

Functions continued: keywords,
higher order, lambdas

Function arguments

formal parameters are used in the function signature

actual parameters are passed in during **function call**

```
[1] def is_divisor(number: int, divisor: int) -> bool:
    if number % divisor == 0:
        return True
    else:
        return False
```

```
# test if 10 is a divisor of 100
result = is_divisor(10, 100)
print(result)
```

False

Positional Arguments

- Order of actual parameters matter!
- 10 will be bound to `number`; 100 will be bound to `divisor`

```
[1] def is_divisor(number: int, divisor: int) -> bool:
    if number % divisor == 0:
        return True
    else:
        return False
```

```
# test if 10 is a divisor of 100
result = is_divisor(10, 100)
print(result)
```

False

Keyword arguments

argument names are specified, followed by = and an actual parameter

```
[1] def is_divisor(number: int, divisor: int) -> bool:
    if number % divisor == 0:
        return True
    else:
        return False
```

```
# test if 10 is a divisor of 100
result = is_divisor(divisor=10, number=100)
print(result)
```

True

the value is the literal 10

the formal parameter name is divisor

Keyword arguments

argument names are specified, followed by = and an actual parameter

```
[1] def is_divisor(number: int, divisor: int) -> bool:
    if number % divisor == 0:
        return True
    else:
        return False
```

```
# test if 10 is a divisor of 100
```

```
div = 10
```

```
num = 100
```

```
result = is_divisor(divisor=div, number=num)
```

```
print(result)
```

```
True
```

the value is the variable `div`

the formal parameter name is `divisor`

Keyword arguments

Discuss with your neighbor!

argument names are specified, followed by = and an actual parameter

```
[1] def is_divisor(number: int, divisor: int) -> bool:
    if number % divisor == 0:
        return True
    else:
        return False
```

```
# test if 10 is a divisor of 100
divisor = 10
number = 100
result = is_divisor(divisor=divisor, number=number)
print(result)
```

True

Answer in Google Form -

<https://forms.gle/MLfcj1MWHrZWALZs6>

```
def is_divisor(number: int, divisor: int) -> bool:
    if number % divisor == 0:
        divisor = -1
        return True
    else:
        return False
```

```
# test if 10 is a divisor of 100
divisor = 10
number = 100
result = is_divisor(divisor=divisor, number=number)
print(result)
print(divisor)
```

Higher Order Functions

Functions can take functions as parameters

- positional or keyword!

```
def compute_square_iterative(  
    contents: str, square_function: Callable[[int], int]  
) -> List[int]:  
    """Compute the square of all of the integer values inside of the contents."""
```


TODO

- locate: renaming of a function without calling it
- locate: function name inside function call
- identify which function is the higher-order function

```
def compute_square_iterative(  
    contents: str, square_function: Callable[[int], int]  
) -> List[int]:  
    """Compute the square of all of the integer values inside of the contents."""
```

