Course	
Term	
Week	
Date	
Chapter. Topic	7. Lists and Tuples

Mixed Lists and Nested Lists

Siva R Jasthi

Computer Science and Cybersecurity

Metropolitan State University

Recap of Lists: What did we learn so far

- Lists: Ordered, Can contain duplicates, Can be changed
- Can contain any type of data
- Map, Filter, Reduce
- List Methods vs Built-in Functions
- List Traversals (for loops) (3 versions)
- List Unpacking
- List Slicing
- List Comprehension

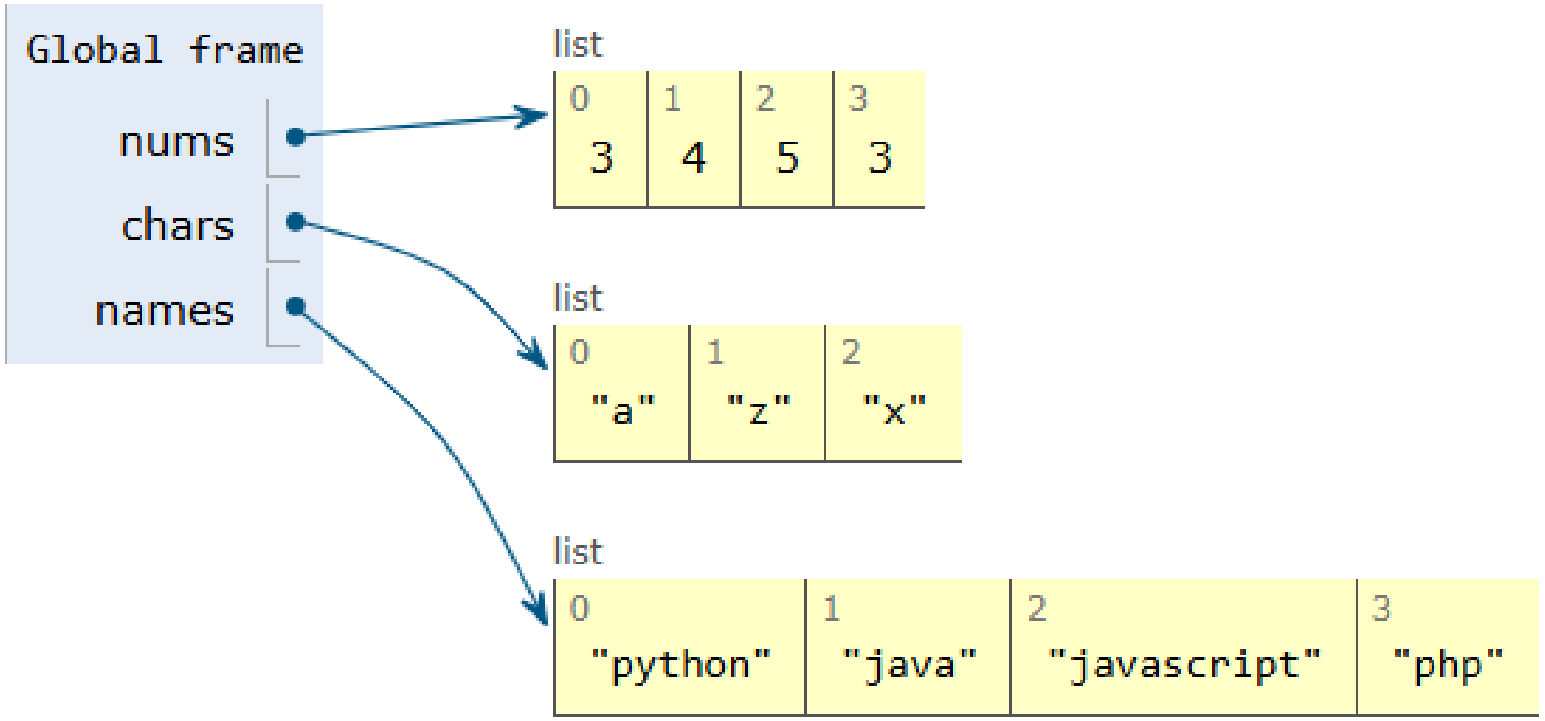
Lists

	Lists
Ordered	✓
Indexed	✓
Add or Update items	✓
Can contain duplicates	✓
Uses	Square Brackets
	[ ]

