**From 3-Processes Scheduling-30-07-2024.pptx:**

1. What is the purpose of process scheduling in an operating system?
   * To make the system more efficient
   * To maximize CPU utilization
   * To determine the next process to be executed
   * **All of the above**
2. Which of the following is a type of CPU scheduling?
   * **Preemptive scheduling**
   * Interactive scheduling
   * Background scheduling
   * Foreground scheduling
3. What type of scheduling interrupts a running process to allocate the CPU to another process?
   * Non-preemptive
   * **Preemptive**
   * Real-time
   * Queue-based
4. Which scheduling algorithm assigns each process a fixed time quantum?
   * **Round Robin**
   * First-Come-First-Serve
   * Shortest Job First
   * Priority Scheduling
5. Which scheduling algorithm is also known as Shortest Job Next?
   * Round Robin
   * Priority Scheduling
   * **Shortest Job First**
   * Multilevel Queue
6. In non-preemptive SJF scheduling, a process continues to run until:
   * It voluntarily releases the CPU
   * **It finishes execution**
   * Another process with higher priority arrives
   * None of the above
7. SJF scheduling is optimal in terms of:
   * **Minimizing average waiting time**
   * Maximizing CPU utilization
   * Reducing context switching
   * Fairness
8. A continuous arrival of shorter processes can lead to:
   * **Starvation**
   * Convoy effect
   * Overhead
   * Fair scheduling
9. Context switching occurs at the end of each:
   * **Time quantum**
   * CPU burst
   * I/O burst
   * Turnaround time
10. Which of the following ensures that each process gets an equal share of CPU time?
    * First-Come-First-Serve
    * Shortest Job First
    * **Round Robin**
    * Priority Scheduling
11. The time quantum in Round Robin scheduling is typically:
    * **10-100 milliseconds**
    * 1-5 seconds
    * 1-10 minutes
    * None of the above
12. In First-Come-First-Serve (FCFS), processes are managed in a:
    * **FIFO queue**
    * Circular queue
    * Priority queue
    * Stack
13. Which scheduling algorithm may cause the convoy effect?
    * Round Robin
    * **First-Come-First-Serve**
    * Priority Scheduling
    * Multilevel Queue
14. What is the main issue with FCFS scheduling?
    * **Convoy effect**
    * Starvation
    * Fairness
    * Complexity
15. A scheduling technique that uses multiple queues for different types of processes is:
    * First-Come-First-Serve
    * Shortest Job First
    * Round Robin
    * **Multilevel Queue**
16. Turnaround Time (TAT) is calculated as:
    * **Completion Time - Arrival Time**
    * Arrival Time - Waiting Time
    * Burst Time + Arrival Time
    * Completion Time + Waiting Time
17. Waiting Time (WT) is defined as the time spent:
    * **In the ready queue waiting for CPU time**
    * Executing on the CPU
    * In I/O operations
    * Completing the process
18. The time from process submission until the first response is called:
    * Turnaround Time
    * Completion Time
    * **Response Time**
    * Waiting Time
19. Completion time of a process is:
    * The time it takes to complete
    * **The time at which it finishes execution**
    * The time from arrival to execution
    * None of the above
20. Arrival time of a process is:
    * **When a process enters the ready queue**
    * When a process finishes execution
    * When a process starts I/O
    * When a process requests CPU
21. In Priority Scheduling, the process with the highest priority:
    * Waits for all other processes
    * **Gets the CPU first**
    * Runs after lower-priority processes
    * Runs only if the queue is empty
22. In SMP, each processor:
    * **Is self-scheduling**
    * Uses shared queues
    * Waits for other processors
    * Does not perform scheduling
23. The concept of keeping a thread on the same processor is known as:
    * Load balancing
    * **Processor Affinity**
    * Symmetric multiprocessing
    * Push migration
24. Load balancing is used to:
    * Increase response time
    * Reduce CPU usage
    * **Distribute workload evenly across CPUs**
    * Minimize context switches
25. In load balancing, push migration means:
    * A processor pulls tasks from another
    * **A task is moved from an overloaded CPU**
    * Balancing occurs every 10 seconds
    * Processes are queued
26. Pull migration in load balancing occurs when:
    * **An idle CPU pulls a task from a busy one**
    * A busy CPU pushes tasks to others
    * Processes are waiting
    * None of the above
27. A scheduling system where processes specify preferred processors is:
    * Symmetric multiprocessing
    * Load balancing
    * **Processor Affinity**
    * Multithreaded cores
28. Soft affinity attempts to:
    * **Keep a thread on the same processor without guarantees**
    * Assign a process to multiple processors
    * Enforce strict processor selection
    * None of the above
29. A processor with multiple cores on a single chip is called:
    * NUMA processor
    * Multiprocessor
    * **Multicore processor**
    * Symmetric processor
30. In NUMA systems, memory access time:
    * **Varies based on memory location and CPU**
    * Is constant across all CPUs
    * Is shared among all threads
    * None of the above

