geoffreyangus.github.io/CS106R/

CS106R

Logistics About Login

Class Information

Schools:
Curitiba, BR
Colegio SESC
Colegio Bom Jesus Centro
Colegio Bom Jesus Lourdes

Dates:
7 Weeks
July 30 to September 14

Teachers:
Sabri Eyuboglu
eyuboglu@stanford.edu

Geoffrey Angus
gangus@stanford.edu

About:
CS106R is a pioneer, introductory computer science course designed for high-schoolers with no prior computer science experience. Students will learn much of the same material as Stanford's introductory computer science class, *CS106A*. However, we have tailored the notes, exercises and

Week 3

Objects, Variables, and Operators

Notes

Objects and Variables

Operators

Advanced Functions Part 1

Exercises

Guest List

Theorem of Pythagoras

Vidente

This week we'll introduce you to the other half of computer science: Objects.

Important links:
- Piazza (Sign Up) Class Code: cs106r
- Attendance (Week 3)
- Challenge: Hailstone (Optional)

Learning Objectives
1.) Objects
2.) Variables
3.) Operators

Week 3

CS106R

Sabri **Eyuboglu** & Geoffrey **Angus**

Objects, Variables and Operators

Objects

Functions are like Verbs

`move()`

`pick_fruit()`

`turn_right()`

Functions are like **Verbs**

Objects are like **Nouns**

```
"Hello, World!"
```

```
163
```

```
"CS106R"
```

```
0.43
```

```
"Brasil"
```

```
5
```

```
0.3
```

Definition

Object - *A piece of information in the memory of the computer.*

Objects

You've used objects before!

Object

```
print("My name is Sabri")
```

```
for i in range(5):
```

Object

4 Basic Object Classes

Object **Classes**

4 Basic Object Classes

string

Sequences of characters – text

Example

```
"Hello, World!"
```

Object **Classes**

4 Basic Object Classes

string

Sequences of characters – text

Example

```
"Hello, World!"
```

int

Integers – whole numbers

Examples

```
5   3450   0   -17   1
```

Object **Classes**

4 Basic Object Classes

string

Sequences of characters – text

Example

```
"Hello, World!"
```

int

Integers – whole numbers

Examples

```
5   3450   0   -17   1
```

float

Fractional numbers

Examples

```
-5.0   0.174   3.14
```

Object **Classes**

4 Basic Object Classes

string

Sequences of characters – text

Example

```
"Hello, World!"
```

int

Integers – whole numbers

Examples

```
5   3450   0   -17   1
```

float

Fractional numbers

Examples

```
-5.0   0.174   3.14
```

bool

True or false

Examples

```
True   False
```

But how do we ***keep track of*** Objects in programs?

Variables

Labeling Objects

```
"Cada um no seu quadrado! (8x)

Eu disse ado-a-ado!
Cada um no seu quadrado!
Ado-a-ado!
Cada um no seu quadrado!

Saci no seu quadrado! (4x)
Saci com giratória! (4x)
Claudinho e Buchecha no seu quadrado! (4x)
Claudinho e Buchecha com giratória! (4x)

Eu disse ado-a-ado!
Cada um no seu quadrado!
Ado-a-ado!
Cada um no seu quadrado!"
```

`string`

Dança do Quadrado

Labeling Objects

```
danca_do_quadrado = "Cada um no seu quadrado! (8x)

Eu disse ado-a-ado!
Cada um no seu quadrado!
Ado-a-ado!
Cada um no seu quadrado!

Saci no seu quadrado! (4x)
Saci com giratória! (4x)
Claudinho e Buchecha no seu quadrado! (4x)
Claudinho e Buchecha com giratória! (4x)

Eu disse ado-a-ado!
Cada um no seu quadrado!
Ado-a-ado!
Cada um no seu quadrado!"
```

variable

label operator

string object

Variables *label* objects

Variables

label = *rotular*

Definition

Variable - *A label for an Object. We use variables in order to use and reuse Objects.*

Label Objects with Variables

```
favorite_singer = "Beyonce"
```

variable — label operator — string object

The **memory** of a computer is like a set of ***boxes***

Variables

```
favorite_singer = "Beyonce"
```

Variables

```
favorite_singer = "Beyonce"
```

Variables

```
favorite_singer = "Beyonce"
```

Memory

Variables

```
favorite_singer = "Beyonce"
```

Memory

Variables

```
favorite_singer = "Beyonce"
```

"Label Operator"

Memory

Variables

```
favorite_singer = "Beyonce"
```

Memory

`favorite_singer`

Variables

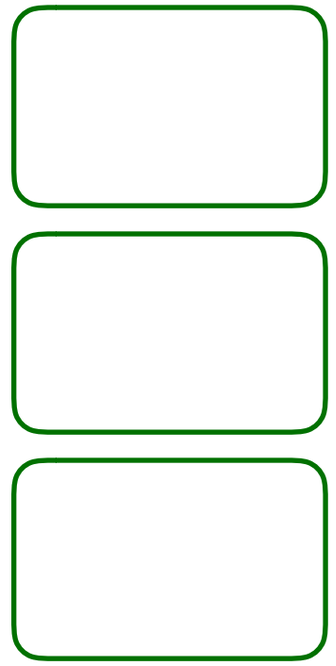
Code

```
def main():
    favorite_singer = "Beyonce"
    print(favorite_singer)
```

Memory

Variables

Objects



Output

Variables

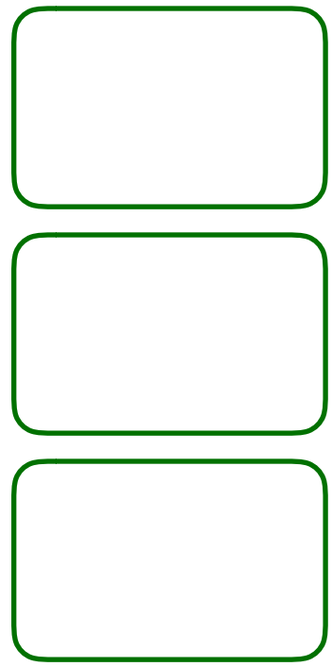
Code

```
def main():
    favorite_singer = "Beyonce"
    print(favorite_singer)
```

Memory

Variables

Objects



Output

Variables

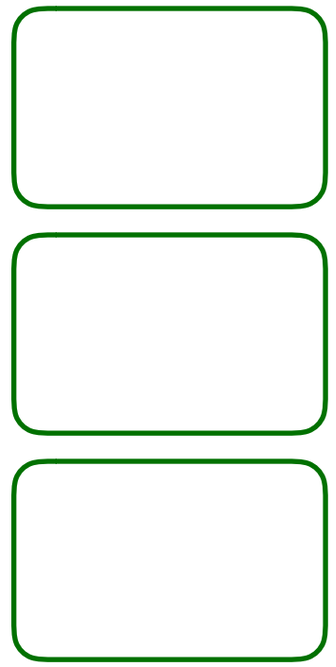
Code

```
def main():
    favorite_singer = "Beyonce"
    print(favorite_singer)
```

Memory

Variables

Objects



Output

Variables

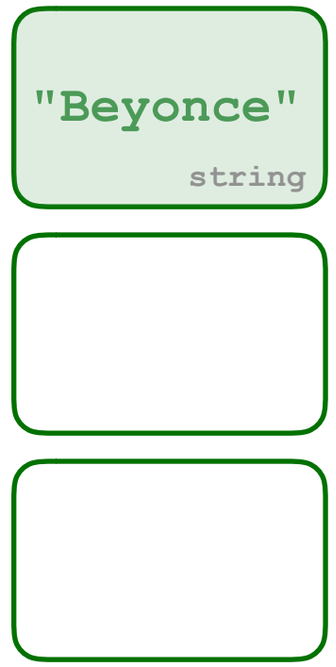
Code

```
def main():
    favorite_singer = "Beyonce"
    print(favorite_singer)
```

Memory

Variables

Objects



Output

Variables

Code

```
def main():
    favorite_singer = "Beyonce"
    print(favorite_singer)
```

Memory

Variables

favorite_singer

Objects

"Beyonce"
string

Output

Variables

Code

```
def main():
    favorite_singer = "Beyonce"
    print(favorite_singer)
```

Memory

Variables

favorite_singer

Objects

"Beyonce"
string

Output

Variables

Code

```
def main():
    favorite_singer = "Beyonce"
    print(favorite_singer)
```

Memory

Variables

favorite_singer

Objects

"Beyonce"
string

Output

```
Beyonce
```

Variables can label the *same* object

Variables

Code

```
def main():
    geoffs_favorite = "Beyonce"
    sabris_favorite = geoffs_favorite

    geoffs_favorite = "Drake"
    print(sabris_favorite)
```

Memory

Variables	Object

Output

Variables

Code

```
def main():
    geoffs_favorite = "Beyonce"
    sabris_favorite = geoffs_favorite

    geoffs_favorite = "Drake"
    print(sabris_favorite)
```

Memory

Variables | Object

Output

Variables

Code

```
def main():
    geoffs_favorite = "Beyonce"
    sabris_favorite = geoffs_favorite

    geoffs_favorite = "Drake"
    print(sabris_favorite)
```

Memory

Variables	Object
	"Beyonce" string

Output

Variables

Code

```
def main():
    geoffs_favorite = "Beyonce"
    sabris_favorite = geoffs_favorite

    geoffs_favorite = "Drake"
    print(sabris_favorite)
```

Memory

Variables	Object
geoffs_favorite	"Beyonce" string

Output

Variables

Code

```
def main():
    geoffs_favorite = "Beyonce"
    sabris_favorite = geoffs_favorite

    geoffs_favorite = "Drake"
    print(sabris_favorite)
```

Memory

Variables	Object
geoffs_favorite	"Beyonce" string

Output

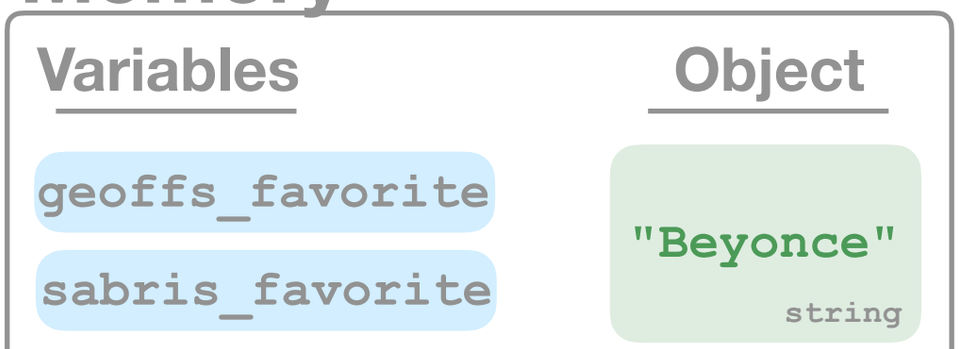
Variables

Code

```
def main():
    geoffs_favorite = "Beyonce"
    sabris_favorite = geoffs_favorite

    geoffs_favorite = "Drake"
    print(sabris_favorite)
```

Memory



Output

Variables

Code

```
def main():
    geoffs_favorite = "Beyonce"
    sabris_favorite = geoffs_favorite

    geoffs_favorite = "Drake"
    print(sabris_favorite)
```

Memory

Variables	Object
geoffs_favorite	"Beyonce" (string)
sabris_favorite	

Output

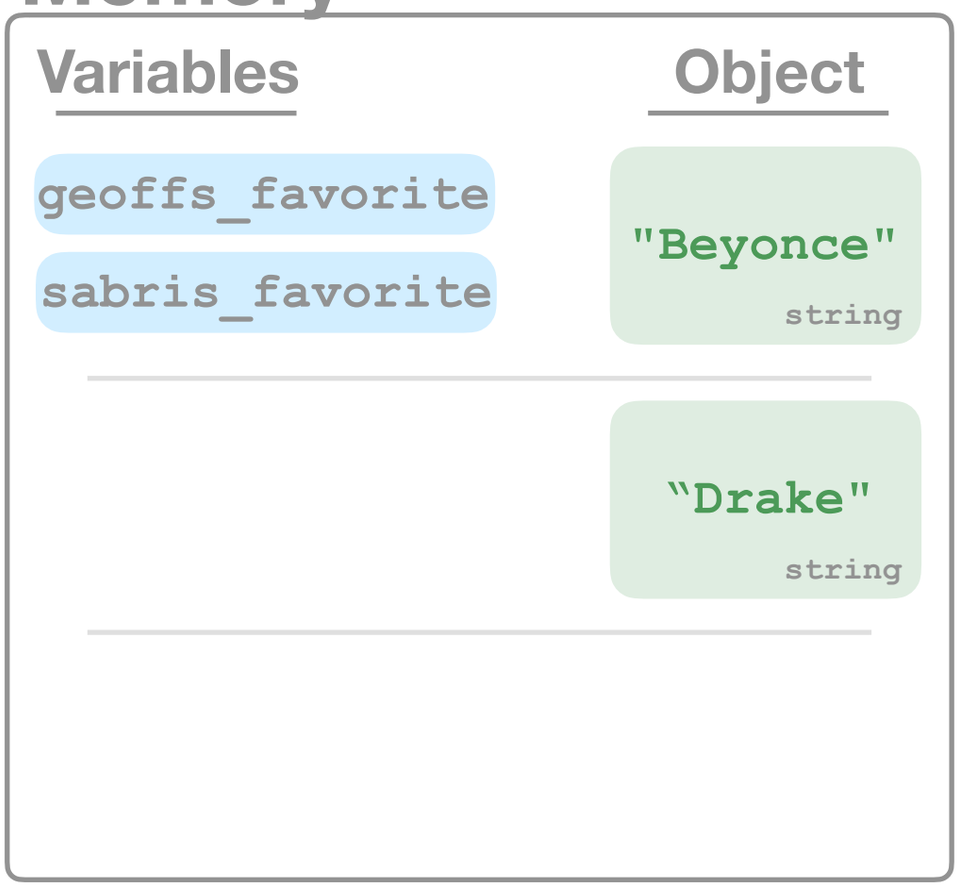
Variables

Code

```
def main():
    geoffs_favorite = "Beyonce"
    sabris_favorite = geoffs_favorite

    geoffs_favorite = "Drake"
    print(sabris_favorite)
```

Memory



Output

Variables

Code

```
def main():
    geoffs_favorite = "Beyonce"
    sabris_favorite = geoffs_favorite

    geoffs_favorite = "Drake"
    print(sabris_favorite)
```

Memory

Variables	Object
sabris_favorite	"Beyonce" (string)
geoffs_favorite	"Drake"

Output

Variables

Code

```
def main():
    geoffs_favorite = "Beyonce"
    sabris_favorite = geoffs_favorite

    geoffs_favorite = "Drake"
    print(sabris_favorite)
```

Memory

Variables	Object
sabris_favorite	"Beyonce" string
geoffs_favorite	"Drake" string

Output

Variables

Code

```
def main():
    geoffs_favorite = "Beyonce"
    sabris_favorite = geoffs_favorite

    geoffs_favorite = "Drake"
    print(sabris_favorite)
```

Memory

Variables	Object
sabris_favorite	"Beyonce" string
geoffs_favorite	"Drake" string

Output

```
Beyonce
```

Objects and Functions

Imagine... ***GeoffBot 2.0***

Two *Brand New Functions*

Object **Passing**

```
go_to_store()
```

```
has_guarana()
```

```
buy_guaranas(num_sodas)
```

```
deliver_message(recipient, message)
```

Object **Passing**

"GeoffBot, go to the store.If they have Guarana, buy five cans. Also, tell the owner I say hi!"

```
go_to_store()

if has_guarana():
    buy_guaranas(5)

deliver_message("owner", "Hi!")
```

Objects and *Variables* allow us to communicate to our **functions**.

Object **Passing**

We can give functions additional information by **passing** them **objects.**

Object **Passing**

```
function_name(object_name)
```

Example

```
buy_guaranas(num_sodas)
```

Object **Passing**

Functions can have multiple parameters!

```
function_name(object_1, object_2)
```

Example

```
deliver_message(recipient, message)
```

You've seen this before:

```
print("My name is Sabri")
```

```
range(5)
```

*Functions can **create** objects*

Returning **Objects**

```
capitalize_string(text)
```

Returning **Objects**

```
"cs106r"
```

```
capitalize_string(text)
```

Returning **Objects**

```
capitalize_string("cs106r")
```

Returning **Objects**

```
"CS106R"
```

```
capitalize_string("cs106r")
```

Returning **Objects**

```
"CS106R"
```

```
capitalize_string(text)
```

Returning **Objects**

```
"CS106R"
```

```
"gritando"
```

```
capitalize_string(text)
```

Returning **Objects**

```
"CS106R"
```

```
capitalize_string("gritando")
```

Returning **Objects**

```
"CS106R"
```

```
"GRITANDO"
```

```
capitalize_string("gritando")
```

Maiúsculas

Guest List

Theorem of Pythagoras

Max Number

Sometimes we want to ask the users for **input**

Input Functions

```
>
PyBot
------
How fast should PyBot move?
Enter slow, normal, or fast:
```

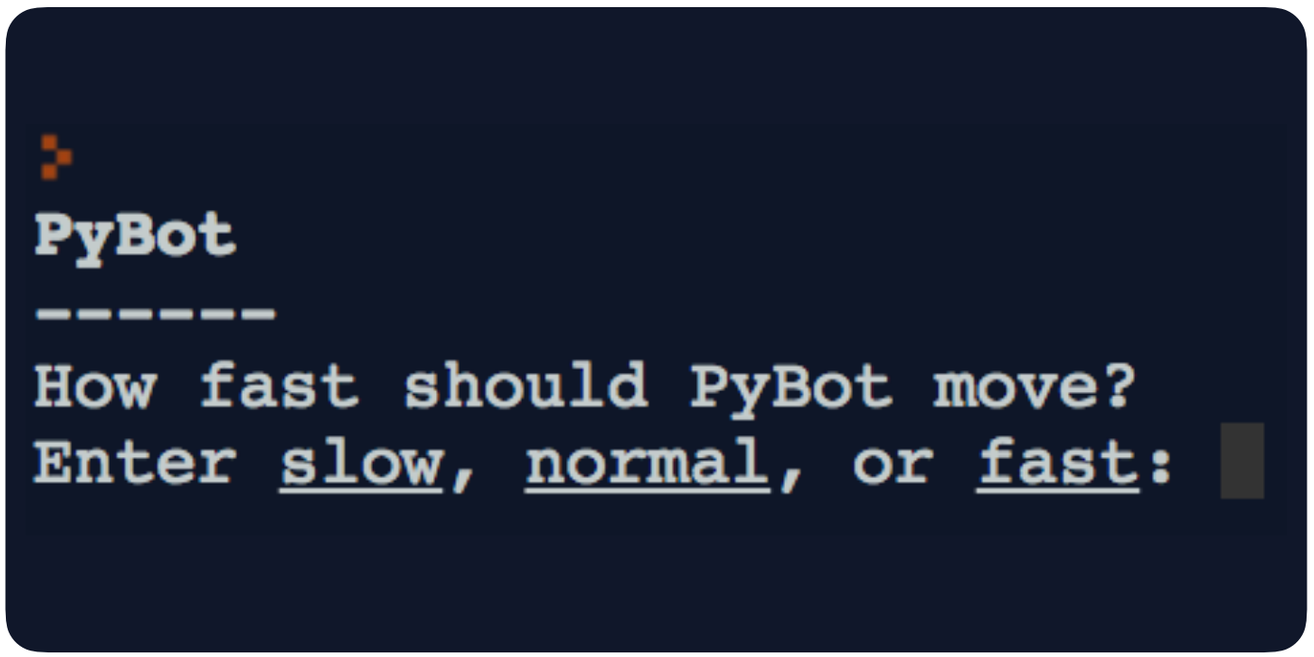
Input Functions

Creating **Accounts**

Choosing **Movies**

Making **Playlists**

Playing **Games**



Input Functions

`input_string(`*`message`*`)` Returns a `string` input by user.

