1. What is the output of `len([1, 2, 3])`?

A) 2
B) 3
C) Error
D) None
✅ **Answer: B**

2. Which of the following is a mutable data type?

A) list
B) tuple
C) string
D) int
✅ **Answer: A**

3. Which method adds an element at the end of a list?

A) append()
B) insert()
C) extend()
D) add()
✅ **Answer: A**

4. How can you remove all elements from a list?

A) del list
B) list.remove()
C) list.clear()
D) list.delete()
✅ **Answer: C**

5. Which of the following is used to create a tuple?

A) `{}`
B) `[]`
C) `()`

D) `<>`
✅ **Answer: C**

6. Which of these data types is immutable?

A) list
B) dictionary
C) set
D) tuple
✅ **Answer: D**

7. Which method is used to remove a particular element from a set?

A) remove()
B) discard()
C) pop()
D) All of the above
✅ **Answer: D**

8. Sets in Python are:

A) Ordered
B) Indexed
C) Mutable
D) Allow duplicate values
✅ **Answer: C**

9. Which of the following will create an empty dictionary?

A) `{}`
B) `dict()`
C) `[]`
D) Both A and B
✅ **Answer: D**

10. How do you access a value in a dictionary?

A) dict.key
B) dict.value
C) dict[key]
D) dict{key}
✅ **Answer: C**

---

11. What is the output of: `len({'a': 1, 'b': 2, 'c': 3})`?

A) 1
B) 2
C) 3
D) Error
✅ **Answer: C**

---

12. Which operation is not allowed on sets?

A) add
B) update
C) append
D) discard
✅ **Answer: C**

---

13. Which data structure uses LIFO?

A) Queue
B) Stack
C) List
D) Set
✅ **Answer: B**

---

14. Which module provides support for array data structure?

A) struct
B) array
C) list

D) collections
✅ **Answer: B**

---

15. What will `my_list = [1, 2, 3]; print(my_list[3])` produce?

A) 3
B) Error
C) None
D) 0
✅ **Answer: B**

---

16. Which keyword is used to define a function in Python?

A) function
B) def
C) fun
D) define
✅ **Answer: B**

---

17. Which data structure does not allow duplicates?

A) list
B) tuple
C) dictionary
D) set
✅ **Answer: D**

---

18. What will `list("abc")` return?

A) ['a', 'b', 'c']
B) ['abc']
C) 'a', 'b', 'c'
D) ('a', 'b', 'c')
✅ **Answer: A**

---

19. The default mode for the `pop()` method in lists removes:

A) First item
B) Last item
C) Random item
D) Middle item
✅ **Answer: B**

---

20. Which structure follows FIFO?

A) Stack
B) Array
C) Queue
D) List
✅ **Answer: C**

---

21. Which of the following can be used as a key in a dictionary?

A) List
B) Dictionary
C) Tuple
D) Set
✅ **Answer: C**

---

22. What is the output of `set([1, 2, 2, 3])`?

A) {1, 2, 2, 3}
B) {1, 2, 3}
C) [1, 2, 3]
D) Error
✅ **Answer: B**

---

23. Which method returns the number of times a value appears in a list?

A) count()
B) index()
C) find()

D) search()
✅ **Answer: A**

24. What does `my_dict.get('key', 'default')` do?

A) Returns ‘key’
B) Returns ‘default’ if ‘key’ is not found
C) Throws error
D) Adds key
✅ **Answer: B**

25. Which method combines two dictionaries in Python 3.9+?

A) merge()
B) update()
C) `|` operator
D) append()
✅ **Answer: C**

26. What is the output of `len(set([1, 2, 2, 3, 4]))`?

A) 5
B) 4
C) 3
D) Error
✅ **Answer: B**

27. Which of the following removes an item from a list by index?

A) del
B) remove()
C) pop()
D) All of the above
✅ **Answer: D**

28. Which is a Python built-in module for implementing queues with thread-safety?

A) queue
B) list
C) collections
D) os
✅ **Answer: A**

---

29. Which method returns the index of first matching item?

A) index()
B) find()
C) locate()
D) position()
✅ **Answer: A**

---

30. What does `reversed([1,2,3])` return?

A) [3, 2, 1]
B) reversed object
C) (3, 2, 1)
D) None
✅ **Answer: B**

31. What is the output of `list(range(3))`?

A) [1, 2, 3]
B) [0, 1, 2]
C) [0, 1, 2, 3]
D) [1, 2]
✅ **Answer: B**

---

32. Which of the following is the correct syntax to create an empty set?

A) `set = {}`
B) `set()`
C) `{}`
D) `[]`
✅ **Answer: B**

33. Which built-in function returns the largest item in an iterable?

A) largest()
B) max()
C) top()
D) big()
✅ **Answer: B**

34. Which method would you use to get all keys from a dictionary?

A) getkeys()
B) keys()
C) items()
D) values()
✅ **Answer: B**

35. Which of the following removes the first item with the specified value in a list?

A) del
B) pop()
C) remove()
D) discard()
✅ **Answer: C**

36. What is the output of `bool([])`?

A) True
B) False
C) Error
D) None
✅ **Answer: B**

37. What is the time complexity of accessing a value in a dictionary by key?

A) O(n)
B) O(log n)

