

股價 x 除息 y 除權 z

除息後股價 $= x - y$

除權後股價 $= \frac{x}{1+z/10}$

除權息：先除息再除權

Sharp ratio:

5 days [5, 6, 7, 6, 8], 0.01 per year

return=[1/5, 1/6, -1/7, 1/3]

mu=0.139, sig=0.201, srd=(mu-0.01/252)/sigma, sry=sqrt(252)*srd

$SMA_U(N)$: 過去 N 天的隔日漲幅平均

$SMA_D(N)$: 過去 N 天的隔日跌幅平均

$$RSI(N) = \frac{SMA_U \times 100\%}{SMA_U + SMA_D}$$

9 days [3 1 4 3 4 5 3 6 13]

[-2 3 -1 1 1 -2 3 7], $SMA_U = (3 + 1 + 1 + 3 + 7)/8$, $SMA_D = (2 + 1 + 2)/8$

$RSI = 75\%$

earnings per share $EPS = \frac{\text{稅後淨利}}{\text{股數}(\text{資本額}/10)}$

資產報酬率 $ROA = \frac{\text{稅後淨利}}{\text{資產}}$

股東權益報酬率 $ROE = \frac{\text{稅後淨利}}{\text{淨值}}$, 淨值 = 資產 - 負債

本益比(PER) = $\frac{\text{股價}}{EPS}$

股價淨值比(PBR) = $\frac{\text{股價}}{\text{每股淨值}(\text{淨值}/\text{股數})}$

殖利率($Yield$) = $\frac{\text{股利}}{\text{股價}}$

DP trading:

stage=[2 1 3 4 5 2]

init cash=10

max cash=[10 10 30 40 50 50]

max stock hold=[5 10 10 10 10 25]

畫圖：sigma橫軸，mu縱軸

minimum variance when indep: $\frac{\sigma_1^2 \sigma_2^2}{\sigma_1^2 + \sigma_2^2}$

REMEMBER to SQRT

talib?

EMA 指數移動平均

$$S_t = \alpha Y_t + (1 - \alpha) S^{t-1}.$$

$$DIF = EMA_{close,12} - EMA_{close,26}$$

$$DEM = EMA_{DIF,9}$$

$$OSC = DIF - DEM$$

$$RSI$$

$$OBV = today + OBV_{yesterday}$$

		Prediction	
		Positive	Negative
Groundtruth	Positive	TP = 30	FN = 10
	Negative	FP = 20	TN = 940

a. Accuracy (recognition rate) 97/100

b. True positive rate (sensitivity, hit rate, recall) 3/4

c. True negative rate (specificity, selectivity) 47/48

d. False positive rate (miss rate) 1/48

e. False negative rate 1/4

f. Precision 3/5

g. F-measure 2/3

Benefit of feature selection: What are the benefits of feature selection for classification?

您已回答

Explore correlation among features

正確！

Reduce computation load

正確！

Explain relationships between features and outputs

正確答案

Increase accuracy

Which is used to verify the signature of a Bitcoin transaction? ans: sender's public key

What is the total amount of Bitcoins according to its design? ans: 21000000

For block chaining, transaction signing, and Merkel tree construction in Bitcoin, which is the size (in bits) of a hash value? ans: 256

In the Bitcoin protocol, which value in a block header is determined by the transactions that a node (miner) collected? ans: Merkle Root

According to the paper published by Satoshi Nakamoto, arrange the steps in correct order to run the Bitcoin network

(1) Nodes accept the block only if all transactions in it are valid and not already spent

(2) New transactions are broadcast to all nodes

(3) When a node finds a proof-of-work, it broadcasts the block to all nodes

(4) Each node collects new transactions into a block

(5) Each node works on finding a difficult proof-of-work for its block

(6) Nodes express their acceptance of the block by working on creating the next block in the chain, using the hash of the accepted block as the previous hash

ans: 245316

Which is used to sign a Bitcoin transaction? ans: sender's private key

In average, how long does it take that a new block is attached to the Bitcoin block chain?
ans: 10min

How long is a private key for Bitcoin or Ethereum? ans: 256

Which is computationally infeasible?

您已回答

Deriving Bitcoin address from its public key

Deriving Bitcoin address from its private key

Deriving Bitcoin public key from its private key

正確答案

Deriving Bitcoin public key from its address

Which is the main reason that Ethereum mining needs GPU instead of ASIC? ans: Hash algorithm

Which algorithm implemented on large-scale quantum computers will break ECDSA of Bitcoin and Ethereum in the future? ans: Shor's

Find s such that $b = as + e$ in the poly ring for small e : ring-LWE

Which cryptocurrency has been implemented with zero-knowledge proof?

QRL

正確！

Zcash

Bitcoin

Ethereum

Find a short nonzero vector x s.t. $Ax \equiv 0 \pmod{q}$ with $n < m$: SIS (short integer solution)

Which is NOT a zero-knowledge proof scheme to provide privacy for the blockchain technology?

正確！

EdDSA

BulletProofs

zk-SNARKs

zk-STARKs

Given bad basis, find good basis such that SVP or CVP is easier: Lattice Basis Reduction

金融科技使得金融服務具有

效率性

普及性

正確！

皆是

問題 2

5 / 5 分

目前CFA 考慮的 Fintech 範圍不包含哪項？

data analytics