Outline for today

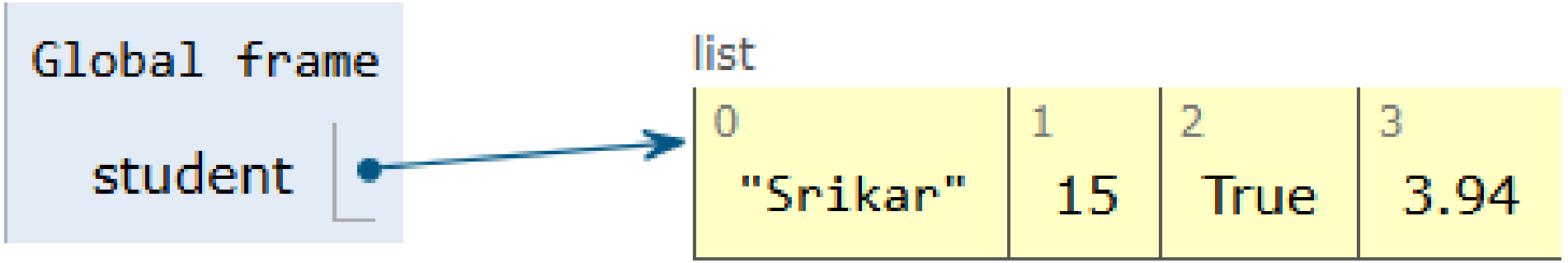
- Mixed Lists
- Nested Lists
- 2-D (Two Dimensional) Lists

Lists of same data type (homogeneous)




```
nums = [3, 4, 5, 3]
chars = ['a', 'z', 'x']
names = ["python", 'java', 'javascript', 'php']
```

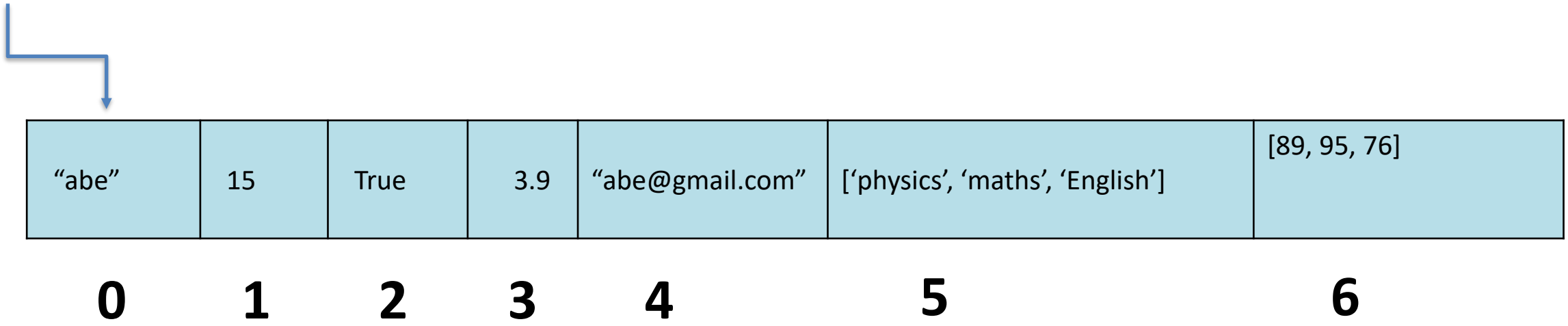
Lists of different data types (heterogeneous)




```
student = ['Srikar', 15, True, 3.94]
```