`input_int(`*`message`*`)` Returns a `int` input by user.

`input_float(`*`message`*`)` Returns a `float` input by user.

`input_bool(`*`message`*`)` Returns a `bool` input by user.

Input Functions

Example: Inputs

Input Functions

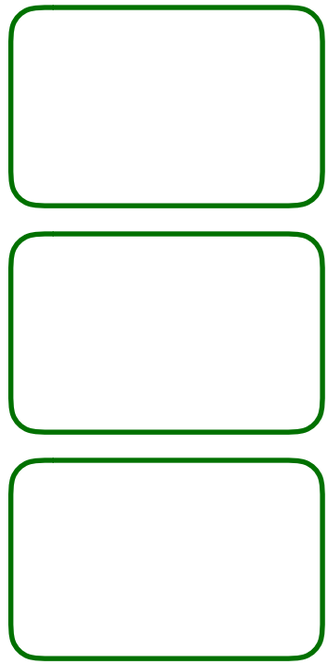
Code

```
def main():
    question = "Who is your favorite singer?"
    favorite_singer = input_string(question)
    print(favorite_singer)
```

Memory

Variables

Object



Output

Input Functions

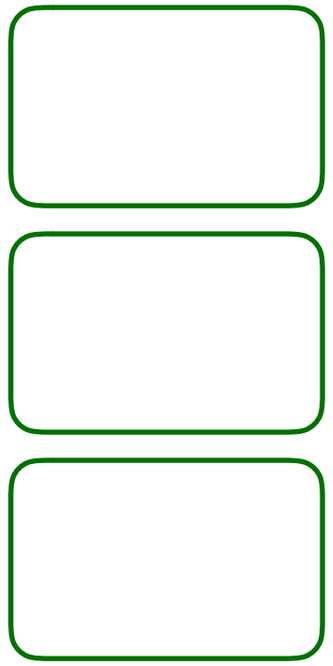
Code

```
def main():
    question = "Who is your favorite singer?"
    favorite_singer = input_string(question)
    print(favorite_singer)
```

Memory

Variables

Object



Output

Input Functions

Code

```
def main():
    question = "Who is your favorite singer?"
    favorite_singer = input_string(question)
    print(favorite_singer)
```

Memory

Variables

question

Object

"Who is your favorite singer?"
string

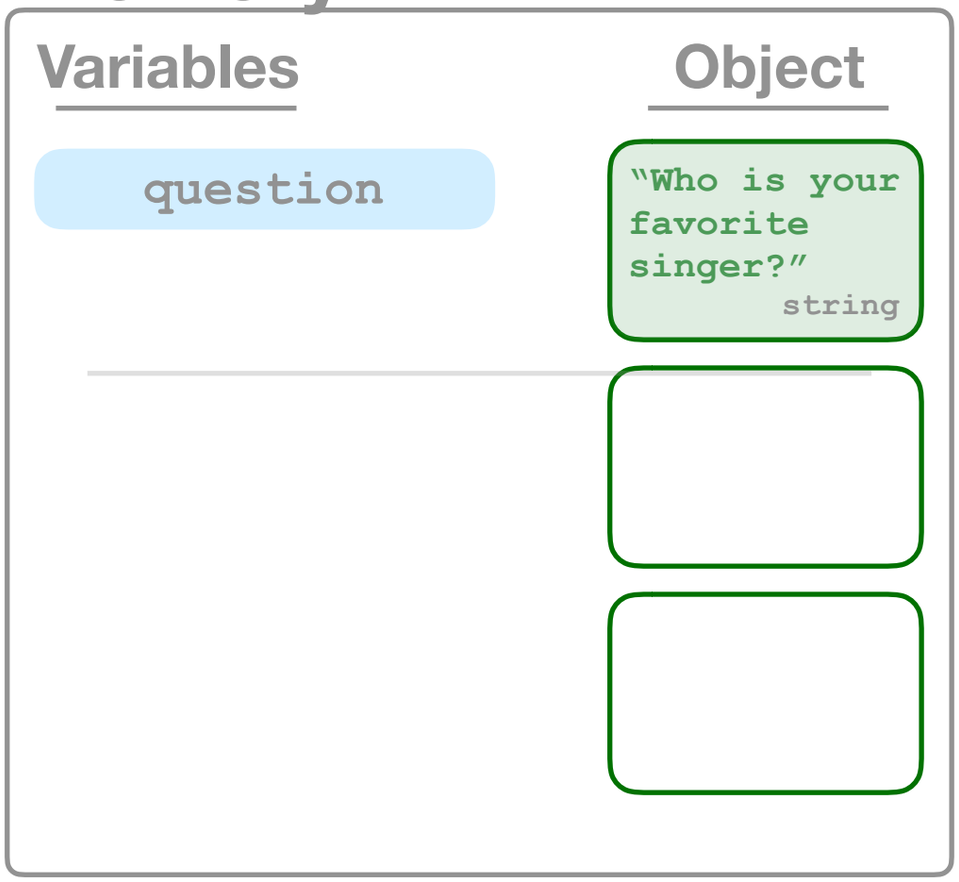
Output

Input Functions

Code

```
def main():
   question = "Who is your favorite singer?"
   favorite_singer = input_string(question)
   print(favorite_singer)
```

Memory



Output

```
>
Who is your favorite singer?
```

Input Functions

Code

```
def main():
    question = "Who is your favorite singer?"
    favorite_singer = input_string(question)
    print(favorite_singer)
```

Memory

Variables

question

Object

"Who is your favorite singer?"
string

Output

```
>
Who is your favorite singer? Frank Ocean
```

Input Functions

Code

```
def main():
    question = "Who is your favorite singer?"
    favorite_singer = input_string(question)
    print(favorite_singer)
```

Memory

Variables

question

Object

"Who is your favorite singer?"
string

"Frank Ocean"
string

Output

```
>
Who is your favorite singer? Frank Ocean
```

Input Functions

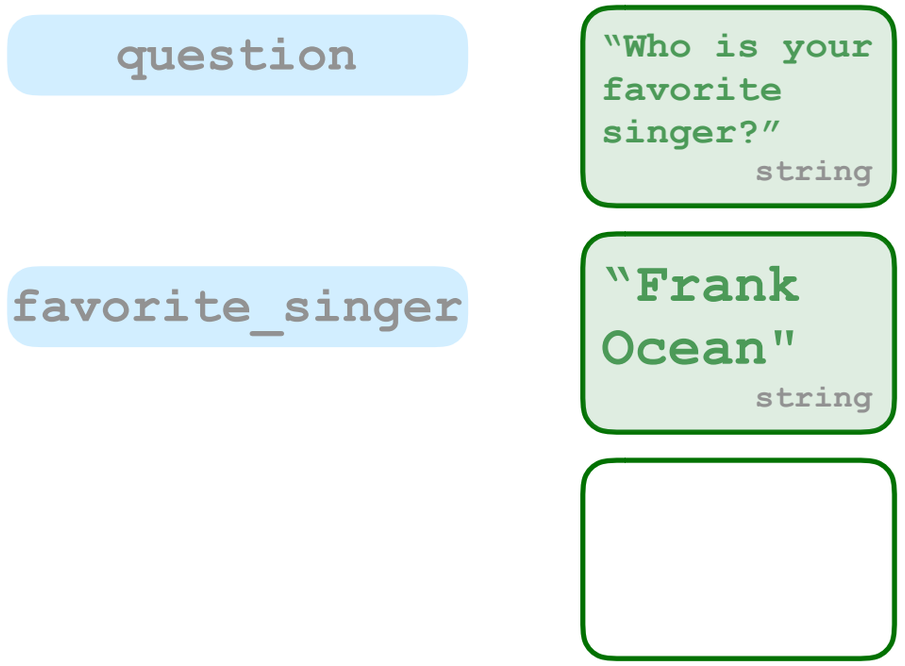
Code

```
def main():
    question = "Who is your favorite singer?"
    favorite_singer = input_string(question)
    print(favorite_singer)
```

Memory

Variables

Object



Output

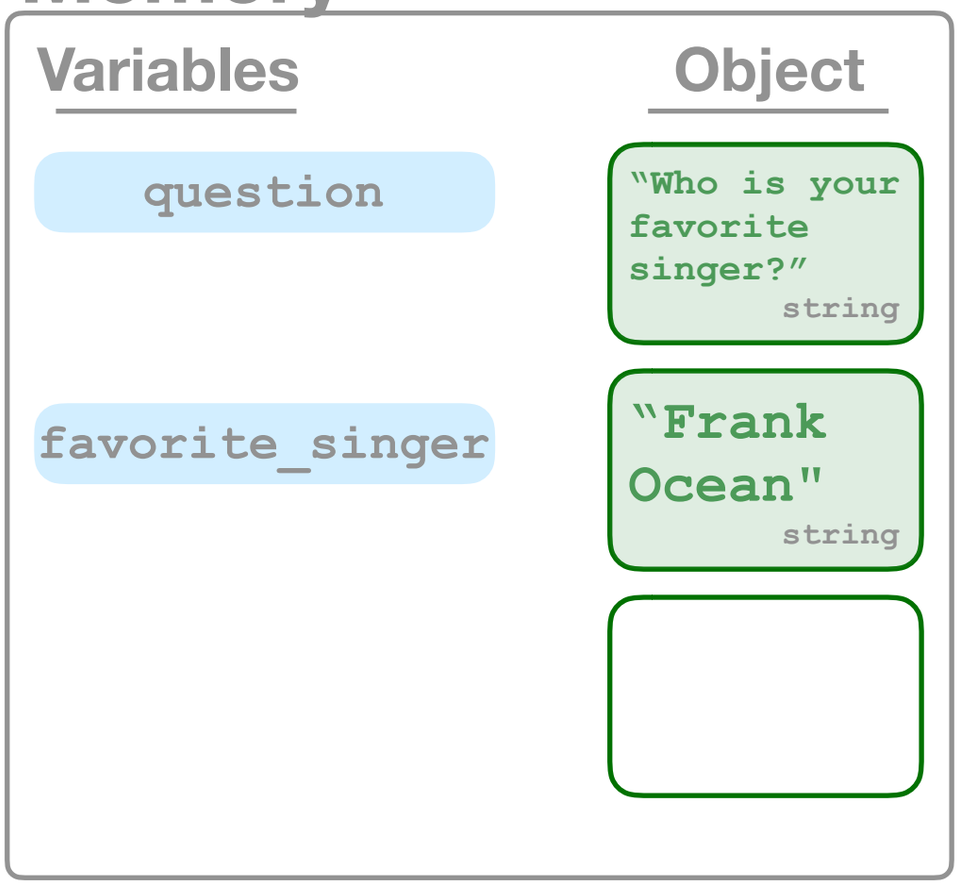
```
>
Who is your favorite singer? Frank Ocean
```

Input Functions

Code

```
def main():
    question = "Who is your favorite singer?"
    favorite_singer = input_string(question)
    print(favorite_singer)
```

Memory



Output

```
>
Who is your favorite singer? Frank Ocean
Frank Ocean
```

Maiúsculas

Guest List

Theorem of Pythagoras

Max Number

Operators

Arithmetic Operators

+

Add two objects together

`int` + `int`

```
5+3
```

`8`

`int`

`string` + `string`

```
"ROFL"+"LMAO"
```

`"ROFLLMAO"`

`string`

`float` + `float`

```
0.14+0.2
```

`0.34`

`float`

`float` + `int`

```
0.14+3
```

`3.14`

`float`

-

Subtract one object from another

***

Multiply two objects together

/

Divide one object by another

Arithmetic Operators

+

Add two objects together

-

Subtract one object from another

`int` - `int`	`float` - `float`	`float` - `int`
`5-3`	`0.14-0.2`	`3.14-3`
`2`	`-0.06`	`0.14`
`int`	`float`	`float`

*****

Multiply two objects together

/

Divide one object by another

Arithmetic Operators

`+`

Add two objects together

`-`

Subtract one object from another

`*`

Multiply two objects together

`int * int`	`string * int`	`float * float`	`float * int`
`5*3`	`"O" * 5`	`0.14*0.2`	`0.25*4`
`15`	`"OOOOO"`	`0.28`	`1.0`
`int`	`string`	`float`	`float`

`/`

Divide one object by another

Arithmetic Operators

+

Add two objects together

-

Subtract one object from another

*****

Multiply two objects together

/

Divide one object by another

`int` / `int`

```
5/2
```

`2.5`

`float`

`float` / `float`

```
0.14/0.2
```

`0.7`

`float`

`float` / `int`

```
1.0 /4
```

`2.5`

`float`

Arithmetic Operators

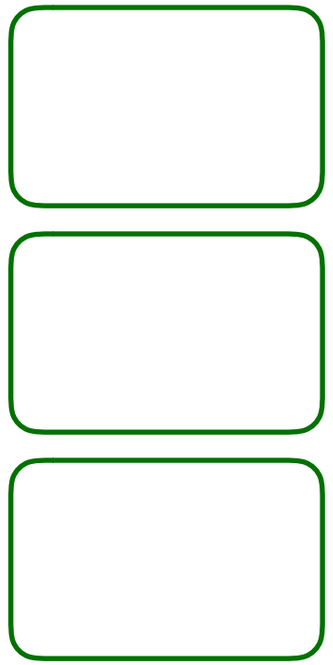
Code

```
def main():
    num_1 = input_int("Enter first int:")
    num_2 = input_int("Enter second int:")
    sum = num_1 + num_2
    print(sum)
```

Memory

Variables

Object



Output

Arithmetic Operators

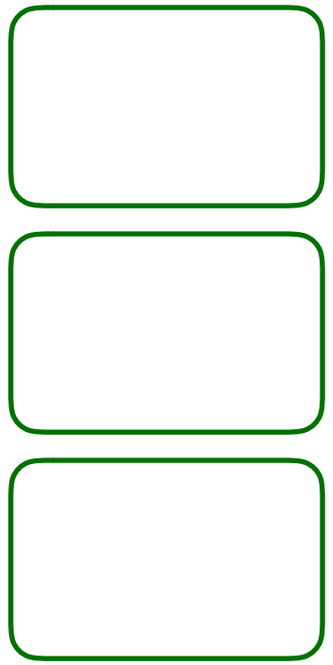
Code

```
def main():
    num_1 = input_int("Enter first int:")
    num_2 = input_int("Enter second int:")
    sum = num_1 + num_2
    print(sum)
```

Memory

Variables

Object



Output

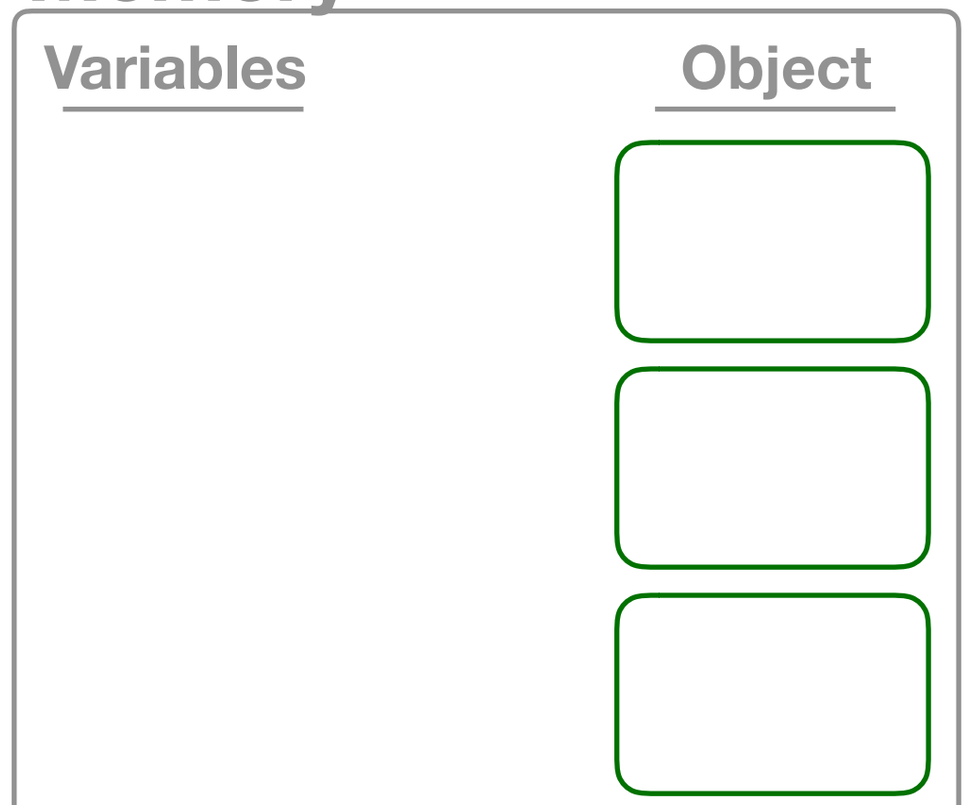
```
>
Enter first int:
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter first int:")
    num_2 = input_int("Enter second int:")
    sum = num_1 + num_2
    print(sum)
```

Memory



Output

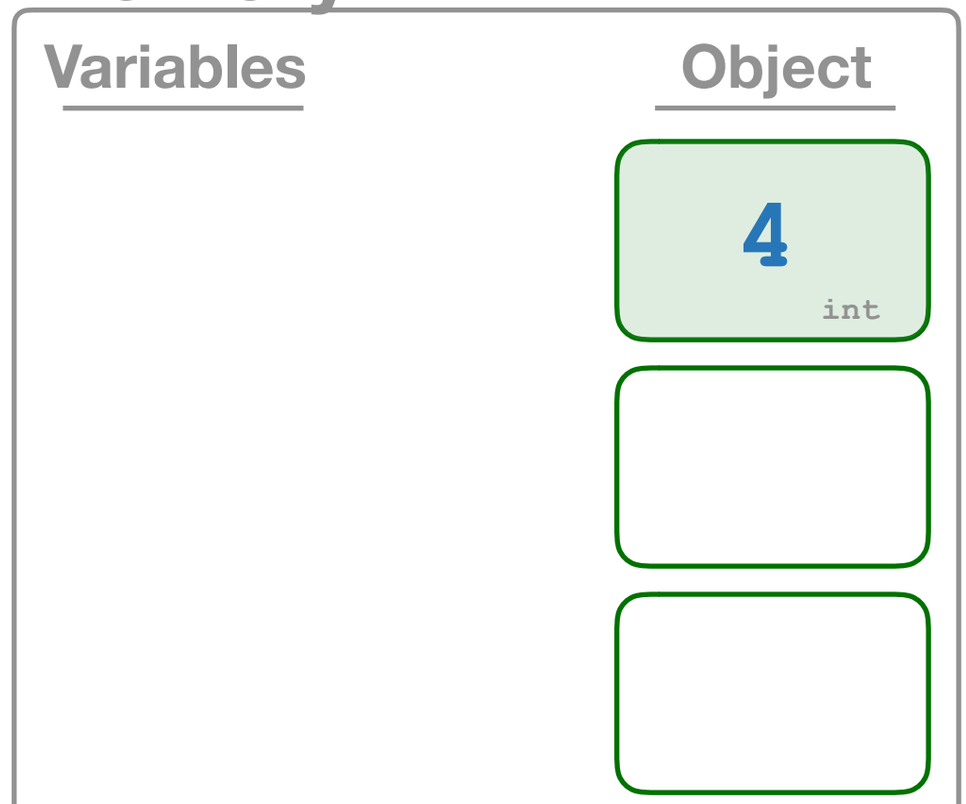
```
>
Enter first int: 4
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter first int:")
    num_2 = input_int("Enter second int:")
    sum = num_1 + num_2
    print(sum)
```