**From 4-Deadlocks-08-08-2024.pptx:**

1. What is a deadlock?
   * **A situation where processes cannot proceed due to resource waiting**
   * A situation where resources are idle
   * Processes executing without interruption
   * System memory is full
2. A deadlock system model includes:
   * Processes and resources
   * Memory and CPU
   * **Resources, processes, and their interactions**
   * Only CPU and memory
3. In a deadlock system model, resources can be:
   * CPU-only
   * I/O-only
   * **Preemptable or non-preemptable**
   * Always sharable
4. Preemptable resources are:
   * **Resources that can be taken from processes**
   * Resources that cannot be shared
   * Held indefinitely
   * Always allocated to the process
5. Non-preemptable resources include:
   * **Printers and hardware devices**
   * CPU cycles
   * Memory
   * Network bandwidth
6. The condition of Mutual Exclusion implies:
   * **Only one process can use a resource at a time**
   * Multiple processes can share resources
   * No resource allocation
   * All resources are preemptable
7. Hold and Wait condition states that:
   * Processes must release resources before requesting
   * **Processes hold resources while requesting others**
   * Processes use resources as they arrive
   * No waiting occurs in deadlock
8. No Preemption condition implies:
   * Resources can be taken away
   * **Resources cannot be forcibly taken from a process**
   * Processes can always share resources
   * Resources are infinite
9. Circular wait involves:
   * Processes waiting randomly
   * Processes requesting resources simultaneously
   * **Processes waiting in a circular chain for resources**
   * None of the above
10. In a deadlock, none of the processes:
    * Can access resources
    * **Can make progress**
    * Can hold resources
    * Can terminate
11. Deadlock prevention can be achieved by invalidating:
    * **Any one of the four necessary conditions**
    * All four conditions simultaneously
    * The hold condition only
    * The preemption condition only
12. The proactive approach to deadlock handling is:
    * **Prevention**
    * Avoidance
    * Detection
    * Rollback
13. Sharing resources can prevent deadlock by avoiding:
    * **Mutual Exclusion**
    * Circular Wait
    * Hold and Wait
    * No Preemption
14. Hold and Wait avoidance is achieved by:
    * Allocating resources one at a time
    * **Requesting all resources at once before execution**
    * Using a queue for resource allocation
    * Terminating processes
15. Resources being requested in a strict order prevents:
    * No preemption
    * **Circular Wait**
    * Hold and Wait
    * Mutual Exclusion
16. In deadlock detection, the system uses a:
    * Resource allocation matrix
    * **Wait-for graph**
    * Process table
    * Timer
17. Deadlock detection algorithms search for:
    * Resource deallocation
    * **Cycles in the wait-for graph**
    * Process duplication
    * Queue positions
18. Deadlock avoidance ensures the system is always in a:
    * **Safe state**
    * Unsafe state
    * Process-only state
    * Preemptable state
19. The Banker’s Algorithm is used for:
    * **Deadlock avoidance**
    * Deadlock prevention
    * Resource allocation without deadlock
    * Multithreading
20. In Banker’s Algorithm, a process request is granted if:
    * **It leaves the system in a safe state**
    * It completes the process instantly
    * Resources are unavailable
    * The system has excess resources
21. A safe state implies that:
    * **All processes can execute without entering deadlock**
    * The CPU is idle
    * Resources are preemptable
    * No resources are available
22. In resource request algorithms, if the request is safe, the resources are:
    * **Allocated to the requesting process**
    * Denied for later
    * Redistributed
    * Shared with other processes
23. To prevent deadlock, resources must:
    * **Be allocated in a way that avoids circular waits**
    * Be preempted from processes
    * Be held indefinitely
    * Not be allocated
24. Deadlock can be resolved by:
    * Retaining all processes
    * **Aborting one or more processes**
    * Allowing deadlock to proceed
    * Restarting the system
25. Rollback in deadlock recovery means:
    * **Returning to a previous safe state**
    * Continuing execution as normal
    * Allocating new resources
    * Aborting processes
26. Resource preemption as a recovery method involves:
    * **Taking resources from one process to allocate to another**
    * Granting more resources
    * Restarting processes
    * Allowing resources to be shared
27. To prevent starvation, recovery systems may:
    * **Limit the number of rollbacks for each process**
    * Use random process selection
    * Increase resource allocation speed
    * Wait indefinitely
28. Using a "claim edge" helps to:
    * **Declare potential resource needs**
    * Allocate resources immediately
    * Track CPU usage
    * Prevent process failures
29. A wait-for graph is useful for:
    * Process termination
    * **Deadlock detection**
    * Resource request tracking
    * Non-preemptive scheduling
30. Recovery from deadlock can be done through:
    * **Process termination and resource preemption**
    * Waiting indefinitely
    * Immediate resource allocation
    * CPU prioritization

