FOUNDATION LESSON

WEEK 6 · LESSON 2

Annualisation, margins and return on assets

Frequency and denominator determine the meaning of a ratio.

THE MENTAL MODEL

MENTAL MODEL

The mental model

Frequency and denominator determine the meaning of a ratio.

AN ANNUAL-EQUIVALENT RATE

CODE WALKTHROUGH W06-L02-S03

```
01 monthly_rate=0.01
02 annual_equivalent=(1+monthly_rate)**12-1
03 print("Monthly percent:",monthly_rate*100)
04 print("Annual-equivalent percent:",round(annual_equivalent*100,
↪  3))
05 print("Assumption: same monthly rate repeated; not a forecast")
```

WHAT TO TRACK

An annual-equivalent rate

PREDICT THE RESULT

Predict the output.
Explain each operation.
Pause before continuing.

AN ANNUAL-EQUIVALENT RATE · RESULT

CODE WALKTHROUGH W06-L02-S04

```
01 monthly_rate=0.01
02 annual_equivalent=(1+monthly_rate)**12-1
03 print("Monthly percent:",monthly_rate*100)
04 print("Annual-equivalent percent:",round(annual_equivalent*100,
↪ 3))
05 print("Assumption: same monthly rate repeated; not a forecast")
```

WHAT TO TRACK

An annual-equivalent rate

VALIDATE THE RESULT

```
Monthly percent: 1.0
Annual-equivalent percent:
12.683
Assumption: same monthly
rate repeated; not a
forecast
```

PROFITABILITY WITH EXPLICIT DENOMINATORS

CODE WALKTHROUGH W06-L02-S05

```
01  revenue=1000; cogs=600; operating_cost=200
02  net_profit=120; assets_begin=900; assets_end=1100
03  gross_profit=revenue-cogs
04  operating_profit=gross_profit-operating_cost
05  average_assets=(assets_begin+assets_end)/2
06  print("Gross margin:",gross_profit/revenue)
07  print("Operating margin:",operating_profit/revenue)
08  print("Net margin:",net_profit/revenue)
09  print("Annual ROA:",net_profit/average_assets)
```

WHAT TO TRACK

Profitability with explicit denominators

PREDICT THE RESULT

Predict the output.
Explain each operation.
Pause before continuing.

PROFITABILITY WITH EXPLICIT DENOMINATORS · RESULT

CODE WALKTHROUGH W06-L02-S06

```
revenue=1000; cogs=600; operating_cost=200
net_profit=120; assets_begin=900; assets_end=1100
gross_profit=revenue-cogs
operating_profit=gross_profit-operating_cost
average_assets=(assets_begin+assets_end)/2
print("Gross margin:",gross_profit/revenue)
print("Operating margin:",operating_profit/revenue)
print("Net margin:",net_profit/revenue)
print("Annual ROA:",net_profit/average_assets)
```

WHAT TO TRACK

Profitability with explicit denominators

VALIDATE THE RESULT

```
Gross margin: 0.4
Operating margin: 0.2
Net margin: 0.12
Annual ROA: 0.12
```

A ZERO-REVENUE BOUNDARY

CODE WALKTHROUGH W06-L02-S07

```
01  def ratio(numerator,denominator):
02      return None if denominator<=0 else numerator/denominator
03  print("Margin:",ratio(-20,0))
04  print("ROA:",ratio(10,100))
```

WHAT TO TRACK

A zero-revenue boundary

PREDICT THE RESULT

Predict the output.
Explain each operation.
Pause before continuing.

A ZERO-REVENUE BOUNDARY · RESULT

CODE WALKTHROUGH W06-L02-S08

```
01  def ratio(numerator,denominator):
02      return None if denominator<=0 else numerator/denominator
03  print("Margin:",ratio(-20,0))
04  print("ROA:",ratio(10,100))
```

WHAT TO TRACK

A zero-revenue boundary

VALIDATE THE RESULT

```
Margin: None
ROA: 0.1
```

GUIDED PRACTICE

LEARNER PRACTICE

Guided practice

Compute annual-equivalent growth for a hypothetical 2% quarterly rate using four periods and state the assumption.

PREDICT · MODIFY · RUN

01 Restate the supplied rules.

02 Predict the result.

03 Modify and run the code.

04 Compare actual output.

05 Explain any difference.

INDEPENDENT PRACTICE

LEARNER PRACTICE

Independent practice

Annual net profit is 80; beginning/end assets are 600/1000. Calculate average-asset ROA and label its period.

PREDICT · MODIFY · RUN

01 Restate the supplied rules.

02 Predict the result.

03 Modify and run the code.

04 Compare actual output.

05 Explain any difference.

CHECK YOUR UNDERSTANDING

MENTAL MODEL

Check your understanding

Diagnostic: Can quarterly profit divided by average quarter assets be labelled annual ROA without another step? No. Its numerator covers only that quarter.

RECAP AND NEXT STEP

Recap and next step

State frequency, profit period and denominator. Label annual-equivalent assumptions and use the documented average-asset convention for ROA.

UNDERSTAND APPLY VALIDATE EXPLAIN