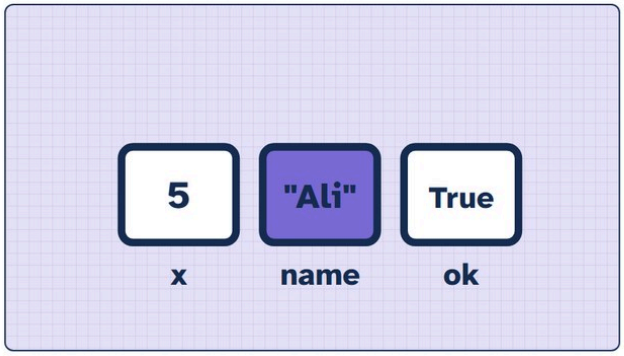
Beginner lesson · Names, values and Python's built-in types

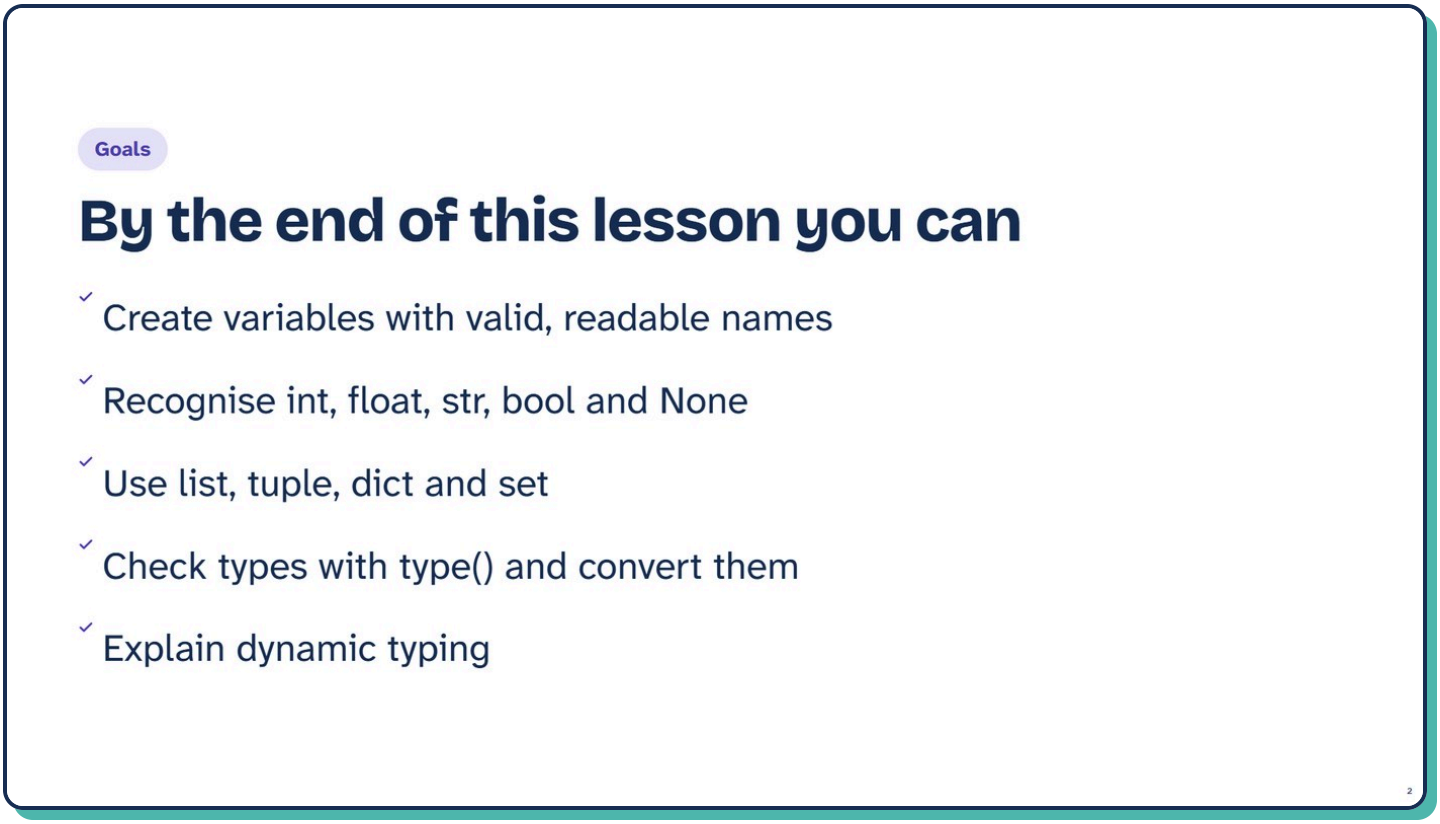
Python Variables and Data Types



Python Variables and Data Types

Teacher notes

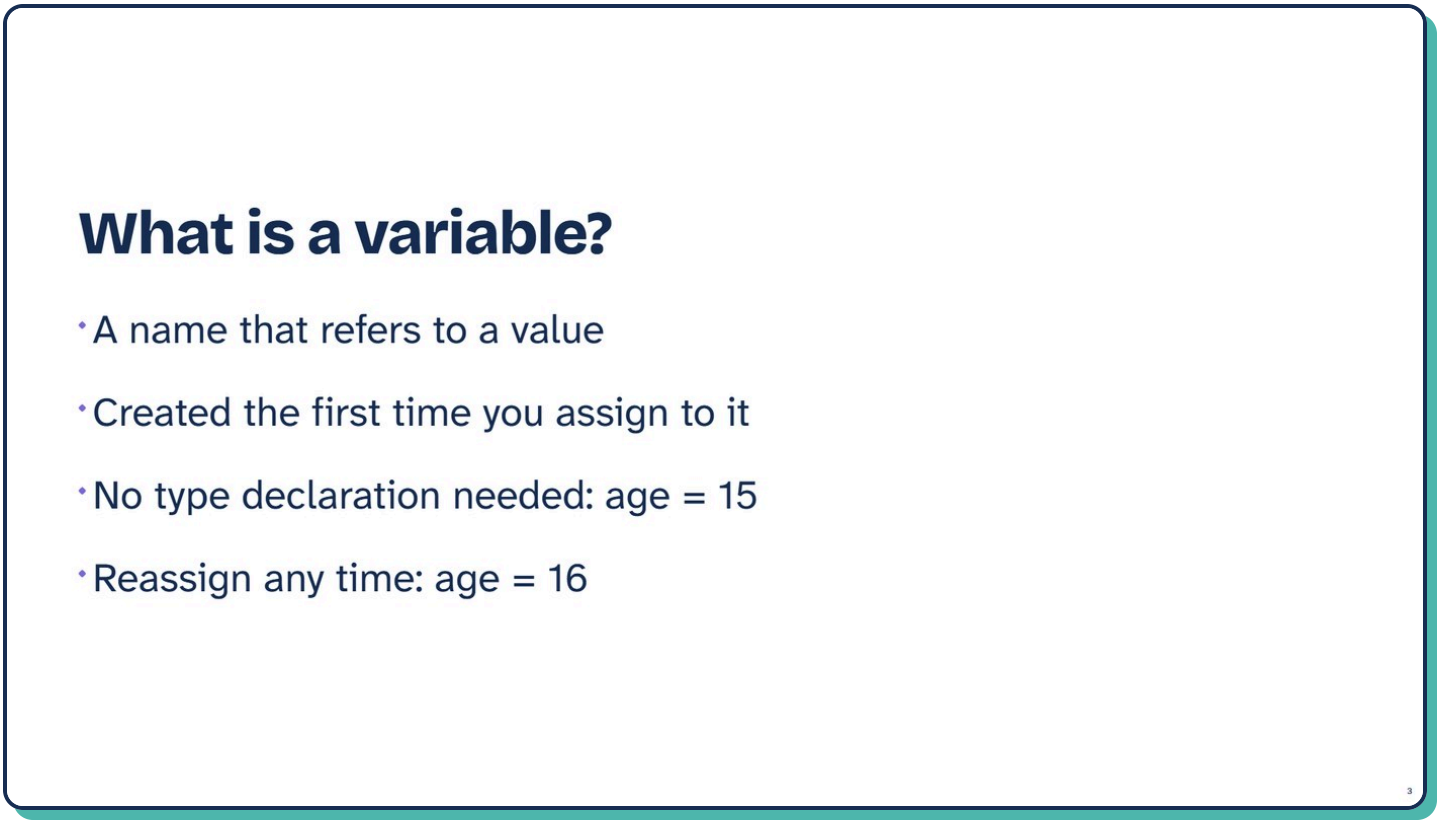
Ask: who has written any code before, even a single line? Reassure beginners that Python reads close to plain English. Tell them every code example in this deck has been run on Python 3, so they can type it in and check.