C) O(1)
D) O(n log n)
✅ **Answer: C**

38. Which data structure uses curly braces `{}` and key-value pairs?

A) List
B) Tuple
C) Set
D) Dictionary
✅ **Answer: D**

39. What does the `update()` method do in a dictionary?

A) Changes values
B) Adds new key-value pairs or updates existing ones
C) Deletes items
D) Resets dictionary
✅ **Answer: B**

40. Which method removes a random element from a set?

A) discard()
B) remove()
C) pop()
D) delete()
✅ **Answer: C**

41. Which collection type is best for storing unique items?

A) List
B) Tuple
C) Set
D) Dictionary
✅ **Answer: C**

42. What is the output of `tuple("abc")`?

A) ('abc')
B) ['a', 'b', 'c']
C) ('a', 'b', 'c')
D) Error
✅ **Answer: C**

---

43. Which of the following methods adds elements from one list to another?

A) append()
B) insert()
C) extend()
D) join()
✅ **Answer: C**

---

44. What is the result of `[1, 2] + [3, 4]`?

A) [1, 2, 3, 4]
B) [1, 2, [3, 4]]
C) Error
D) [4, 6]
✅ **Answer: A**

---

45. Which method gives you a copy of a list?

A) clone()
B) copy()
C) duplicate()
D) replicate()
✅ **Answer: B**

---

46. What data structure is best suited for a Last-In-First-Out (LIFO) use case?

A) List
B) Set
C) Stack

D) Queue
✅ **Answer: C**

47. Which keyword is used to iterate over items in a collection?

A) repeat
B) loop
C) iterate
D) for
✅ **Answer: D**

48. How do you check if a key exists in a dictionary?

A) `key in dict`
B) `dict.has_key(key)`
C) `dict.exists(key)`
D) `key.exists()`
✅ **Answer: A**

49. What is the output of `len((1, 2, (3, 4)))`?

A) 2
B) 3
C) 4
D) Error
✅ **Answer: B**

50. Which of the following types is not ordered?

A) List
B) Tuple
C) Dictionary (before Python 3.7)
D) String
✅ **Answer: C**

1. What is the time complexity of linear search in the worst case?

A) O(1)
B) O(log n)
C) O(n)
D) O(n log n)
✅ **Answer: C**

---

2. Binary search can be applied only on:

A) Unsorted arrays
B) Sorted arrays
C) Any array
D) None
✅ **Answer: B**

---

3. What is the time complexity of binary search in the best case?

A) O(n)
B) O(log n)
C) O(1)
D) O(n log n)
✅ **Answer: C**

---

4. Which of the following is not true about linear search?

A) It is simple and easy to implement
B) It works on sorted and unsorted arrays
C) It is faster than binary search
D) It scans each element one by one
✅ **Answer: C**

5. What is the worst-case time complexity of binary search?

A) O(n)
B) O(log n)
C) O(n log n)
D) O(1)
✅ **Answer: B**

6. In binary search, if the element is not found, the search space becomes:

A) Half of the list
B) Entire list
C) Zero
D) Same
✅ **Answer: C**

7. In a list of 1024 elements, what is the maximum number of comparisons in binary search?

A) 10
B) 1024
C) 512
D) 11
✅ **Answer: D**

(Reason: $\log_2(1024) = 10$, but worst-case is $\log_2(n)+1$ comparisons)

8. What will a linear search return if the target is not found?

A) 0
B) -1
C) None
D) Error
✅ **Answer: B** *(commonly used convention)*

9. Which of the following is a recursive implementation of binary search likely to use?

A) Loop
B) Queue
C) Stack
D) Array
✅ **Answer: C** *(recursion uses stack)*

---

10. In binary search, after each comparison, how is the array divided?

A) Randomly
B) Into three equal parts
C) In half
D) It is not divided
✅ **Answer: C**

---

11. What is required before performing binary search?

A) Sorting the array
B) Checking length
C) Counting elements
D) Nothing
✅ **Answer: A**