Lists can contain other lists as well

`student_1`



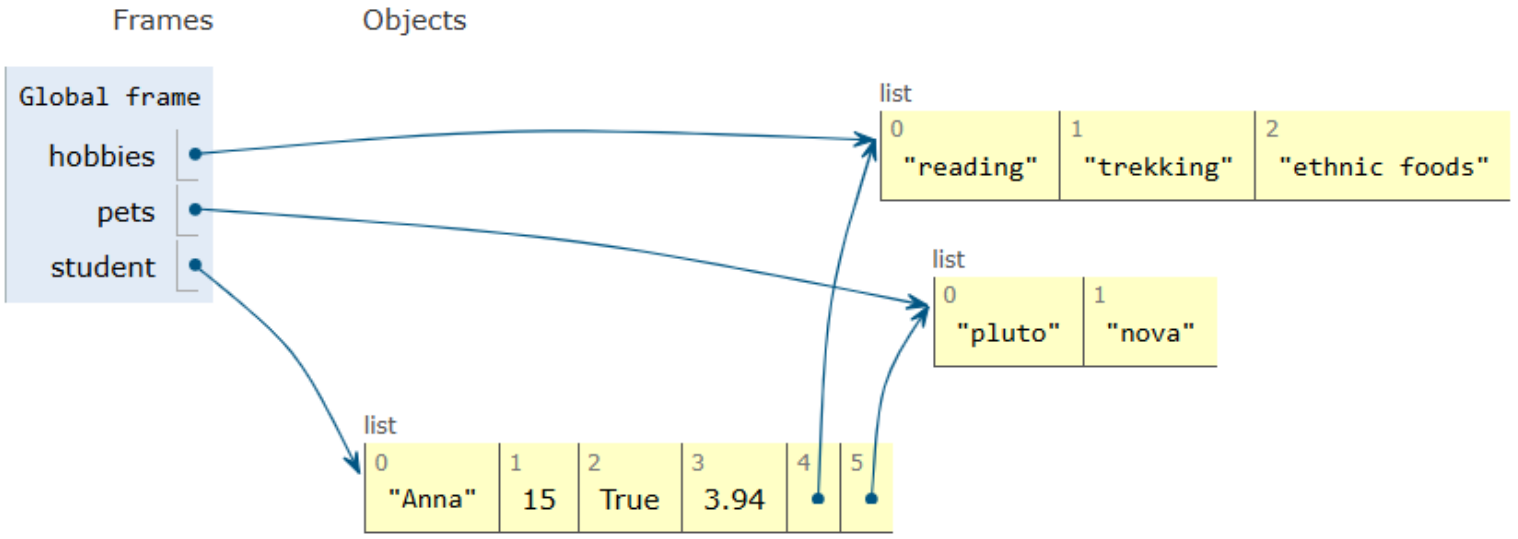
Wht are all the classes the student is taking?

Student_1[5] → list

What is the last course he/she is taking?

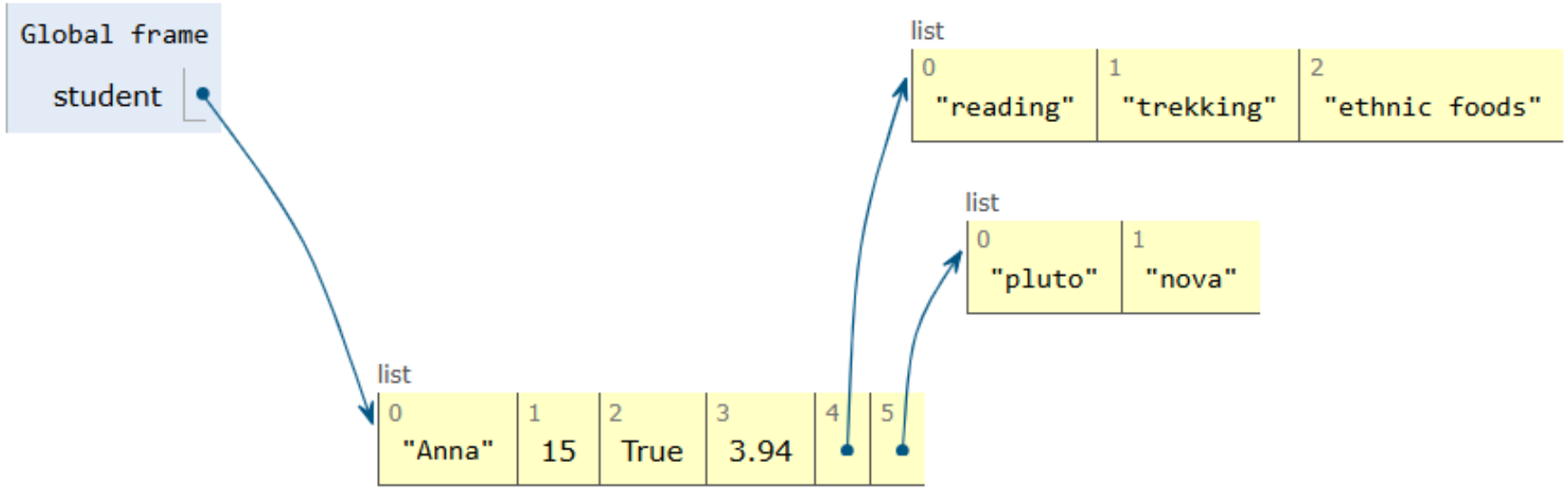
Student_1[5][-1] → 'English'