Memory



Output

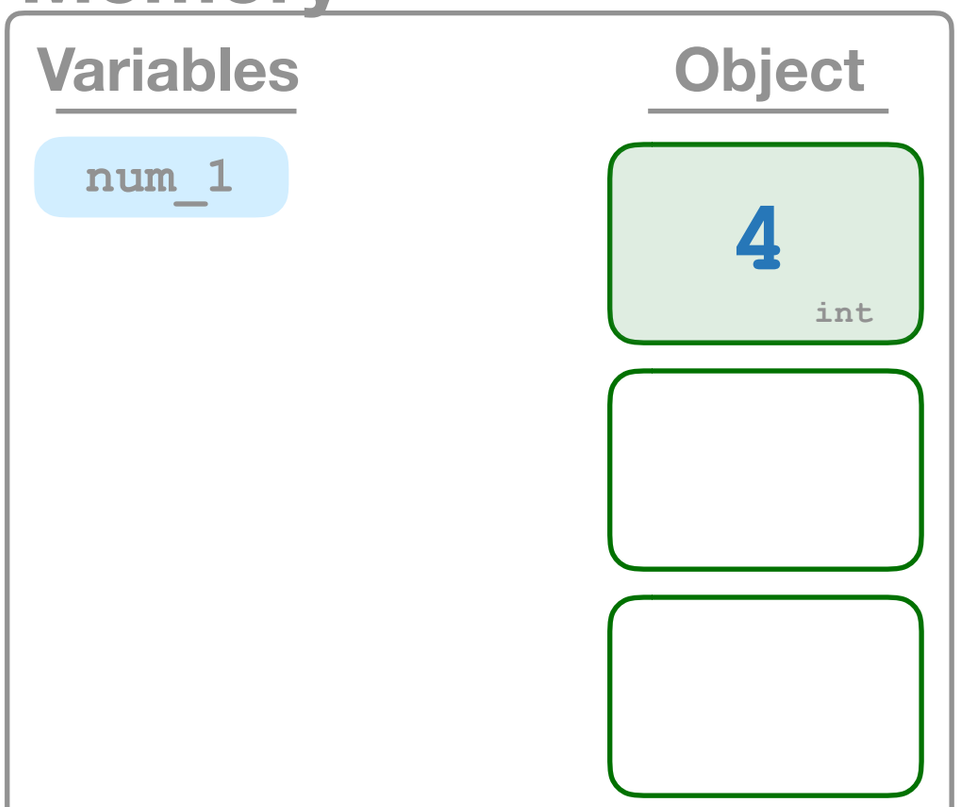
```
>
Enter first int: 4
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter first int:")
    num_2 = input_int("Enter second int:")
    sum = num_1 + num_2
    print(sum)
```

Memory



Output

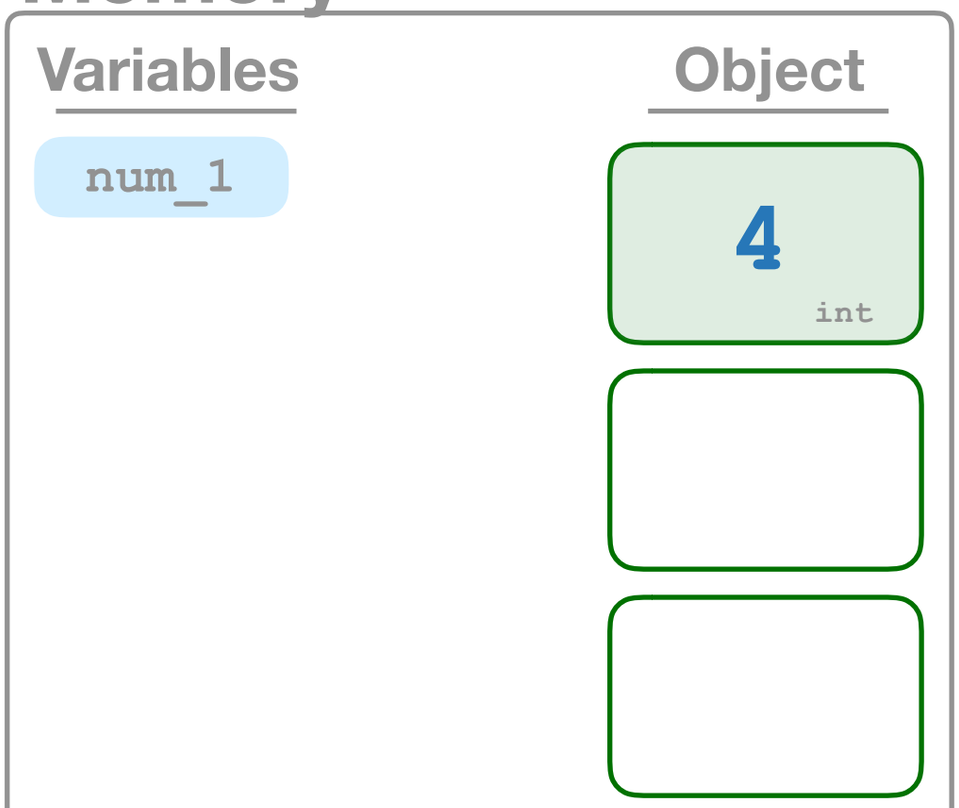
```
>
Enter first int: 4
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter first int:")
    num_2 = input_int("Enter second int:")
    sum = num_1 + num_2
    print(sum)
```

Memory



Output

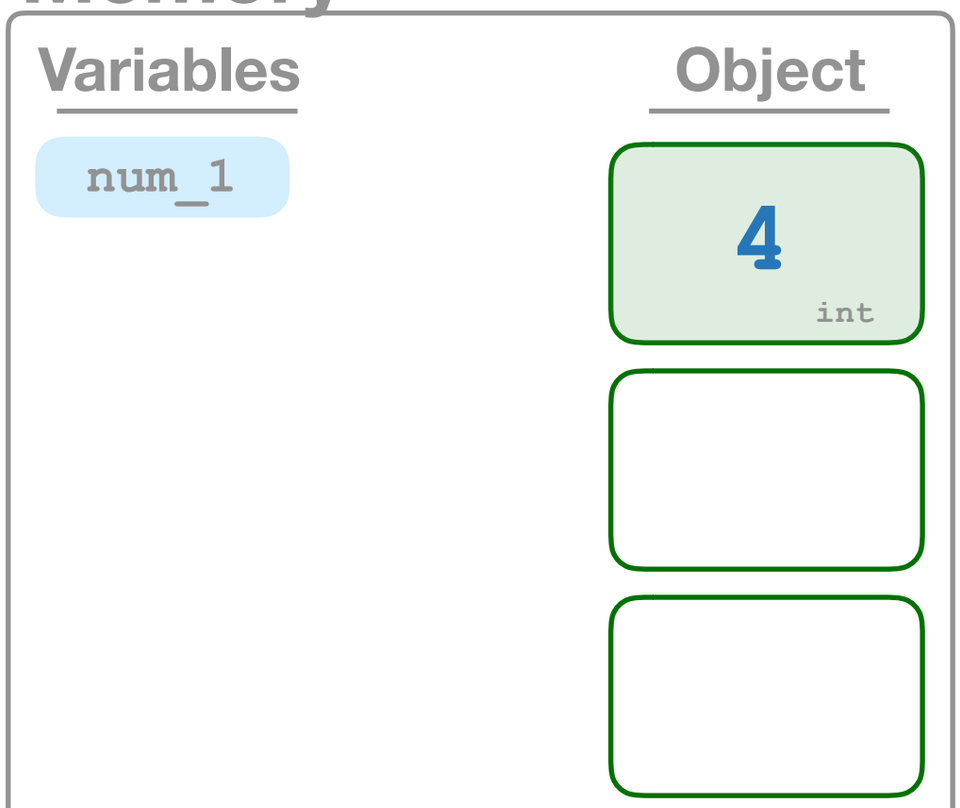
```
>
Enter first int: 4
Enter second int:
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter first int:")
    num_2 = input_int("Enter second int:")
    sum = num_1 + num_2
    print(sum)
```

Memory



Output

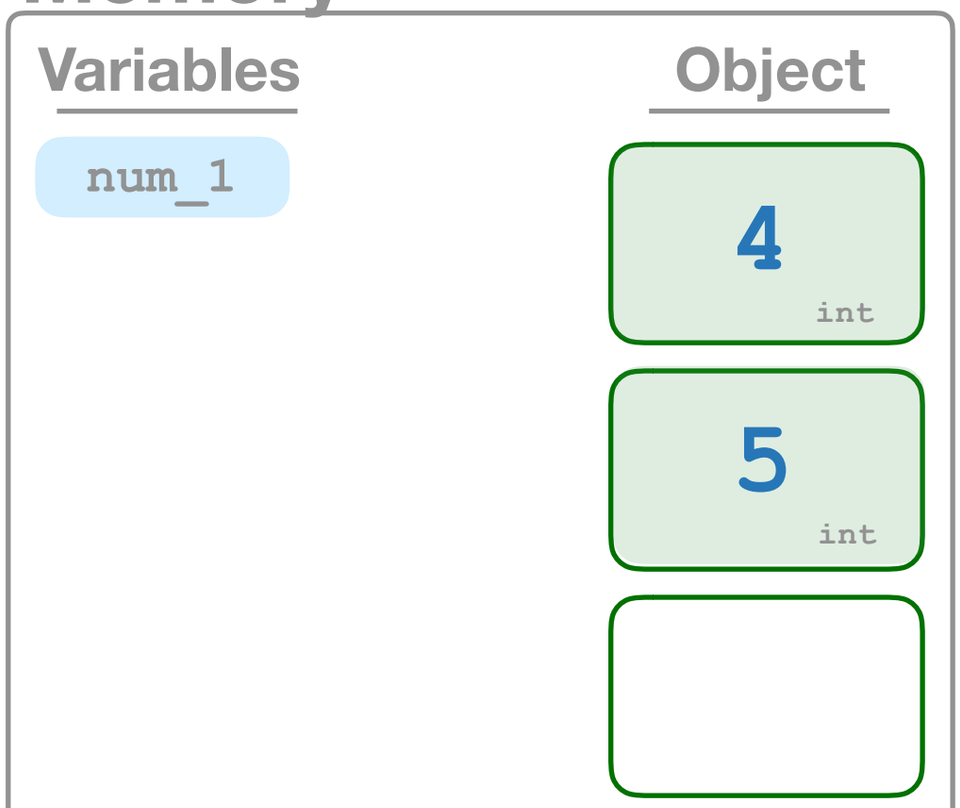
```
>
Enter first int: 4
Enter second int: 5
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter first int:")
    num_2 = input_int("Enter second int:")
    sum = num_1 + num_2
    print(sum)
```

Memory



Output

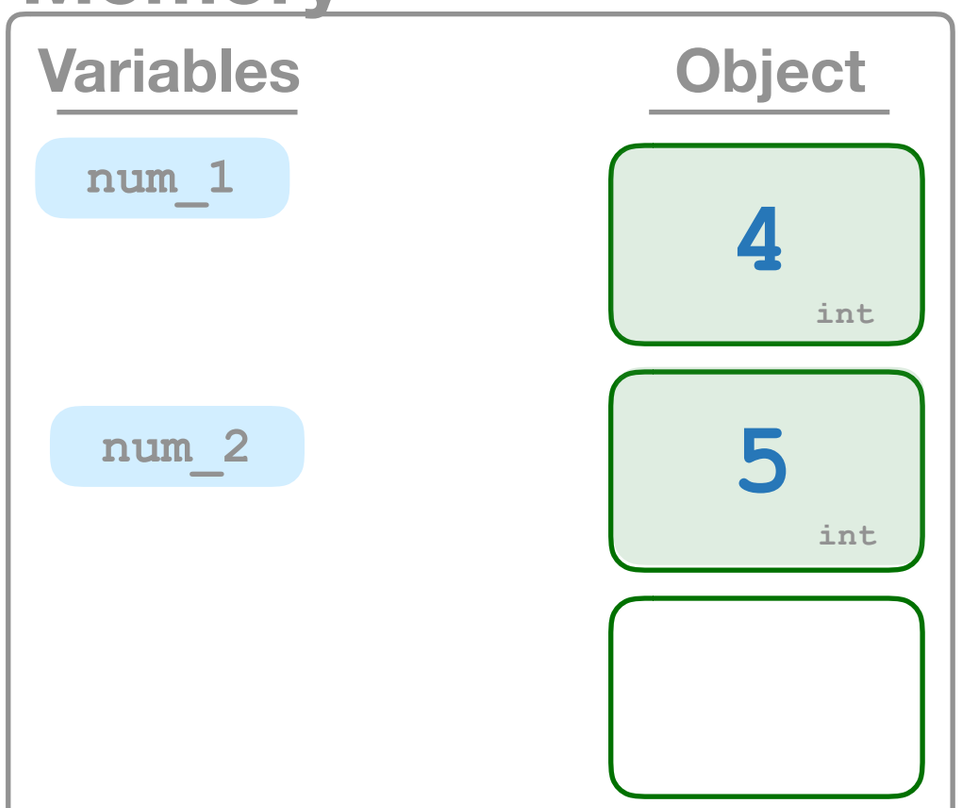
```
>
Enter first int: 4
Enter second int: 5
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter first int:")
    num_2 = input_int("Enter second int:")
    sum = num_1 + num_2
    print(sum)
```

Memory



Output

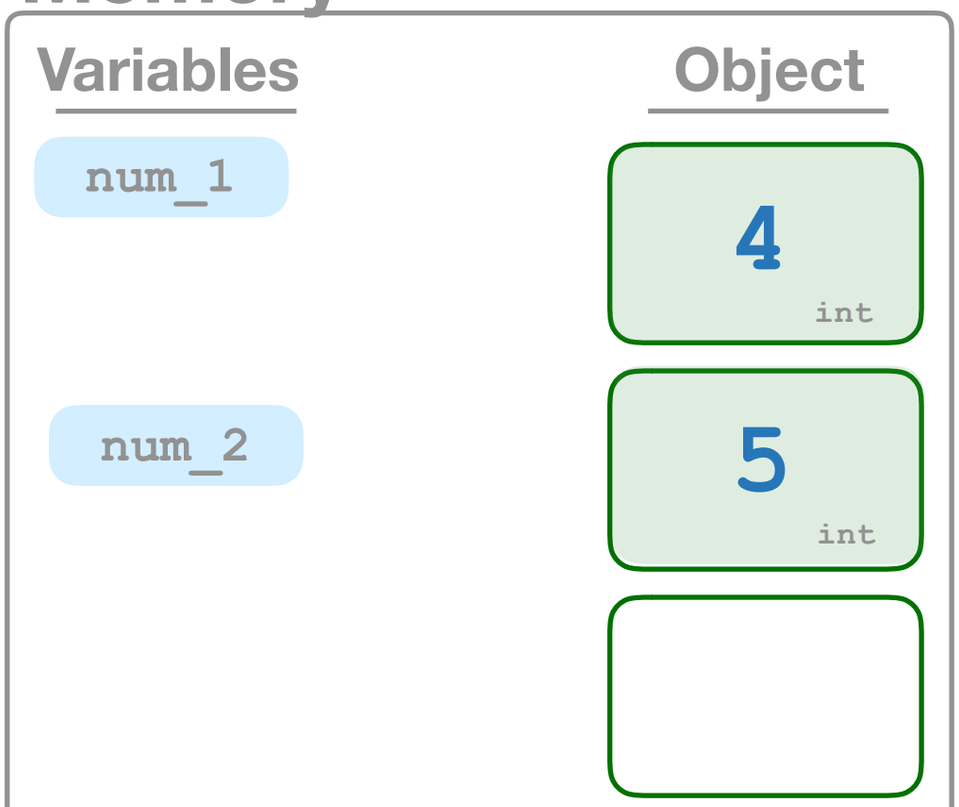
```
>
Enter first int: 4
Enter second int: 5
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter first int:")
    num_2 = input_int("Enter second int:")
    sum = num_1 + num_2
    print(sum)
```

Memory



Output

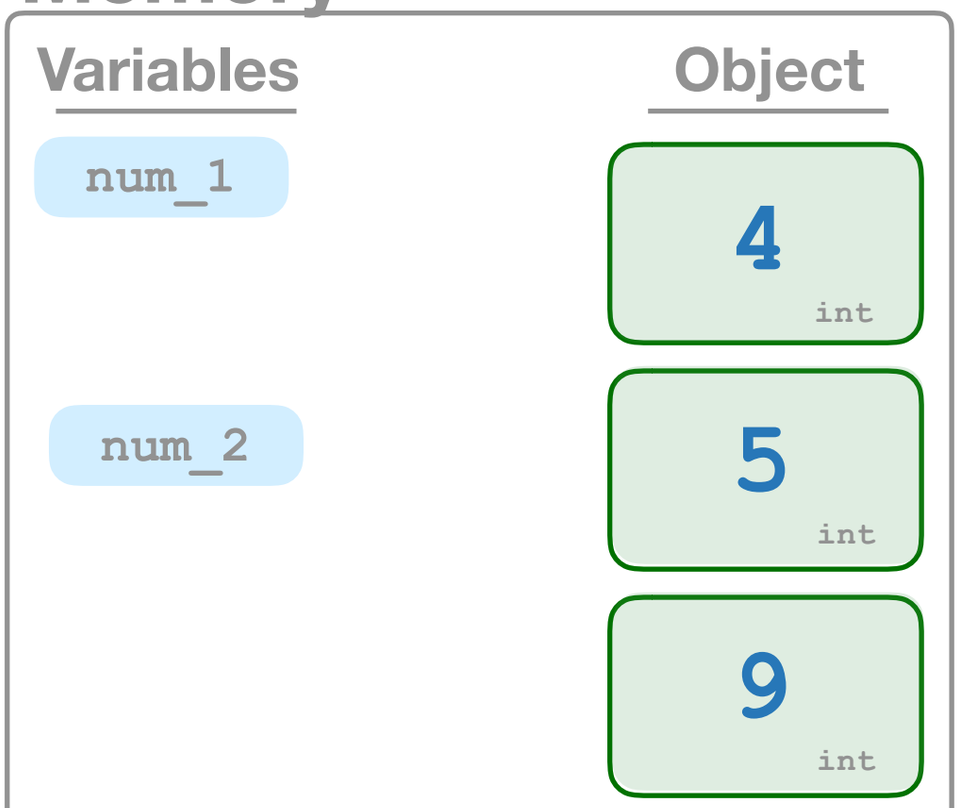
```
>
Enter first int: 4
Enter second int: 5
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter first int:")
    num_2 = input_int("Enter second int:")
    sum = num_1 + num_2
    print(sum)
```

