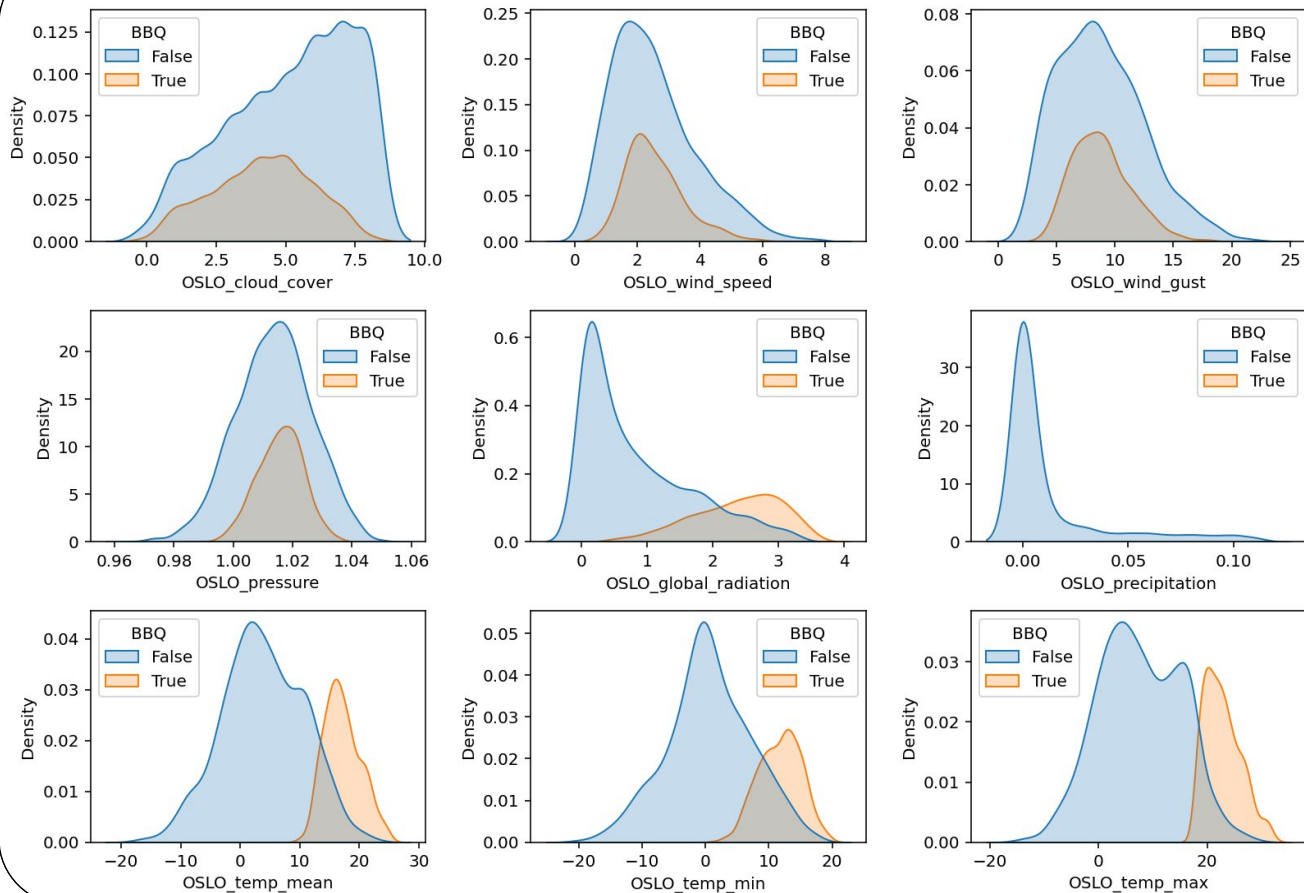
Classificazione su base mensile



EDA

Distribuzione classi

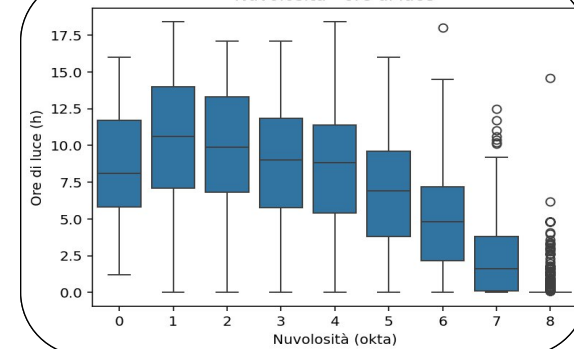
Distribuzione classi rispetto alle feature



