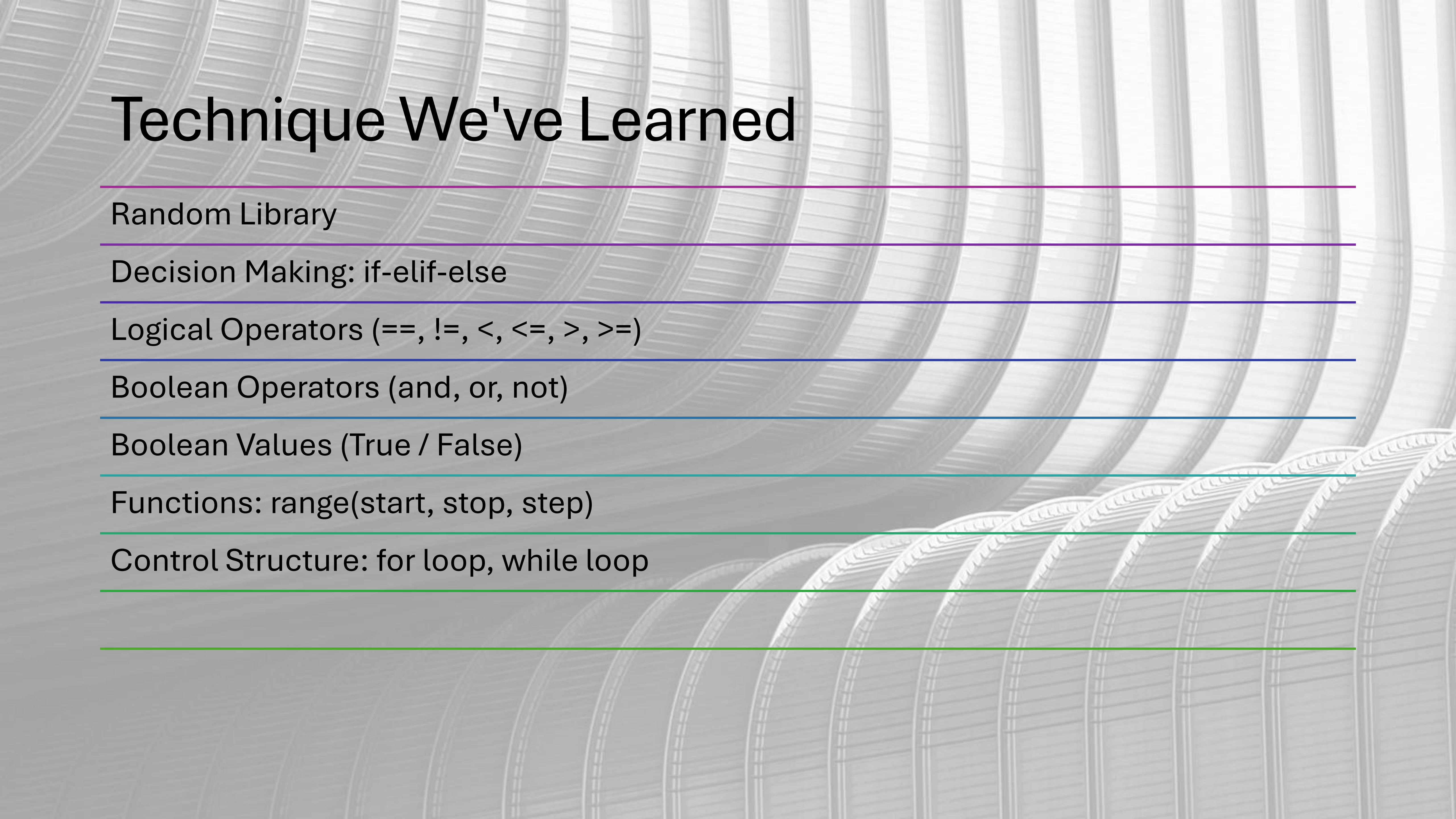
Lesson 4

Python Fundamental

Revisit

- For loop reinforcement – enhance dice program
- While loop
- Comparison of for loop and while loop
- Boolean Operators (and, or, not)
- Boolean Values (True / False)
- Functions: range(start, stop, step)
- Control Structure: for loop, while loop
- Lab: The dice program enhancement, a while loop to sum positive inputs
- Exercise: a program that simulates basic backing transactions



Technique We've Learned

Random Library

Decision Making: if-elif-else

Logical Operators (==, !=, <, <=, >, >=)

Boolean Operators (and, or, not)

