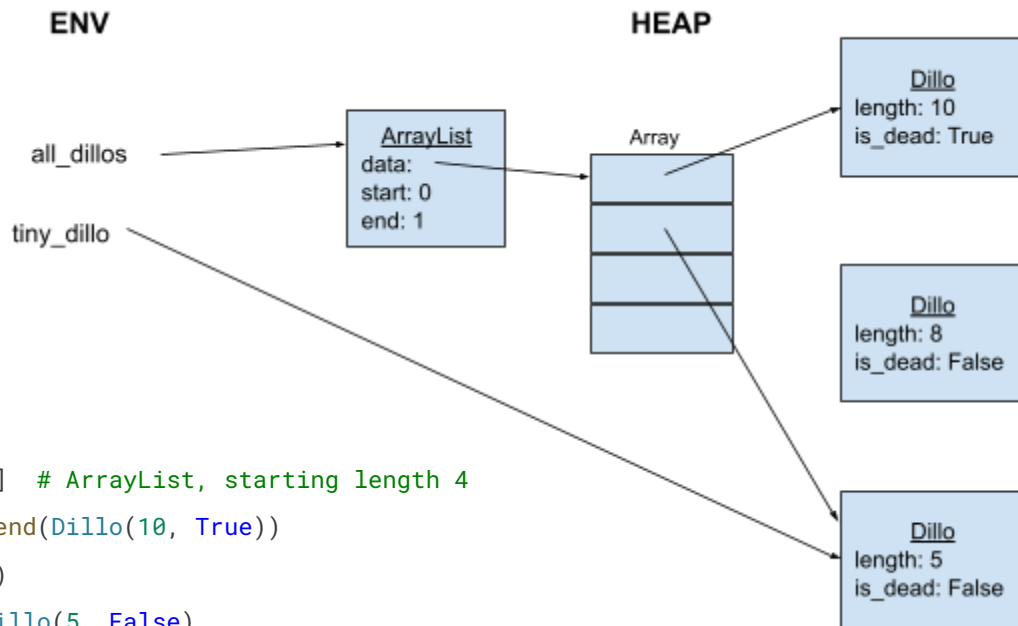


Lecture 35: Garbage Collection

```
class Dillo:
    def __init__(self, length: int, is_dead: bool):
        self.length = length
        self.is_dead = is_dead

all_dillos = [] # ArrayList, starting length 4
all_dillos.append(Dillo(10, True))
Dillo(8, False)
tiny_dillo = Dillo(5, False)
all_dillos.append(tiny_dillo)
```



```

all_dillos = [] # ArrayList, starting length 4
all_dillos.append(Dillo(10, True))
Dillo(8, False)
tiny_dillo = Dillo(5, False)
all_dillos.append(tiny_dillo)

```

env		heap		
all_dillos	-----> @1001	@	1001	ArrayList(data:@1002, start:0, end:1, size:2, cap:4)
tiny_dillo	-----> @1008	@	1002	@1006
		@	1003	@1008
		@	1004	
		@	1005	
		@	1006	Dillo(length: 10, is_dead: True)
		@	1007	Dillo(length: 8, is_dead: False)
		@	1008	Dillo(length: 5, is_dead: False)
		@	1009	free
		@	1010	free
		@	1011	free
		@	1012	free

Bonus: what would happen if we resized the arraylist to size 8?

env			heap	
all_dillos	-----> @1001		@ 1001	ArrayList(data:@1002, start:0, end:1, size:2, cap:4)
tiny_dillo	-----> @1008		@ 1002	@1006
			@ 1003	@1008
			@ 1004	
			@ 1005	
			@ 1006	Dillo(length: 10, is_dead: True)
			@ 1007	Dillo(length: 8, is_dead: False)
			@ 1008	Dillo(length: 5, is_dead: False)
			@ 1009	free
			@ 1010	free
			@ 1011	free
			@ 1012	free
			@ 1013	free
			@ 1014	free
			@ 1015	free
			@ 1016	free
			@ 1017	free
			@ 1018	free
			@ 1019	free
			@ 1020	free

What Generates Garbage?

Example: Find the average of a list of positive numbers

Example 1

```
nums = [67, 45, 0, 66, -21, 50]
pos_nums = [x for x in nums if x > 0]
avg_val = sum(pos_nums) / len(pos_nums)
print(avg_val)
```

Example 2

```
def avg_pos(numlist: list[int]) -> float:
    pos_nums = [x for x in numlist if x > 0]
    avg_val = sum(pos_nums) / len(pos_nums)
    return avg_val

avg_val = avg_pos(nums)
print(avg_val)
```