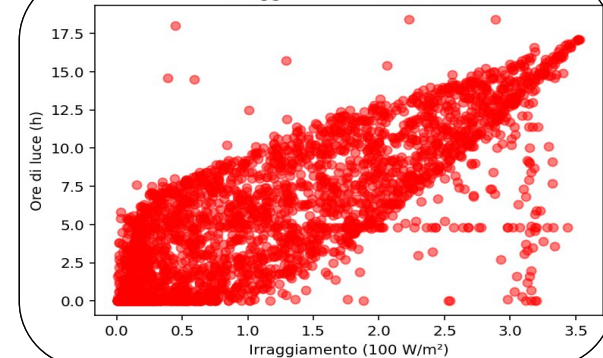
EDA

Analisi bivariata e multivariata

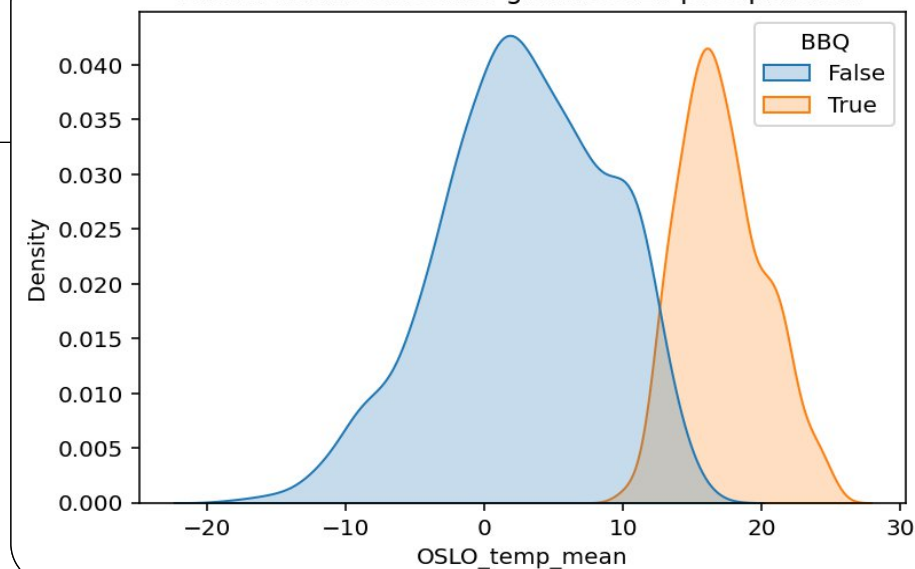
Nuvolosità - ore di luce



Irraggiamento - ore di luce



Distribuzione classi nei giorni senza precipitazioni



- SVC
- Logistic Regression
- SVM poly
- SVM rbf

Modelli allenati

C: [0.1, 1, 10, 100]
degree: [2, 3, 4]
gamma: [scale, auto, 1]

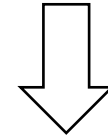
Valori iperparametri SVM

solver: [saga, liblinear]
C: [0.1, 1, 10, 100]