Boolean Values (True / False)

Functions: range(start, stop, step)

Control Structure: for loop, while loop

Exercise 3 Review

- Refer to code repository

Data Structure: List

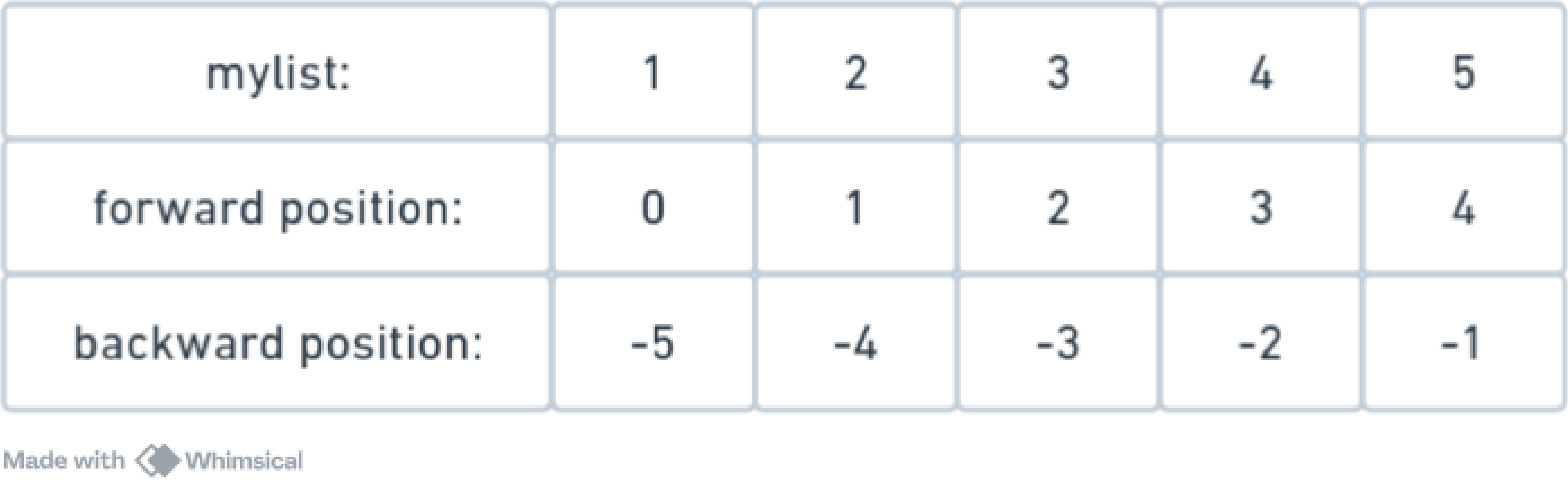
- A list is a collection of items stored in a specific order.
- The items can be of any type, like numbers, words, or even other lists.
- What is the output of below *print* statement?

```
mylist = [1, 2, 3, 4, 5]
print(mylist[2])
```

