

Exercise 3

Module 3: Variables and Data Types

1. The code below has four type errors. Identify each error and state the correct fix.

```
crop_type = wheat           # line 1
num_cows  = "142"          # line 2
frost_alert = true         # line 3
total_milk = num_cows * "24.7" # line 4
```

2. A Python dictionary stores a complete field record:

```
field = {
    "name":      "South Field",
    "area_ha":   8.3,
    "crop":      "barley",
    "num_plots": 4,
    "irrigated": True
}
```

- List the data type of each value in the dictionary.
- Write the Python code to access the crop type stored in this dictionary.
- Add a new key called `harvest_yield` with the value 5.2 to the dictionary.

3. Complete the farm variable table below. Fill in the missing data type and a brief reason why that type fits.

Variable = value	Data type	Why this type?
<code>field_size_ha = 12.5</code>	float	Measurement in hectares, needs decimal precision
<code>num_sensors = 6</code>		
<code>crop_name = "maize"</code>		
<code>harvest_ready = False</code>		

sensor_ids = [1,2,3,4]		
row_spacing_cm = 75		
region = "Bavaria"		
ndvi_score = 0.78		

4. Design a Farm Record

You are building a Python data structure to store a complete record for one crop field on a smart farm.

(a) Choose at least 6 meaningful variables for a field record. For each one, write:

- The variable name (use snake_case)
- An example value
- The data type and why you chose it

(b) Organise all 6 variables into a Python dictionary called field_record.