Operating Systems Interview Questions

1. Basics of Operating Systems

1. **What is an operating system?**
2. **What are the main functions of an operating system?**
3. **What are the different types of operating systems?**
4. **What is the difference between a kernel and an operating system?**
5. **What are system calls in an operating system?**
6. **What is a shell in an operating system?**
7. **What is the difference between CLI and GUI?**
8. **What are the components of an operating system?**
9. **What is firmware?**
10. **What are the advantages of using an operating system?**

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2. Process Management

11. **What is a process?**
12. **What are the different states of a process?**
13. **What is the difference between a process and a thread?**
14. **What is multitasking?**
15. **What is the difference between multiprogramming and multitasking?**
16. **What is process scheduling?**
17. **What is context switching?**
18. **What is a PCB (Process Control Block)?**
19. **What are the different types of schedulers in an OS?**
20. **What is a long-term scheduler, short-term scheduler, and medium-term scheduler?**

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3. CPU Scheduling Algorithms

21. **What is CPU scheduling?**
22. **What are the different types of CPU scheduling algorithms?**
23. **Explain First Come First Serve (FCFS) scheduling.**
24. **Explain Shortest Job Next (SJN) scheduling.**
25. **What is Round Robin (RR) scheduling?**

26. Explain Priority Scheduling.

27. What is Multilevel Queue Scheduling?

28. What is Multilevel Feedback Queue Scheduling?

29. How does starvation occur in scheduling?

30. What is aging in scheduling?

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4. Threads & Concurrency

31. What is a thread in an operating system?

32. What is the difference between user-level threads and kernel-level threads?

33. What is multithreading?

34. What is the difference between concurrency and parallelism?

35. What are advantages of multithreading?

36. What is a race condition?

37. What is a critical section in concurrency?

38. What are semaphores in process synchronization?

39. What is the difference between binary semaphore and counting semaphore?

40. What is a deadlock?

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5. Deadlocks

41. What are the necessary conditions for deadlock?

42. What are the different strategies for handling deadlocks?

43. What is deadlock prevention?

44. What is deadlock avoidance?

45. What is the Banker's Algorithm?

46. What is deadlock detection and recovery?

47. What are safe and unsafe states in deadlock prevention?

48. What is resource allocation graph?

49. How can deadlocks be resolved?

50. What is livelock?

Operating Systems Interview Questions

6. Memory Management

- **51. What is memory management?**
- **52. What is virtual memory?**
- **53. What is paging in OS?**
- **54. What is segmentation?**
- **55. What is demand paging?**
- **56. What is swapping?**
- **57. What is a page fault?**
- **58. What is thrashing in an OS?**
- **59. What are page replacement algorithms?**
- **60. Explain FIFO page replacement algorithm.**

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7. File Systems

- **61. What is a file system?**
- **62. What are different types of file systems?**
- **63. What is the difference between FAT32, NTFS, and ext4?**
- **64. What are the different file access methods?**
- **65. What is the difference between sequential access and direct access?**
- **66. What is file allocation table (FAT)?**
- **67. What is the inode in a file system?**
- **68. What are file permissions?**
- **69. What is the difference between soft link and hard link?**
- **70. What is disk scheduling?**

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8. Disk Scheduling Algorithms

- **71. What is disk scheduling in an OS?**
- **72. What are the different types of disk scheduling algorithms?**
- **73. Explain FCFS (First Come First Serve) disk scheduling.**
- **74. Explain SSTF (Shortest Seek Time First) disk scheduling.**
- **75. What is SCAN disk scheduling?**

76. What is C-SCAN disk scheduling?
77. What is LOOK and C-LOOK disk scheduling?
78. What is seek time and latency time?
79. What is the difference between SSD and HDD in OS perspective?
80. How does RAID improve disk performance?

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9. Security & Protection

81. What is system security in an operating system?
82. What are the different types of threats to an OS?
83. What is authentication in an OS?
84. What is the difference between authentication and authorization?
85. What are access control lists (ACLs)?
86. What is an antivirus, and how does it work?
87. What is a firewall in an OS?
88. What are common OS vulnerabilities?
89. What is data encryption?
90. What are the common security features in modern OS?

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10. Modern Operating Systems & Virtualization

91. What is a distributed operating system?
92. What is a real-time operating system (RTOS)?
93. What is the difference between cloud computing and virtualization?
94. What is a hypervisor in virtualization?
95. What is the difference between Type-1 and Type-2 hypervisors?
96. What are containers in an OS?
97. What is Kubernetes?
98. What is the difference between a monolithic kernel and a microkernel?
99. What are some examples of modern operating systems?
100. What are the future trends in OS development?