List - Positioning

- Try to print below content:

```
print(mylist[2])
print(mylist[-2])
```



mylist:	1	2	3	4	5
forward position:	0	1	2	3	4
backward position:	-5	-4	-3	-2	-1

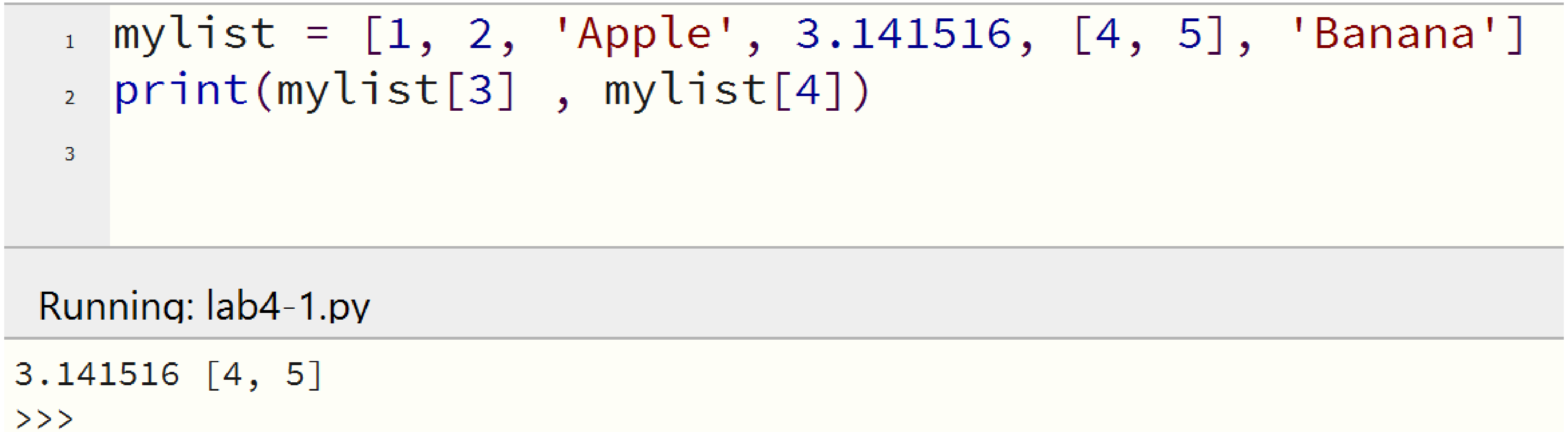
Quiz 1

- True or False: a list in Python only store values of the same data type?

(e.g., only numbers or only strings).

Multiple Data Types in a List

- Different data types can be stored in a list



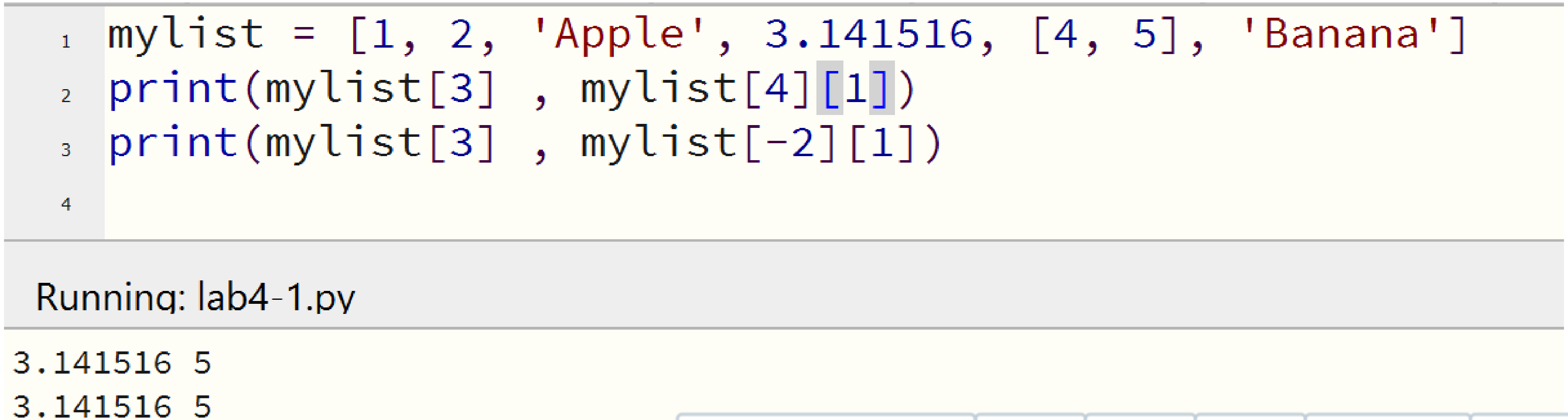
```python
mylist = [1, 2, 'Apple', 3.141516, [4, 5], 'Banana']
print(mylist[3] , mylist[4])

```

Running: lab4-1.py

```
3.141516 [4, 5]
>>>
```

Question: How can you print the number ‘5’ form **`mylist`**?