Nested List – An example



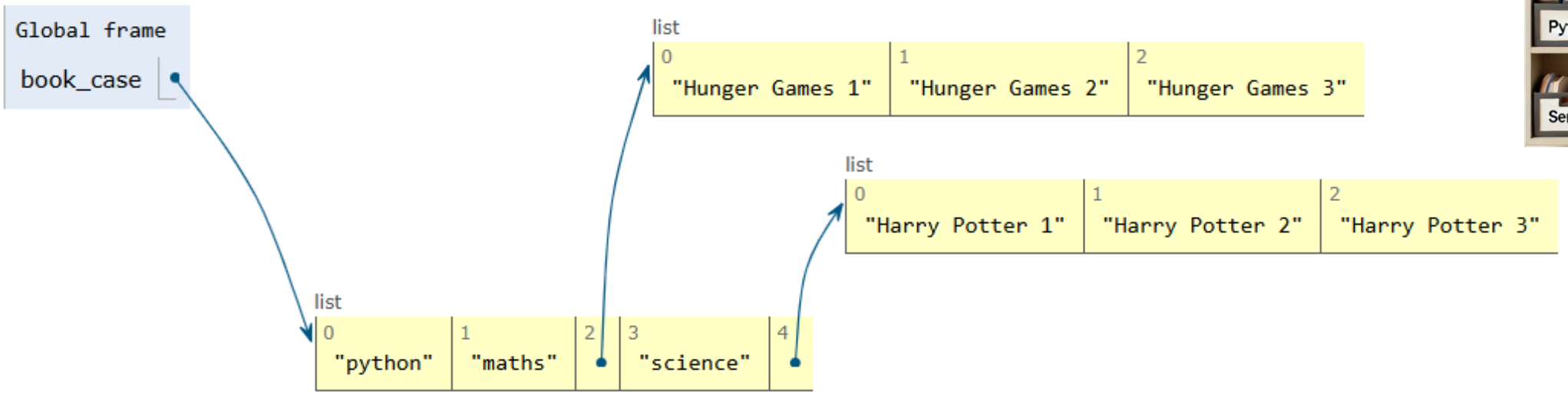

```
hobbies = ['reading', 'trekking', 'ethnic foods']
pets = ['pluto', 'nova']

student = [Anna', 15, True, 3.94, hobbies, pets]
```

Nested List – An example



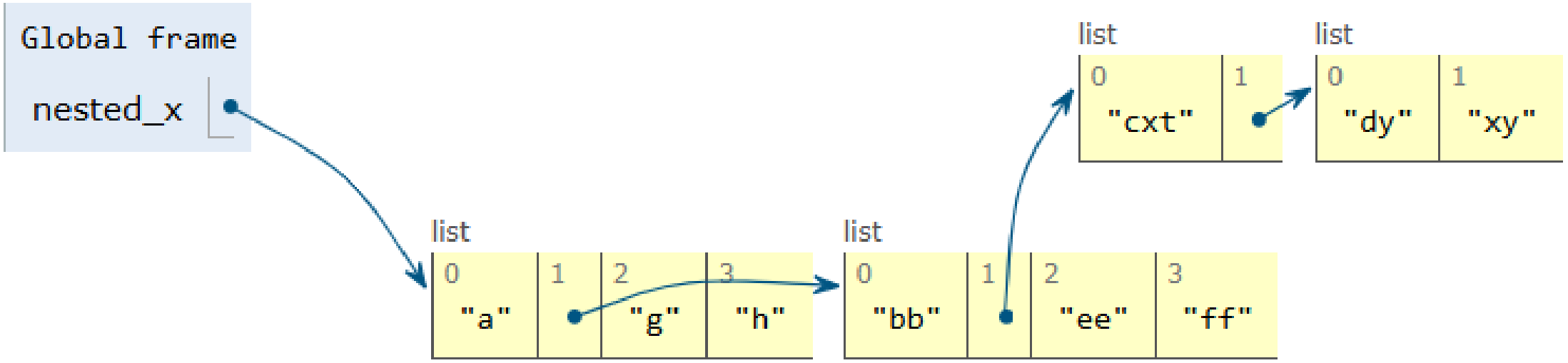

```
student = ['Anna', 15, True, 3.94,
                ['reading', 'trekking', 'ethnic foods'],
            ['pluto', 'nova']          ]
```