By the end of this lesson you can

Teacher notes

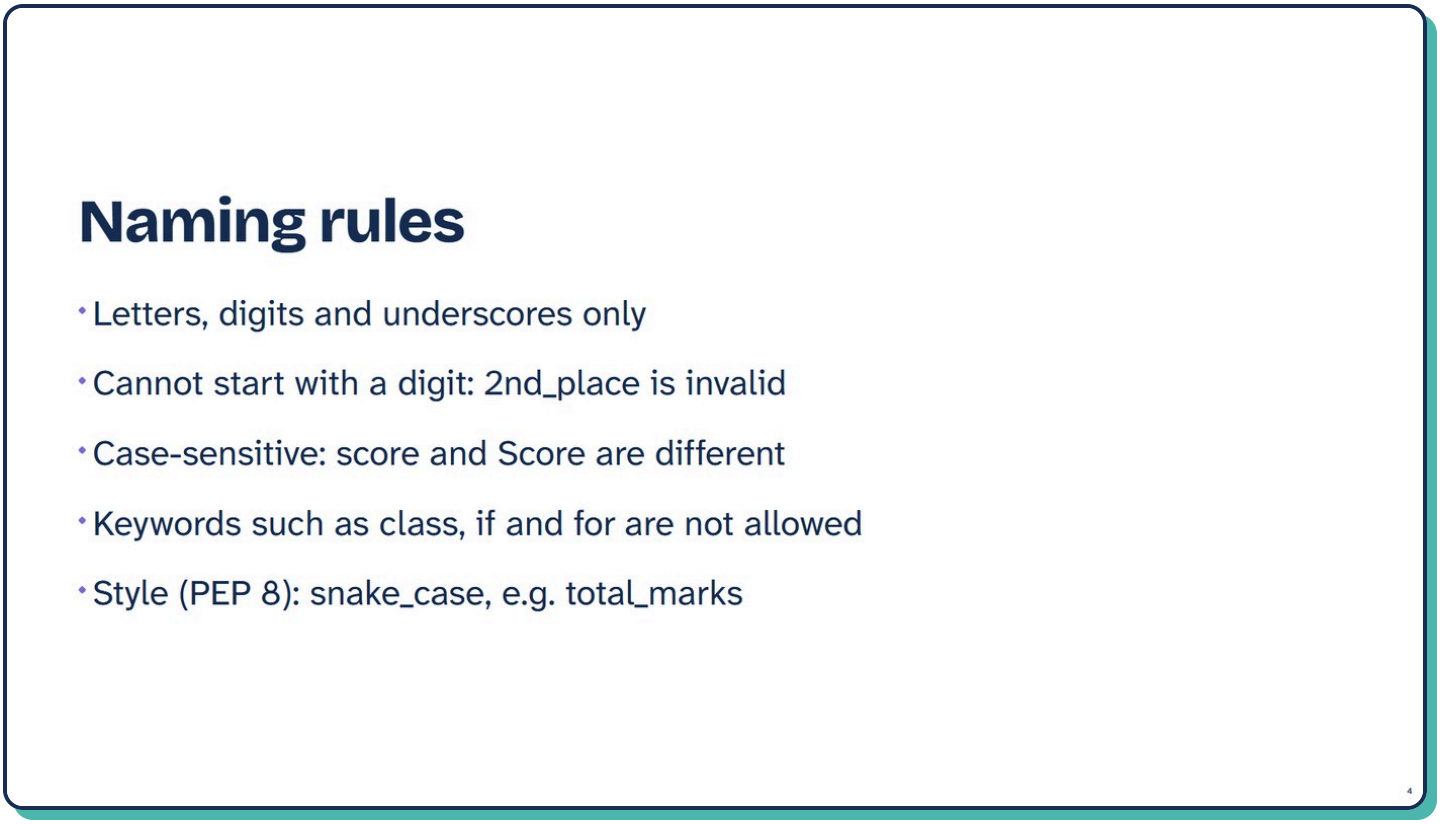
Read the objectives aloud. If computers are available, ask learners to open a Python shell now and try each example as you go.



What is a variable?

Teacher notes

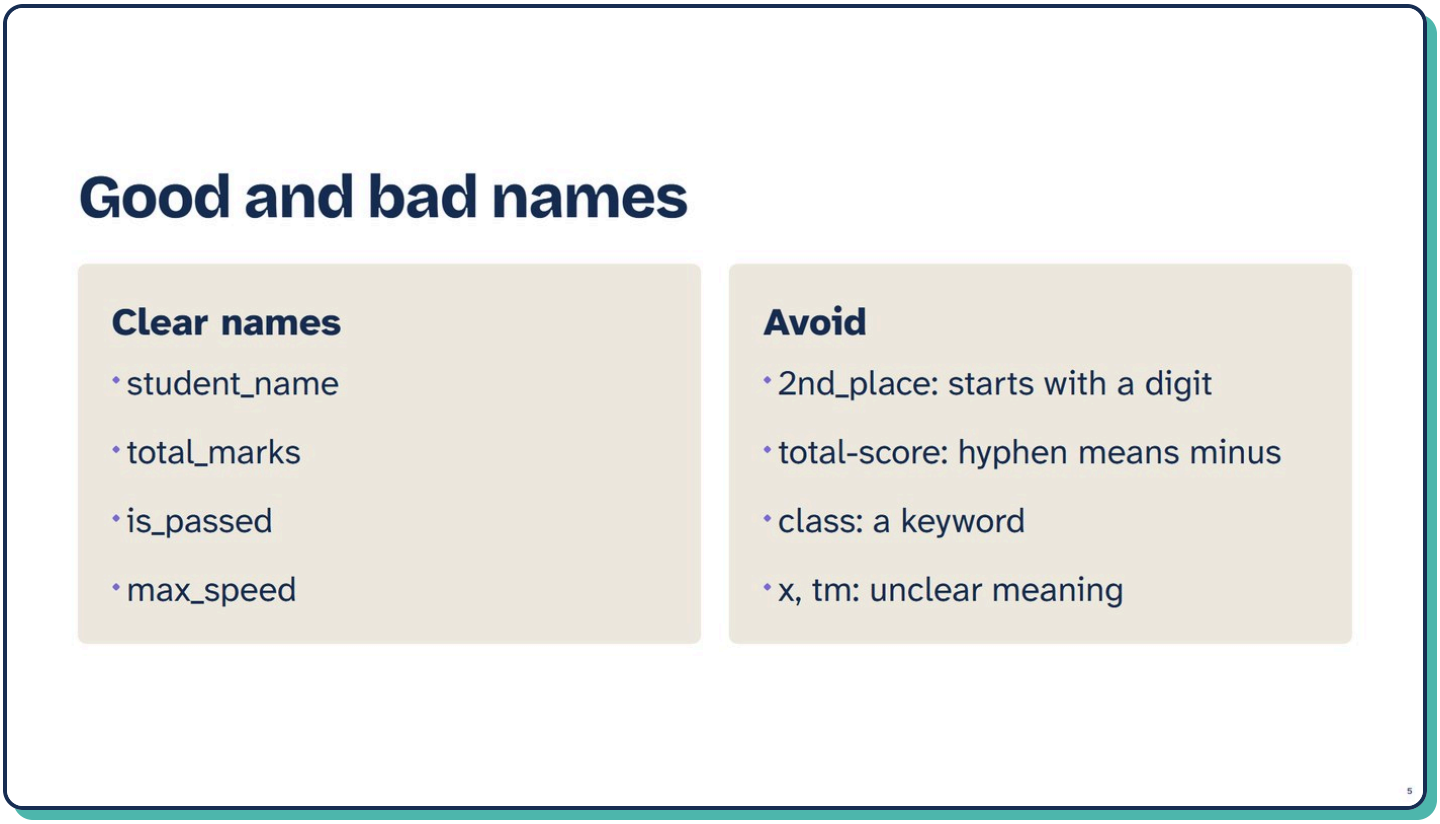
Compare a variable to a label stuck on a value rather than a box. Ask: what does = mean in maths, and what does it mean here? In Python it means assign, not equals; == tests equality.