Memory



Output

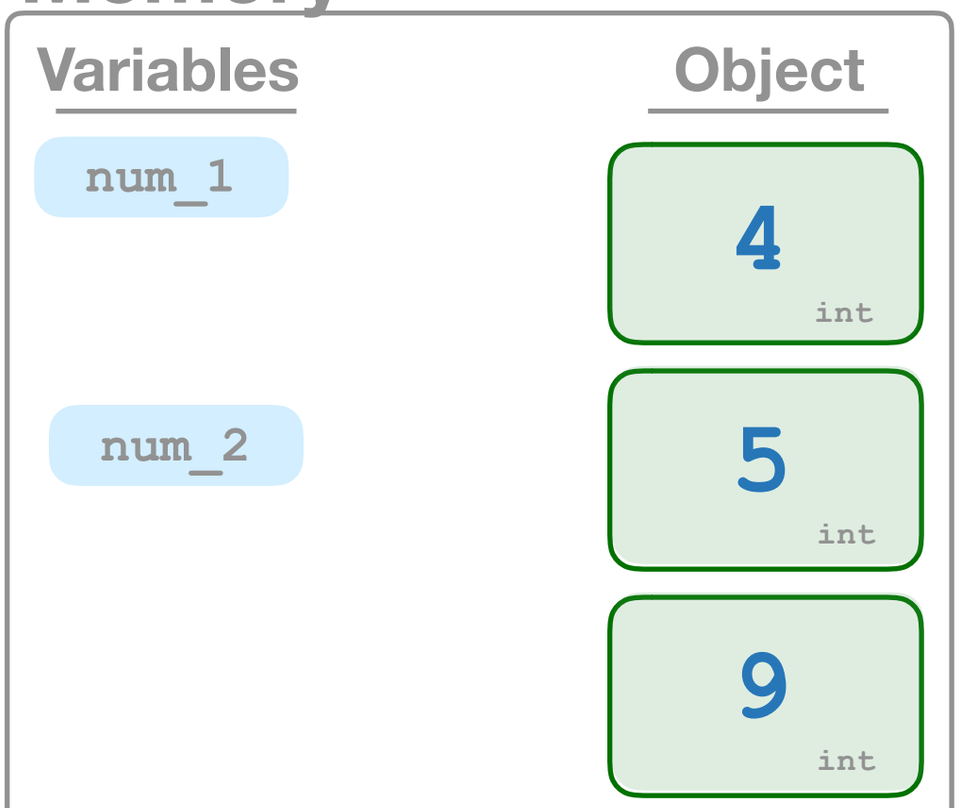
```
>
Enter first int: 4
Enter second int: 5
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter first int:")
    num_2 = input_int("Enter second int:")
    sum = num_1 + num_2
    print(sum)
```

Memory



Output

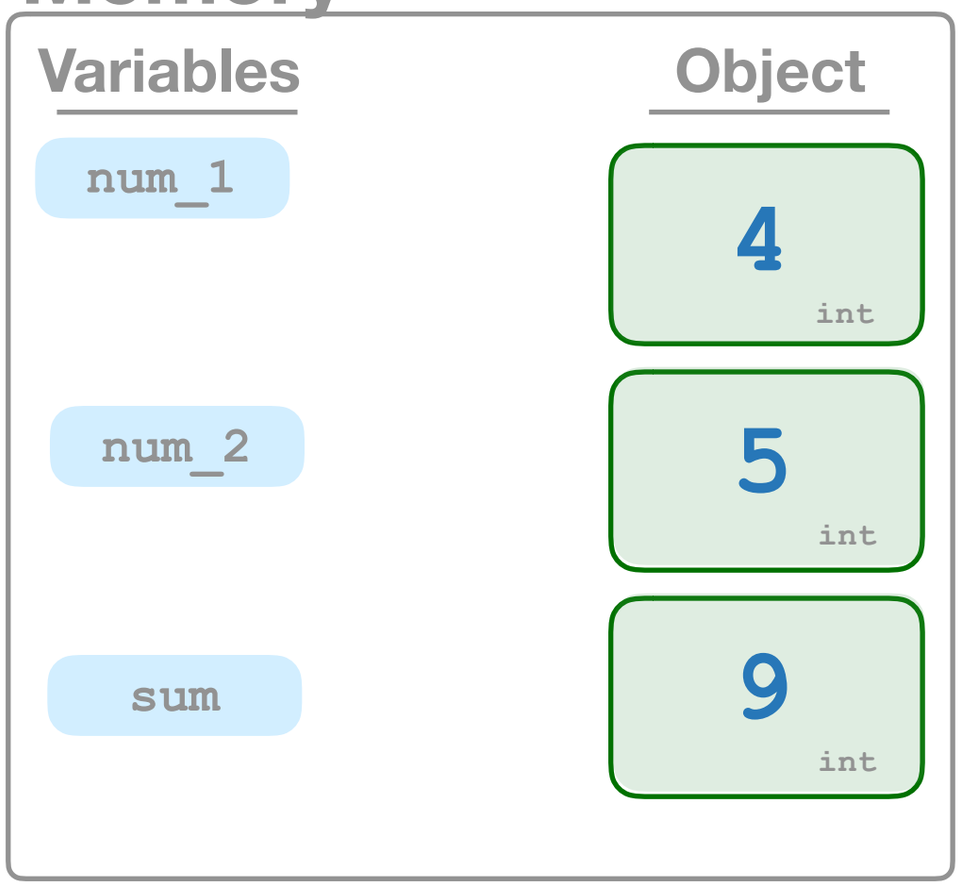
```
>
Enter first int: 4
Enter second int: 5
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter first int:")
    num_2 = input_int("Enter second int:")
    sum = num_1 + num_2
    print(sum)
```

Memory



Output

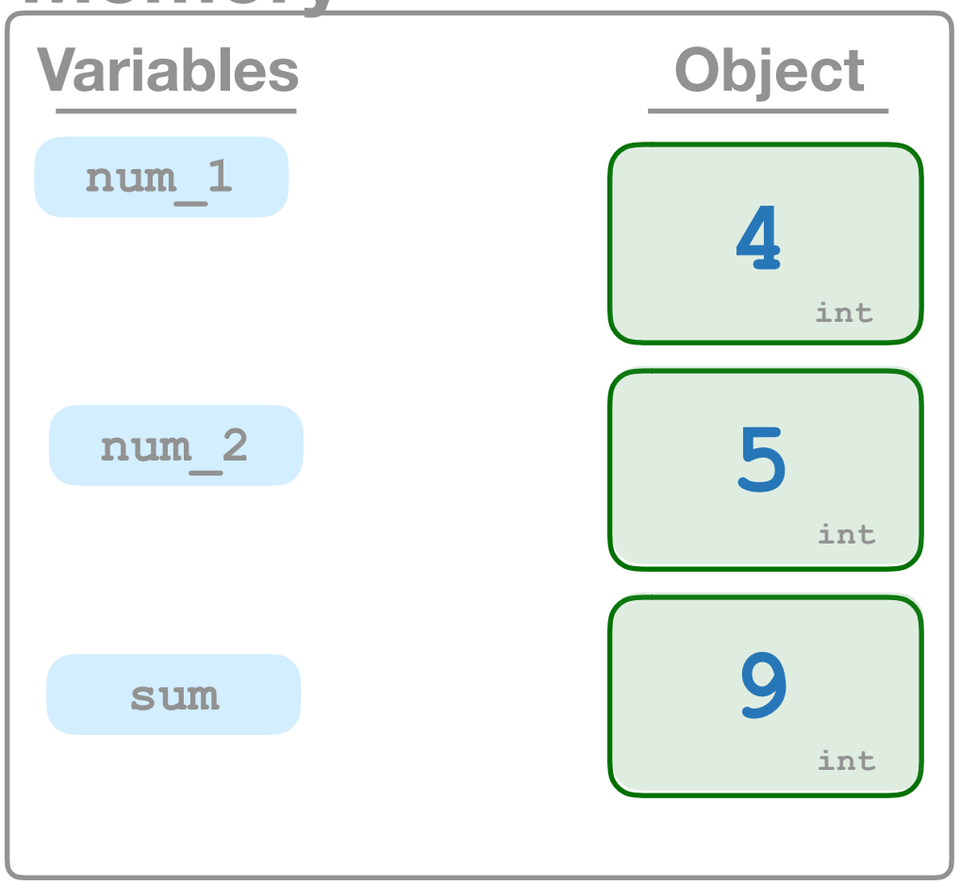
```
>
Enter first int: 4
Enter second int: 5
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter first int:")
    num_2 = input_int("Enter second int:")
    sum = num_1 + num_2
    print(sum)
```

Memory



Output

```
>
Enter first int: 4
Enter second int: 5
9
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    num_3 = num_1 / num_2
    num_3 = num_3 + 1
    print(num_3)
```

Output

Memory

Variables | Object

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    num_3 = num_1 / num_2
    num_3 = num_3 + 1
    print(num_3)
```

Memory

Variables | Object

Output

```
>
Enter the first int:
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    num_3 = num_1 / num_2
    num_3 = num_3 + 1
    print(num_3)
```

Memory

Variables | Object

Output

```
Enter the first int: 10
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    num_3 = num_1 / num_2
    num_3 = num_3 + 1
    print(num_3)
```

Memory

Variables

Object

10

int

Output

```
Enter the first int: 10
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    num_3 = num_1 / num_2
    num_3 = num_3 + 1
    print(num_3)
```

Memory

Variables

num_1

Object

10

int

Output

```
Enter the first int: 10
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    num_3 = num_1 / num_2
    num_3 = num_3 + 1
    print(num_3)
```

Memory

Variables

num_1

Object

10

int

Output

```
Enter the first int: 10
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    num_3 = num_1 / num_2
    num_3 = num_3 + 1
    print(num_3)
```

Memory

Variables

num_1

Object

10

int

Output

```
>
Enter the first int: 10
Enter the second int:
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    num_3 = num_1 / num_2
    num_3 = num_3 + 1
    print(num_3)
```

Memory

Variables

num_1

Object

10

int

Output

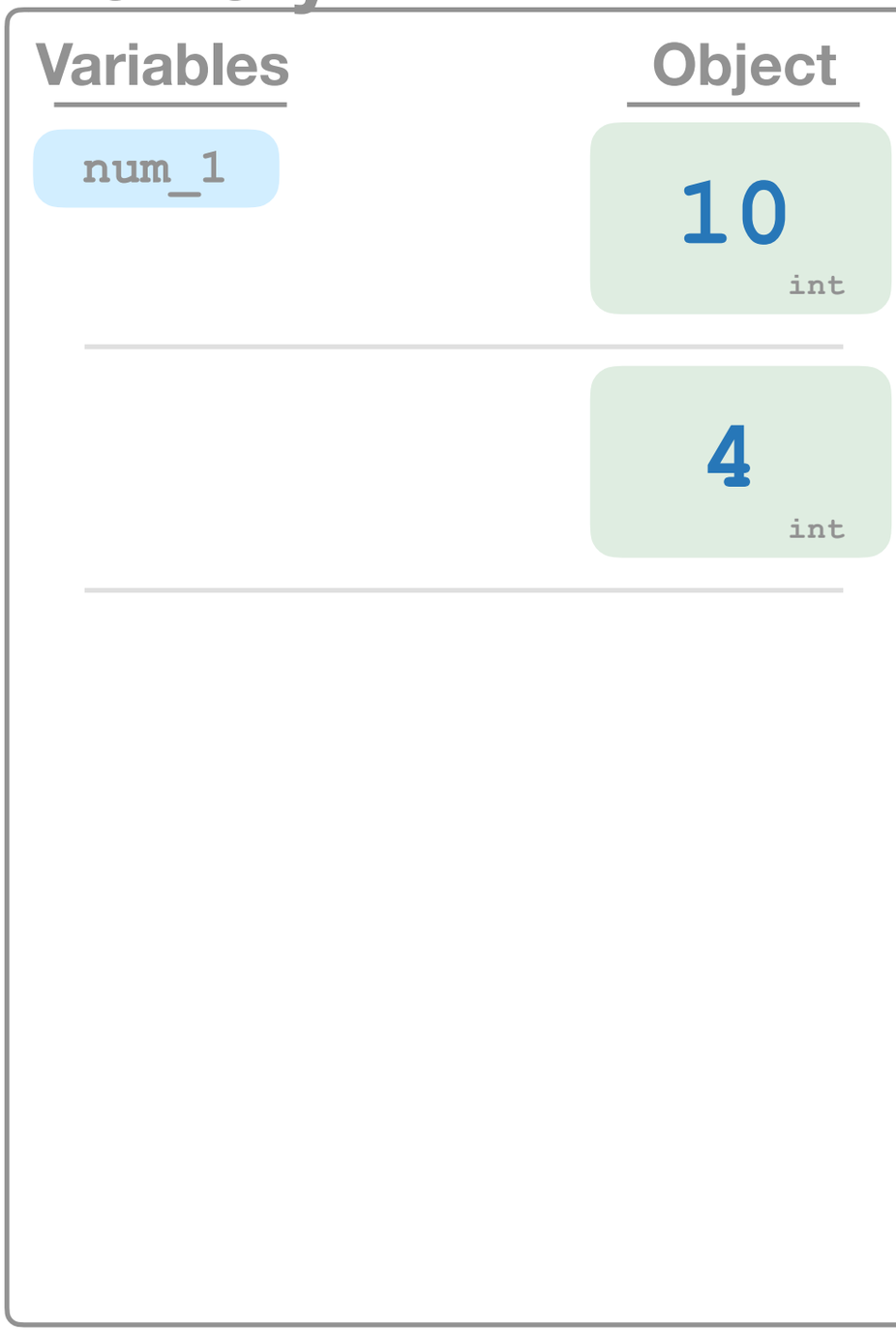
```
Enter the first int: 10
Enter the second int: 4
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    num_3 = num_1 / num_2
    num_3 = num_3 + 1
    print(num_3)
```

Memory



Output

```
>
Enter the first int: 10
Enter the second int: 4
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    num_3 = num_1 / num_2
    num_3 = num_3 + 1
    print(num_3)
```

Memory

Output

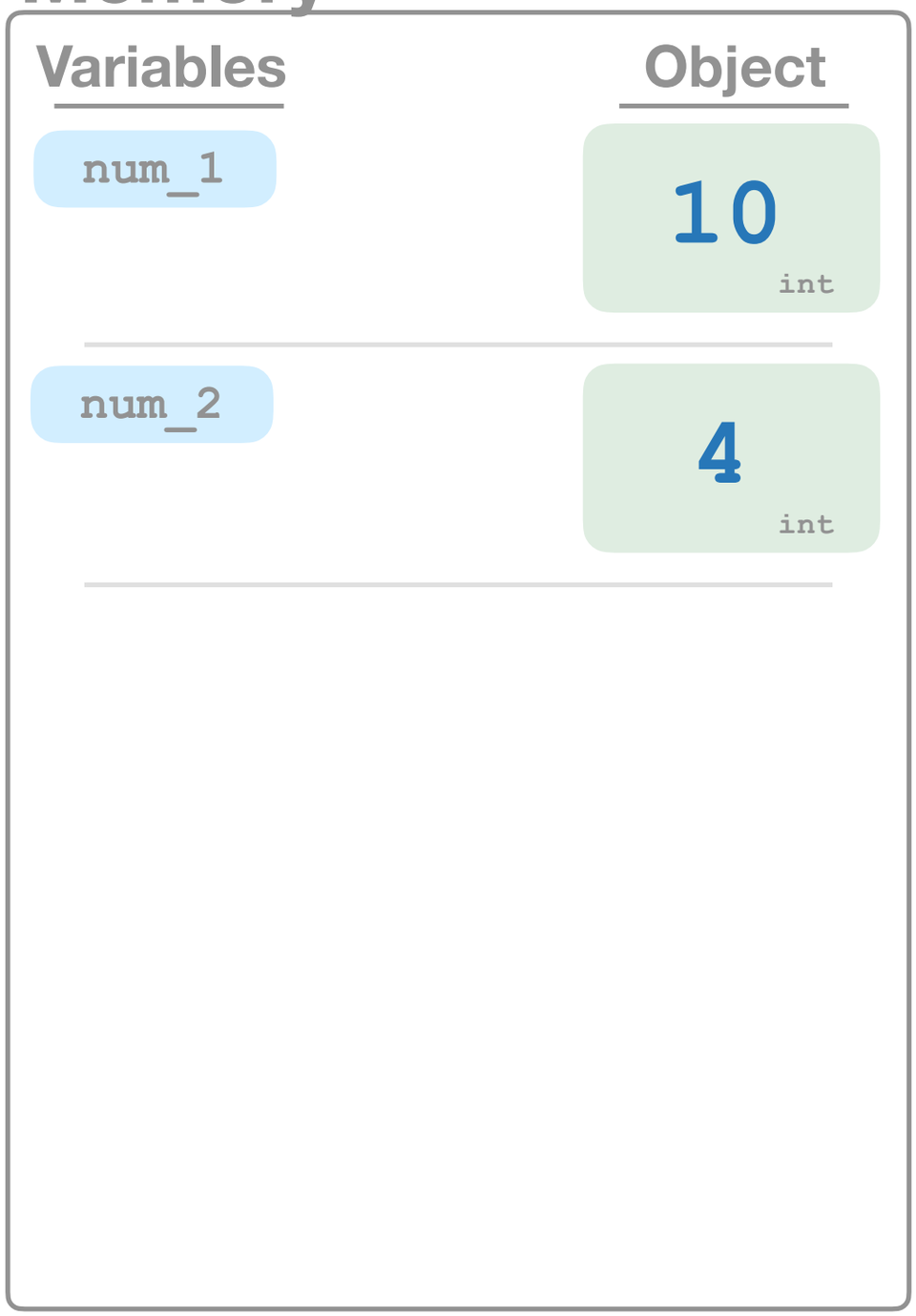
```
Enter the first int: 10
Enter the second int: 4
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    num_3 = num_1 / num_2
    num_3 = num_3 + 1
    print(num_3)
```

Memory



Output

```
Enter the first int: 10
Enter the second int: 4
```

Arithmetic Operators

Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    num_3 = num_1 / num_2
    num_3 = num_3 + 1
    print(num_3)
```

Output

```
Enter the first int: 10
Enter the second int: 4
```

Memory

Arithmetic Operators

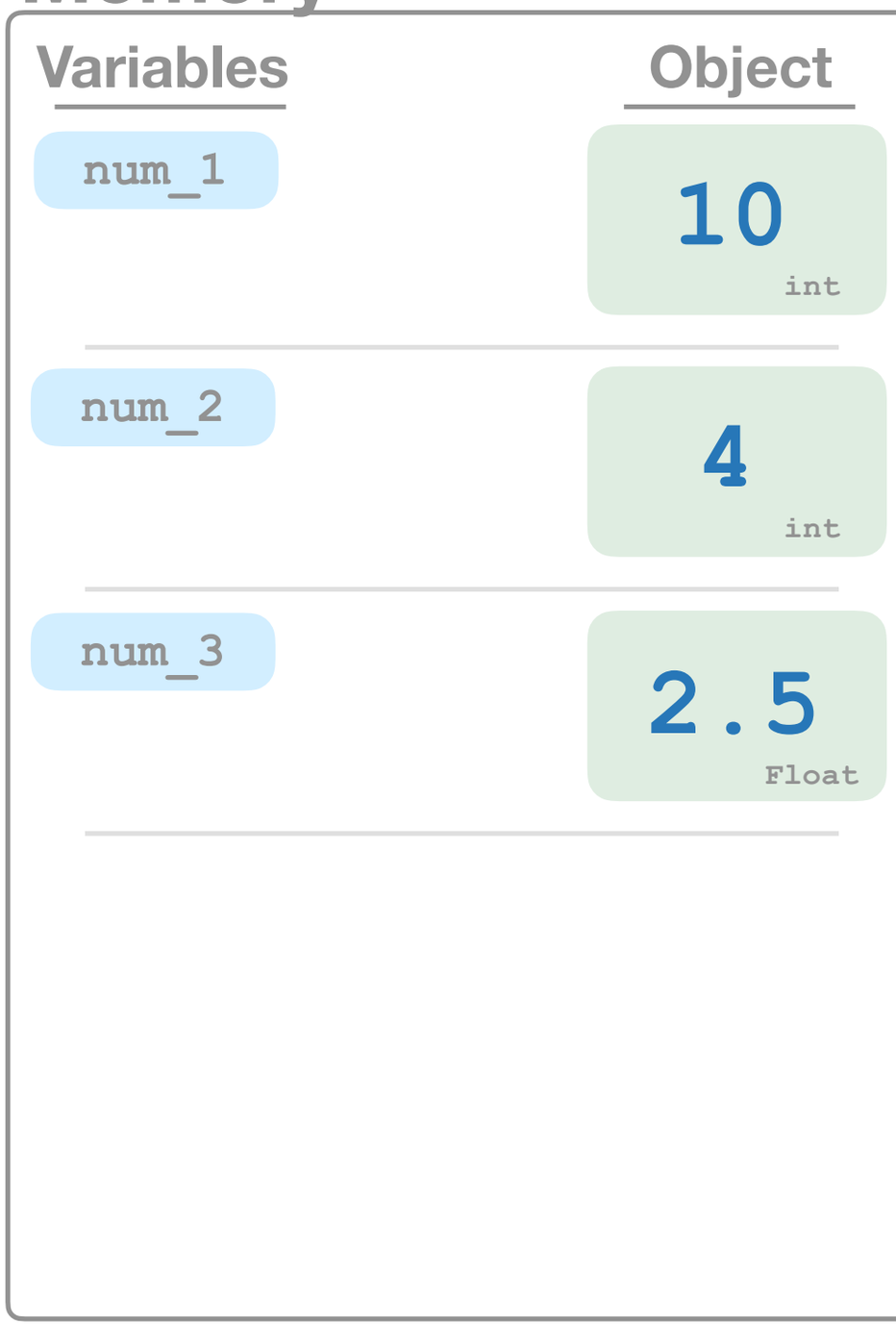
Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    num_3 = num_1 / num_2
    num_3 = num_3 + 1
    print(num_3)
```

Output

