An item at an index value of zero is removed ②. Now the number of items in the list is reduced ③. Items starting from an index value of 2 up to 4 but excluding the value of 4 is removed from the list ④. All the items in the list can be removed by specifying only the colon operator without *start* or *stop* index values ⑥–⑦.

6.7 Summary

- Lists are a basic and useful data structure built into the Python language.
- Built-in functions include *len()*, which returns the length of the list; *max()*, which returns the maximum element in the list; *min()*, which returns the minimum element in the list and *sum()*, which returns the sum of all the elements in the list.
- An individual elements in the list can be accessed using the index operator [].
- Lists are mutable sequences which can be used to add, delete, sort and even reverse list elements.
- The *sort()* method is used to sort items in the list.
- The *split()* method can be used to split a string into a list.
- Nested list means a list within another list.

Multiple-Choice Questions

1. The statement that creates the list is
   a. superstore = list()
   b. superstore = []
   c. superstore = list([1,2,3])
   d. All of the above
2. Suppose continents = [1,2,3,4,5], what is the output of len(continents)?
   a. 5
   b. 4
   c. None
   d. error
3. What is the output of the following code snippet?
   islands = [111,222,300,411,546]
   max(islands)
   a. 300
   b. 222
   c. 546
   d. 111

4. Assume the list superstore is [1,2,3,4,5], which of the following is correct syntax for slicing operation?
   a. print(superstore[0:])
   b. print(superstore[:2])
   c. print(superstore[:-2])
   d. All of these
5. If zoo = ["lion", "tiger"], what will be zoo * 2?
   a. ['lion']
   b. ['lion', 'lion', 'tiger', 'tiger']
   c. ['lion', 'tiger', 'lion', 'tiger']
   d. ['tiger']
6. To add a new element to a list the statement used is?
   a. zoo. add(5)
   b. zoo.append("snake")
   c. zoo.addLast(5)
   d. zoo.addend(4)
7. To insert the string "snake" to the third position in zoo, which of the following statement is used?
   a. zoo.insert(3, "snake")
   b. zoo. insert(2, "snake")
   c. zoo.add(3, "snake")
   d. zoo.append(3, "snake")
8. Consider laptops = [3, 4, 5, 20, 5, 25, 1, 3], what will be the output of laptops.reverse()?
   a. [3, 4, 5, 20, 5, 25, 1, 3]
   b. [1, 3, 3, 4, 5, 5, 20, 25]
   c. [25, 20, 5, 5, 4, 3, 3, 1]
   d. [3, 1, 25, 5, 20, 5, 4, 3]
9. Assume quantity = [3, 4, 5, 20, 5, 25, 1, 3], then what will be the items of quantity list after quantity.pop(1)?
   a. [3, 4, 5, 20, 5, 25, 1, 3]
   b. [1, 3, 3, 4, 5, 5, 20, 25]
   c. [3, 5, 20, 5, 25, 1, 3]
   d. [1, 3, 4, 5, 20, 5, 25]
10. What is the output of the following code snippet?

    letters = ['a', 'b', 'c', 'd', 'e']

    letters[::-2]

    a. ['d', 'c', 'b']
    b. ['a', 'c', 'e']
    c. ['a', 'b', 'd']
    d. ['e', 'c', 'a']

11. Suppose list_items is [3, 4, 5, 20, 5, 25, 1, 3], then what is the result of list_items.remove(4)?
    a. 3, 5, 29, 5
    b. 3, 5, 20, 5, 25, 1, 3
    c. 5, 20, 1, 3
    d. 1, 3, 25
12. Find the output of the following code.

```
matrix= [[1,2,3],[4,5,6]]
v = matrix[0][0]
for row in range(0, len(matrix)):
    for column in range(0, len(matrix[row])):
        if v < matrix[row][column]:
            v = matrix[row][column]
print(v)
```

    a. 3
    b. 5
    c. 6
    d. 33
13. Gauge the output of the following.

```
matrix = [[1, 2, 3, 4],
          [4, 5, 6, 7],
          [8, 9, 10, 11],
          [12, 13, 14, 15]]

for i in range(0, 4):
    print(matrix[i][1])
```

    a. 1 2 3 4
    b. 4 5 6 7
    c. 1 3 8 12
    d. 2 5 9 13
14. What will be the output of the following?

```
data = [[[1, 2], [3, 4]], [[5, 6], [7, 8]]]
print(data[1][0][0])
```

    a. 1
    b. 2
    c. 4
    d. 5

15. The list function that inserts the item at the given index after shifting the items to the right is
    a. sort()
    b. index()
    c. insert()
    d. append()
16. The method that is used to count the number of times an item has occurred in the list is
    a. count()
    b. len()
    c. length()
    d. extend()

Review Questions

1. Explain the advantages of the list.
2. Explain the different ways in which the lists can be created.
3. Explain the different list methods with an example.
4. With the help of an example explain the concept of nested lists.
5. Explain the ways of indexing and slicing the list with examples.
6. Differentiate between the following:
    a. pop() and remove() methods of list.
    b. Del statement and pop() method of list.
    c. append() and insert() methods of list.
7. Write a program that creates a list of 10 random integers. Then create two lists by name odd_list and even_list that have all odd and even values of the list respectively.
8. Write a program to sort the elements in ascending order using insertion sort.
9. Write a Python program to use binary search to find the key element in the list.
10. Make a list of the first eight letters of the alphabet, then using the slice operation do the following operations:
    a. Print the first three letters of the alphabet.
    b. Print any three letters from the middle.
    c. Print the letters from any particular index to the end of the list.
11. Write a program to sort the elements in ascending order using selection sort.
12. Write a program that prints the maximum value of the second half of the list.
13. Write a program that creates a list of numbers 1–100 that are either divisible by 5 or 6.
14. Write a function that prompts the user to enter five numbers, then invoke a function to find the GCD of these numbers.