用隐马尔科夫模型分析股票市场数据

- import datetime
- import numpy as np
- import matplotlib.pyplot as plt
- from hmmlearn.hmm import GaussianHMM
- try:
- from matplotlib.finance import quotes_historical_yahoo_ochl
- except ImportError:
- from matplotlib.finance import quotes_historical_yahoo as quotes_historical_yahoo_ochl
- '''功能作用 ： 用隐马尔科夫模型分析股票市场数据'''# 从雅虎财经获取股票报价quotes = quotes_historical_yahoo_ochl("INTC", datetime.date(1994, 4, 5), datetime.date(2015, 7, 3))
- # 每个报价包含6个值,如 股票的收盘价和一定时期内股票的成交量# 提取需要的数值dates = np.array([quote[0] for quote in quotes], dtype=np.int)
- closing_values = np.array([quote[2] for quote in quotes])
- volume_of_shares = np.array([quote[5] for quote in quotes])[1:]
- # 计算每天收盘价的变化率，用这个变化率作为一个特征
- diff_percentage = 100.0 * np.diff(closing_values) / closing_values[:-1]
- dates = dates[1:]
- # 将两个数组进行列堆叠，以用作训练 -- 将变化率与交易量组合起来
- X = np.column_stack([diff_percentage, volume_of_shares])
- # 创建并训练高斯HMM模型
- print ("\nTraining HMM....")
- model = GaussianHMM(n_components=5, covariance_type="diag", n_iter=1000)
- model.fit(X)
- # 用模型生成数据
- num_samples = 500 samples, _ = model.sample(num_samples)
- plt.plot(np.arange(num_samples), samples[:,0], c='black')
- plt.show()