Valori iperparametri Logistic
Regression

**SVC(C=100,
kernel='linear')**

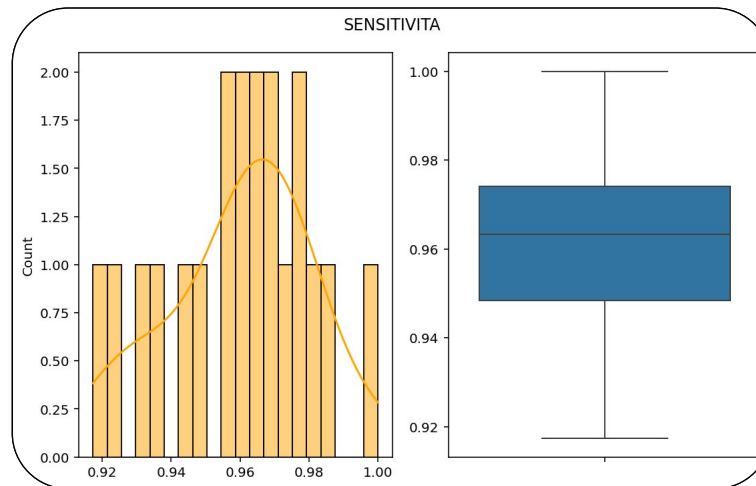
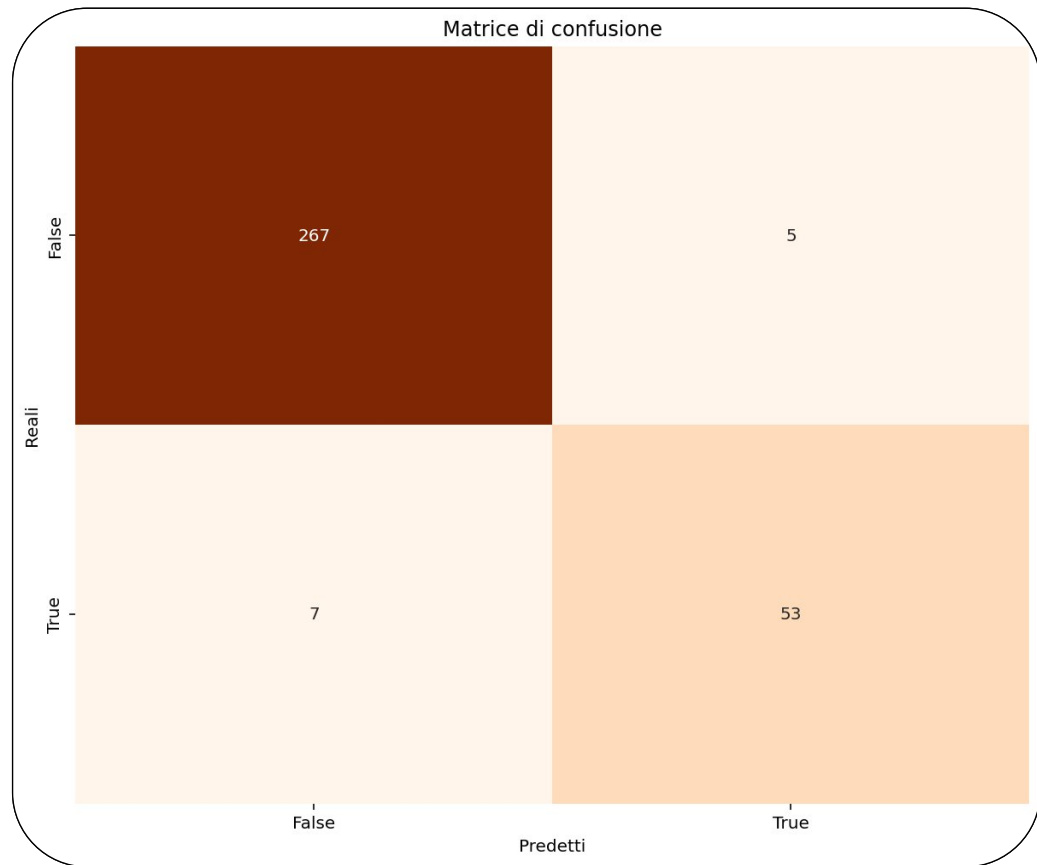
Modello scelto