---

12. What is the average-case time complexity of linear search?

A) O(n)
B) O(log n)
C) O(1)
D) $O(n^2)$
✅ **Answer: A**

---

13. Which search algorithm is better for a small number of elements?

A) Linear Search
B) Binary Search
C) Hash Search
D) None

✅ **Answer: A**

14. Which of the following is correct for binary search algorithm?

A) Starts at first element
B) Always checks the last element
C) Uses the middle element
D) Uses hash function

✅ **Answer: C**

15. Which search method guarantees finding the first occurrence of a value in an unsorted list?

A) Binary Search
B) Linear Search
C) Hash Search
D) Jump Search

✅ **Answer: B**

16. In which scenario is linear search preferable over binary search?

A) Sorted list
B) Large list
C) List with only a few elements
D) None

✅ **Answer: C**

17. Binary search is a type of:

A) Divide and Conquer algorithm
B) Dynamic Programming

C) Greedy Algorithm
D) Brute Force
✅ **Answer: A**

18. What will `binary_search([1,3,5,7,9], 4)` return (assuming proper implementation)?

A) 2
B) 3
C) -1
D) 1
✅ **Answer: C**

19. What is returned in a successful binary search?

A) Boolean value
B) Index of found element
C) All elements
D) Middle element
✅ **Answer: B**

20. Which of the following is true about both linear and binary search?

A) Both require sorted input
B) Both use recursion
C) Both can find a missing element
D) Both return the index of the element if found
✅ **Answer: D**

Let me know if you'd like:

- A **printable version** (PDF/Doc/Excel)
- **Code examples** of linear and binary search in Python
- Or **interactive quiz format** with scoring!

4o

You said:

10 more question

ChatGPT said:

Here are **10 more MCQs** on **"Searching: Linear and Binary Search"** in Python, continuing from the previous sets, with correct answers included:

🔍 More MCQs on Linear and Binary Search

21. What is the main limitation of binary search?

A) Can’t search large lists
B) Requires sorted data
C) Needs recursion
D) Returns Boolean only
✅ **Answer: B**

22. Which of the following is not true for linear search?

A) It can search in unsorted arrays
B) It compares each element one by one
C) It requires the list to be sorted
D) It works well with small datasets
✅ **Answer: C**

23. Which one of the following uses divide-and-conquer strategy?

A) Linear Search
B) Binary Search
C) Jump Search
D) Linear Probing
✅ **Answer: B**

24. Which statement is true about binary search?

A) Works faster than linear search on unsorted data
B) Needs the list to be sorted before searching
C) Always takes O(n) time
D) Searches each element sequentially

✅ **Answer: B**

25. Which Python module provides a built-in implementation of binary search on sorted sequences?

A) heapq
B) array
C) bisect
D) search

✅ **Answer: C**

26. In binary search, if the target is less than the middle element, what happens next?

A) Search right half
B) Search whole list again
C) Search left half
D) Return -1

✅ **Answer: C**

27. What will be the output of `linear_search([2, 4, 6, 8], 6)` if implemented correctly?

A) 2
B) 3
C) -1
D) None

✅ **Answer: A**

28. Which type of error will occur if you perform binary search on an unsorted array?

A) TypeError
B) Logical Error (wrong result)
C) Syntax Error
D) Runtime Error
✅ **Answer: B**

29. What is the maximum number of comparisons required in linear search for a list of 50 items?

A) 49
B) 50
C) 25
D) 10
✅ **Answer: B**

30. Which search algorithm is better suited for linked lists?

A) Binary Search
B) Linear Search
C) Interpolation Search
D) Jump Search
✅ **Answer: B**

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---

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---

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B) 3
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D) None
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---

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D) 10
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---

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A) Binary Search
B) Linear Search
C) Interpolation Search
D) Jump Search
✅ **Answer: B**

21. Which sorting algorithm is similar to the method used for sorting playing cards in hands?

A) Selection Sort
B) Merge Sort
C) Insertion Sort
D) Bubble Sort
✅ **Answer: C**

---

22. What is the average-case time complexity of Bubble Sort?

A) O(n)
B) O(log n)
C) $O(n^2)$
D) O(n log n)
✅ **Answer: C**

---

23. Which of the following sorts is adaptive?

A) Bubble Sort
B) Insertion Sort
C) Both A and B
D) Selection Sort
✅ **Answer: C**

---

24. Which sorting algorithm performs better when the number of elements is large?

A) Bubble Sort
B) Selection Sort
C) Insertion Sort
D) None of these
✅ **Answer: D**