**From Document 1: Inter-process Communication and Synchronization**

**1. What does IPC stand for?**

* A. Inter-Process Computing
* **B. Inter-Process Communication**
* C. Intra-Program Communication
* D. Interrupt Process Communication

**2. Which IPC mechanism uses shared variables to enable communication?**

* A. Message Passing
* **B. Shared Memory**
* C. Semaphore
* D. Socket

**3. What does a critical section in a program represent?**

* **A. Code segment that accesses shared resources**
* B. Entire program execution
* C. CPU scheduling block
* D. I/O operation code

**4. The term "race condition" occurs when:**

* A. Multiple processes execute simultaneously
* **B. Processes access shared data concurrently**
* C. Deadlock happens
* D. Processes execute sequentially

**5. Which synchronization tool guarantees mutual exclusion?**

* A. Socket
* **B. Semaphore**
* C. Paging
* D. Memory allocation

**6. In the Readers-Writers problem, the goal is to:**

* **A. Ensure writers do not overwrite shared data**
* B. Prevent memory fragmentation
* C. Allocate I/O resources efficiently
* D. Improve CPU utilization

**7. What does a semaphore counter value signify?**

* **A. Available resources**
* B. Number of running processes
* C. CPU time used
* D. Context switch frequency

**8. Which condition leads to deadlock in a system?**

* A. High CPU utilization
* **B. Circular wait**
* C. Shared memory usage
* D. Large file I/O

**9. What does the "bounded buffer problem" address?**

* A. Deadlock resolution
* **B. Producer-consumer synchronization**
* C. Paging in virtual memory
* D. Interruption handling

**10. Which of the following is a non-blocking IPC method?**

* A. Shared memory
* B. Sockets
* **C. Message queues**
* D. Paging

**11. What is "priority inversion"?**

* A. A scheduling algorithm
* **B. A higher-priority process waits for a lower-priority one**
* C. Shared memory fragmentation
* D. Virtual memory mismanagement

**12. In mutual exclusion, starvation is prevented by:**

* A. Semaphore
* **B. Aging**
* C. Deadlock resolution
* D. Page swapping

**13. Which concept is NOT associated with critical sections?**

* **A. Virtual memory**
* B. Mutual exclusion
* C. Synchronization
* D. Process communication

**14. A monitor is:**

* A. An I/O control device
* B. An alternative to memory paging
* **C. A synchronization tool**
* D. Used for cache management