Naming rules

Teacher notes

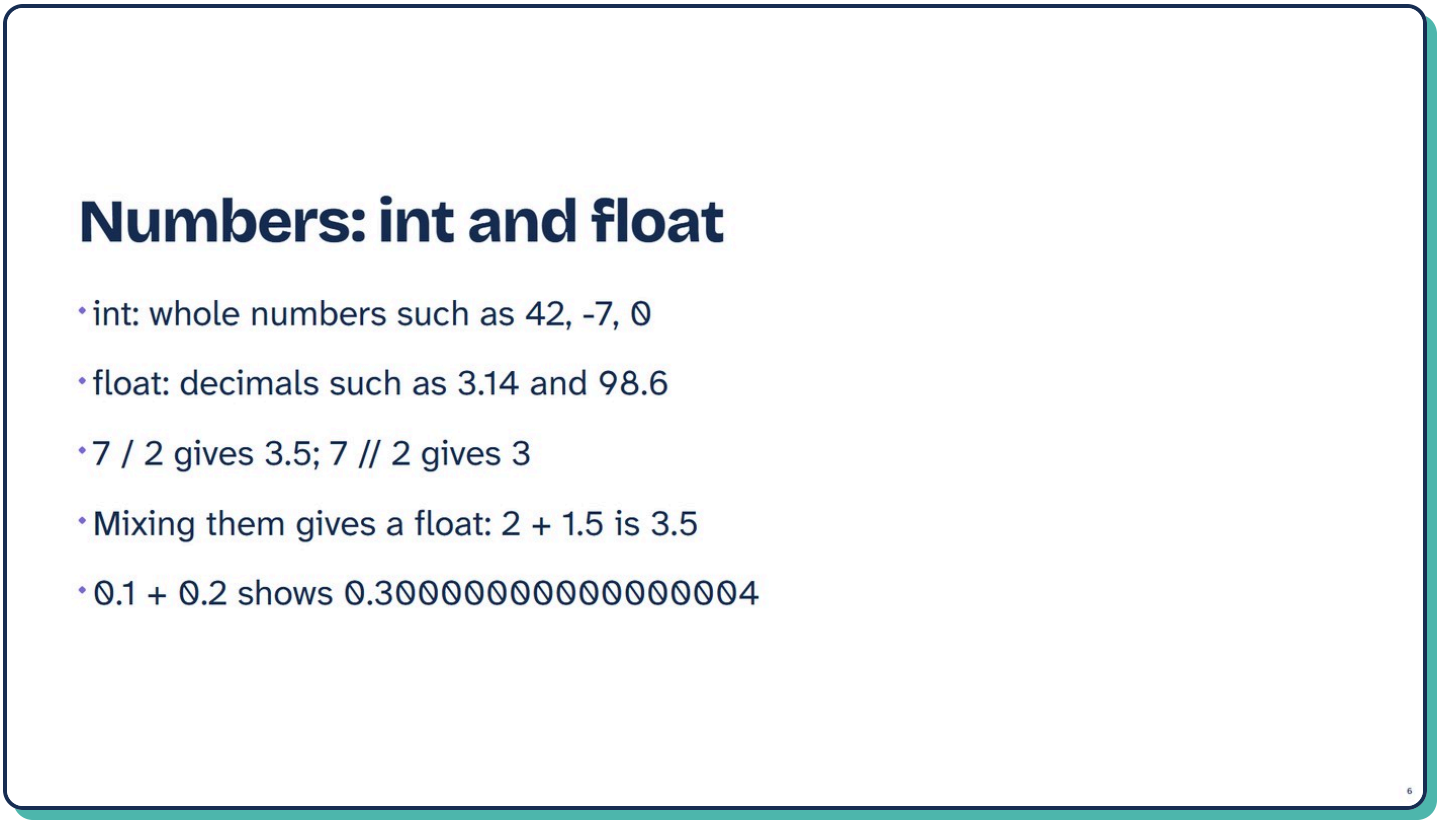
Type 2nd_place = 1 in the shell to show the SyntaxError. Ask: why might score and Score in the same program cause a bug? Python treats them as two separate variables.



Good and bad names

Teacher notes

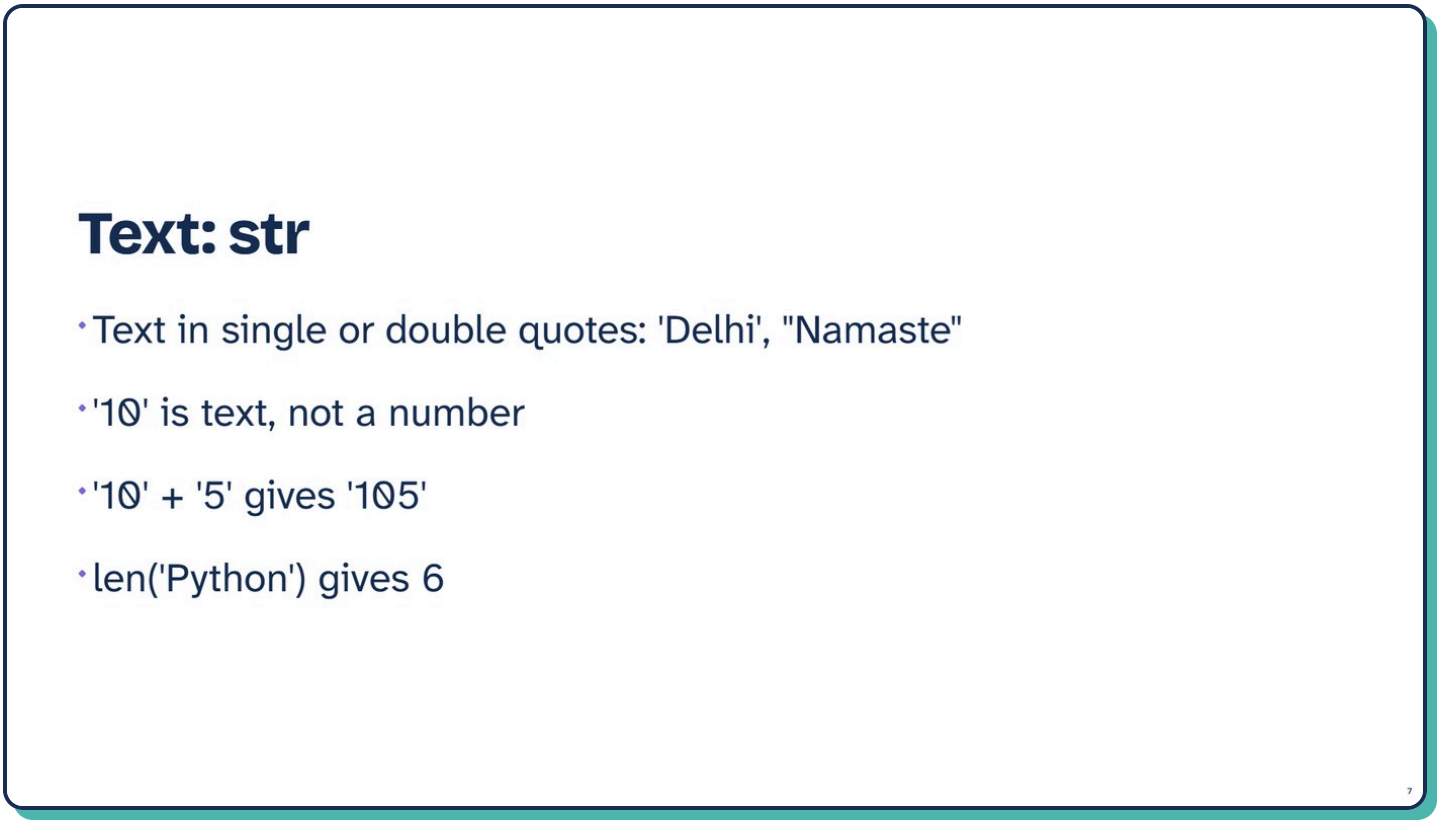
The first three names in the right column cause errors; the last one runs but is hard to read. Ask learners to rename tm to something meaningful. Code is read far more often than it is written.



