

Solution 3

Module 3: Variables and Data Types

1.

Answer:

Line 1: wheat has no quotes → should be `crop_type = "wheat"` (str needs quotes)

Line 2: "142" is a string → should be `num_cows = 142` (int, no quotes) logically it will not be error but should be type int

Line 3: true (lowercase) is not valid → should be `frost_alert = True` (capital T)

Line 4: "24.7" is a string, cannot multiply with int → should be `24.7` (float, no quotes)

2.

Answer:

a) "South Field" → str | 8.3 → float | "barley" → str | 4 → int | True → bool

b) `field["crop"]` → returns "barley"

c) `field["harvest_yield"]` = 5.2

3.

Answer, the filled rows:

`num_sensors = 6` → int (whole count, no fraction possible)

`crop_name = "maize"` → str (text label, needs quotes)

`harvest_ready = False` → bool (yes/no state, ready or not)

`sensor_ids = [1,2,3,4]` → list (ordered sequence of IDs)

`row_spacing_cm = 75` → int (whole number in centimetres)

`region = "Bavaria"` → str (place name, text)

`ndvi_score = 0.78` → float (vegetation index, decimal between 0 and 1)

4.

Answer:

a) Example variables (accept any sensible alternatives):

`field_name = "West Plot"` str text label

`area_ha = 8.5` float decimal measurement

`crop_type = "barley"` str category name

`num_rows = 120` int whole count

`soil_ph = 6.8` float decimal measurement

`irrigation_on = False` bool on/off state

b) `field_record = {"field_name": "West`

`Plot", "area_ha": 8.5, "crop_type": "barley", "num_rows": 120, "soil_ph": 6.8, "irrigation_on": False}`