Nested List (book_case)




```
book_case = ['python',
             'maths',
             ["Hunger Games 1", "Hunger Games 2", "Hunger Games 3"],
             "science",
             ["Harry Potter 1", "Harry Potter 2", "Harry Potter 3"]
            ]
```

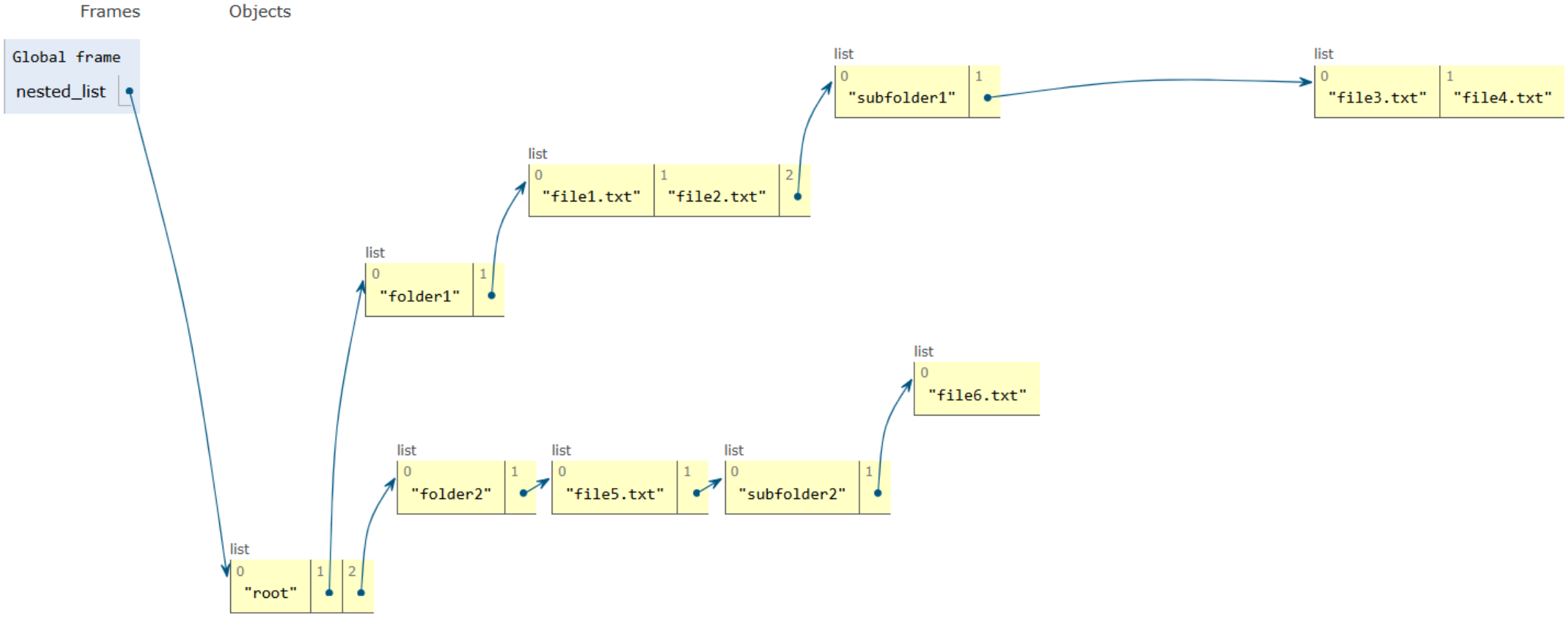
Deeply Nested List – Another example




```
nested_x  = ['a', ['bb', ['cxt', ['dy', 'xy'], 'ee', 'ff'], 'g', 'h']
```

```
a = nested_x[1][1][1][1][1]
```

Nested List (folders and files)



See the python code here [pythontutor]

Summary

- A **mixed list** is a list that contains different data types such as integers, floats, strings, booleans, and even other data structures.

- A **nested list** is a list that contains other lists as elements. This is useful for representing structured data like matrices hierarchical data, or multi-dimensional arrays.