Numbers: int and float

Teacher notes

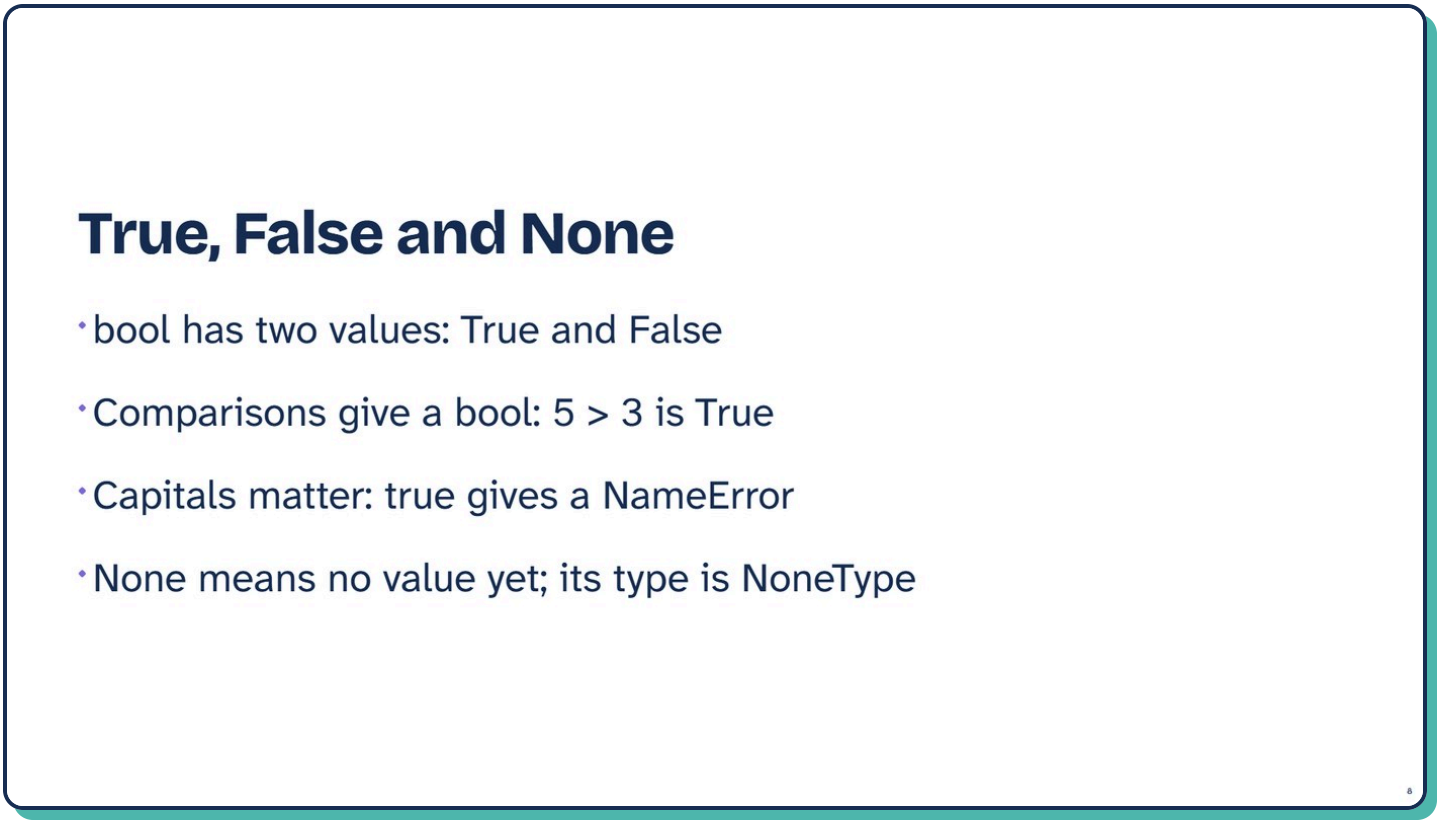
Run 0.1 + 0.2 live: it surprises everyone. Explain that floats are stored in binary, so some decimals are approximations. Ask: which operator would you use to share 7 sweets equally between 2 people?



Text: str

Teacher notes

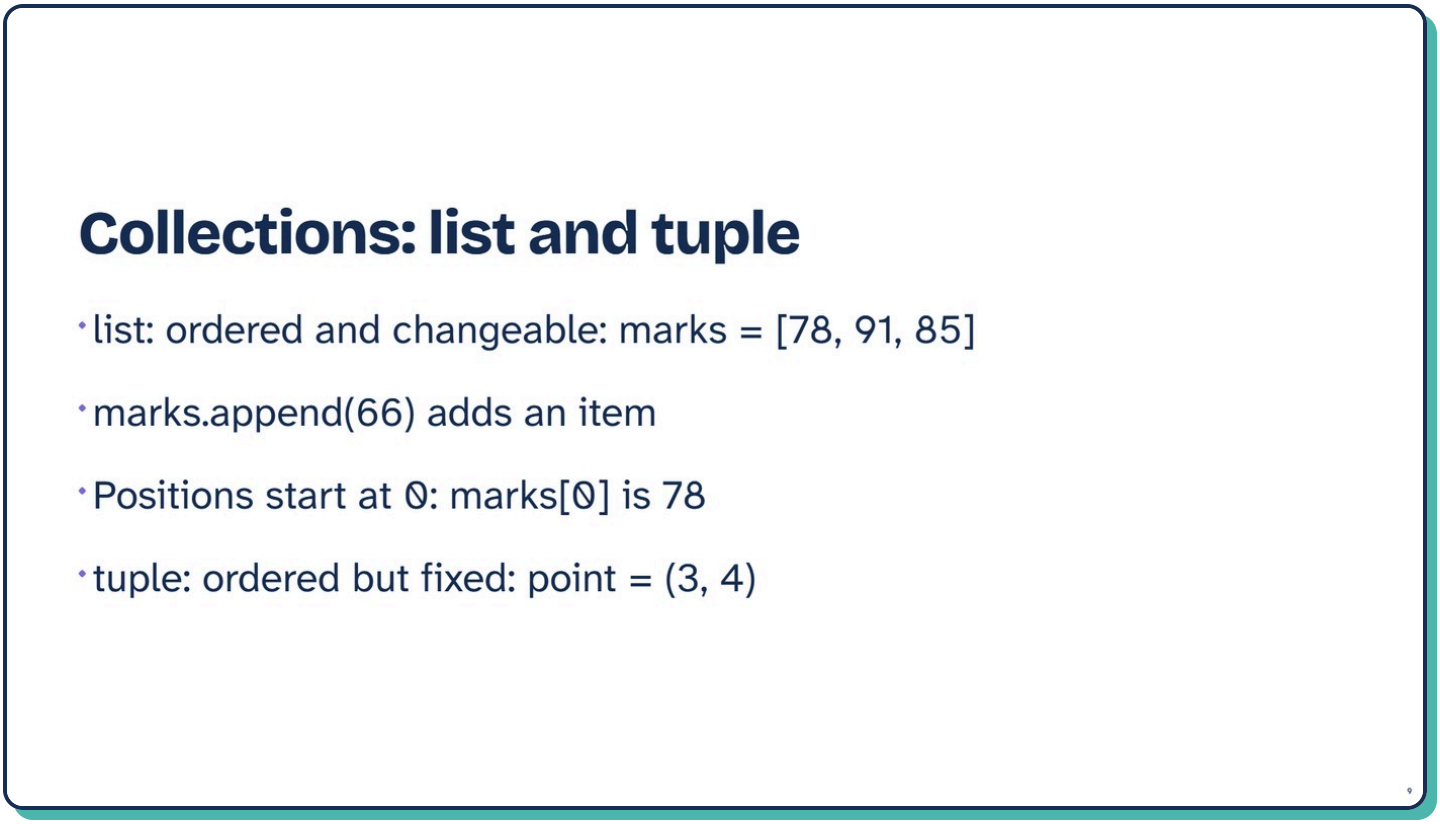
Show that + joins strings instead of adding them. Ask: what would '10' * 3 give? It repeats the text: '101010'. A common error is trying to add a str and an int, which raises a TypeError.



