IS1110 Tutorial 3 – Exercises

This tutorial builds on last week. You will continue to practise variables, types, operators, user input, flowcharts and pseudocode.

0) SETUP

Create a folder Tutorial_3 and a Python file tutorial3.py. Save your code for each exercise there.

1) Receipt: subtotal, tax, and total

A shop applies a sales tax to a purchase. Ask for the **subtotal** and the **tax rate** as a percentage (e.g., enter 23 for 23%). Compute the **tax amount** and the **grand total**.

- Print in the following format: Subtotal: €X.XX | Tax (XX%): €X.XX | Total: €X.XX

2) Seconds → hh:mm:ss

Ask a user for a **number of seconds** (int). Convert it to hours:minutes:seconds using // and % only.

- Result should look like 01:05:09

3) Triangle area (base & height)

Ask user for base and a height in metres. Compute area = 0.5 * base * height.

Round answer to 1 decimal place and print answer with unit

4) Concatenate vs Add (casting practice)

Ask the user for **two whole numbers**, but read them **as strings** first.

1. Print their string concatenation (variable a + variable b).
2. Then convert both to integers and
    - Calculate sum
    - Multiply together
    - Find average as a float with 1 decimal place.
    - Print results for sum, multiply and average

5) Tip & split calculator

Ask for the **bill amount** (float), **tip percent** (e.g., 12.5), and **number of people** (int). Compute **tip**, **total**, and **amount per person**.

- Print in the following format: Tip: €X.XX | Total: € X.XX | Each: € X.XX

6) pseudocode & flowchart exercises (no coding)

For each: is is required to

(a) list **I/P/O**,

(b) write **pseudocode**,

(c) draw a **flowchart**.

1) Library late fee

A library charges **€0.25 per day** late. Ask for **days late** (int). Compute and output the **fee** in euros to 2 decimals.

2) Travel time calculator

Ask for **distance in km** (float) and **average speed in km/h** (float). Compute **time in hours** as distance / speed. Also compute **hours** and **minutes** (minutes are the fractional part × 60, rounded to nearest whole minute).

3) Unit converter combo

Ask for a **length in centimetres** (float). Output the equivalent in **meters** and **millimetres**.

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# 1. Library Late Fee

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## I/P/O

Inputs:
- days_late (integer)

Processes:
- Compute late_fee = days_late * €0.25
- Round late_fee to 2 decimal points