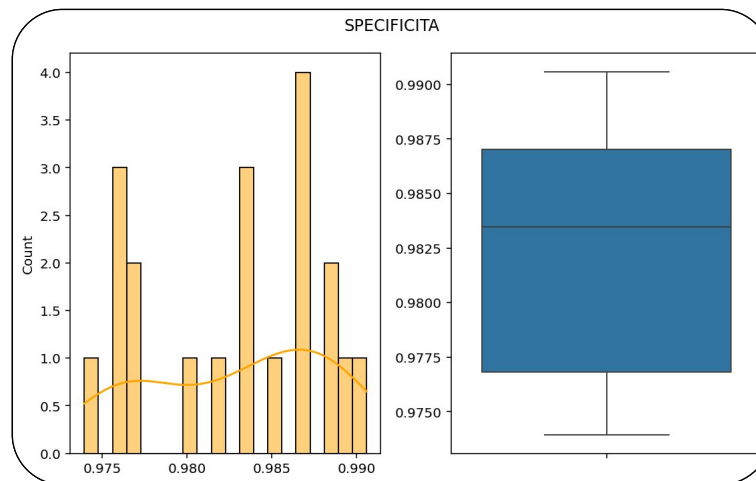
Accuratezza

Testing set: 0.9639
Validation set: 0.9759
Training set: 0.958500

Classificazione

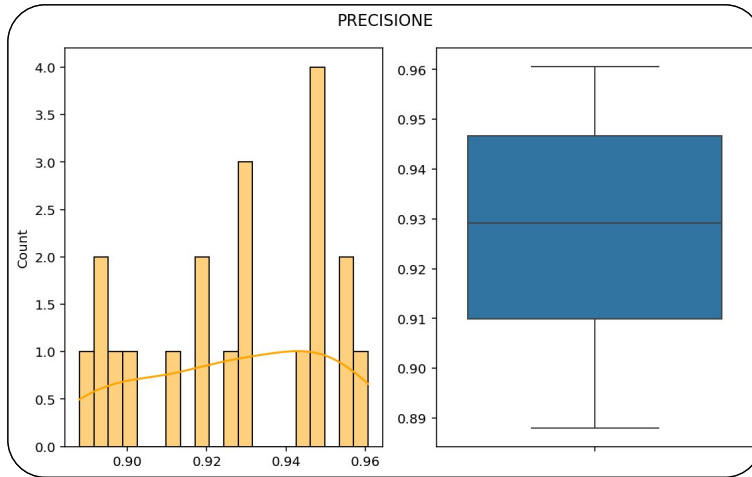


Media: 0.9829
Intervallo di confidenza:
[0.9804; 0.9854]
Mediana: 0.9835
Dev. standard: 0.0052
IQR: 0.0102

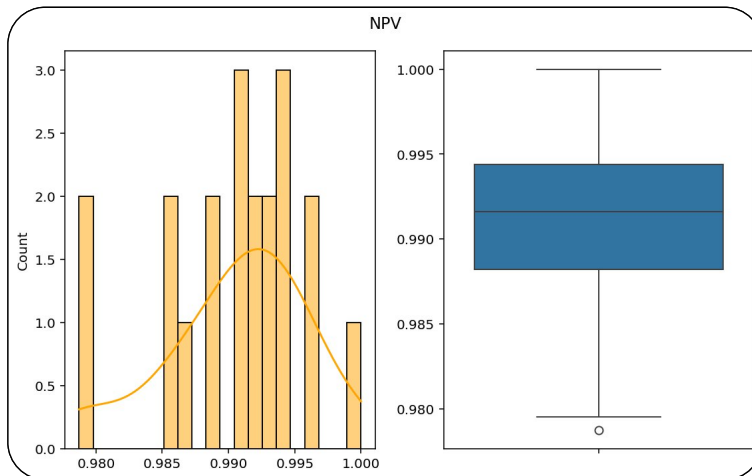


Media: 0.9598
Intervallo di confidenza:
[0.9500; 0.9696]
Mediana: 0.9632
Dev. standard: 0.0204
IQR: 0.0256

