Chapter 18 Linked Lists, Stacks, Queues, and Priority Queues

1.   A *data structure* is a collection of data organized in some fashion. In object-oriented thinking, a data structure, also known as a *container*, is an object that stores other objects, referred to as data or elements. The structure not only stores data but also supports operations for accessing and manipulating the data.

2. A new node is created to hold the element. This new node is linked to the first element of the list. The new node now becomes the first element in the list. The variable head now points to this new node.

3. A new node is created to hold the element. This new node is linked to the last element of the list. The new node now becomes the last element in the list. The variable tail now points to this new node.

4. None.

5. Yes.

6. The first node is deleted from the list. The variable head now points to the second node in the list. The element in the first node in the original list is returned.

7. The last node is deleted from the list. The variable tail now points to the second last node in the list. The element in the last node in the original list is returned.

8. A search is first performed to locate the element in the linked list with the current node that contains the element and the previous node for the current node. The current node is removed. The current.next is now assigned to previous.next. The removed element is returned.

9. If you have to add or delete the elements at the beginning of the list, use **LinkedList**? If most of operations on a list involve retrieving an element at a given index, should you use **list**.

10. __iter__(self)

11. **__next__(self)**

12. Yes.

13. Use yield rather than return.

14. When an iterator's **__next__()** method is called for the first time, it starts to execute the generator and continue until the **yield** keyword is encountered. When the **__next__()** method is called again, execution resumes in the generator function on the statement immediately following the yield

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keyword. All local variables in the function will remain intact. If the yield
statement occurs within a loop, execution will continue within the loop as
though execution had not been interrupted. When the generator
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15. list

16. linked list

17. An ordinary queue is a first-in, first-out data structure. Elements are appended to the end of the queue and removed from the beginning. In a priority queue, elements are assigned with priorities. When accessing elements, the element with the highest priority is removed first. A priority queue has a largest-in, first-out behavior.

A priority queue is implemented using a heap.