Output:
- late_fee in Euro

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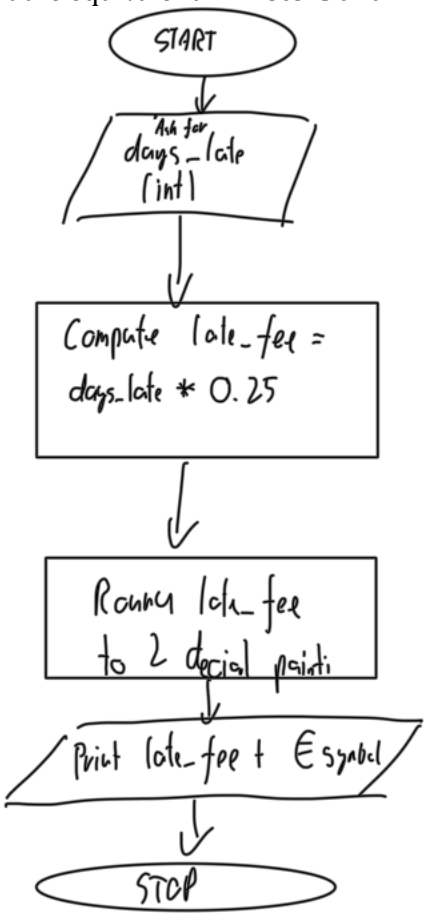
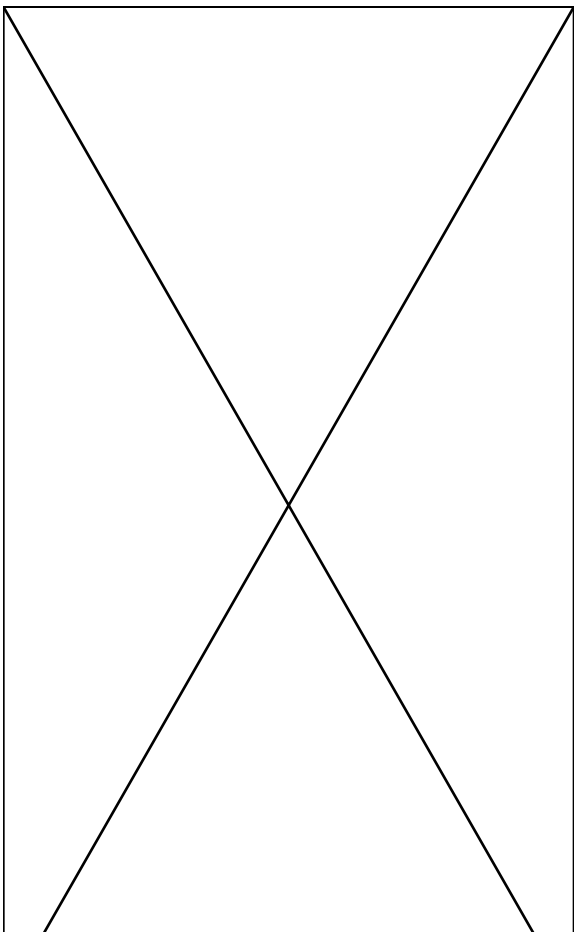
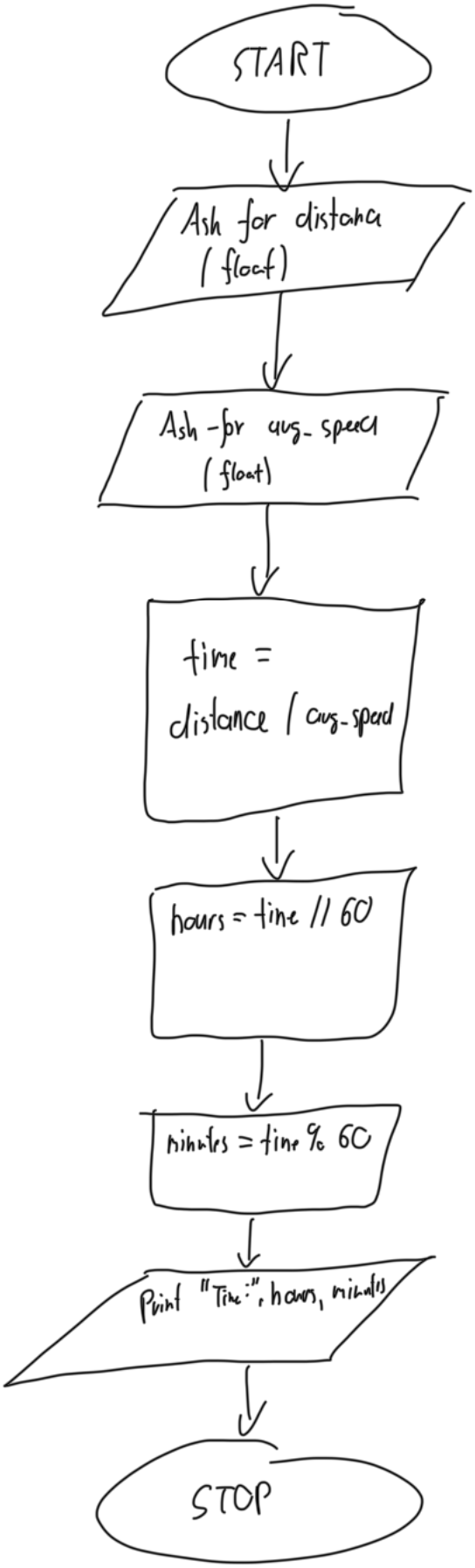
## Pseudocode

INPUT days_late
PROCESS late_fee = days_late * 0.25
PROCESS round(late_fee, 2)
```






START
Ask for distance
(float)
Ask for avg_speed
(float)
time =
distance / avg_speed
hours = time // 60
minutes = time % 60
Print "Time:", hours, minutes
STOP

#Task 3: Unit Converter Combo

Input:
- length in centimiters (float)

Process:
- Calculate length in meters
- Calculate length in miliniters

Output:
- Print: length, "in cm equals to", meters, "meters or" miliniters, "miliniters"

INPUT length_cm
COMPUTE length_m = length_cm / 100
COMPUTE length_mm = length_cm * 10
OUTPUT length_cm equals to length_m or length_mm