True, False and None

Teacher notes

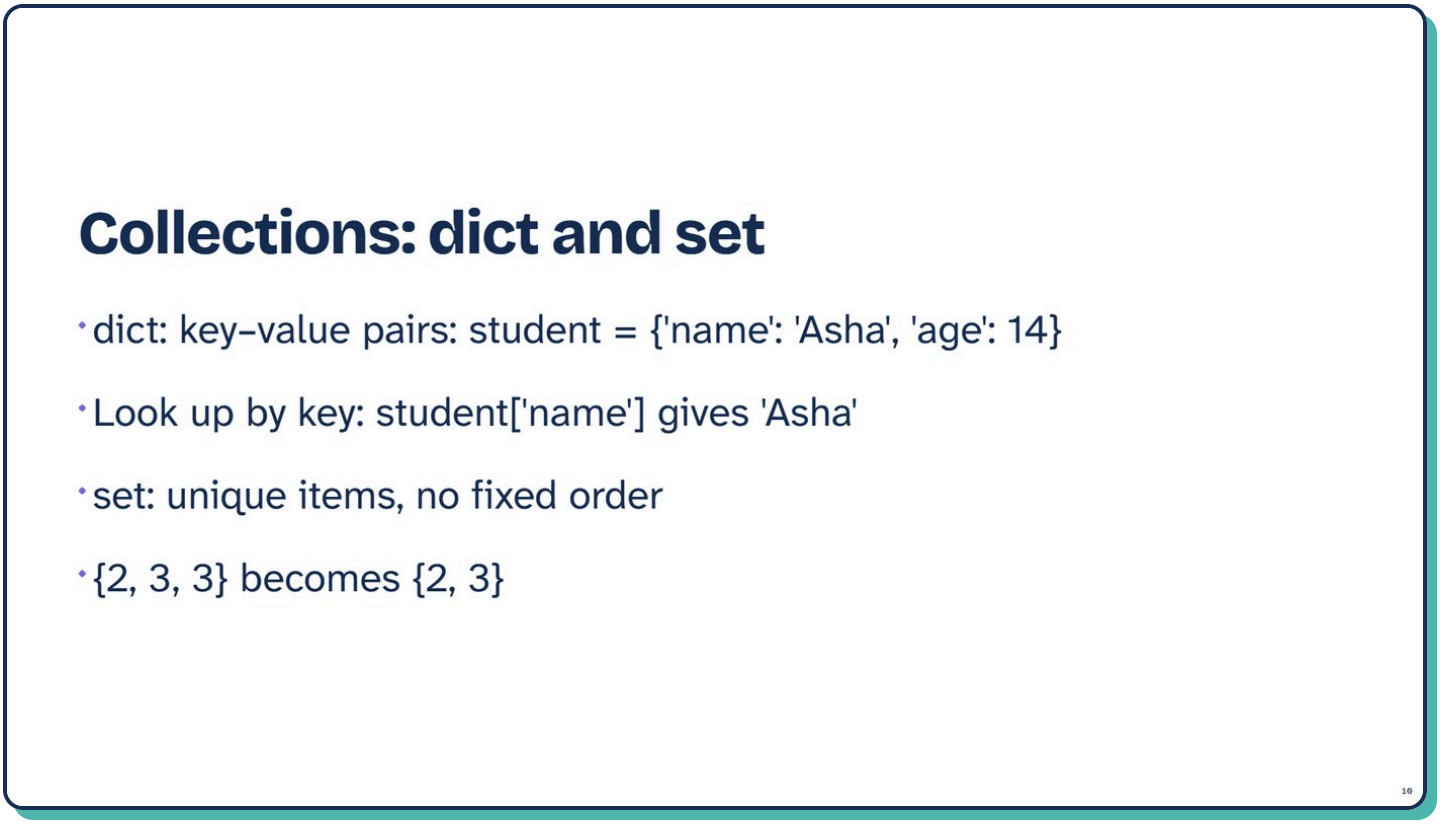
Type true in the shell to show NameError: name 'true' is not defined. Ask: where might you use None? For example, a phone number that has not been entered yet.



Collections: list and tuple

Teacher notes

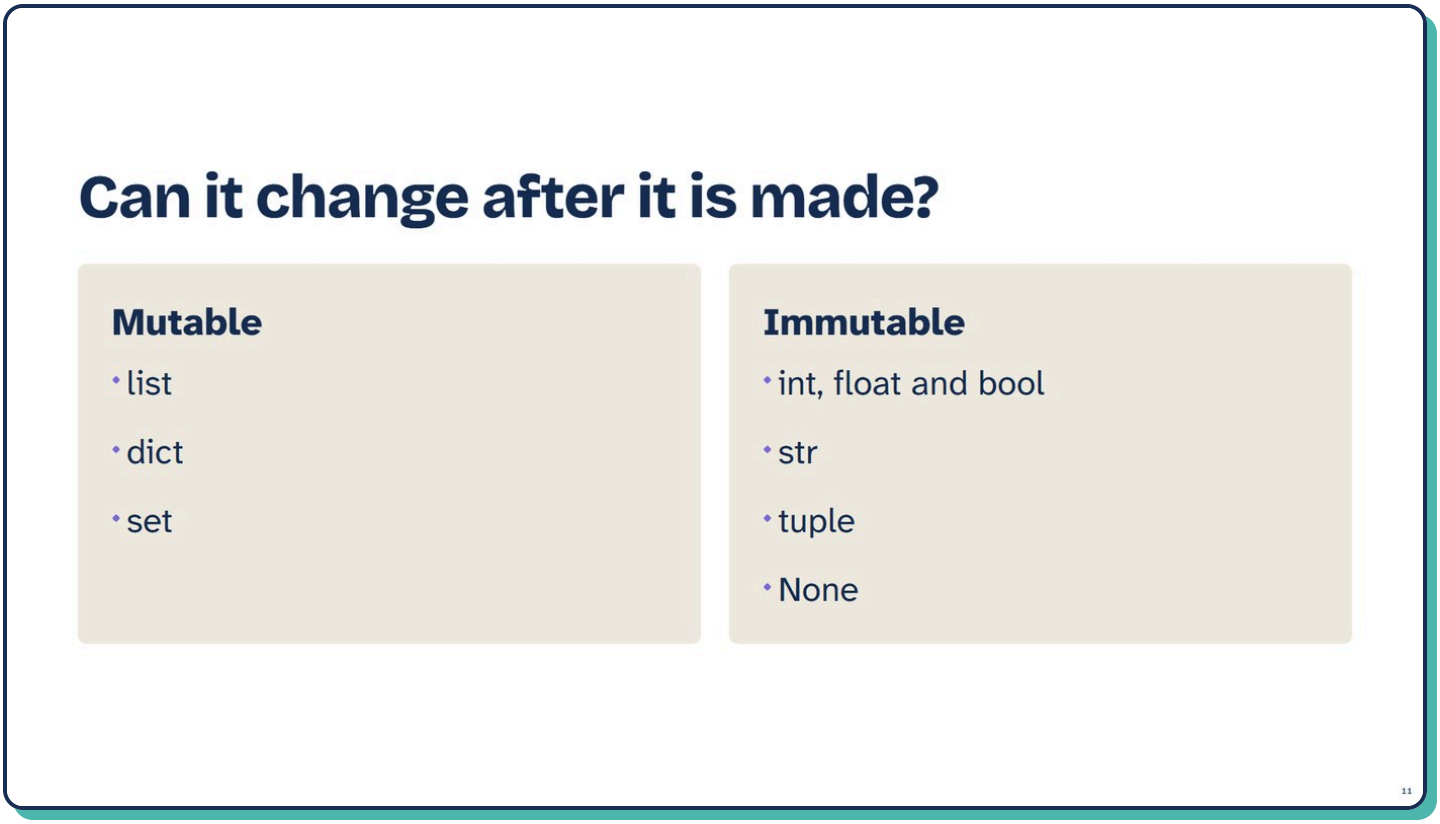
After append, marks is [78, 91, 85, 66]. Ask: why would you choose a tuple for map coordinates? Because they should not change by accident.



