Modello Black-Scholes dal Miranda, Applied computational economics and finance, Mit, 2002.

$$C = S \cdot \mathcal{N}(d_1) - K \cdot e^{-rt} \cdot \mathcal{N}(d_2)$$

```
import math

def black_scholes(S, K, t, r, sigma, type='call'):
    d1 = (math.log(S / K) + (r + sigma**2 / 2) * t) / (sigma * math.sqrt(t))
    d2 = d1 - sigma * math.sqrt(t)
    if type == 'call':
        return S * math.norm.cdf(d1) - K * math.exp(-r * t) * math.norm.cdf(d2)
    elif type == 'put':
        return K * math.exp(-r * t) * math.norm.cdf(-d2) - S * math.norm.cdf(-d1)
    else:
        raise ValueError("Invalid option type. Must be 'call' or 'put'.")

S = 100
K = 100
t = 1
r = 0.05
sigma = 0.2

call_price = black_scholes(S, K, t, r, sigma, type='call')
put_price = black_scholes(S, K, t, r, sigma, type='put')

print("Call price:", call_price)
print("Put price:", put_price)
```

Uso congiunto media mobile (1) e trendline (2) dal Pring, Technical analysis explained, McGraw Hill, 1991.

(1)

$$Ma = \frac{1}{n} \sum_{i=1}^{n} x_i$$

(2)

$$y = \beta_0 + \beta_1 x + \epsilon$$

(1)

```
import talib
import pandas as pd

data = pd.read_csv('your_data.csv', index_col='Date', parse_dates=['Date'])
```

```
sma = talib.SMA(data['Close'], timeperiod=20)

print(sma_20)
```

(2)

```
import talib
import pandas as pd

data = pd.read_csv('your_data.csv', index_col='Date', parse_dates=['Date'])

trendline = talib.LINEARREG(data['Close'], timeperiod=14)

print(trendline)
```