**15. How does a binary semaphore differ from a counting semaphore?**

* **A. Binary semaphore has only 0 or 1 values**
* B. Binary semaphore uses paging
* C. Binary semaphore does not block processes
* D. Binary semaphore is faster

**16. Deadlock avoidance can be achieved using:**

* A. Paging
* B. FIFO scheduling
* **C. Banker's algorithm**
* D. Memory fragmentation

**17. The Dining Philosophers problem is a classic example of:**

* A. Memory paging
* **B. Synchronization in shared resources**
* C. CPU scheduling
* D. I/O management

**18. What is the main role of a mutex?**

* **A. Ensure only one thread accesses shared resources**
* B. Handle context switches
* C. Reduce memory fragmentation
* D. Schedule processes

**19. What is "process starvation"?**

* **A. A process waits indefinitely for resources**
* B. A process gets multiple resources at once
* C. Processes share memory
* D. Resources are preempted

**20. Which IPC mechanism ensures the highest speed of data transfer?**

* A. Semaphore
* B. Message passing
* **C. Shared memory**
* D. Paging

**21. What is the main disadvantage of message passing?**

* **A. Higher communication overhead**
* B. Reduced memory usage
* C. Poor synchronization
* D. Limited communication range

**22. A monitor’s condition variable is used to:**

* A. Swap pages in virtual memory
* **B. Block and signal threads**
* C. Preempt processes
* D. Resolve deadlock

**23. The Dining Philosophers problem illustrates which kind of deadlock?**

* **A. Circular wait**
* B. Hold and wait
* C. Preemption
* D. Priority inversion

**24. Which of the following prevents critical section problems?**

* A. Memory management
* B. Paging
* **C. Mutex**
* D. Shared memory

**25. What is required for mutual exclusion?**

* A. High CPU usage
* **B. Only one process in the critical section at a time**
* C. Memory paging
* D. Message passing

**26. In IPC, what is meant by "blocking"?**

* **A. The process waits until conditions are met**
* B. The process runs indefinitely
* C. The process stops permanently
* D. None of the above

**27. What is the main problem in the Producer-Consumer model?**

* **A. Buffer synchronization**
* B. Memory allocation
* C. Paging
* D. Thread preemption

**28. Which algorithm helps in synchronization?**

* A. FIFO scheduling
* B. Paging algorithm
* **C. Peterson's algorithm**
* D. LRU

**29. A semaphore uses which operation to block a process?**

* **A. Wait**
* B. Signal
* C. Release
* D. Lock

**30. Which of the following is a distributed IPC mechanism?**

* **A. Remote procedure call (RPC)**
* B. Paging
* C. Virtual memory
* D. Semaphore

**What is the primary goal of memory management in an operating system?**

* A. To manage hardware devices
* **B. To allocate and deallocate memory efficiently**
* C. To synchronize processes
* D. To improve network communication

**2. What is "virtual memory"?**

* A. A backup memory device
* **B. A memory management technique to use secondary storage as main memory**
* C. A type of RAM
* D. A shared memory mechanism

**3. Paging is a memory management scheme that:**

* **A. Eliminates external fragmentation**
* B. Increases internal fragmentation
* C. Requires contiguous memory allocation
* D. Reduces page faults

**4. What is a "page fault"?**

* A. When a program crashes
* **B. When a program accesses a page not in memory**
* C. When a page exceeds memory capacity
* D. When memory allocation fails

**5. Which type of fragmentation does paging solve?**

* A. Internal
* **B. External**
* C. Both
* D. None

**6. What is the purpose of the page table?**

* A. To manage I/O devices
* **B. To map logical addresses to physical addresses**
* C. To synchronize processes
* D. To track CPU scheduling

**7. In demand paging, pages are loaded into memory:**

* **A. Only when they are required**
* B. All at once
* C. Based on CPU scheduling
* D. Continuously

**8. What is the main drawback of swapping in memory management?**

* **A. High I/O overhead**
* B. Reduced CPU utilization
* C. Increased internal fragmentation
* D. Page table corruption