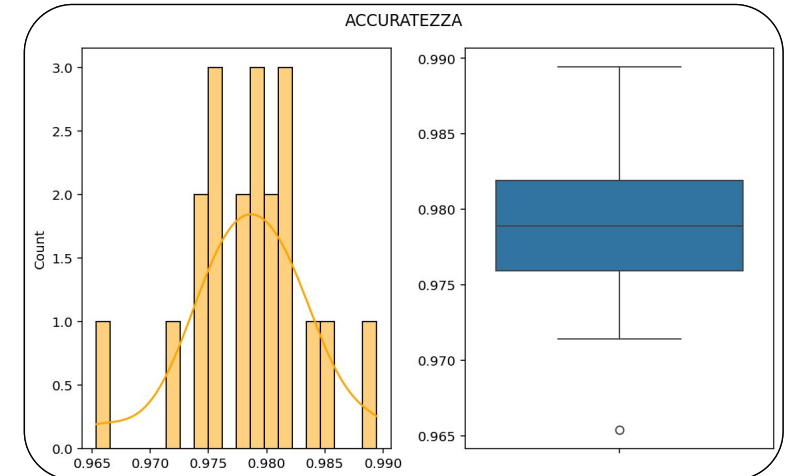
Classificazione



Media: 0.9273
Intervallo di confidenza:
[0.9164; 0.9382]
Mediana: 0.9292
Dev. standard: 0.0227
IQR: 0.0368