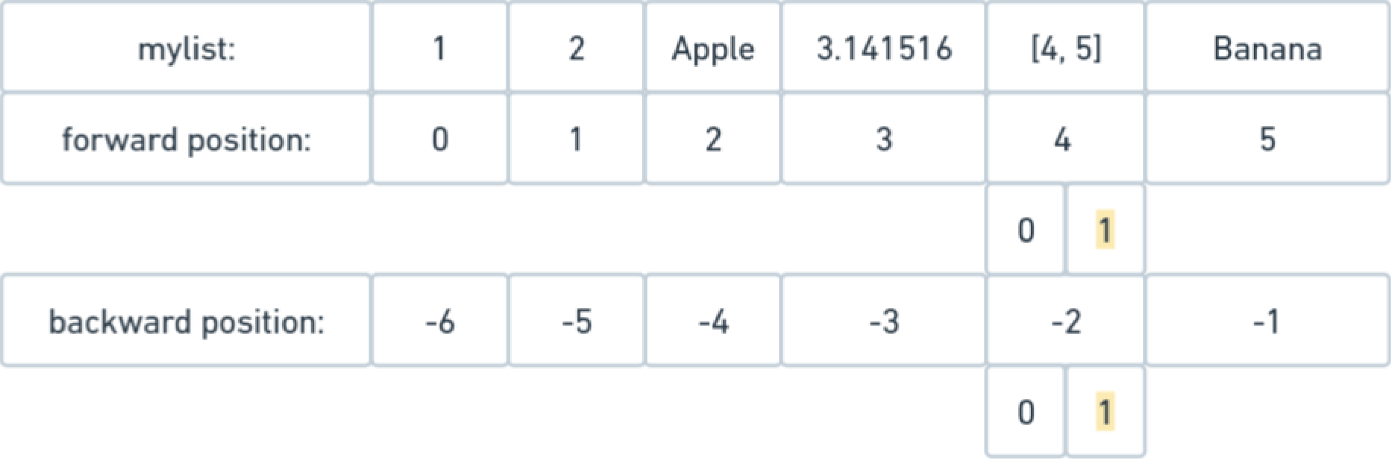
List - Slicing



```python
mylist = [1, 2, 'Apple', 3.141516, [4, 5], 'Banana']
print(mylist[3] , mylist[4][1])
print(mylist[3] , mylist[-2][1])

```

Running: lab4-1.py

```
3.141516 5
3.141516 5
>>>
```



mylist:	1	2	Apple	3.141516	[4, 5]	Banana
forward position:	0	1	2	3	4	5
					0 1	
backward position:	-6	-5	-4	-3	-2	-1
					0 1	