```
Enter the first int: 10
Enter the second int: 4
```

Memory



Arithmetic Operators

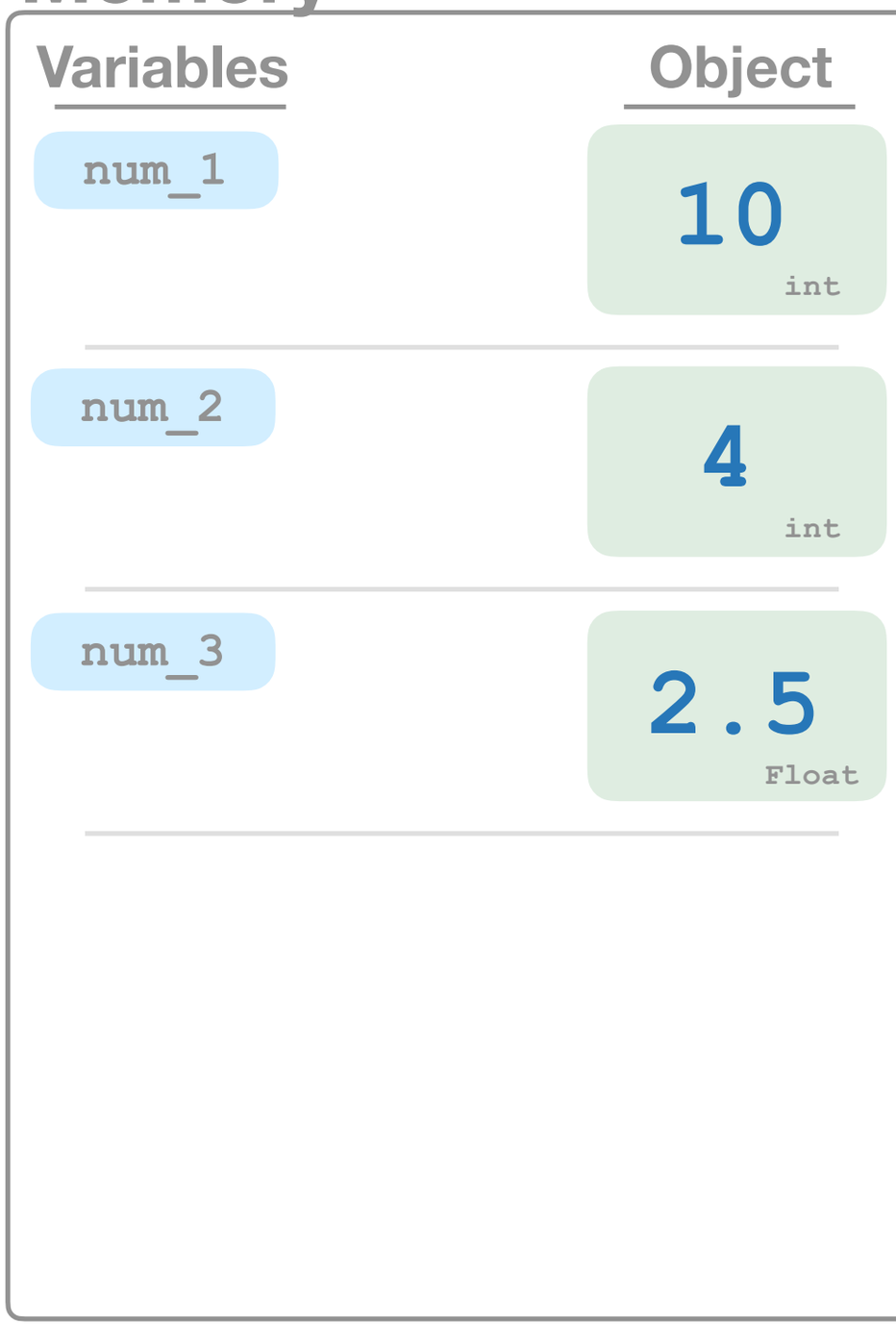
Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    num_3 = num_1 / num_2
    num_3 = num_3 + 1
    print(num_3)
```

Output

```
Enter the first int: 10
Enter the second int: 4
```

Memory



Arithmetic Operators

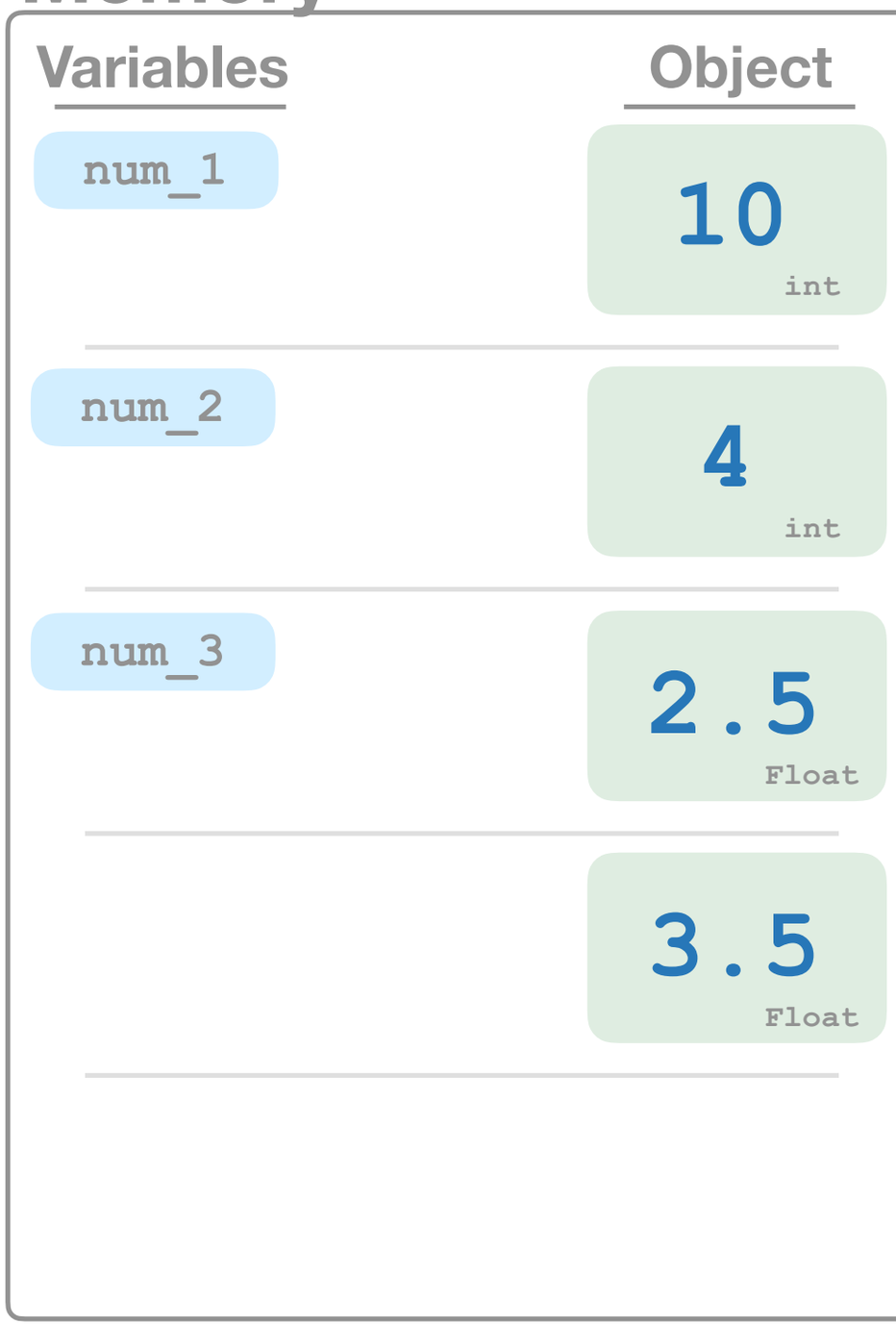
Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    num_3 = num_1 / num_2
    num_3 = num_3 + 1
    print(num_3)
```

Output

```
Enter the first int: 10
Enter the second int: 4
```

Memory



Arithmetic Operators

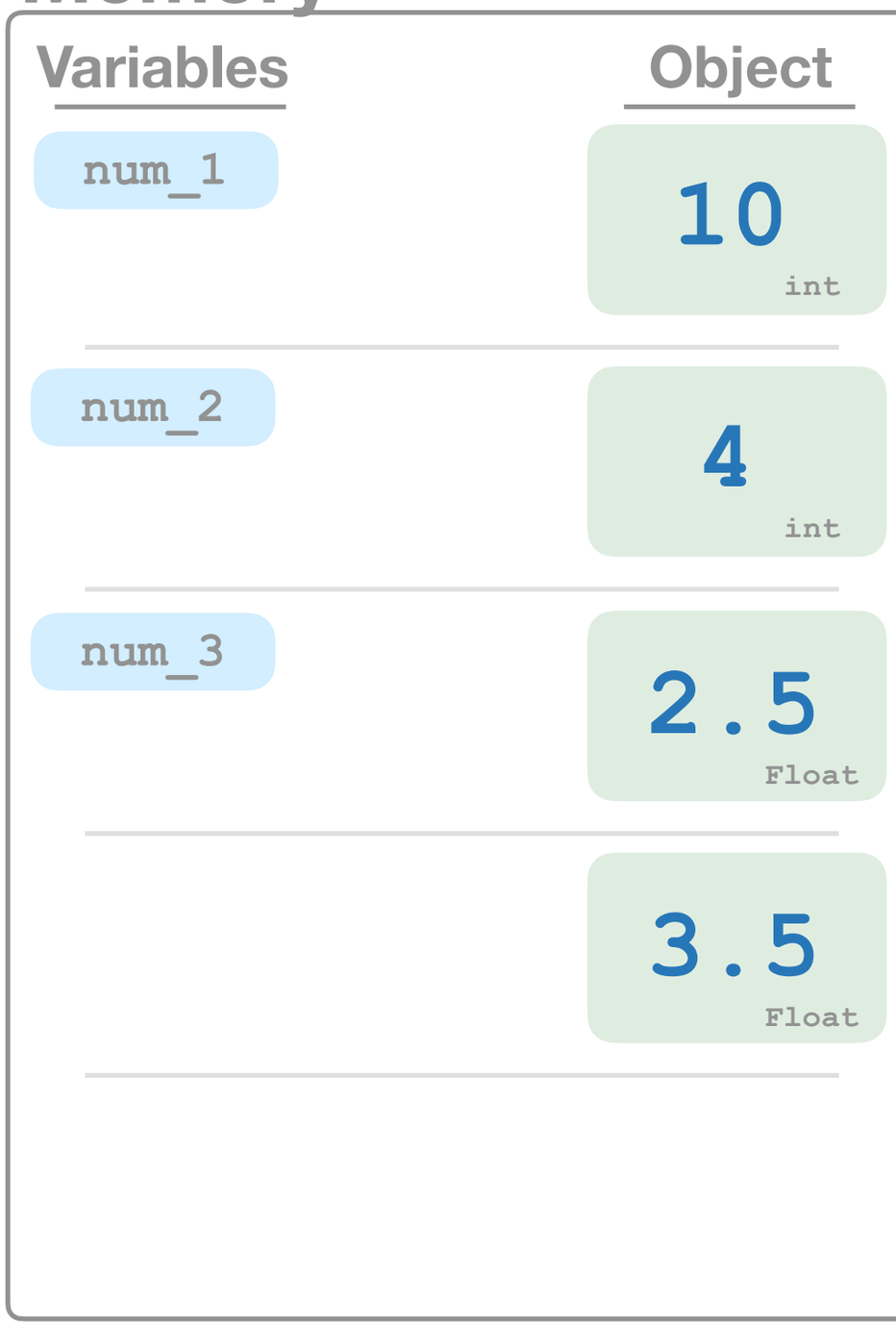
Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    num_3 = num_1 / num_2
    num_3 = num_3 + 1
    print(num_3)
```

Output

```
Enter the first int: 10
Enter the second int: 4
```

Memory



Arithmetic Operators

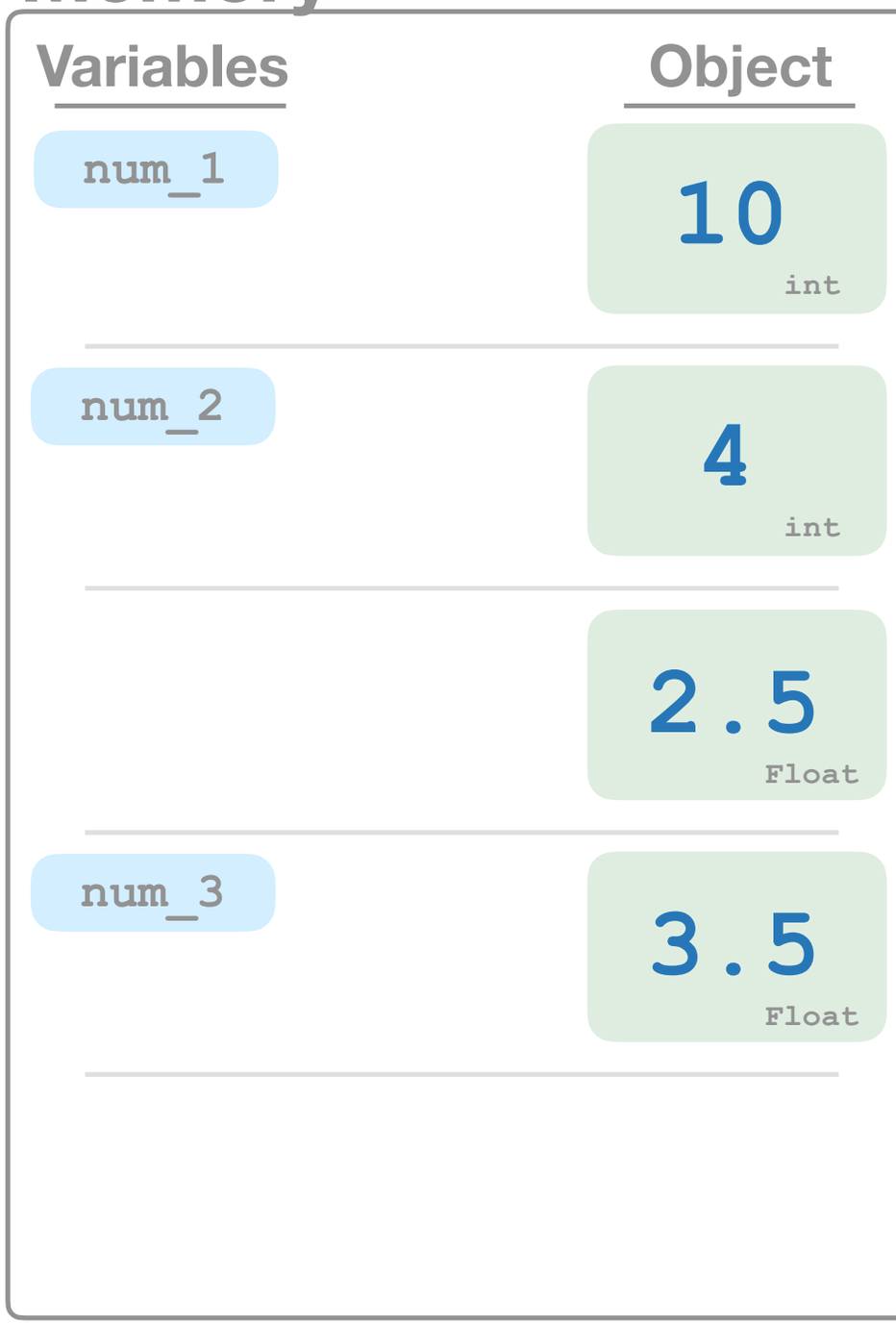
Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    num_3 = num_1 / num_2
    num_3 = num_3 + 1
    print(num_3)
```

Output

```
Enter the first int: 10
Enter the second int: 4
```

Memory



Arithmetic Operators

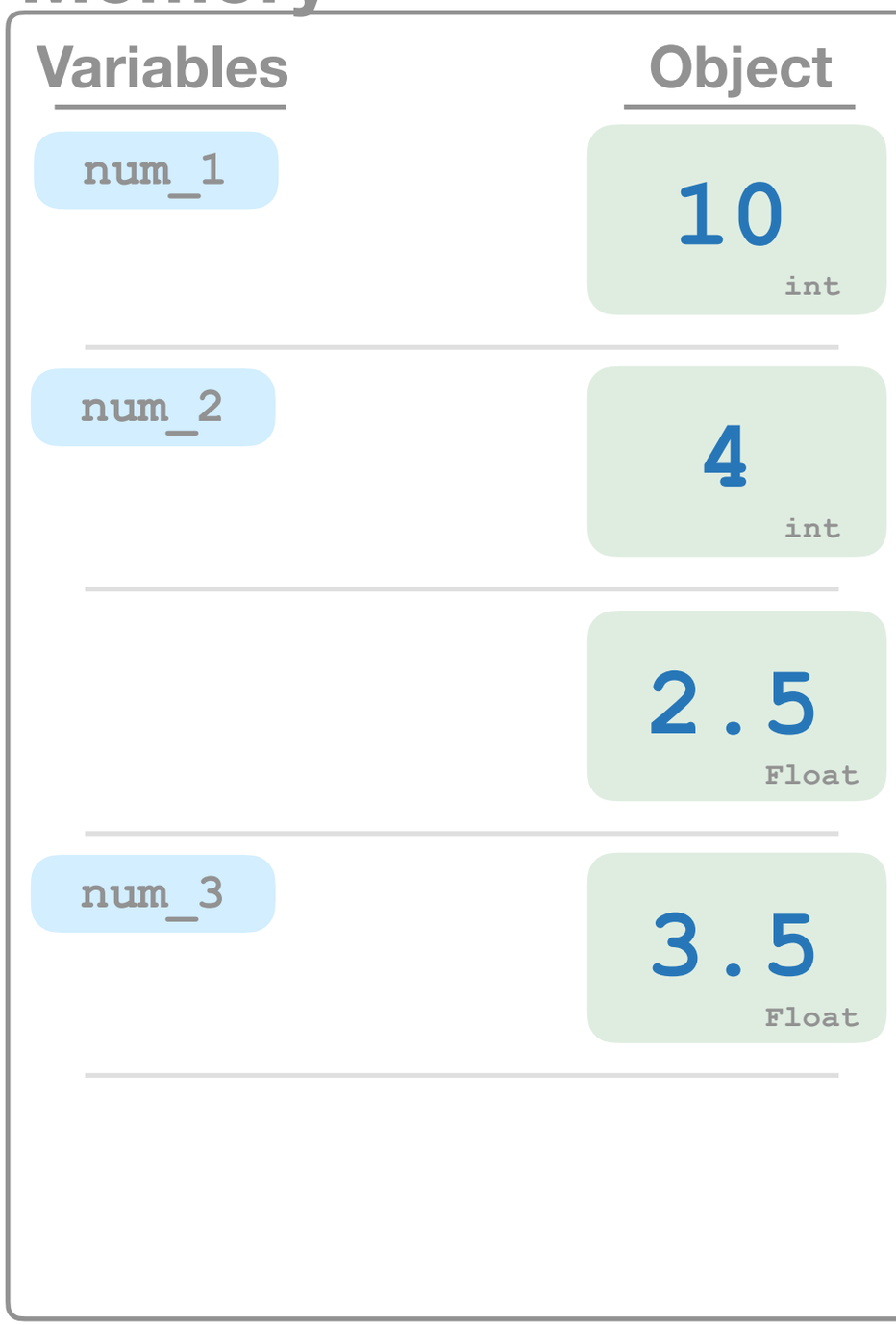
Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    num_3 = num_1 / num_2
    num_3 = num_3 + 1
    print(num_3)
```