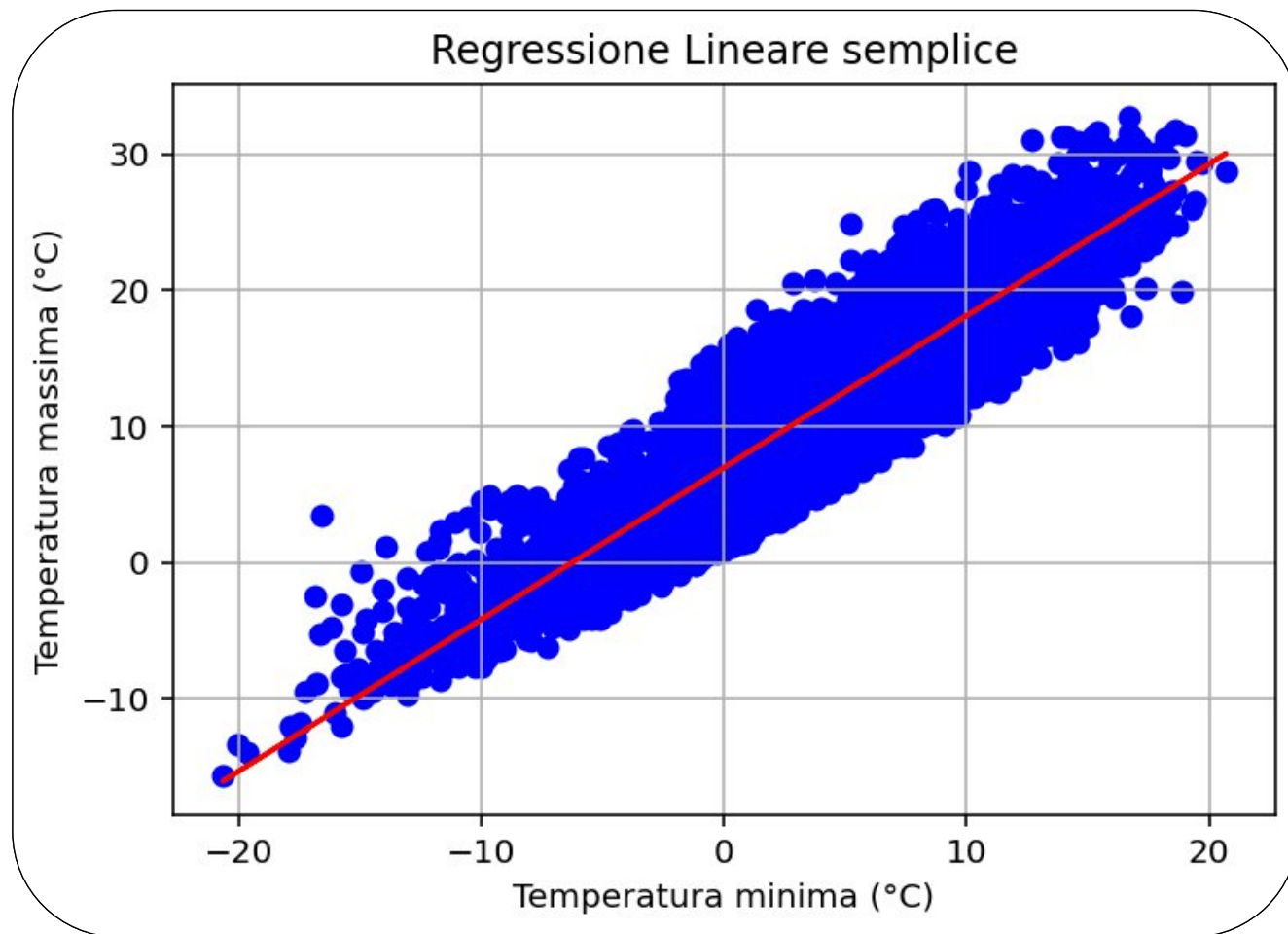


Media: 0.9906
Intervallo di confidenza:
[0.9880; 0.9931]
Mediana: 0.9916
Dev. standard: 0.0053
IQR: 0.0062



Media: 0.9785
Intervallo di confidenza:
[0.9760; 0.9809]
Mediana: 0.9789
Dev. standard: 0.0050
IQR: 0.0060

