CMSC 105 Elementary Programming

Simple Programming Examples

Variables- Quick Recap

- A **variable** is a named piece of data (memory). It stores a **value**!

- Variables are used to reference values that may be changed in the program

- It has a **type** that defines how the memory is interpreted and what operations are allowed
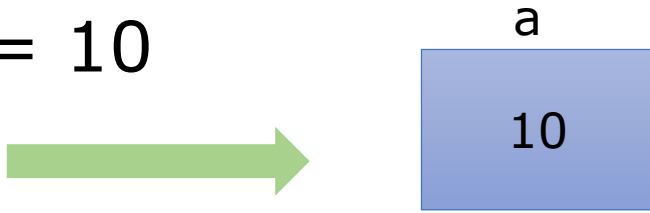
var = value

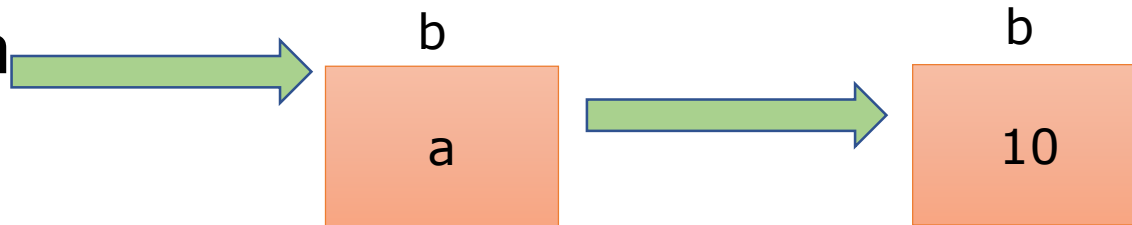Example: radius = 5

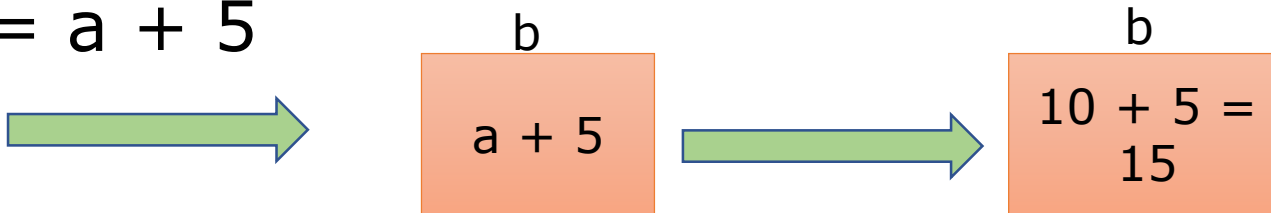# Variables Example

```
>>> a = 10
>>> a
10
>>> b = a
>>> b
10
>>> b = a + 5
>>> b
15
>>> b = b + 10
>>> b
25
```
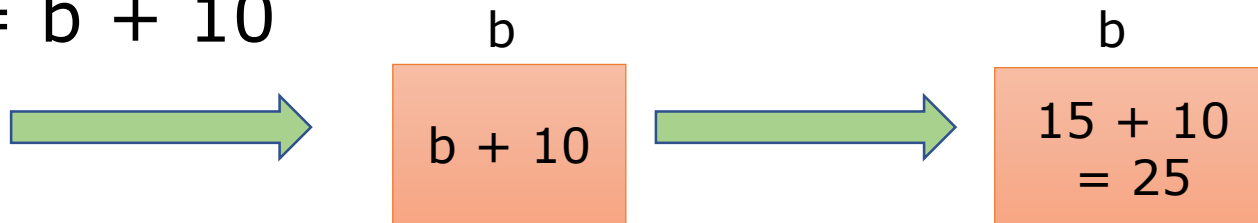
a

10

b

a

b

10

b

a + 5

b

10 + 5 = 15

b

b + 10

b

15 + 10 = 25

Statements

>>> print('We are learning python') → This is a statement

This thing is a string.
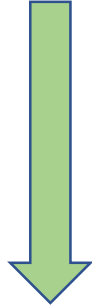
Strings are surrounded by single or double quotes.

>>> print('We are learning python')

This thing is a string.

This is print function that displays the string on screen

>>> print('We are learning python')

By running it on Python command line

We are learning python

Note: There are no quotation marks on printing the statement.

Reading input from the console

```
>>> read_value = input("Enter a number")
Enter a number10
>>> read_value
'10'
```

input is a function to collect key strokes from the console

It has quotation marks as read_value variable has a value of '10' (a string!)

```
>>> read_value=eval(input("Enter a number"))
Enter a number10
>>> read_value
10
```

eval is a function that converts those key strokes to a value

It has no quotation marks as read_value variable has a value of 10 (an integer!)

Reading input from the console cont'd

>>> read_value = float(input("Enter a number"))

Enter a number10

Converts the input into a float value

>>> read_value

10.0

It has a decimal as read_value variable has a value of 10.0 (a floating number!)

Programming Example

The code below calculates the sum of two numbers. It reads (takes as input) 2 numbers and displays the sum.

Here's how we write a program:

```
''' Author name: abc
This program calculates the sum of 2 numbers'''

number1=eval(input("Enter number 1"))  # Asks users to input number 1
number2=eval(input("Enter number 2"))  # Asks users to input number 2

add_result= number1 + number2

print("Sum of 2 numbers is", add_result)
```

This is comment block where you describe your program. You can use ''' or # signs for this.

Reads input. As explained in Section 3 of this lab, the input entered will be in **string** format. **eval** will convert it into a value

Calculates the sum of numbers

Displays (prints) the output result i.e. **add_result** here

A program has mainly 4 components:

- Comments
- Input statements
  - Initialize a variable
    or
  - Read input values from user
- Computation
- Output/display statement

Example 2

- Write a python program that reads as input 3 numbers and display their average

Let's discuss!

Example 3

- Write a python program that reads the value in seconds and display the corresponding time in minutes and remaining seconds.

  For example, 75 seconds is equivalent to 1 minute, 15 seconds.

  Hint: Use mathematical operators // and %

  Let's discuss!

Thank you!
Questions?