Collections: dict and set

Teacher notes

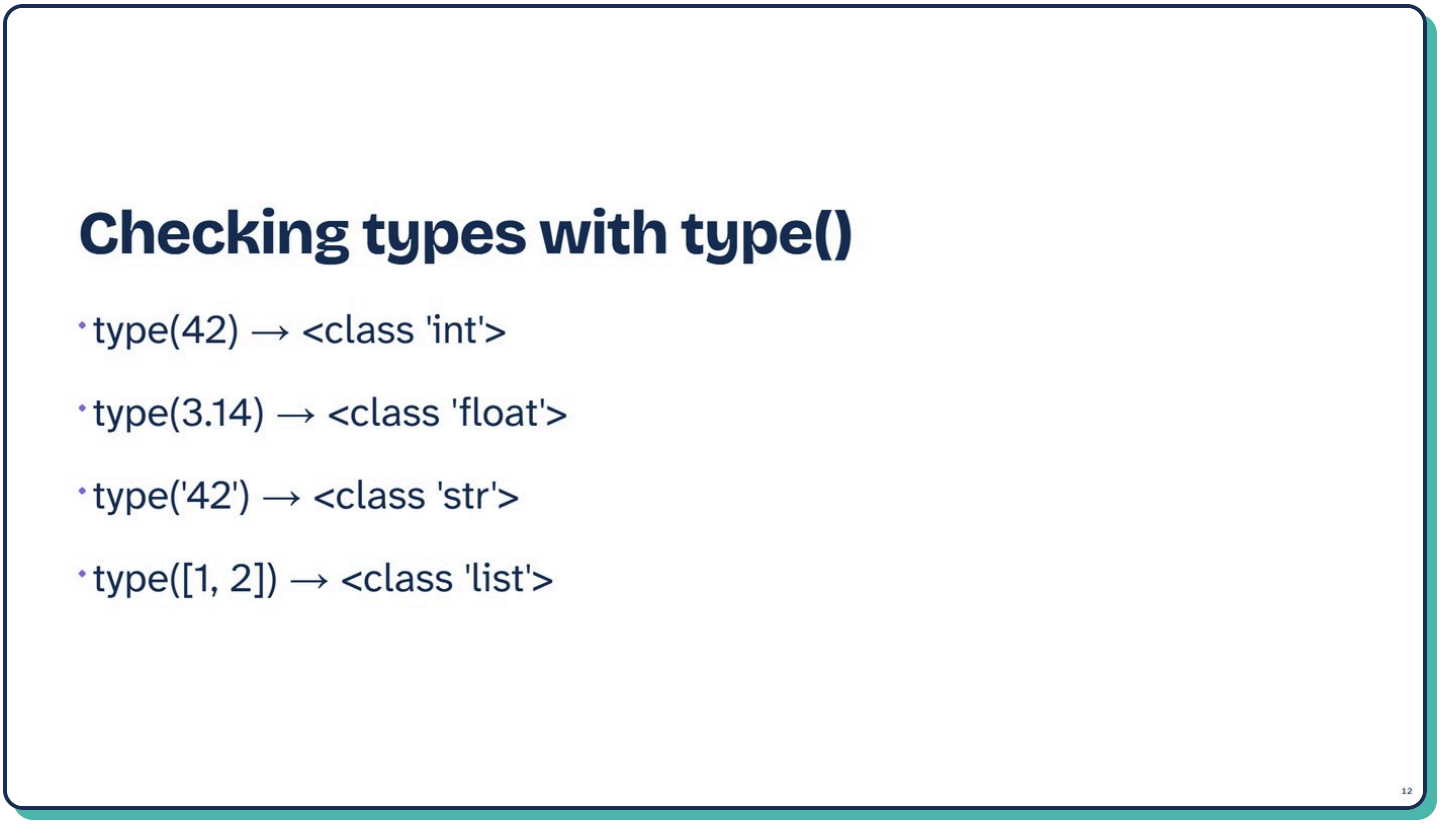
Relate a dict to a school ID card: each label (key) has a value. Ask: how could a set help count how many different states students come from? It removes duplicates automatically.



Can it change after it is made?

Teacher notes

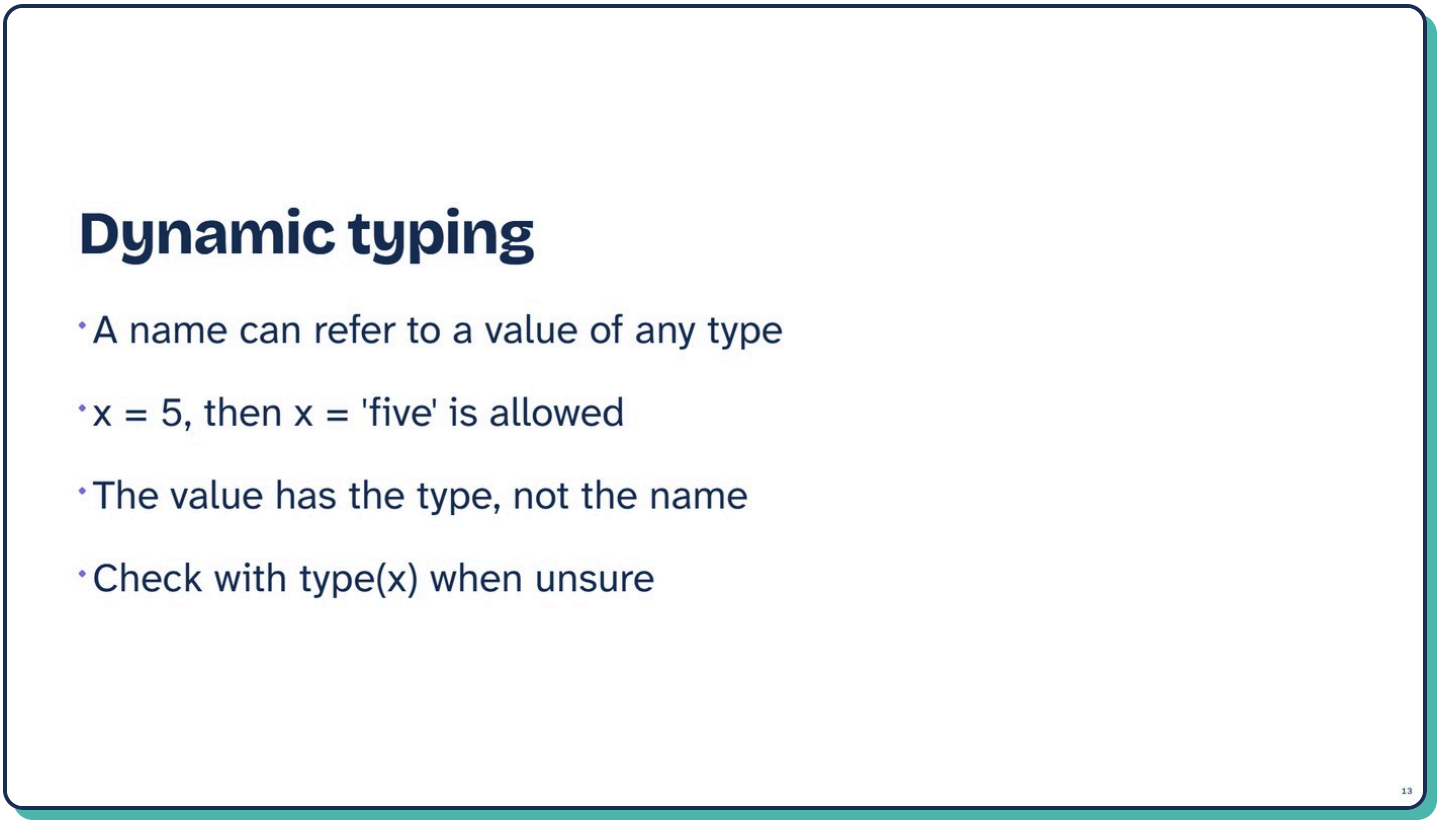
Show that t[0] = 9 on a tuple raises TypeError: 'tuple' object does not support item assignment. The same happens for a str. Reassigning a name is allowed; changing an immutable value in place is not.



