

In [55]: `import pandas as pd
import numpy as np`

In [56]: `df = pd.read_csv(r"C:\Users\frede\OneDrive\Documents\Concordia\InnovationLab\data.csv")`

In [57]: `#Compute length of lower_wick
def lower_wick(df):
 lw = []
 for i in range(0,len(df)):
 lw.append(abs(min(df["Open"][i], df["Close"][i]) - df["Low"][i]))
 return lw`

In [58]: `# test proportion btwn lower wick and body
def proportion(body,lowerWick):
 prop = []
 for i in range(len(body)):
 prop.append(lowerWick[i] >= 2 * body[i])

 return prop`

In [75]: `#test if the body is in the upper range
def upper_range(df,k):
 upperRange = []
 for i in range(len(df) ):
 upperRange.append(min(df["Open"][i], df["Close"][i]) >= df["Low"][i] + k*(df["High"][i] - df["Low"][i]))
 return upperRange`

In [80]: `#test if we have a price decline
def price_decline(df):
 priceDec = [False,False]
 for i in range(2,len(df)):
 priceDec.append(df["Close"][i-1] <= df["Close"][i-2] and df["Close"][i-2] <= df["Close"][i-3] and
 df["Low"][i-1] <= df["Low"][i-2] and df["Low"][i-2] <= df["Low"][i-3])

 return priceDec`

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In [87]: `def hammer(df):
 body = abs(df["Open"] - df["Close"])
 lowerWick = lower_wick(df)
 prop = proportion(body,lowerWick)
 upperRange = upper_range(df,0.67)
 priceDec = price_decline(df)
 return [prop[i] and upperRange[i] and priceDec[i] for i in range(len(df))]`

In [88]: `df["Hammer"] = hammer(df)`

In [89]: `df["Hammer"].value_counts()`

Out[89]: `False 1029
True 13
Name: Hammer, dtype: int64`

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In [90]: `df.to_csv(r"C:\Users\frede\OneDrive\Documents\Concordia\InnovationLab\data2.csv")`

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