---

25. What happens if no swaps are made in a pass of bubble sort?

A) The algorithm continues
B) The list is reversed
C) The algorithm stops early

D) An error occurs
✅ **Answer: C**

---

26. Which is the most swap-efficient among the three: bubble, selection, insertion?

A) Bubble Sort
B) Selection Sort
C) Insertion Sort
D) All are same
✅ **Answer: B**

---

27. In Insertion Sort, which element is considered in the second pass?

A) First
B) Second
C) Third
D) Last
✅ **Answer: C**

---

28. Selection Sort finds the minimum element in:

A) First half only
B) Entire unsorted part
C) Whole list
D) Sorted part only
✅ **Answer: B**

---

29. What is the main purpose of the inner loop in Bubble Sort?

A) To find minimum element
B) To insert elements
C) To compare and swap adjacent elements
D) To sort using divide and conquer
✅ **Answer: C**

---

30. Which sort is most suitable for real-time systems where swaps are costly?

A) Bubble Sort
B) Insertion Sort
C) Selection Sort
D) Quick Sort
✅ **Answer: C**

---

31. Which sorting technique does not require checking every adjacent pair each time?

A) Bubble Sort
B) Insertion Sort
C) Selection Sort
D) Heap Sort
✅ **Answer: C**

---

32. In which sort does the number of comparisons always remain the same regardless of order?

A) Bubble Sort
B) Selection Sort
C) Insertion Sort
D) None
✅ **Answer: B**

---

33. Which sort is guaranteed to make at most (n-1) swaps in all cases?

A) Bubble Sort
B) Insertion Sort
C) Selection Sort
D) Merge Sort
✅ **Answer: C**

---

34. In Python, how do we insert elements in Insertion Sort?

A) Use `insert()` method
B) Swap until in position
C) Shift larger elements

D) Use slicing
✅ **Answer: C**

---

35. Which sorting algorithm keeps growing a sorted list from left to right?

A) Bubble Sort
B) Insertion Sort
C) Selection Sort
D) Radix Sort
✅ **Answer: B**

---

36. Which algorithm always compares all remaining elements to find the minimum?

A) Insertion Sort
B) Selection Sort
C) Bubble Sort
D) Heap Sort
✅ **Answer: B**

---

37. What type of sorting is Bubble Sort?

A) Divide and conquer
B) Exchanging sort
C) Insertion-based sort
D) Counting sort
✅ **Answer: B**

---

38. What happens if we do not use the swap condition in Bubble Sort?

A) It runs faster
B) It does not sort correctly
C) It sorts using insertion
D) Nothing changes
✅ **Answer: B**

---

39. Is Selection Sort a stable sort?

A) Yes
B) No
C) Sometimes
D) Only in Python
✅ **Answer: B**

---

40. In Selection Sort, how many comparisons are made in the first pass for `n` elements?

A) n
B) n-1
C) n-2
D) 1
✅ **Answer: B**

---

41. Which sorting algorithm requires the most number of swaps?

A) Bubble Sort
B) Selection Sort
C) Insertion Sort
D) None
✅ **Answer: A**

---

42. In worst case, how many comparisons does Insertion Sort make for `n` elements?

A) n
B) n log n
C) $n^2/2$
D) n(n-1)/2
✅ **Answer: D**

---

43. In Python, what happens when you call `.sort()` on a list?

A) Bubble Sort
B) Merge Sort (Timsort)
C) Selection Sort

D) Insertion Sort
✅ **Answer: B**

---

44. Which sort is least efficient on large datasets?

A) Selection Sort
B) Merge Sort
C) Bubble Sort
D) Quick Sort
✅ **Answer: C**

---

45. Which sorting algorithm checks all previous elements before inserting?

A) Selection Sort
B) Insertion Sort
C) Merge Sort
D) Bubble Sort
✅ **Answer: B**

---

46. What does `swap(arr, i, j)` function do in Bubble Sort?

A) Sorts the whole list
B) Replaces all i with j
C) Exchanges arr[i] with arr[j]
D) Copies arr[i] to arr[j]
✅ **Answer: C**

---

47. Which sort will finish early if the list becomes sorted before all passes?

A) Selection Sort
B) Insertion Sort
C) Bubble Sort
D) Both B and C
✅ **Answer: D**

---

48. What is the time complexity of selection sort in the average case?

A) O(n log n)
B) $O(n^2)$
C) O(n)
D) O(log n)
✅ **Answer: B**

---

49. Which sorting method uses the fewest comparisons in the best case?

A) Bubble Sort
B) Insertion Sort
C) Selection Sort
D) None
✅ **Answer: B**

---

50. What kind of algorithm is Insertion Sort?

A) Exchange sort
B) Divide and conquer
C) Incremental sort
D) Partition-based sort
✅ **Answer: C**