FOUNDATION LESSON

WEEK 6 · LESSON 5

Comparable entities and deterministic scenarios

Scale, period and assumptions determine whether a comparison is meaningful.

THE MENTAL MODEL

MENTAL MODEL

The mental model

Scale, period and assumptions determine whether a comparison is meaningful.

PROFIT AND MARGIN RANKINGS

CODE WALKTHROUGH W06-L05-S03

```
01  import pandas as pd
02  d=pd.DataFrame({"entity":["A","B"],
03   "revenue":[1000,400],"profit":[120,80]})
04  d["margin"]=d["profit"]/d["revenue"]
05  print(d.to_string(index=False))
```

WHAT TO TRACK

Profit and margin rankings

PREDICT THE RESULT

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

PROFIT AND MARGIN RANKINGS · RESULT

CODE WALKTHROUGH W06-L05-S04

```
01  import pandas as pd
02  d=pd.DataFrame({"entity":["A","B"],
03   "revenue":[1000,400],"profit":[120,80]})
04  d["margin"]=d["profit"]/d["revenue"]
05  print(d.to_string(index=False))
```

WHAT TO TRACK

Profit and margin rankings

VALIDATE THE RESULT

```
entity  revenue  profit
margin
     A     1000     120
0.12
     B      400      80
0.20
```

A TRANSPARENT COST SCENARIO

CODE WALKTHROUGH W06-L05-S05

```
revenue=1000; baseline_cost=800
scenarios={"base":1.0,"cost_up_10pct":1.1,"cost_down_10pct":.9}
for name,factor in scenarios.items():
    profit=revenue-baseline_cost*factor
    print(name,"profit",round(profit,2),"margin",round(profit/revenue,3))
print("Revenue held fixed; deterministic scenarios, not forecasts")
```

WHAT TO TRACK

A transparent cost scenario

PREDICT THE RESULT

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

A TRANSPARENT COST SCENARIO · RESULT

CODE WALKTHROUGH W06-L05-S06

```
revenue=1000; baseline_cost=800
scenarios={"base":1.0,"cost_up_10pct":1.1,"cost_down_10pct":.9}
for name,factor in scenarios.items():
    profit=revenue-baseline_cost*factor
    print(name,"profit",round(profit,2),"margin",round(profit/revenue,3))
print("Revenue held fixed; deterministic scenarios, not forecasts")
```

WHAT TO TRACK

A transparent cost scenario

VALIDATE THE RESULT

```
base profit 200.0 margin 0.2
cost_up_10pct profit 120.0 margin 0.12
cost_down_10pct profit 280.0 margin 0.28
Revenue held fixed; deterministic scenarios, not forecasts
```

AN INVALID INDEX BASELINE

CODE WALKTHROUGH W06-L05-S07

```
01  values=[0,20,30]
02  if values[0]<=0:
03      raise ValueError("Index baseline must be positive")
04  print([v/values[0]*100 for v in values])
```

WHAT TO TRACK

An invalid index baseline

PREDICT THE RESULT

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

AN INVALID INDEX BASELINE · RESULT

CODE WALKTHROUGH W06-L05-S08

```
01  values=[0,20,30]
02  if values[0]<=0:
03      raise ValueError("Index baseline must be positive")
04  print([v/values[0]*100 for v in values])
```

WHAT TO TRACK

An invalid index baseline

VALIDATE THE RESULT

```
ValueError: Index baseline
must be positive
```

GUIDED PRACTICE

LEARNER PRACTICE

Guided practice

Compare revenue/profit pairs 200/30 and 500/50. Print margins and identify the higher margin.

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

Revenue is 600 and cost 450. Apply a 1.2 cost factor without changing the baseline variable.

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: Is a scenario with a ten percent cost increase a forecast that costs will rise by ten percent? No. It is a stated hypothetical input.

RECAP AND NEXT STEP

Recap and next step

Compare like periods and definitions, distinguish amounts from margins, and describe scenarios through their explicit assumptions.

UNDERSTAND APPLY VALIDATE EXPLAIN