Chapter 6. Searching

1. Locating a particular element in a collection of elements is known as_____
   a) **Searching** b) Sorting c)Fixing d) Finding
2. In Linear Search, the maximum number of comparisons required to find an element in a list of size `n` is :
   a) n-1 **b) n** c) n/2 d) n+1
3. Binary Search works only when the list is:
   a) Random **b) Sorted** c) Small d) Reversed
4. The time complexity of Linear Search in the worst case is:
   a) O(1) **b) O(n)** c) $O(n^2)$ d) O(n log n)
5. The time complexity of Binary Search in the worst case is:
   a) O(n) **b) O(log n)** c) $O(n^2)$ d) $O(\sqrt{n})$
6. In hashing, the function used to calculate the index of an element is called:
   a) Map function b) Index function **c) Hash function** d) Key function
7. If two elements are assigned the same index by a hash function, it is called:
   a) Mapping **b) Collision** c) Indexing d) Searching
8. Which of the following search techniques always requires the least number of comparisons (on average)?
   a) Linear Search b) Binary Search **c) Hashing** d) Sequential Search
9. A perfect hash function is one in which:
   a) Collisions never occur b) All keys map to index 0
   c) It works only for prime-sized tables d) It uses binary division
10. Linear Search is also known as:
    a) Binary Search **b) Serial Search** c) Hashing d) Direct Search
11. Best case time complexity of Linear Search is:
    a) O(n) **b) O(1)** c) O(log n) d) O(n log n)
12. If the key is the **last element** in a list of `n` elements, Linear Search will take:
    a) 1 comparison b) n+1 comparisons
    c) n comparisons d) n/2 comparisons
13. The main advantage of Binary Search over Linear Search is:
    a) Works on all lists **b) Requires fewer comparisons**
    c) Requires no sorting d) Works on unsorted data
14. If the middle element is greater than the key in Binary Search, the next step is:
    a) Search entire list again **b) Search in first half**
    c) Search in second half d) End the search
15. Time complexity of Binary Search is:
    a) O(1) b) O(n) c) O(log n) d) O(n log n)
15. Hashing is a technique used to:
    a) Sort data b) Encrypt data **c) Search data** d) Compress data
16. The function that maps a key to an index in a hash table is called:
    a) Index function **b) Hash function**

c) Mapping function d) Key locator

17. The situation when two elements are mapped to the same hash value is called:
a) Overflow **b) Collision** c) Mapping error d) Indexing

18. The time complexity of search using Hashing (without collisions) is:
a) O(n) b) O(log n) **c) O(1)** d) $O(n^2)$

19. A hash function is said to be perfect if:
a) It uses prime numbers **b) Collisions never occur**
c) All elements map to index 0 d) It always returns unique keys

20. Which of the following is an example of a simple hash function?
a) h(key) = key % table_size b) h(key) = log(key)
c) $h(key) = key^2$ d) h(key) = key / 2

21. If the list has only one element, both Linear and Binary Search will take:
a) 0 comparisons **b) 1 comparison**
c) log n comparisons d) n comparisons

22. Searching a word in a dictionary is an example of:
a) Linear Search b) Hashing
c) Binary Search d) Sequential Search

23. The suitable technique to search in the collection of items that are small in size and are unordered.
a) **Linear Search** b) Binary Search c) Hashing d) All of the above

24. Finding a phone number from a telephone directory is most efficiently done using:
a) Linear Search b) Hashing
c) Binary Search d) Sequential Search

25. Which searching technique is most efficient if the dataset is very large and unordered?
a) Linear Search b) Binary Search
c) Hashing d) Sorting + Binary Search

26. Name the searching technique which generates index value for every element___
a) Linear Search b) **Hashing** **c)** Binary Search d) Sequential Search

27. In Linear Search, if the key is not present, number of comparisons =
a) $\log_2 n$ **b) n** c) n/2 d) 1

28. In Binary Search, the search space reduces by ___ after each comparison.
a) Half b) One element c) Two elements d) Three elements

29. Sequential search or serial search is the other name given to _____.
a) **Linear Search** b) Binary Search c) Hashing d) All of the above

30. If the hash table size is 10 and key = 34, hash function h(key) = key % 10 gives index
a) 34 b) 3 **c) 4** d) 0

31. Each element in the list is compared one by one with the_____.
a) **key** b) ele c) index d)numlist

32. Name the searching technique, in which the entire list is traversed to find the matching element is
a) **Linear Search** b) Binary Search c) Hashing d) All of the above

33. In binary search, the key to be searched is compared with the element in the _____of a sorted list
a) Left b) Right **c) Middle** d) Full

34. In binary search, we declare the search successful and the searching process ends when
a) the element at the middle position itself matches the key
b) the element at the middle position is greater than the key or
c) the element at the middle position is smaller than the key
d) All of the above

35. In binary search, if the middle element is greater than the key, it means___
a) **the key is present in the left half** b) the key is present in the right half
c) the key is not found in the list d) None of the above

36. In binary search, if the middle element is less than the key, it means___
a) the key is present in the left half b) **the key is present in the right half**
c) the key is not found in the list d) None of the above

37. In binary search, if the middle element is greater than the key, it means___
a) **the key is present in the first half** b) the key is present in the right half
c) the key is not found in the list d) None of the above

38. In binary search, if the middle element is less than the key, it means___
a) the key is present in the left half b) **the key is present in the second half**
c) the key is not found in the list d) None of the above

39. A technique which can be used to know the presence of a key in a list in just one step.
a) Linear Search b) Binary Search c) **Hashing** d) All of the above

40. Formula called ____ is used to calculate the value at an index in the list in hashing.
a) Hash function b) Hash formula c) Hash Value d) Hash Key

41. (A): The size of the hash table can be larger than the size of the list.
(R): In hashing, multiple elements may map to the same index.
a) **both A and R True** b) both A and R False
c) A True and R False d) A False and R True

42. A simple hash function that works with numeric values is known as _____
a) **Remainder method** b) division method c) Hash table method d) group method

43. A mechanism for placing the other items with the same hash value in the hash table___
a) perfect collision b) **collision resolution** c) Hash Function d) transformation

44. If a hash function is perfect, collision will occur _____
a) always b) sometimes c) **never** d) once

45. The process of identifying a slot for the second and further items in the hash table in the event of collision, is called ___
a) Perfect collision b) **collision resolution** c) Hash Function d) transformation