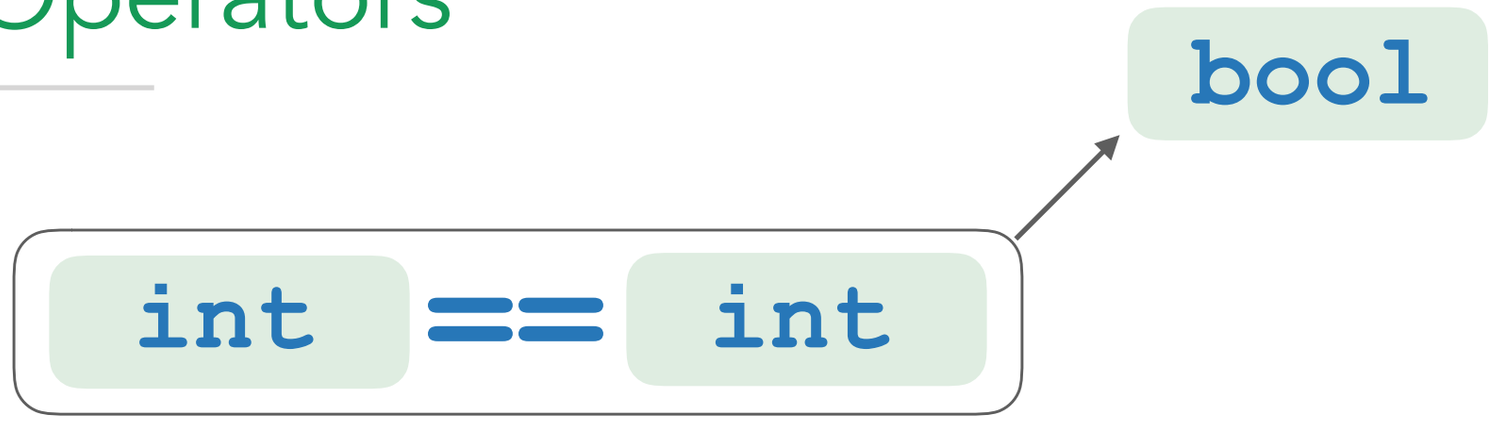
Output

```
Enter the first int: 10
Enter the second int: 4
3.5
```

Memory



Comparison Operators



==

"Equal To"

True

```
3 == 3
4.0 == 4
1.2 == 1.2
“hi” == “hi”
```

False

```
4.0 == 7.1
3 == 5
“ya” == “no”
```

!= “Not Equal To”

< “Less Than” or… **>** “Greater Than”

<= “Less Than or Equal To” or… **>=** “Greater Than or Equal To”

Comparison Operators

```
int != int
```

→ `bool`

`==` "Equal To"

`!=` "Not Equal To"

True

```
4.0 != 7.1
  3 != 5
"ya" != "no"
```

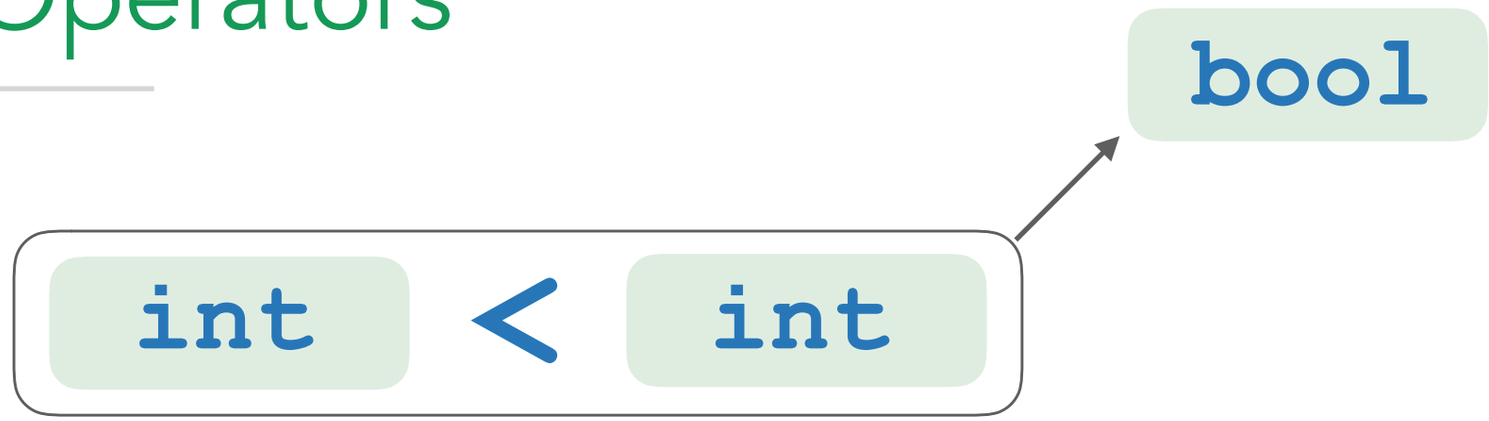
False

```
  3 != 3
4.0 != 4
1.2 != 1.2
"hi" != "hi"
```

`<` "Less Than" or… `>` "Greater Than"

`<=` "Less Than or Equal To" or… `>=` "Greater Than or Equal To"

Comparison Operators



`==` "Equal To”

`!=` “Not Equal To”

`<` or `>`

“Less Than” or
“Greater Than"

`True`

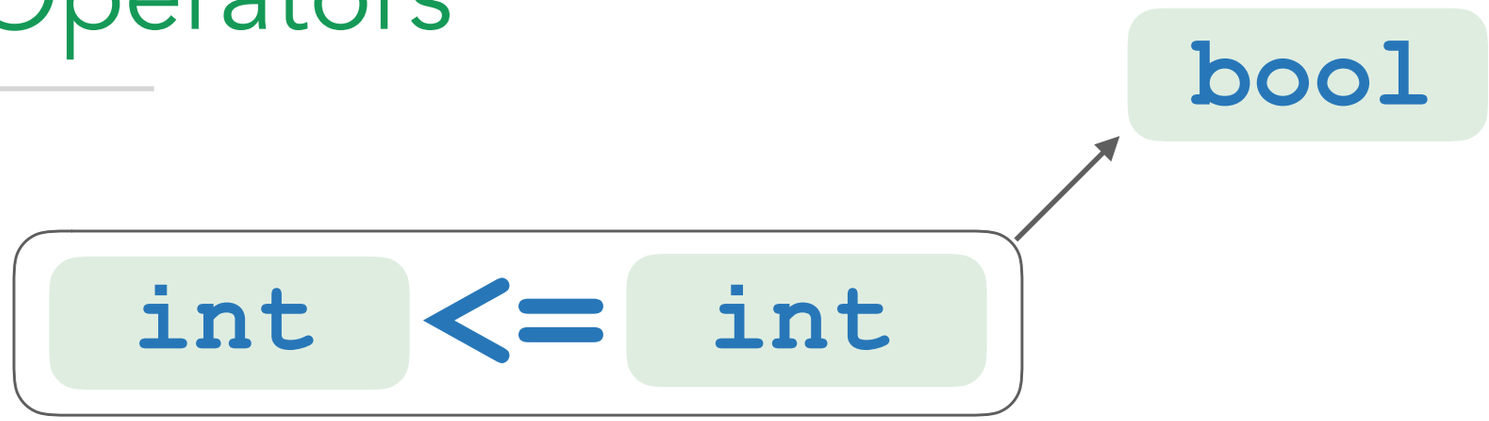
```
4.0 < 7.1
  3 < 5
  5 > 3
```

`False`

```
4.0 < 4.0
 19 < 15
  5 > 7
```

`<=` “Less Than or Equal To” or… `>=` “Greater Than or Equal To”

Comparison Operators



`==` "Equal To"

`!=` "Not Equal To"

`<` "Less Than" or… `>` "Greater Than"

`<=` or `>=`

"Less Than or Equal To" or
"Greater Than or Equal To"

`True`

```
4.0 <= 4.0
  3 <= 5
  5 >= 3
```

`False`

```
 7 < 5
19 < 15
 5 > 7
```

Comparison Operators

Code

```
def main():
  num_1 = input_int("Enter the first int:")
  num_2 = input_int("Enter the second int:")
  if (num_1 > num_2):
    print("The first number is bigger!")
  elif (num_2 > num_1):
    print("The second number is bigger!")
  elif (num_1 == num_2):
    print("The numbers are the same!")
```

Output

```
>
```

Memory

Variables | Object

Comparison Operators

Code

```
def main():
  num_1 = input_int("Enter the first int:")
  num_2 = input_int("Enter the second int:")
  if (num_1 > num_2):
    print("The first number is bigger!")
  elif (num_2 > num_1):
    print("The second number is bigger!")
  elif (num_1 == num_2):
    print("The numbers are the same!")
```

Output

```
>
Enter the first int:
```

Memory

Variables | Object

Comparison Operators

Code

```
def main():
  num_1 = input_int("Enter the first int:")
  num_2 = input_int("Enter the second int:")
  if (num_1 > num_2):
    print("The first number is bigger!")
  elif (num_2 > num_1):
    print("The second number is bigger!")
  elif (num_1 == num_2):
    print("The numbers are the same!")
```

Output

```
>
Enter the first int: 49
```

Memory

Variables | Object

Comparison Operators

Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    if (num_1 > num_2):
        print("The first number is bigger!")
    elif (num_2 > num_1):
        print("The second number is bigger!")
    elif (num_1 == num_2):
        print("The numbers are the same!")
```

Output

```
>
Enter the first int: 49
```

Memory

Variables	Object
	49 int

Comparison Operators

Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    if (num_1 > num_2):
        print("The first number is bigger!")
    elif (num_2 > num_1):
        print("The second number is bigger!")
    elif (num_1 == num_2):
        print("The numbers are the same!")
```

Output

```
Enter the first int: 49
```

Memory

Comparison Operators

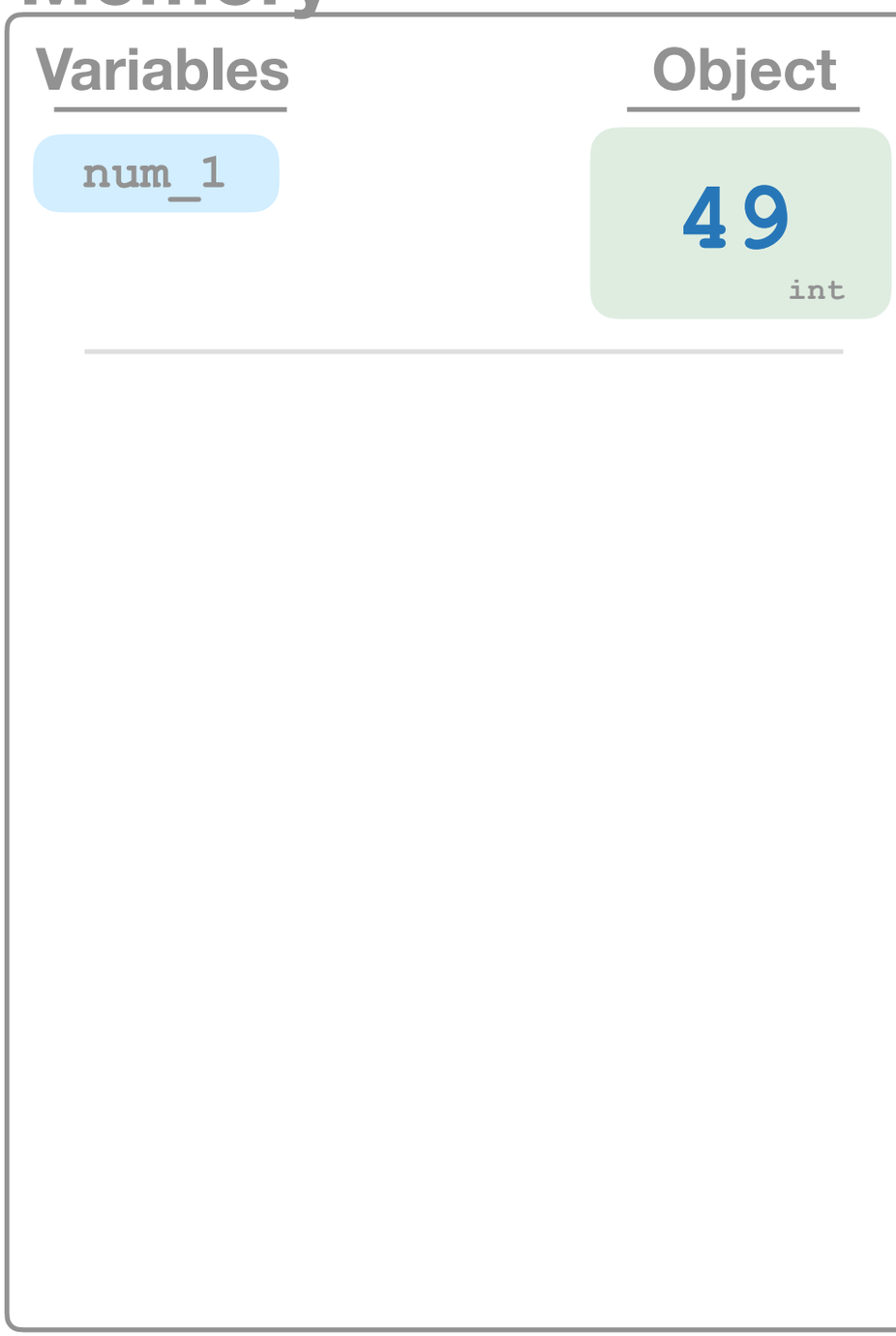
Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    if (num_1 > num_2):
        print("The first number is bigger!")
    elif (num_2 > num_1):
        print("The second number is bigger!")
    elif (num_1 == num_2):
        print("The numbers are the same!")
```

Output

```
>
Enter the first int: 49
```

Memory



Comparison Operators

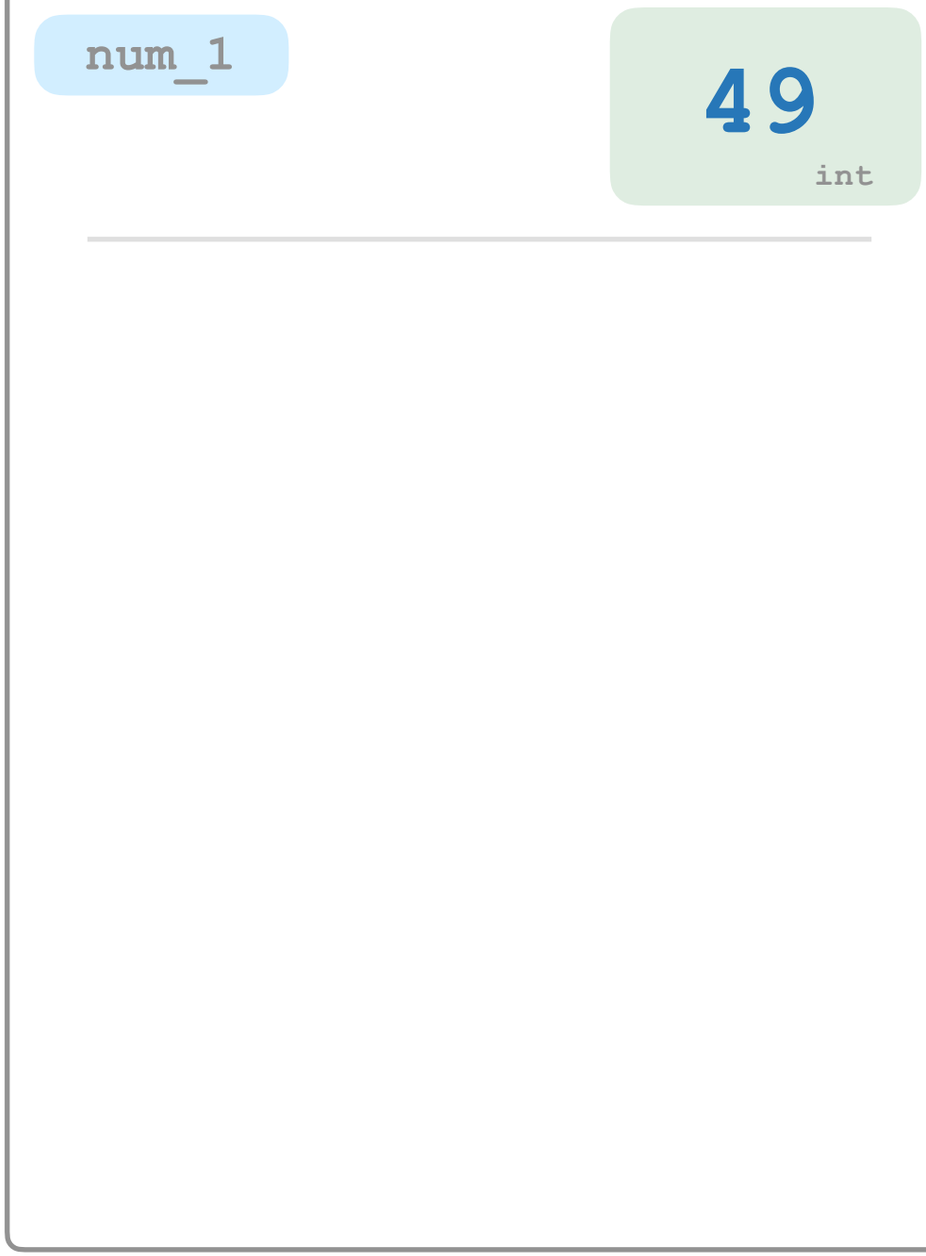
Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    if (num_1 > num_2):
        print("The first number is bigger!")
    elif (num_2 > num_1):
        print("The second number is bigger!")
    elif (num_1 == num_2):
        print("The numbers are the same!")
```

