Students:
Section 2.1 is a part of 1 assignment: **CSC108 CH02.1-2.10 P2A**

This assignment's due date has passed. Activity will still be recorded, but will not count towards this assignment (unless the due date is changed). See this article for more info.

Includes: PA
Due: 02/04/2025, 11:59 PM EST

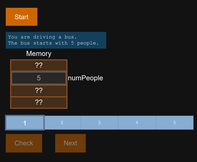
2.1 Variables and assignments (general)

Remembering a value

Here's a variation on a common schoolchild riddle.

PARTICIPATION ACTIVITY 2.1.1: People on bus.

For each step, keep track of the current number of people by typing in the numPeople box (the box is editable).



Feedback?

By the way, the real riddle's ending question is actually "What is the bus driver's name?"-- the subject usually says "How should I know?" The riddler then says "I started with YOU are driving a bus."

The box above served the same purpose as a variable in a program, introduced below.

Variables and assignments

In a program, a ***variable*** is a named item, such as x or numPeople, used to hold a value.

An ***assignment*** assigns a variable with a value, such as x = 5. That assignment means x is assigned with 5, and x keeps that value during subsequent assignments, until x is assigned again.

An assignment's left side must be a variable. The right side can be an expression, so an assignment may be x = 5, y = x, or z = x + 2. The 5, x, and x + 2 are each an expression that evaluates to a value.

PARTICIPATION ACTIVITY 2.1.2: Variables and assignments.

Captions

1. In programming, a variable is a place to hold a value. Here, variables x, y, and z are depicted graphically as boxes.
2. An assignment assigns the left-side variable with the right-side expression's value. x = 5 assigns x with 5.
3. y = x assigns y with x's value, which presently is 5. z = x + 2 assigns z with x's present value plus 2, so 5 + 2 or 7.
4. A subsequent x = 3 assigns x with 3. x's former value of 5 is overwritten and thus lost. Note that the values held in y and z are unaffected, remaining as 5 and 7.
5. In algebra, an equation means "the item on the left always equals the item on the right". So for x + y = 5 and x * y = 6, one can determine that x = 2 and y = 3 is a solution.
6. Assignments look similar but have a VERY different meaning. The left side MUST be one variable.
7. The = isn't "equals", but is an action that PUTS a value into the variable. Assignments only make sense when executed in sequence.

Feedback?

= is not equals

In programming, = is an assignment of a left-side variable with a right-side value. = is NOT equality as in mathematics. Thus, x = 5 is read as "x is assigned with 5", and not as "x equals 5". When one sees x = 5, one might think of a value being put into a box.

PARTICIPATION ACTIVITY 2.1.3: Valid assignments.

Indicate which assignments are valid.

1) x = 1
- Valid
- Invalid

2) x = y
- Valid
- Invalid

3) x = y + 2
- Valid
- Invalid

4) x + 1 = 3
- Valid
- Invalid

5) x + y = y + x
- Valid
- Invalid

Feedback?

PARTICIPATION ACTIVITY 2.1.4: Variables and assignments.

Given variables x, y, and z.

1) x = 9
y = x + 1
What is y?

Check Show answer

2) x = 9
y = x + 1
What is x?

Check Show answer

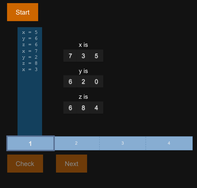
3) x = 9
y = x + 1
x = 5
What is y?

Check Show answer

Feedback?

PARTICIPATION ACTIVITY 2.1.5: Trace the variable value.

Select the correct value for x, y, and z after the following assignments execute.



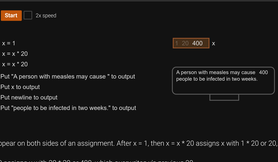
Feedback?

Assignments with variable on left and right

Because in programming = means assignment, a variable may appear on both the left and right as in x = x + 1. If x was originally 6, x is assigned with 6 + 1, or 7. The assignment overwrites the original 6 in x.

Increasing a variable's value by 1, as in x = x + 1, is common, and known as ***incrementing*** the variable.

PARTICIPATION ACTIVITY 2.1.6: A variable may appear on the left and right of an assignment.



Captions

1. A variable may appear on both sides of an assignment. After x = 1, then x = x * 20 assigns x with 1 * 20 or 20, overwriting x's previous 1.
2. Another x = x * 20 assigns x with 20 * 20 or 400, which overwrites x's previous 20.
3. Only the latest value is held in x. The previous values are shown greyed out above but in actuality are completely gone.

Feedback?

PARTICIPATION ACTIVITY 2.1.7: Variable on both sides.

Indicate the value of x after the assignments execute.

1) x = 5
x = x + 7

Check Show answer

2) x = 2
y = 3

x = x * y
x = x * y

Check Show answer

3) y = 30
x = y + 2
x = x + 1

Check Show answer

4) Complete this assignment to increment y: y = ____

Check Show answer

Feedback?

How was this section? | Provide section feedback

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