Checking types with type()

Teacher notes

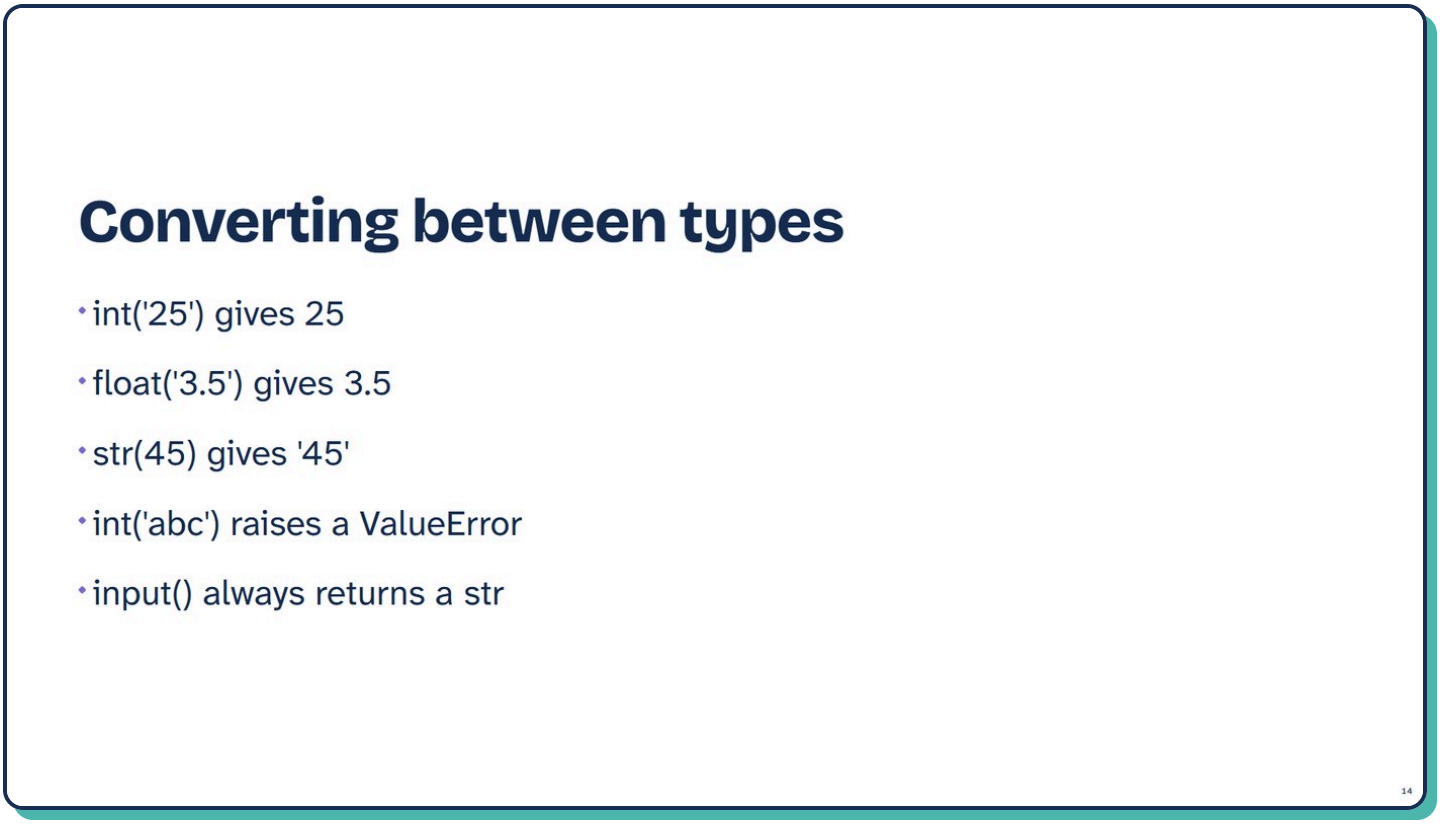
Ask learners to predict type(3.0) before running it; the answer is float, because of the decimal point. type() is the quickest way to debug a value that behaves strangely.



Dynamic typing

Teacher notes

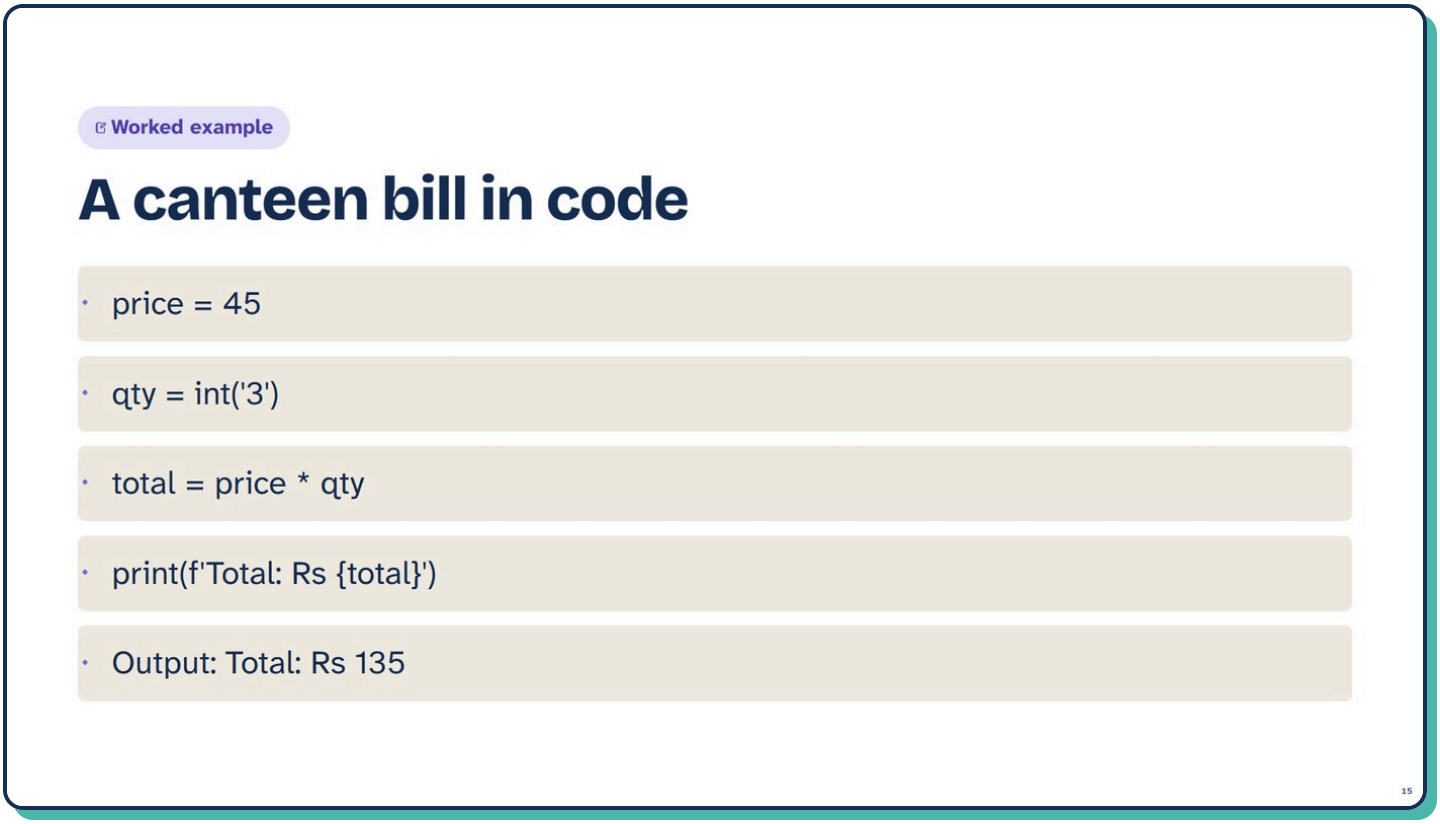
Run x = 5, type(x), then x = 'five', type(x): the result changes from int to str. Ask: what problem could this cause in a long program? A name may hold a different type than you expect.



