

# Variable Scopes: Takeaways

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## Syntax

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### USING BUILT-IN FUNCTIONS

- To find the the length of an object: `len()`
- To return a float: `float()`
- To find the smallest item: `min()`
- To find the largest item: `max()`

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### OVERWRITING A BUILT-IN FUNCTION

- To overwrite the built-in function `sum()`:

```
b = [1,2]
sum = sum(b)
sum(20)
```

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## SCOPES

- Variables defined inside a function are not connected to variables defined outside the function:

```
def add(a,b):
    total = a + b
    return total

total = 15
print(add(10, 20))
print(total)
```

---

## SCOPE ISOLATION

- Variables defined within one function are not connected to variables defined in another function:

```
def add(a,b):  
    total = a + b  
    return total  
  
def subtract(a,b):  
    total = a - b  
    return total  
  
print(add(1,5))  
print(subtract(1,5))
```

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## SCOPE INHERITANCE

- When our code uses a variable name in a *local scope* that it hasn't defined there yet, the Python interpreter will check whether the variable exists in the *global scope*:

```
total = 50  
  
def find_average(column):  
    length = len(column)  
    return total / length
```

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## BUILT-IN INHERITANCE

- If a variable is not located in local or global scope, the interpreter will check the built-in:

```
def total(a):  
    return sum(a)
```

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## GLOBAL VARIABLES

- We define global variables using the global keyword:

```
total = 10

def add_to_total(a):
    global total
    total = total + a

add_to_total(20)

print(total)
```

## Concepts

- When we use a variable in python, the interpreter will look for its value according to simple rules:
  - Look for variables within the *local scope*.
  - Look at any *enclosing scopes*, starting with the innermost.
  - Look for variables in the *global scope*.
  - Look in the built-in functions.
  - Throw an error if it doesn't find the variable.

## Resources

- [Python Documentation on Built-In Functions](#)



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