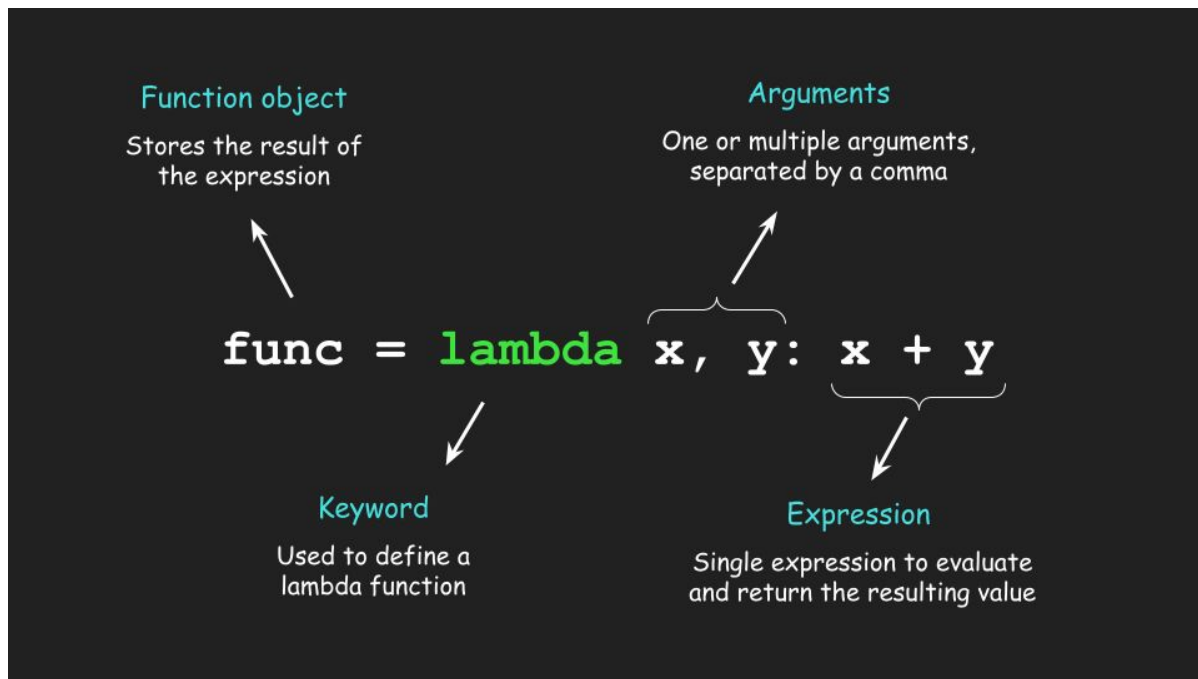
```
90     if approach.value == IntegerSquareApproach.FOR_LOOP:  
91         # specify the square function to be compute_square_for  
92         square_function = compute_square_for  
93         # the while loop approach should be invoked  
94     elif approach.value == IntegerSquareApproach.WHILE_LOOP:  
95         # specify the square function to be compute_square_while  
96         square_function = compute_square_while  
97         # call the compute_square_iterative function with:  
98         # --> the contents_text variable with the numerical values as text  
99         # --> the square function that is set to be the square function  
100    square_list = compute_square_iterative(contents_text, square_function)
```

keyword or positional?



lambdas

- anonymous functions (no name)
- special syntax



```
51 def compute_square_iterative(  
52     contents: str, square_function: Callable[[int], int]  
53 ) -> List[int]:  
54     """Compute the square of all of the integer values inside of the contents."""  
55     list_of_squared_vals: List[int] = []  
56     split_contents = contents.split("\n")  
57     for line in split_contents:  
58         try:  
59             number = int(line)  
60             num_squared = square_function(number)  
61             list_of_squared_vals.append(num_squared)  
62         except ValueError:  
63             pass  
64     return list_of_squared_vals  
65
```

```
100 square_list = compute_square_iterative(contents_text, square_function)
```

```
51 def compute_POWER_iterative(  
52     contents: str, POWER_function: Callable[[int], int]  
53 ) -> List[int]:  
54     """Compute the POWER of all of the integer values inside of the contents."""  
55     list_of_POWER_vals: List[int] = []  
56     split_contents = contents.split("\n")  
57     for line in split_contents:  
58         try:  
59             number = int(line)  
60             num_POWER = POWER_function(number)  
61             list_of_POWER_vals.append(num_POWER)  
62         except ValueError:  
63             pass  
64     return list_of_POWER_vals  
65
```

```
66 contents_text = "3\n5\n2\n4\n"  
67 compute_POWER_iterative(contents_text, lambda number: number**3)
```

Explore these concepts

20240212_keyword_args_lambdas.ipynb

Midterm Reminder

Monday Feb 19th at 9am

- in person
 - 50 minute exam
 - you can work anywhere in Alden with an open door
 - repo
 - Just python scripts and markdown files (no poetry environments)
 - python 3 is required. Make sure you can run a script using python 3
-
- create a one page cheat sheet ON PAPER to use during the exam
 - Letter size, front and back