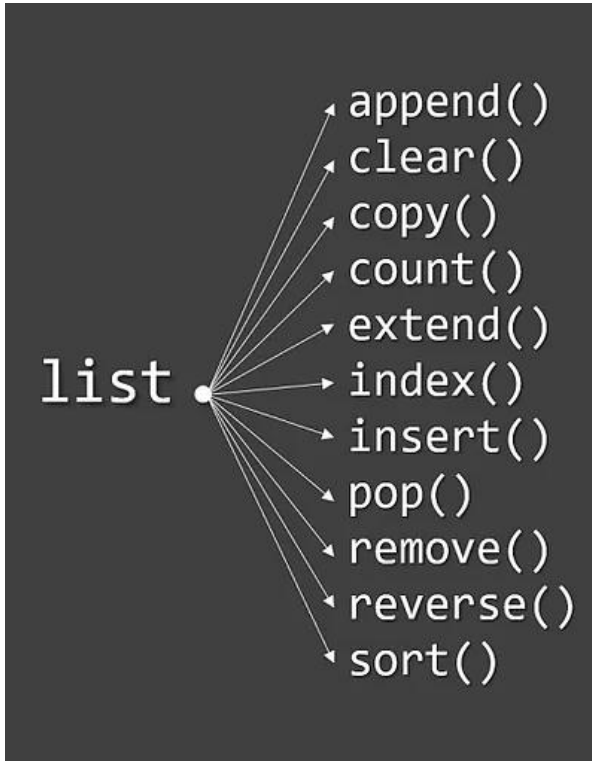
Made with Whimsical

Quiz 2

- What will be the output of the following code?
- A) 1
- B) 3
- C) 4
- D) 5

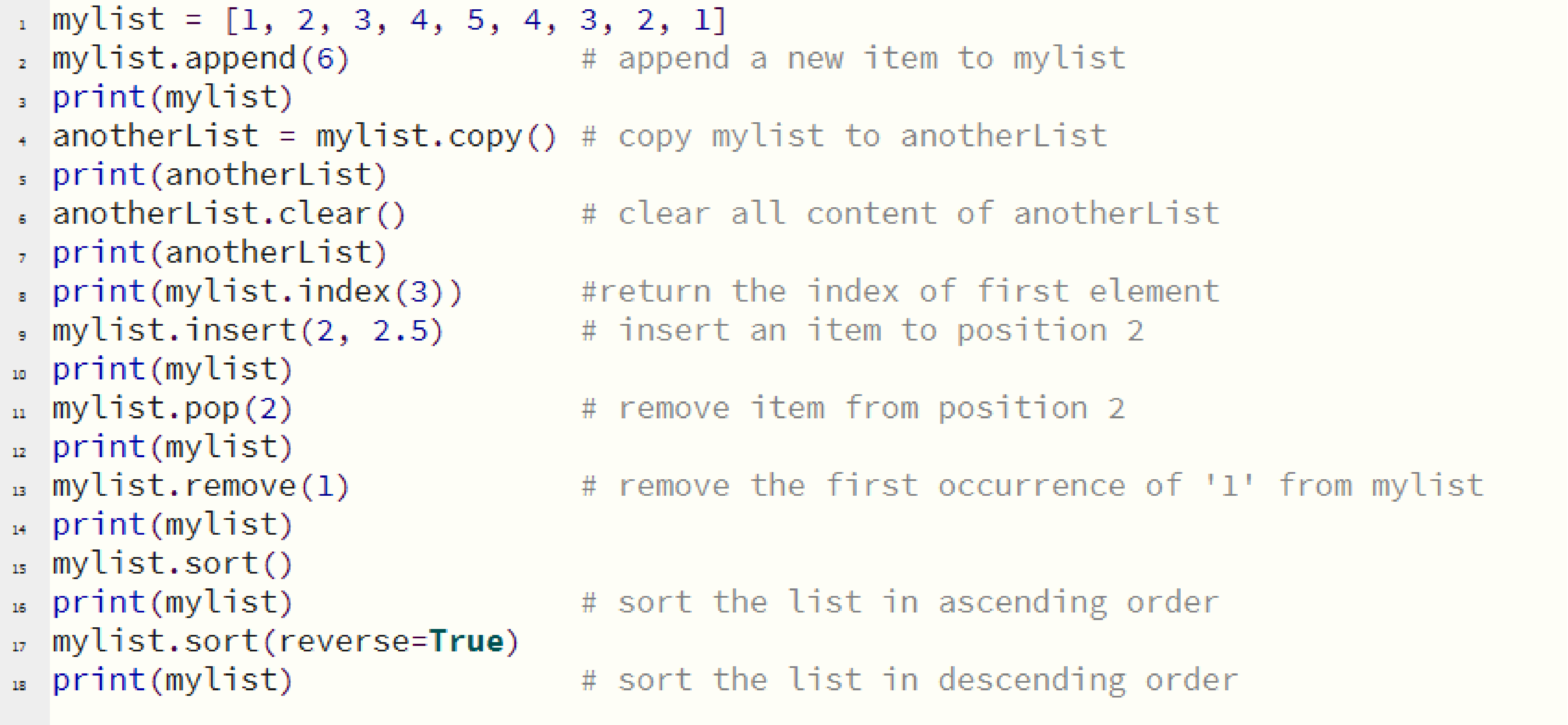
```
mylist = [1, 2, 3, 4, 5]
print(mylist[-2])
```

List – Manipulations



list

append()
clear()
copy()
count()
extend()
index()
insert()
pop()
remove()
reverse()
sort()



```python
mylist = [1, 2, 3, 4, 5, 4, 3, 2, 1]
mylist.append(6)            # append a new item to mylist
print(mylist)
anotherList = mylist.copy() # copy mylist to anotherList
print(anotherList)
anotherList.clear()         # clear all content of anotherList
print(anotherList)
print(mylist.index(3))      #return the index of first element
mylist.insert(2, 2.5)       # insert an item to position 2
print(mylist)
mylist.pop(2)               # remove item from position 2
print(mylist)
mylist.remove(1)            # remove the first occurrence of '1' from mylist
print(mylist)
mylist.sort()
print(mylist)               # sort the list in ascending order
mylist.sort(reverse=True)
print(mylist)               # sort the list in descending order
```

Quiz 3

- The following list is given:

```
mylist = ["apple", "banana", "cherry", "date"]
```

- How would you modify this list to:
  - Add "grape" to the end? (.append)
  - Remove "banana"? (.remove)
  - Sot mylist (.sort)
  - Print all elements one by one? (for loop)

List, Tuples, Sets, Dictionaries

- Tutorial

Exercise

Create a shopping list:

1. Start with an Empty List
   - Create an empty list called shoppingList.
2. Add Items to the List:
   - Ask the user to enter one shopping item at a time.
   - Use a **`for`** loop to ask for 5 items.
   - After the user enters each item, add (append) it to the shoppingList
   - After all 5 items are entered, sort the shoppingList in alphabetical order.
3. Display the List:
   - Use another for loop to print each item in the sorted shoppingList.
4. Output should look like this:

```
Enter item 1: milk
Enter item 2: bread
Enter item 3: eggs
Enter item 4: apples
Enter item 5: cereal
Your shopping list is: ['milk', 'bread', 'eggs', 'apples', 'cereal']
```