Classificazione



$$Y = 1.11X + 6.99$$

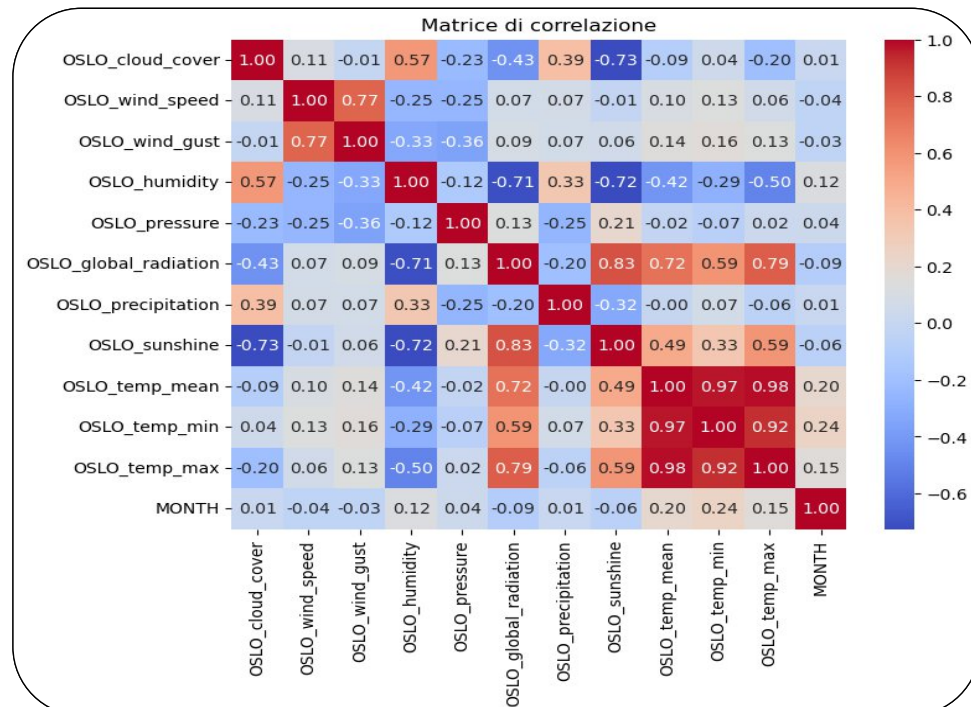
Equazione retta di regressione

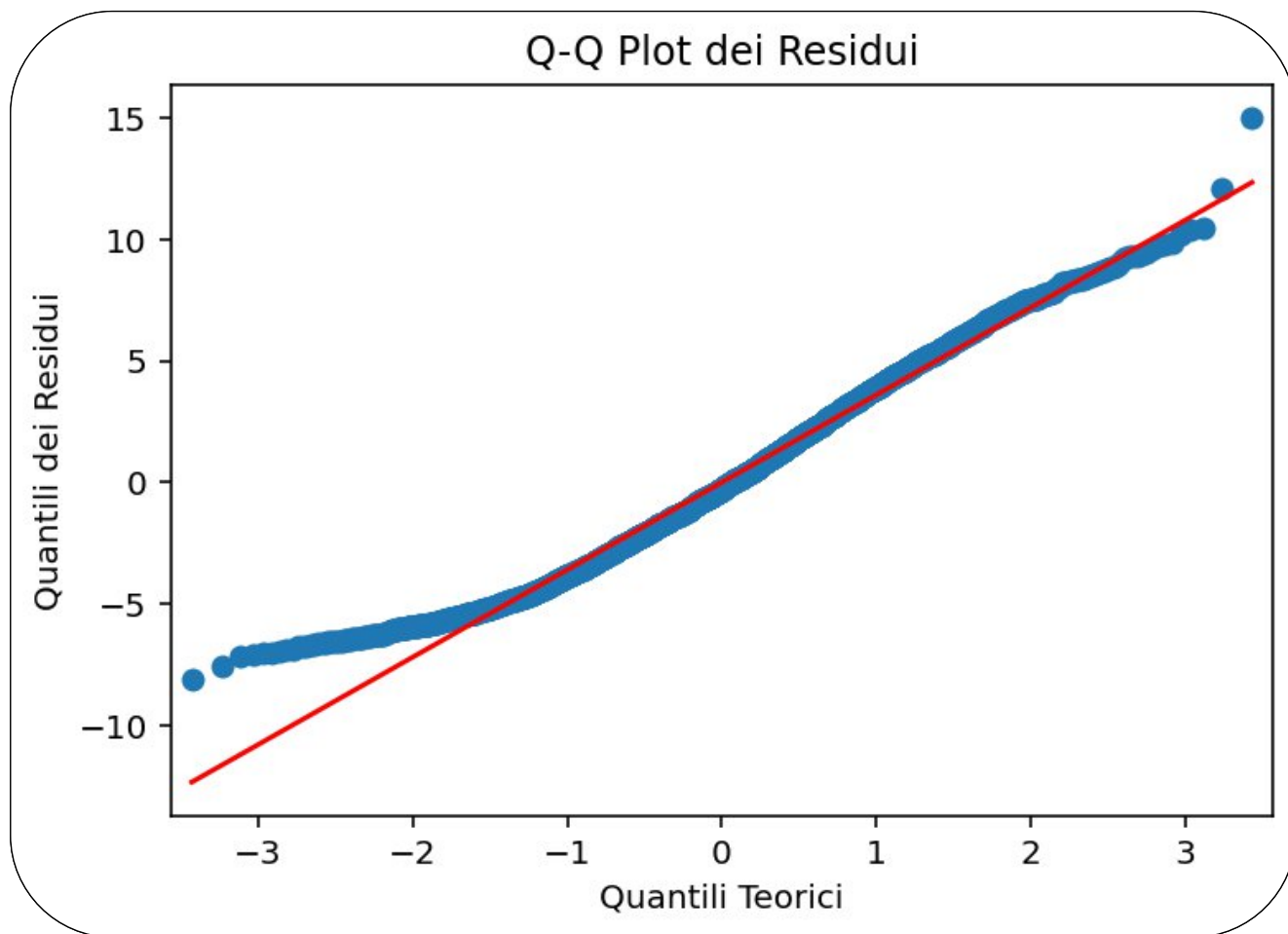
$$r^2: 0.8450$$

$$\text{MSE: } 12.9536$$

Metriche di valutazione

Regressione lineare





Regressione lineare

Analisi di normalità dei residui

p-value: 4.2677e-19

Test di Shapiro-Wilk

media: 1.1142e-16

Media dei residui

$$\varepsilon_i = y_i - (\beta_1 x_i + \beta_0)$$

