Zeri di funzioni

Bisezione

```
import numpy as np
import matplotlib.pyplot as plt


def f(x: float) -> float:
    return np.exp(x) - x ** 2


# Estremi intervallo
a = -1
b = 1

x_real = -0.7034674

xx = np.linspace(a, b, 50)


def bisezione(E_tol: float):
    if f(a) * f(b) > 0:
        return

    X = []
    E = []

    n = b
    p = a
    q = (n+p) / 2
    X.append(q)
    E_abs = abs(q-x_real)
    E.append(E_abs)

    if f(a) < f(b):
        n = a
        p = b

    while E_abs > E_tol:
        if f(q) <= 0:
            n = q
        else:
            p = q
```

```
        q = (n+p) / 2
        X.append(q)
        E_abs = abs(q-x_real)
        E.append(E_abs)

    return (X, E)


tol = 0.01

bis, bis_err = bisezione(tol)


fig, (ax1, ax2) = plt.subplots(2)
ax1.plot([a, b], [0, 0], 'g')
ax1.plot(xx, list(map(f, xx)), linewidth=2.0)
ax1.plot(bis, list(map(f, bis)), 'o')

ax2.plot(range(len(bis_err)), bis_err)
```