Output

```
>
Enter the first int: 49
Enter the second int:
```

Memory



Comparison Operators

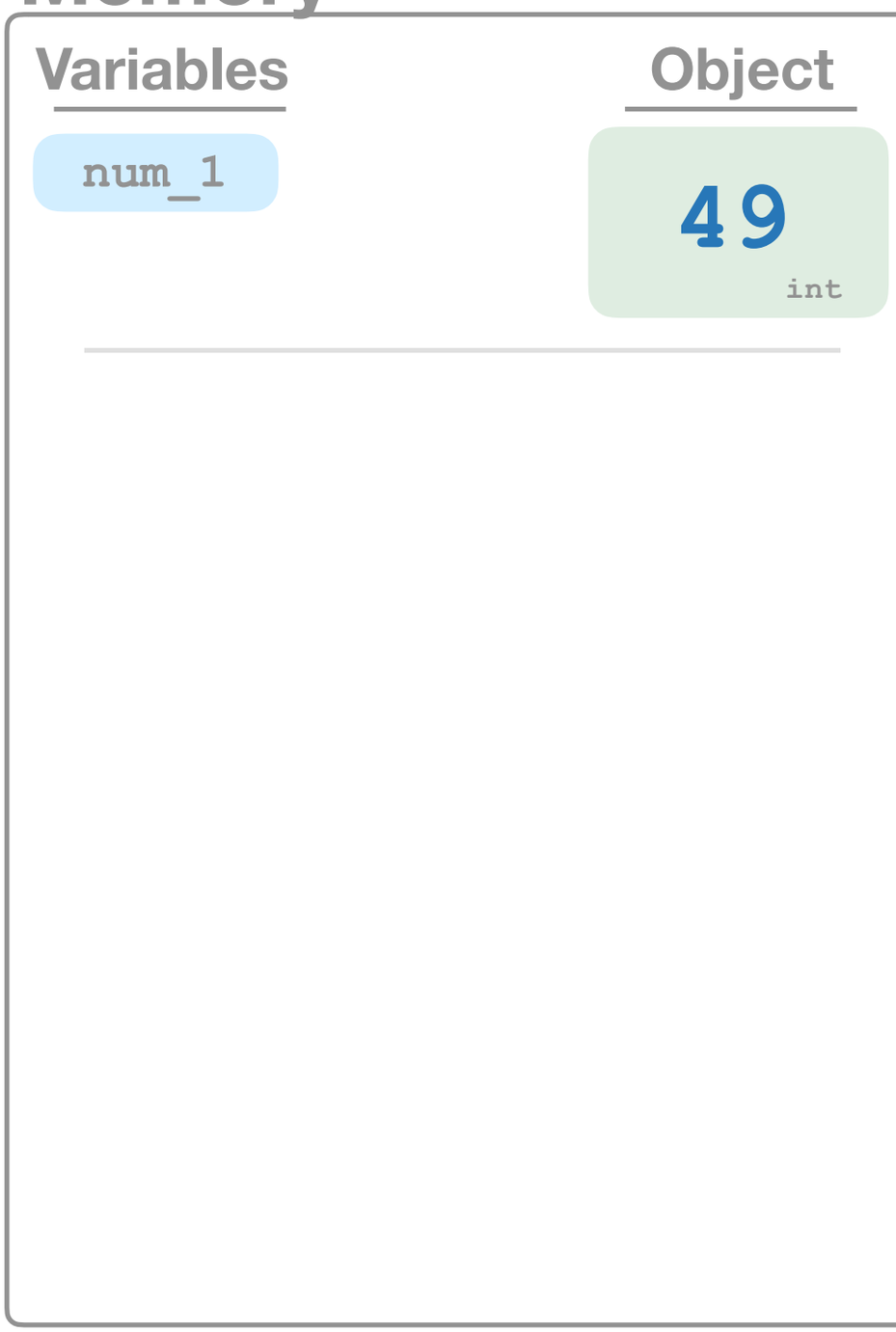
Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    if (num_1 > num_2):
        print("The first number is bigger!")
    elif (num_2 > num_1):
        print("The second number is bigger!")
    elif (num_1 == num_2):
        print("The numbers are the same!")
```

Output

```
>
Enter the first int: 49
Enter the second int: 276
```

Memory



Comparison Operators

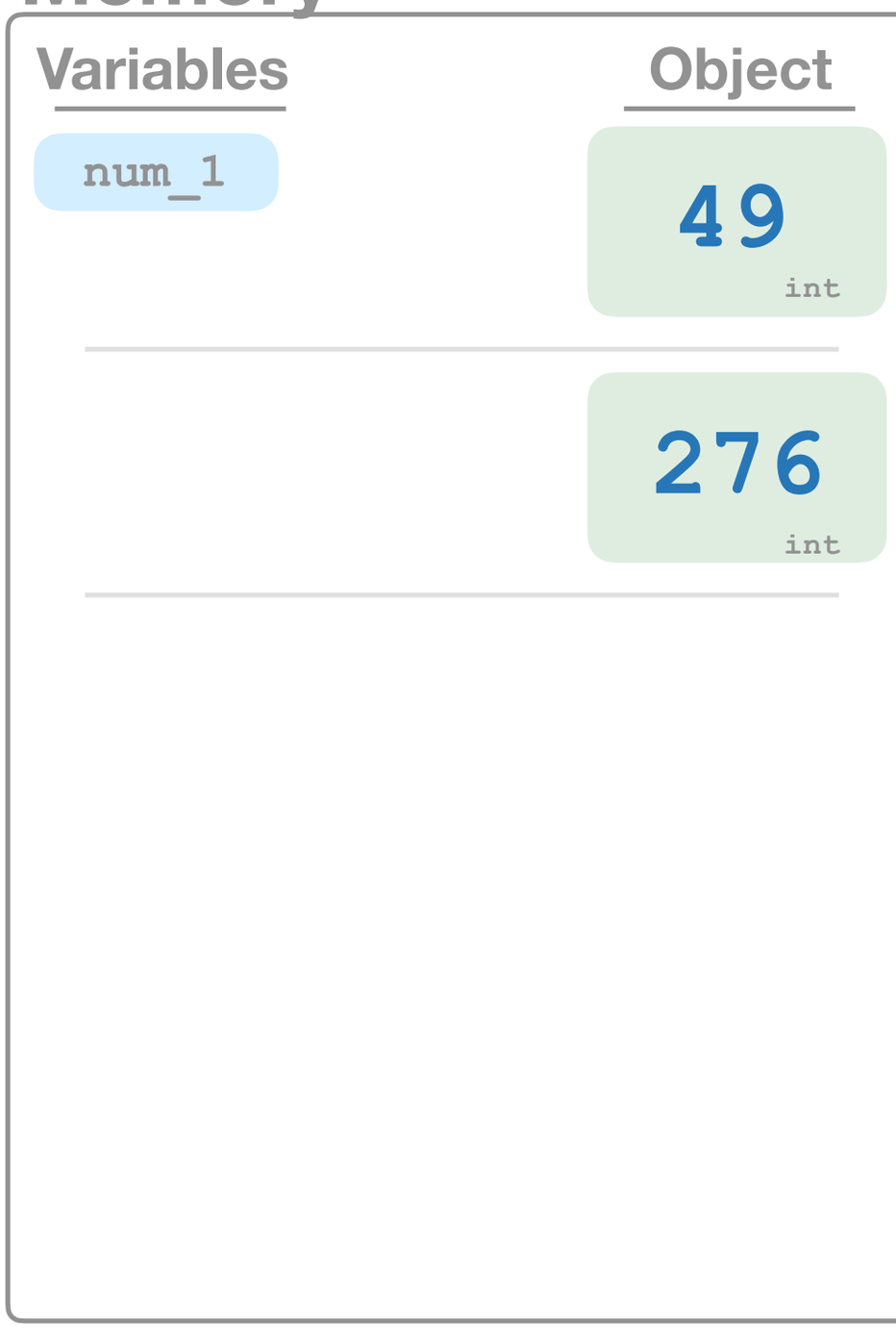
Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    if (num_1 > num_2):
        print("The first number is bigger!")
    elif (num_2 > num_1):
        print("The second number is bigger!")
    elif (num_1 == num_2):
        print("The numbers are the same!")
```

Output

```
>
Enter the first int: 49
Enter the second int: 276
```

Memory



Comparison Operators

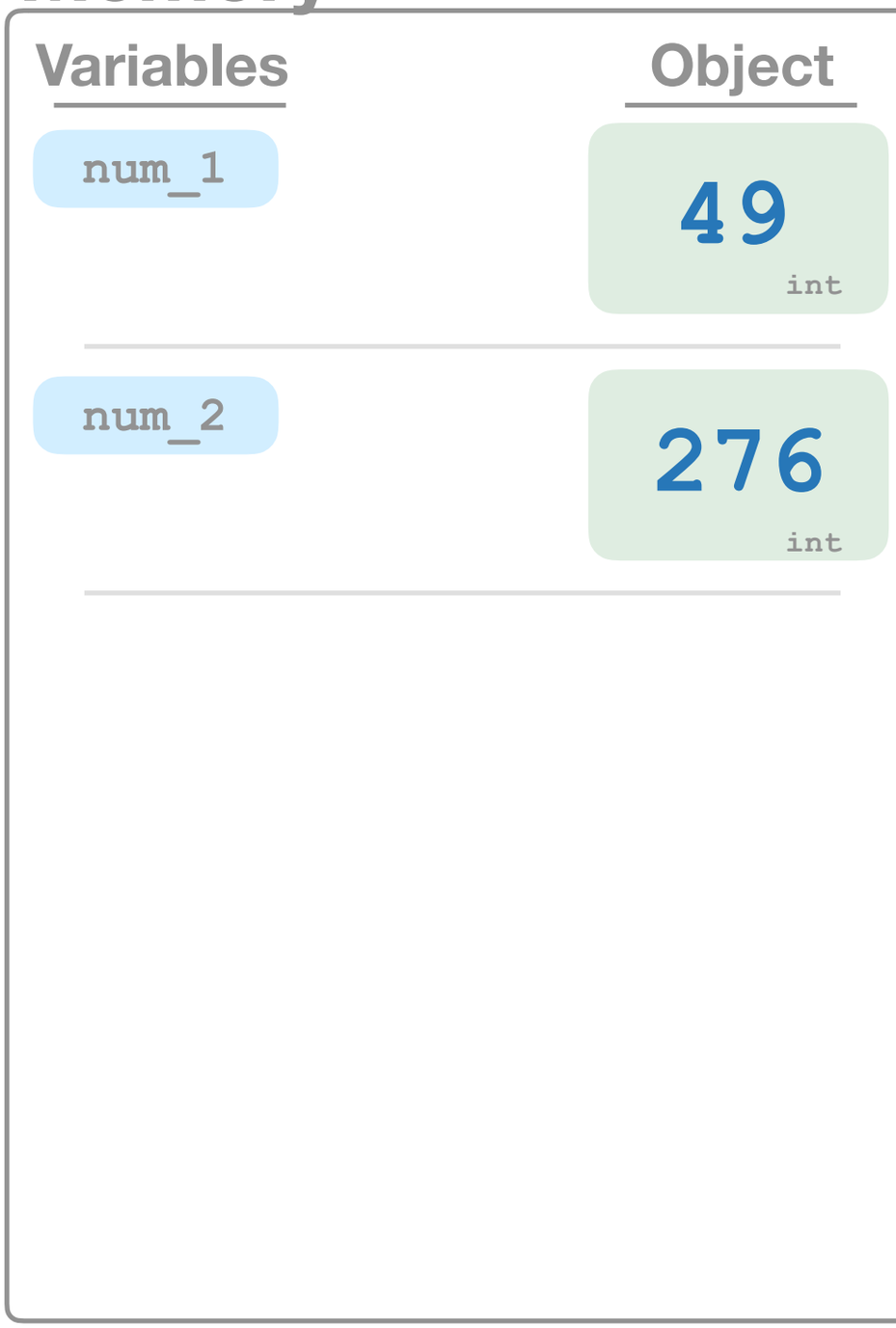
Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    if (num_1 > num_2):
        print("The first number is bigger!")
    elif (num_2 > num_1):
        print("The second number is bigger!")
    elif (num_1 == num_2):
        print("The numbers are the same!")
```

Output

```
>
Enter the first int: 49
Enter the second int: 276
```

Memory



Comparison Operators

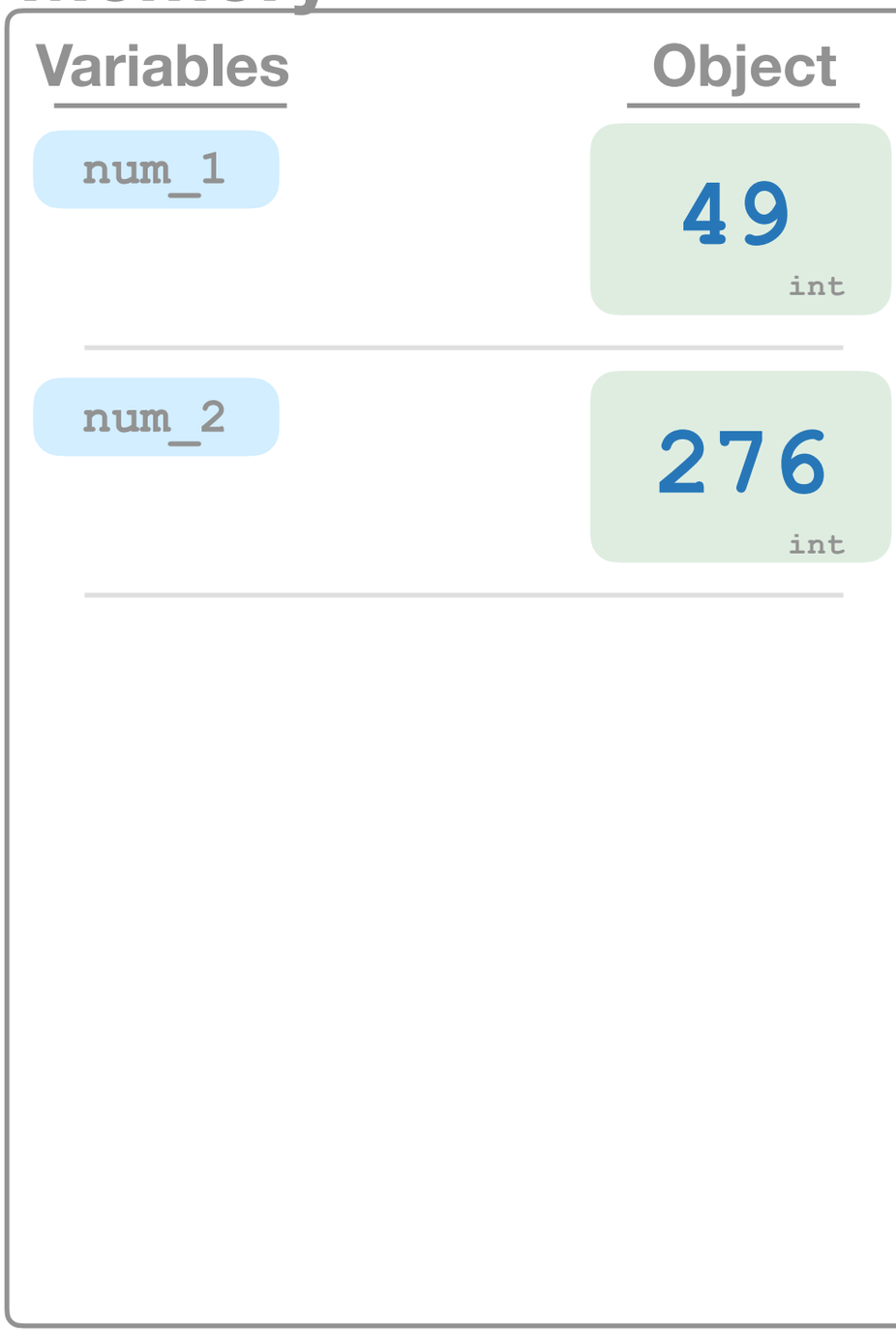
Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    if (num_1 > num_2):
        print("The first number is bigger!")
    elif (num_2 > num_1):
        print("The second number is bigger!")
    elif (num_1 == num_2):
        print("The numbers are the same!")
```

Output

```
>
Enter the first int: 49
Enter the second int: 276
```

Memory



Comparison Operators

Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    if (num_1 > num_2):
        print("The first number is bigger!")
    elif (num_2 > num_1):
        print("The second number is bigger!")
    elif (num_1 == num_2):
        print("The numbers are the same!")
```

Output

```
>
Enter the first int: 49
Enter the second int: 276
```

Memory

Variables	Object
num_1	49 (int)
num_2	276 (int)
	False (bool)

Comparison Operators

Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    if (num_1 > num_2):
        print("The first number is bigger!")
    elif (num_2 > num_1):
        print("The second number is bigger!")
    elif (num_1 == num_2):
        print("The numbers are the same!")
```

Output

```
>
Enter the first int: 49
Enter the second int: 276
```

Memory

Variables	Object
num_1	49 (int)
num_2	276 (int)
	False (bool)

Comparison Operators

Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    if (num_1 > num_2):
        print("The first number is bigger!")
    elif (num_2 > num_1):
        print("The second number is bigger!")
    elif (num_1 == num_2):
        print("The numbers are the same!")
```

Output

```
>
Enter the first int: 49
Enter the second int: 276
```

Memory

Variables	Object
num_1	49 (int)
num_2	276 (int)
	False (bool)

Comparison Operators

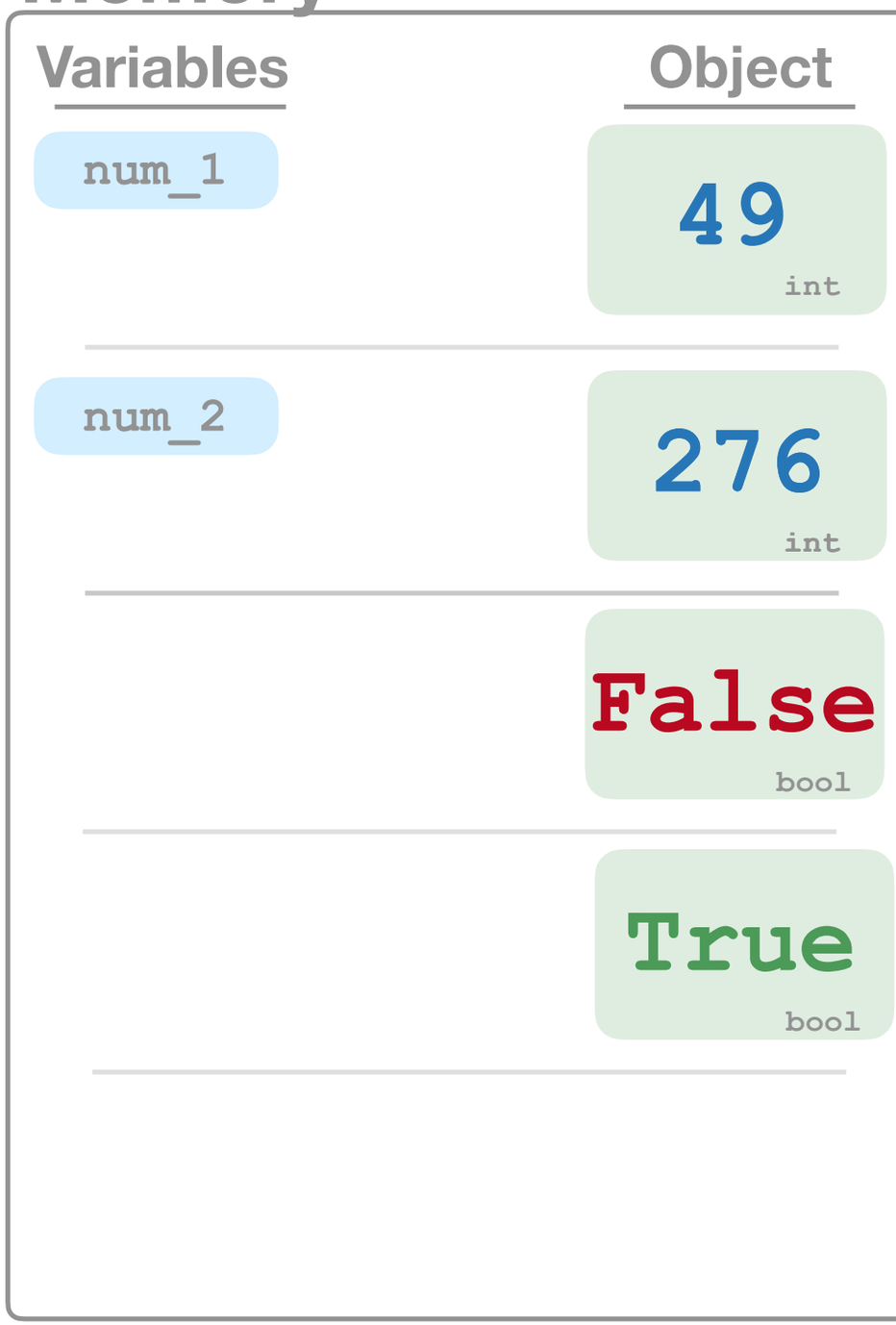
Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    if (num_1 > num_2):
        print("The first number is bigger!")
    elif (num_2 > num_1):
        print("The second number is bigger!")
    elif (num_1 == num_2):
        print("The numbers are the same!")
```

