**Time and Space complexity**

1. **What is the time complexity of binary search in a sorted array?**  
   A) O(n)  
   B) O(log n)  
   C) O(n log n)  
   D) O(1)

Answer : B O(log n)

1. **What is the average-case time complexity of quicksort?**  
   A) O(n log n)  
   B) O(n²)  
   C) O(log n)  
   D) O(n)

Answer : A O(n log n)

**3. Consider the following code:**

for (int i = 0; i < n; i++) {

for (int j = 0; j < n; j++) {

System.out.print("\*");

}

}

What is the time complexity?  
A) O(n)  
B) O(log n)  
C) O(n²)  
D) O(1)

Answer : O(n2)

1. **What is the space complexity of merge sort?**  
   A) O(1)  
   B) O(n)  
   C) O(log n)  
   D) O(n²)

Answer : bn O(n)

**5. What is the time complexity of the following loop?**

for (int i = 1; i < n; i \*= 2) {

System.out.println(i);

}

1. O(n)  
   B) O(log n)  
   C) O(n log n)  
   D) O(1)

Answer : O(log n)

**6. What is the space complexity of an iterative binary search algorithm?**  
A) O(n)  
B) O(1)  
C) O(log n)  
D) O(n²)

Answer : B O(1)

**7. What is the time complexity of inserting an element at the start of a LinkedList?**  
A) O(n)  
B) O(1)  
C) O(log n)  
D) O(n log n)

Answer : C O(1)

**8. What is the time complexity of accessing an element in an array using its index?**  
A) O(n)  
B) O(log n)  
C) O(1)  
D) O(n²)

Answer : C O(1)

**9. What is the worst-case time complexity of bubble sort?**  
A) O(n log n)  
B) O(n²)  
C) O(log n)  
D) O(n)

Answer :b O(n2)

**10. Consider the following code:**

int count = 0;

for (int i = 0; i < n; i++) {

count += 1;

}

What is the time complexity?  
A) O(n²)  
B) O(n log n)  
C) O(n)  
D) O(1)

Answer : O(n)

**11. What is the time complexity of reversing a LinkedList with n elements (iterative approach)?**  
A) O(n)  
B) O(log n)  
C) O(n²)  
D) O(1)

Answer : A O(n)

**12. What is the space complexity of the following recursive function?**

void printRec(int n) {

if (n == 0) return;

System.out.println(n);

printRec(n - 1);

}

A)O(n)  
B) O(1)  
C) O(log n)  
D) O(n²)

Answer : O(n) space

**13. What is the time complexity of inserting an element in a HashMap (average case)?**  
A) O(n)  
B) O(1)  
C) O(log n)  
D) O(n log n)

Answer : B O(1)

**14. Consider the following code:**

for (int i = 0; i < n; i++) {

for (int j = 0; j < Math.sqrt(n); j++) {

System.out.print("\*");

}

}

What is the time complexity?  
A) O(n²)  
B) O(n log n)  
C) O(n√n)  
D) O(log n)

Answer : C O(n√n)

**15. What is the space complexity of an array of size n?**  
A) O(log n)  
B) O(n)  
C) O(1)  
D) O(n²)

Answer : b O(n)

**16. Which of the following has the lowest average-case time complexity?**  
A) Selection Sort  
B) Merge Sort  
C) Bubble Sort  
D) Insertion Sort

Answer : b Merge Sort

**17. What is the time complexity of multiplying two n x n matrices using the standard method?**  
A) O(n)  
B) O(n²)  
C) O(n³)  
D) O(n log n)

Answer : C O((n³)

**18. What is the best-case time complexity of insertion sort?**  
A) O(n)  
B) O(n log n)  
C) O(n²)  
D) O(1)

Answer : A O(n)

**19. What is the time complexity of this loop?**

for (int i = 0; i < n; i++) {

for (int j = i; j < n; j++) {

System.out.print("\*");

}

}

A)O(n²)  
B) O(n)  
C) O(log n)  
D) O(n log n)

Answer : A O(n2)

**20. What is the time complexity of searching in a hash table in the worst case?**  
A) O(1)  
B) O(log n)  
C) O(n)  
D) O(n log n)

Answer : C O(n)