

★ CODING & COMPONENT DESIGN

■ 1. LINKED LIST – najčešći u Microsoftu

Ovo su *apsolutni klasici*. Moras ih znati.

- ✓ Reverse Linked List
 - ✓ Merge Two Sorted Linked Lists
 - ✓ Detect Cycle in a Linked List
 - ✓ Remove N-th Node From End
 - ✓ Middle of Linked List
 - ✓ Palindrome Linked List
 - ✓ Add Two Numbers (Linked List) — često dolazi
 - ✓ Intersection of Two Linked Lists
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■ 2. BINARY TREES / BINARY SEARCH TREES

Apsolutno najčešće dolazi:

- ✓ Invert Binary Tree (BANALNO, ali obavezno dolazi)
- ✓ Maximum Depth of Binary Tree

- ✓ Same Tree
 - ✓ Symmetric Tree
 - ✓ Path Sum
 - ✓ Lowest Common Ancestor (BST ili normal tree)
 - ✓ Validate Binary Search Tree
 - ✓ Binary Tree Level Order Traversal (BFS)
 - ✓ Binary Tree Inorder Traversal
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3. ARRAYS – OBAVEZNO

Ovo želi da čuje svaki Microsoft intervjuer.

- ✓ Two Sum
- ✓ Contains Duplicate
- ✓ Best Time to Buy/Sell Stock
- ✓ Product of Array Except Self
- ✓ Maximum Subarray (Kadane)
- ✓ Merge Intervals
- ✓ Insert Interval
- ✓ Rotate Array
- ✓ Majority Element
- ✓ Missing Number

✓ Find Pivot Index

✓ Move Zeroes

4. SLIDING WINDOW – ekstremno važno

Applied Scientist intervjui vole *intuiciju* i *efikasnost*.

✓ Minimum Window Substring (napredno, ali odlično ako ga znaš objasniti)

✓ Longest Substring Without Repeating Characters

✓ Longest Repeating Character Replacement

✓ Permutation in String

✓ Find All Anagrams in a String

✓ Max Consecutive Ones III

5. HASHMAP / SET zadaci

Ovi se jako često pojavljuju jer pokazuju razumevanje linearnih struktura.

✓ Two Sum

✓ Group Anagrams

✓ Top K Frequent Elements

✓ Valid Anagram

✓ Ransom Note

✓ First Unique Character in a String

6. STACK / QUEUE

Microsoft obožava ova dva zadatka:

- ✓ Valid Parentheses
 - ✓ Min Stack
 - ✓ Implement Queue Using Stacks
 - ✓ Daily Temperatures
 - ✓ Evaluate Reverse Polish Notation
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7. BINARY SEARCH

Obavezno za Component Design.

- ✓ Binary Search (klasicni)
 - ✓ Search in Rotated Sorted Array
 - ✓ First Bad Version
 - ✓ Find Peak Element
 - ✓ Search 2D Matrix
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8. DYNAMIC PROGRAMMING (LAKI NIVEO JE DOVOLJAN)

Junior Applied Scientist NE dobija teška DP pitanja.

Najčešće dolazi:

- ✓ Climbing Stairs

- ✓ House Robber
 - ✓ House Robber II
 - ✓ Longest Increasing Subsequence (ponekad)
 - ✓ Coin Change (pojednostavljena verzija)
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9. MATRIX PROBLEMS

Vrlo često:

- ✓ Number of Islands
 - ✓ Flood Fill
 - ✓ Rotting Oranges
 - ✓ Max Area of Island
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10. COMPONENT DESIGN zadaci

Ovi nisu "algoritamski", već žele da vide kako bi implementirala komponentu u sistemu.

Najčešće:

- ✓ Design HashMap
- ✓ Design LRU Cache
- ✓ Design Hit Counter
- ✓ Design Rate Limiter
- ✓ Design Logger (rate-limited logger)

I. MUST-HAVE (OBAVEZNO) — ovi zadaci gotovo SIGURNO dolaze

1. Reverse a Linked List

Najklasičniji zadatak svih vremena.

Moraš znati iterativno + rekuzivno.

2. Invert (Reverse) Binary Tree

Najčešći zadatak u istoriji Microsoft intervjua.

3. Two Sum

Hash map obavezno.

4. Best Time to Buy and Sell Stock

Jedan prolaz, minimalni broj, maksimalni profit.

5. Contains Duplicate

Hash set.

6. Valid Anagram

Sort ili hash map.

7. Valid Parentheses

Stack.

8. Merge Sorted Arrays / Merge Two Sorted Lists

Klasično spajanje.

9. Binary Search

Osnovno + varijacije.

10. Maximum Subarray (Kadane)

Vrlo često dolazi.

11. Product of Array Except Self

Bez korišćenja deljenja, prefix + suffix.

12. Group Anagrams

Hash map sa tuple ključem ili sorted string.

13. Longest Common Prefix

String trikovi.

14. Palindrome Check

Two pointers.

15. Remove Duplicates From Sorted Array

Two pointers.

II. 2nd Tier — veoma često (ali nisu 100% obavezni)

16. Sliding Window – Find Longest Substring Without Repeating Characters

Vrlo često dolazi.

17. Sliding Window – Minimum Window Substring

Teži, ali ponekad pitaju.

18. Check Inclusion / Find All Anagrams in a String

Standardan sliding window.

19. Kth Largest Element

Heap ili Quickselect.

20. Top K Frequent Elements

Hash map + heap.

21. Binary Tree Level Order Traversal

BFS.

22. Diameter of Binary Tree

DFS + računanje dubina.

23. Maximum Depth of Binary Tree

Jednostavno.

24. Balanced Binary Tree

DFS + difference of heights.

25. Serialize / Deserialize Binary Tree (ponekad)

Ređe za juniora, ali moguće.

III. Component Design / Mini-System Design (za kodiranje)

Ovo se razlikuje od "System Design" dela koji smo završile.

Ovde ti traže da *nacrtaš klasu* ili *API logiku*:

26. Implement Queue Using Stacks

27. Implement Stack Using Queues

28. LRU Cache

Vrlo često se pojavljuje.

29. Design Hit Counter

Brojanje request-ova u poslednjih X sekundi.

30. Design Rate Limiter

Junior-friendly varijanta.

IV. Sortiranje + osnovni koncepti

31. Merge Sort (razumevanje)

Ne mora implementacija.

32. Quick Sort (razumevanje)

Isto — koncept.

V. Microsoft specifični mini-zadaci

33. Move Zeroes

Two pointers.

34. Rotate Array

Reverse trik.

35. Intersection of Two Arrays

Hash set.

36. Plus One (dodavanje broja u niz cifara)

Simple.

VI. Graphs (samo 2 jednostavna!)

Applied Scientist junior NIKADA ne dobija teške grafove.

37. Number of Islands (DFS)

Najklasičniji graph zadatak.

38. Clone Graph

Ređe, ali jednostavno.

VII. Dynamic Programming (samo laka varijanta)

39. Climbing Stairs

Osnovni DP.

40. House Robber

Malo naprednije, ali standardno.