

Q1: Insert into list

- Execute the following:


```
>>> x = [5, 6, 5, 9, 10]
>>> x[3] = -1
>>> x.insert(1, 2)
```
- What is x[4]?

A: 10
 B: 9
 C: -1
 D: ERROR
 E: I don't know

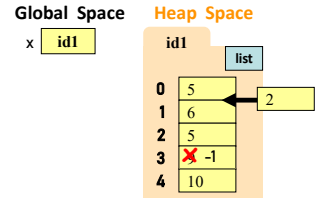
17

A1: Insert into list

- Execute the following:


```
>>> x = [5, 6, 5, 9, 10]
>>> x[3] = -1
>>> x.insert(1, 2)
```
- What is x[4]?

A: 10
 B: 9
 C: -1 **CORRECT**
 D: ERROR
 E: I don't know



(Original elements 1-4 are shifted down to be elements 2-5)

18

Q2: Swap List Values?

```
def swap(b, h, k):
```

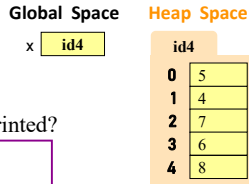
```
    """Procedure swaps b[h] and b[k] in b
    Precondition: b is a mutable list, h
    and k are valid positions in the list"""
```

```
1 temp= b[h]
2 b[h]= b[k]
3 b[k]= temp
```

```
x = [5,4,7,6,8]
swap(x, 3, 4)
print(x[3])
```

What gets printed?

A: 8
 B: 6
 C: Something else
 D: I don't know



21

A2: Swap List Values?

```
def swap(b, h, k):
```

```
    """Procedure swaps b[h] and b[k] in b
    Precondition: b is a mutable list, h
    and k are valid positions in the list"""
```

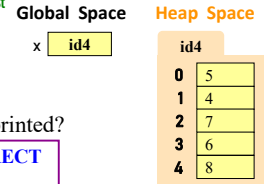
```
1 temp= b[h]
2 b[h]= b[k]
3 b[k]= temp
```

```
x = [5,4,7,6,8]
swap(x, 3, 4)
print(x[3])
```

What gets printed?

A: 8 **CORRECT**
 B: 6
 C: Something else
 D: I don't know

Swaps b[h] and b[k], because parameter b contains name of list.



22

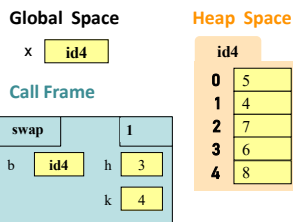
Q2: Swap List Values - Explanation (1)

```
def swap(b, h, k):
```

```
    """Procedure swaps b[h] and b[k] in b
    Precondition: b is a mutable list, h
    and k are valid positions in the list"""
```

```
1 temp= b[h]
2 b[h]= b[k]
3 b[k]= temp
```

```
x = [5,4,7,6,8]
swap(x, 3, 4)
print(x[3])
```



23

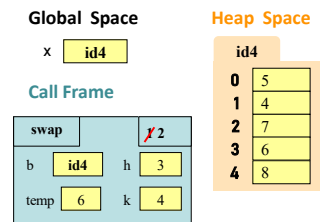
Q2: Swap List Values - Explanation (2)

```
def swap(b, h, k):
```

```
    """Procedure swaps b[h] and b[k] in b
    Precondition: b is a mutable list, h
    and k are valid positions in the list"""
```

```
1 temp= b[h]
2 b[h]= b[k]
3 b[k]= temp
```

```
x = [5,4,7,6,8]
swap(x, 3, 4)
print(x[3])
```



24

Q2: Swap List Values - Explanation (3)

```
def swap(b, h, k):
```

```
    """Procedure swaps b[h] and b[k] in b
    Precondition: b is a mutable list, h
    and k are valid positions in the list"""
```

```
1 temp= b[h]
2 b[h]= b[k]
3 b[k]= temp
```

```
x = [5,4,7,6,8]
swap(x, 3, 4)
print(x[3])
```

Global Space

x id4

Call Frame

swap			
b	id4	h	3
temp	6	k	4

Heap Space

id4	
0	5
1	4
2	7
3	6
4	8

25

Q2: Swap List Values - Explanation (4)

```
def swap(b, h, k):
```

```
    """Procedure swaps b[h] and b[k] in b
    Precondition: b is a mutable list, h
    and k are valid positions in the list"""
```

```
1 temp= b[h]
2 b[h]= b[k]
3 b[k]= temp
```

```
x = [5,4,7,6,8]
swap(x, 3, 4)
print(x[3])
```

Global Space

x id4

Call Frame

swap			
b	id4	h	3
temp	6	k	4
RETURN	None		

Heap Space

id4	
0	5
1	4
2	7
3	6
4	8

26

Q3: List Slicing

- Execute the following:

```
>>> x = [5, 6, 5, 9, 10]
>>> y = x[1:]
>>> y[0] = 7
```

- What is x[1]?

A: 7
B: 5
C: 6
D: ERROR
E: I don't know

28

A3: List Slicing

- Execute the following:

```
>>> x = [5, 6, 5, 9, 10]
>>> y = x[1:]
>>> y[0] = 7
```

- What is x[1]?

A: 7
B: 5
C: 6 CORRECT
D: ERROR
E: I don't know

Global Space

x id5

y id6

Heap Space

id5	
0	5
1	6
2	5
3	9
4	10

id6	
0	7
1	5
2	9
3	10

29

Q4

- Execute the following:

```
>>> x = [5, 6, 5, 9, 10]
>>> y = x
>>> y[1] = 7
```

- What is x[1]?

A: 7
B: 5
C: 6
D: ERROR
E: I don't know

30

A4

- Execute the following:

```
>>> x = [5, 6, 5, 9, 10]
>>> y = x
>>> y[1] = 7
```

- What is x[1]?

A: 7 CORRECT
B: 5
C: 6
D: ERROR
E: I don't know

Global Space

x id5

y id5

Heap Space

id5	
0	5
1	7
2	5
3	9
4	10

31