数据库第13周补充作业

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1. 把"上证指数"看作一只特殊的股票，例如某天上证指数收市为 3100，相当于这只股票价格为 3100 元，其它雷同。如果在 2012 年 5 月 1 日给你 100 万买卖这只股票，按照连升 3 天就全部卖出，连跌 3 天就全部买入的策略，到 2022 年 5 月 1 日，你还会剩下多少？（简单起见，成交价都用收市价，并假设无需交易费用）

```sql
with t1 as (
    select day, close,
        close - lag(close) over (order by day) gradient
    from ss001
), t2 as (
    select day, close,
        min(gradient) over (
            order by day
            rows between 2 preceding and current row
        ) min_gradient,
        max(gradient) over (
            order by day
            rows between 2 preceding and current row
        ) max_gradient
    from t1
), t3 as (
    select
        day, close, min_gradient, max_gradient,
        case
            when min_gradient > 0 then 'RISE'
            when max_gradient < 0 then 'DOWN'
            else null
        end status
    from t2
    where min_gradient * max_gradient >= 0 and day >= '2012-05-01' and day <= '2022-05-01'
), t4 as (
    select close, status from (
        select close, status, lag(status) over (order by day) ls from t3
    ) where status <> ls
)
select 1000000 * exp((
    select sum(ln(close)) from t4 where status = 'RISE'
) - (
    select sum(ln(close)) from t4 where status = 'DOWN'
)) money from dual;
```

```
TERMINAL    PROBLEMS    OUTPUT    DEBUG CONSOLE

SQL =  @"src\13-8 machine-stock-operation.sql"

    MONEY
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1115519.13

SQL =
```

2. 如果把策略改为"黄金交叉"买入，"死亡交叉"卖出，类似地计算盈亏情况

```sql
with analysis1 as (
    select
        day,
        close,
        avg(close) over (
            order by day
            rows between 10 preceding and 1 preceding
        ) MA10,
        avg(close) over (
            order by day
            rows between 30 preceding and 1 preceding
        ) MA30
    from ss001
), analysis2 as (
    select
        day, close, MA10, MA30,
        lag(MA10 - MA30) over(order by day) LAST_DAY,
        MA10 - MA30 TODAY
    from analysis1
), analysis3 as (
    select day,close,MA10,MA30,LAST_DAY,TODAY,
    case
        when LAST_DAY < 0 and TODAY > 0 then 'GOLDEN'
        when LAST_DAY > 0 and TODAY < 0 then 'DEAD'
        else null
    end OPERATE
    from analysis2
    where day >= '2012-05-01' and day <= '2022-05-01'
)
select 1000000 * exp((
    select sum(ln(close)) from analysis3 where OPERATE = 'DEAD'
) - (
    select sum(ln(close)) from analysis3 where OPERATE = 'GOLDEN'
)) / 2363.43701 money from dual;
```

```
TERMINAL    PROBLEMS    OUTPUT    DEBUG CONSOLE

SQL =  @"src\13-9 operate-according-macd.sql"

      MONEY
  ----------
1133549.75

SQL =
```