Output

```
>
Enter the first int: 49
Enter the second int: 276
```

Memory



Comparison Operators

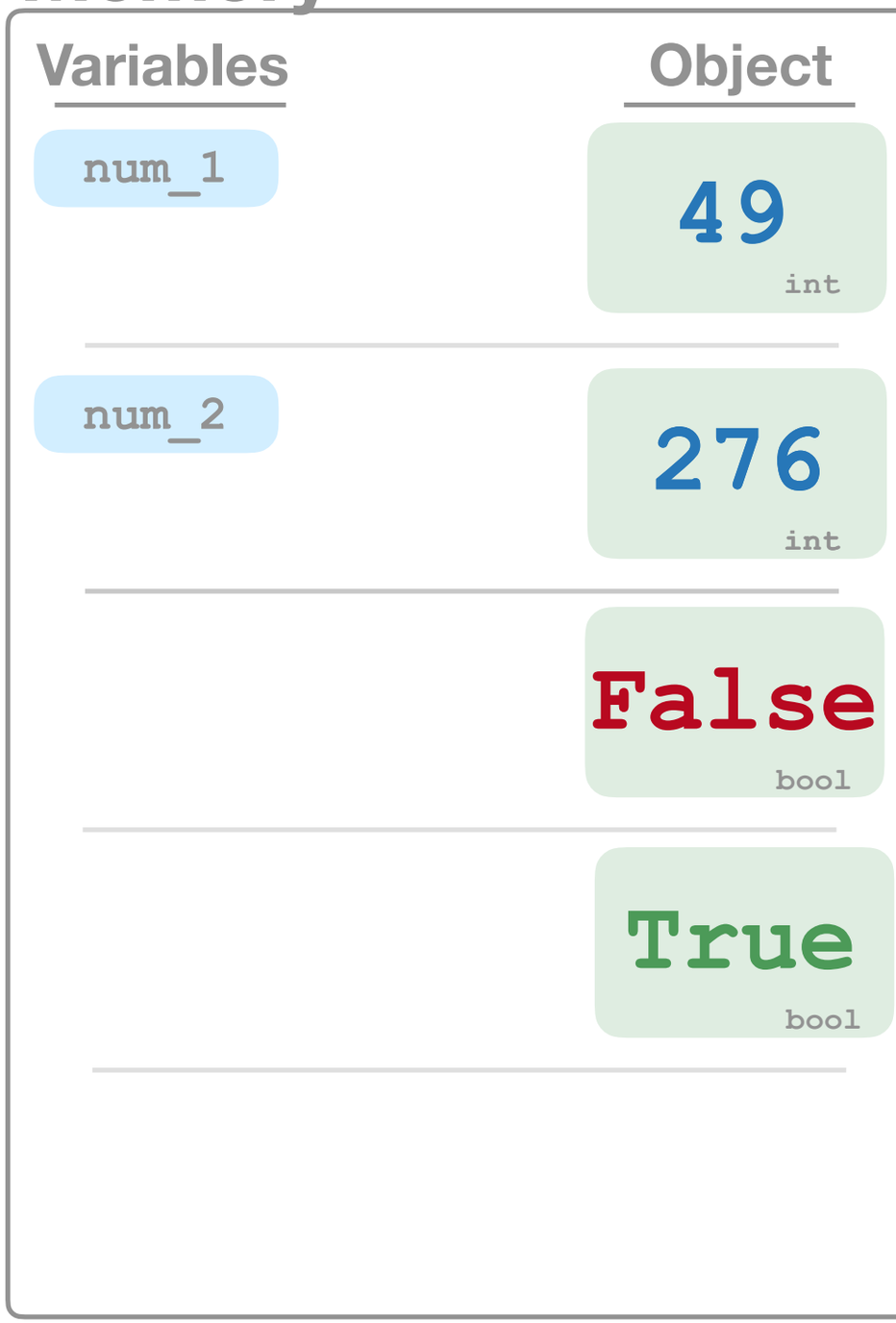
Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    if (num_1 > num_2):
        print("The first number is bigger!")
    elif (num_2 > num_1):
        print("The second number is bigger!")
    elif (num_1 == num_2):
        print("The numbers are the same!")
```

Output

```
>
Enter the first int: 49
Enter the second int: 276
```

Memory



Comparison Operators

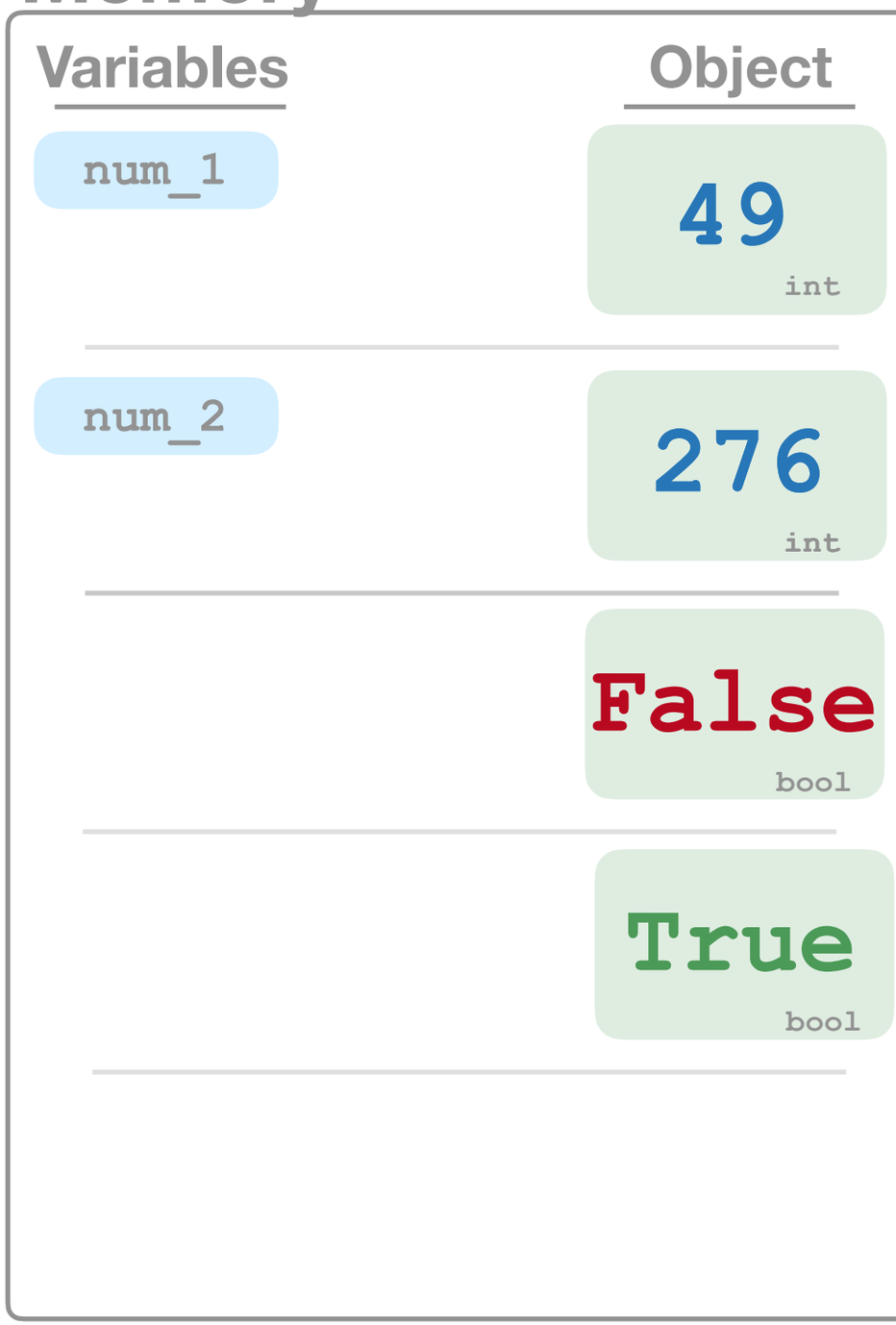
Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    if (num_1 > num_2):
        print("The first number is bigger!")
    elif (num_2 > num_1):
        print("The second number is bigger!")
    elif (num_1 == num_2):
        print("The numbers are the same!")
```

Output

```
>
Enter the first int: 49
Enter the second int: 276
```

Memory



Comparison Operators

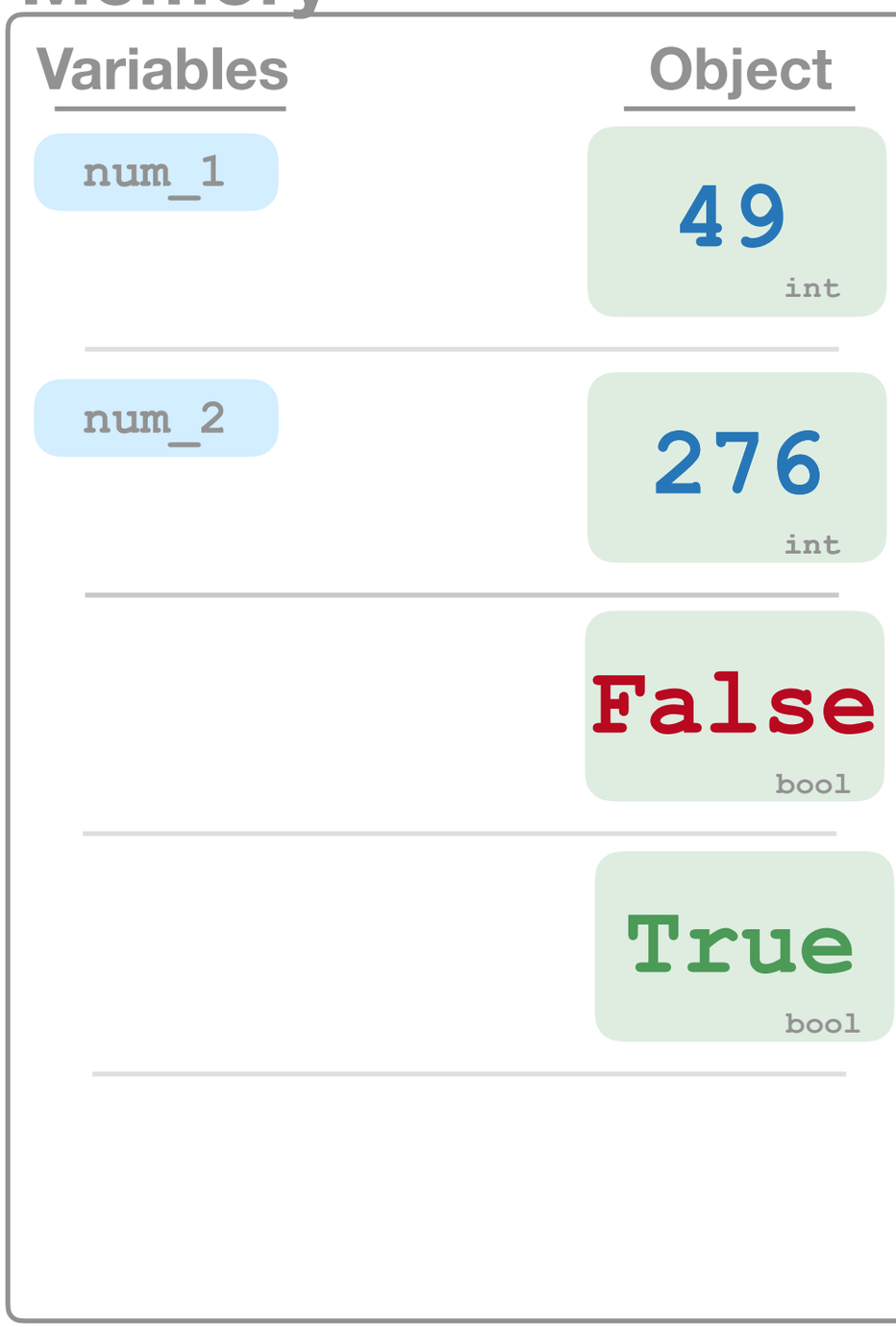
Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    if (num_1 > num_2):
        print("The first number is bigger!")
    elif (num_2 > num_1):
        print("The second number is bigger!")
    elif (num_1 == num_2):
        print("The numbers are the same!")
```

Output

```
Enter the first int: 49
Enter the second int: 276
The second number is bigger!
```

Memory



Comparison Operators

Code

```
def main():
    num_1 = input_int("Enter the first int:")
    num_2 = input_int("Enter the second int:")
    if (num_1 > num_2):
        print("The first number is bigger!")
    elif (num_2 > num_1):
        print("The second number is bigger!")
    elif (num_1 == num_2):
        print("The numbers are the same!")
```

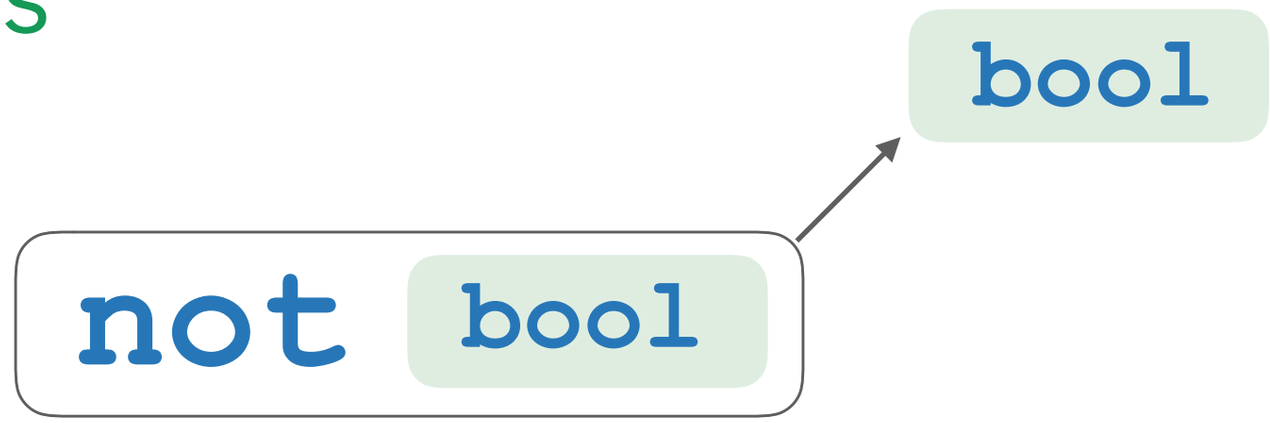
Output

```
Enter the first int: 49
Enter the second int: 276
The second number is bigger!
```

Memory

Variables	Object
num_1	49 (int)
num_2	276 (int)
	False (bool)
	True (bool)

Logical Operators



not

`True`

```
not False
not (5 < 3)
```

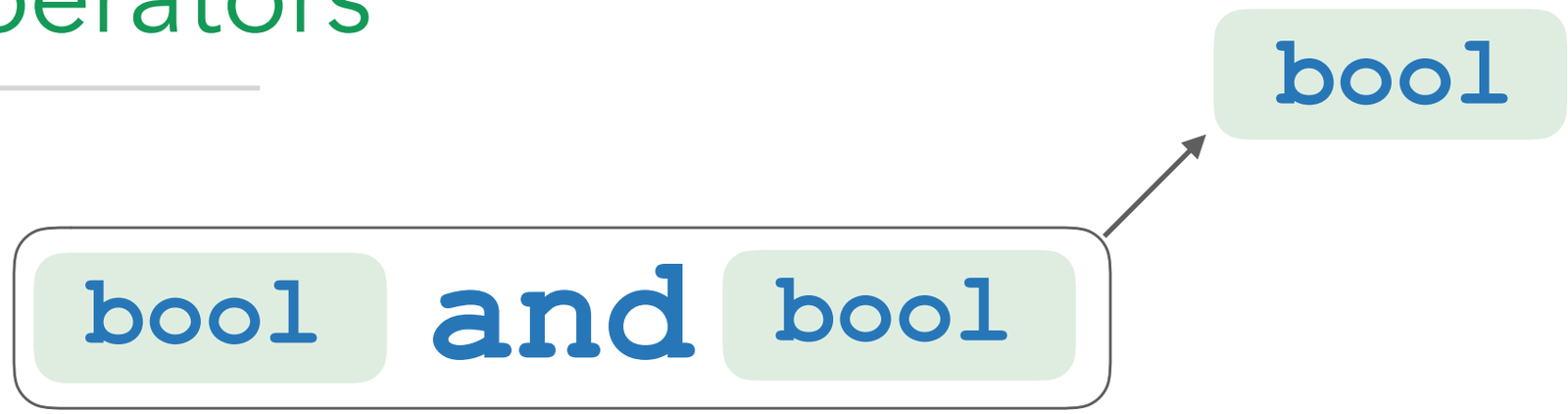
`False`

```
not True
not (7 > 4)
```

and

or

Logical Operators



not

and

`True`

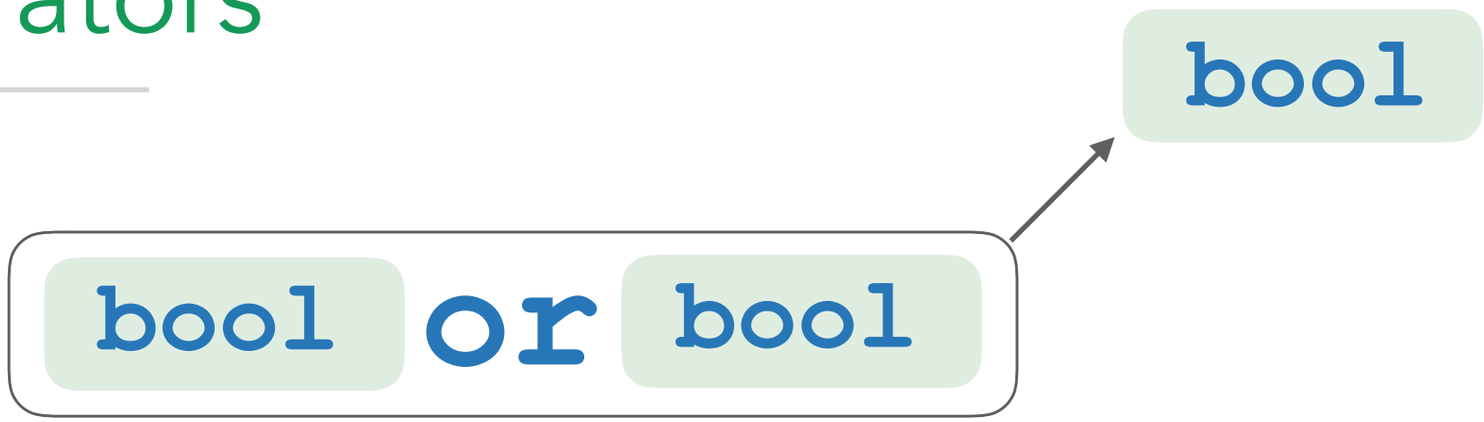
```
True and True
(3 == 3) and (5 <= 7)
```

`False`

```
False and True
 True and False
False and False
```

or

Logical Operators



not

and

or

`True`

```
True or True
True or False
False or True
```

`False`

```
False or False
(1 == 3) or (1 == 5)
```

Maiúsculas

Guest List

Theorem of Pythagoras

Max Number

Recap

Objects = Pieces of information inside of your computer!

Variables = Labels for objects! Unlabeled objects are lost!

Functions Pt. 2 = Functions can give / receive objects!

Operators = Allow objects to interact with each other!