Converting between types

Teacher notes

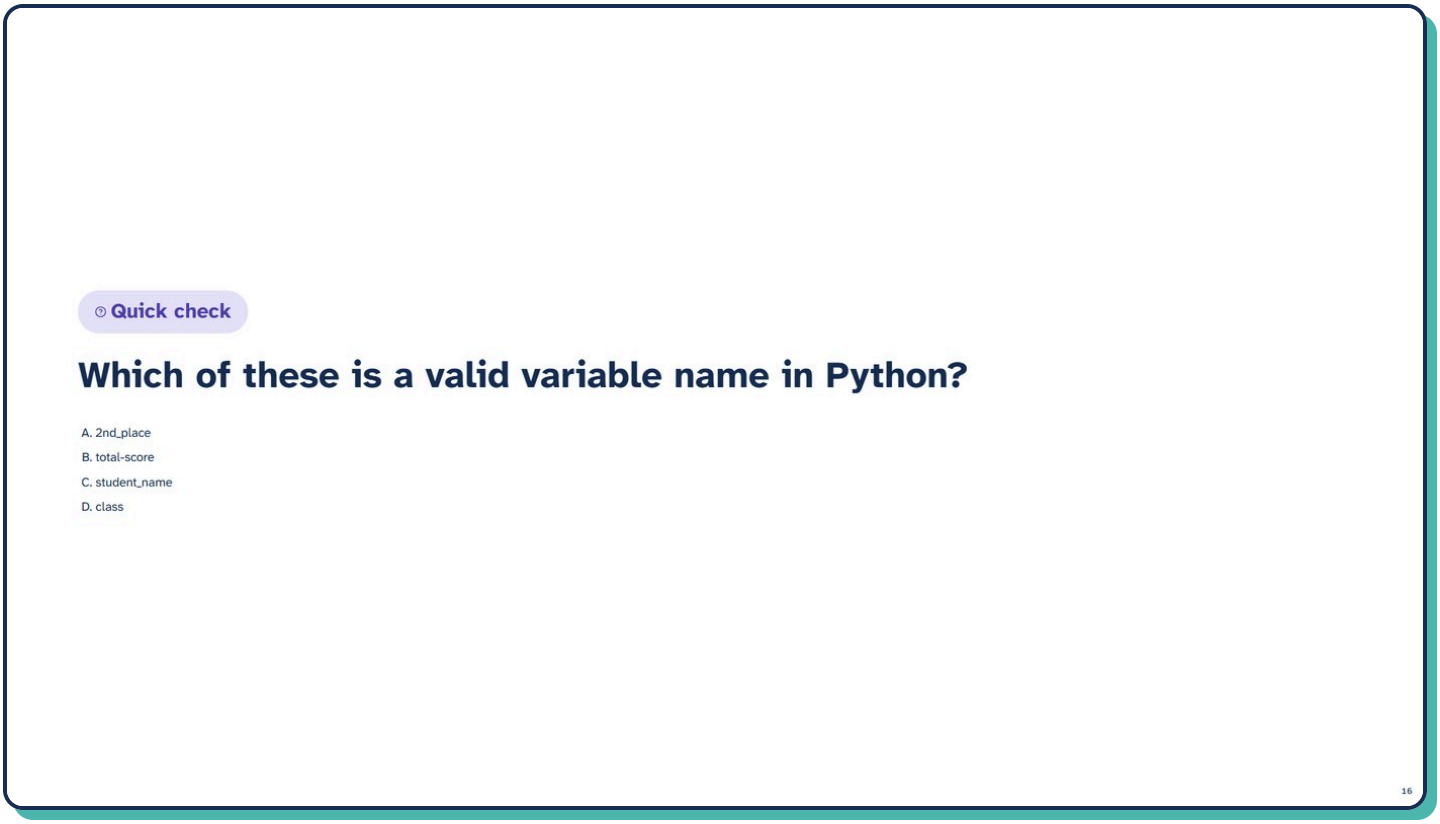
This is the most common beginner bug: adding a number typed by the user without converting it. Ask: what does int('3.5') do? It raises a ValueError; use float() first.



A canteen bill in code

Teacher notes

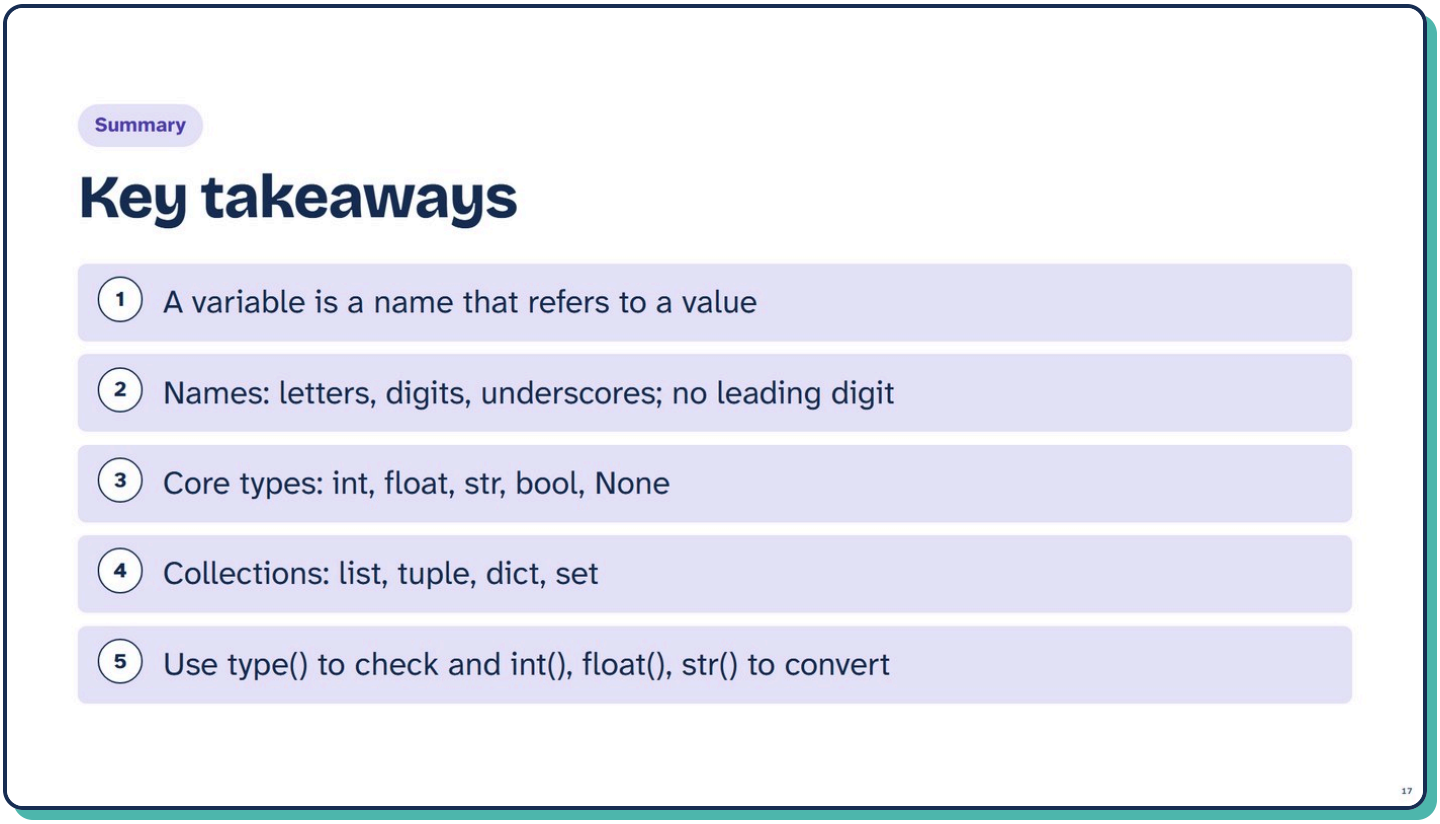
In a real program qty would come from input(), which returns the text '3', so int() is needed. Ask: what would print if we forgot int()? '3' * 45 repeats the text, a classic surprise.



Quick check

Teacher notes

Answer: C, student_name. 2nd_place starts with a digit, total-score contains a minus sign, and class is a reserved keyword.



Key takeaways

Teacher notes

Recap with one live example per bullet. Then take the five-question quiz on the page and set a short task: store your name, age and three favourite foods in suitable variables and print their types.