**9. Which of the following is NOT a memory allocation strategy?**

* A. First-fit
* B. Best-fit
* C. Worst-fit
* **D. Page-fault-fit**

**10. What is "segmentation" in memory management?**

* A. A method to resolve deadlocks
* **B. Dividing memory into variable-sized segments**
* C. A technique to reduce page faults
* D. Synchronizing threads

**11. What is thrashing in memory management?**

* **A. Excessive swapping between memory and disk**
* B. Allocating contiguous memory blocks
* C. Fragmentation due to paging
* D. Reducing CPU usage

**12. The translation lookaside buffer (TLB) is used for:**

* A. Synchronizing memory and disk
* B. Managing external fragmentation
* **C. Speeding up address translation**
* D. Handling page faults

**13. The term "compaction" refers to:**

* A. Allocating contiguous memory
* **B. Moving memory blocks to eliminate fragmentation**
* C. Increasing CPU efficiency
* D. Allocating larger page sizes

**14. Which scheduling algorithm minimizes page faults?**

* A. FIFO
* **B. Least Recently Used (LRU)**
* C. Round-robin
* D. Shortest Job Next

**15. Which memory allocation method may lead to the smallest unused space?**

* A. First-fit
* **B. Best-fit**
* C. Worst-fit
* D. Paging

**16. What is internal fragmentation?**

* A. Memory allocated but not used within a process
* **B. Unused memory inside allocated partitions**
* C. Memory left outside allocated blocks
* D. Excessive page table entries

**17. In virtual memory systems, what is the “working set”?**

* A. All pages in memory
* B. Pages allocated to the OS
* **C. The set of pages a process needs for execution**
* D. Pages with the lowest priority

**18. What is the purpose of the "swap space" in virtual memory?**

* **A. To temporarily store pages that are not in main memory**
* B. To store CPU instructions
* C. To replace page tables
* D. To eliminate segmentation faults

**19. Which replacement policy is most optimal theoretically?**

* A. FIFO
* B. LRU
* **C. Optimal Page Replacement (OPT)**
* D. Random

**20. What does the "dirty bit" indicate in a page table entry?**

* A. The page is not allocated
* **B. The page has been modified**
* C. The page is ready for deallocation
* D. The page caused a fault

**21. A page replacement algorithm aims to:**

* A. Increase CPU scheduling efficiency
* **B. Minimize page faults**
* C. Reduce TLB misses
* D. Allocate contiguous memory

**22. Segmentation differs from paging because:**

* A. It causes more fragmentation
* B. It avoids all page faults
* **C. It divides memory into variable-sized blocks**
* D. It improves TLB performance

**23. Which of the following is NOT part of the memory hierarchy?**

* A. Cache
* **B. CPU scheduler**
* C. RAM
* D. Disk

**24. When a process requests more memory than available, it leads to:**

* A. Page faults
* **B. Out of memory error**
* C. TLB miss
* D. Internal fragmentation

**25. What does a frame in paging represent?**

* A. A process in the ready state
* **B. A fixed-size block of physical memory**
* C. A variable memory partition
* D. A process control block

**26. In the first-fit allocation strategy:**

* **A. The first suitable block is allocated**
* B. The smallest suitable block is allocated
* C. The largest suitable block is allocated
* D. All blocks are compacted

**27. The main advantage of dynamic partitioning is:**

* **A. Reducing external fragmentation**
* B. Preventing internal fragmentation
* C. Easier memory compaction
* D. Increasing memory size

**28. The term "buddy system" in memory allocation refers to:**

* A. Synchronizing processes
* **B. A hierarchical memory allocation technique**
* C. Cache allocation
* D. Segmentation

**29. What happens during page swapping?**

* A. A page is marked for deallocation
* **B. A page is moved between main memory and secondary storage**
* C. All processes are paused
* D. Contiguous memory allocation is optimized

**30. Which of the following is true for multi-level paging?**

* A. It reduces page table size
* **B. It increases memory access overhead**
* C. It reduces address translation time
* D. It eliminates page faults

**. What is memory management?**

* **A. Efficient allocation and deallocation of memory**
* B. Managing CPU scheduling
* C. Process communication
* D. Device I/O

**2. Paging avoids which type of fragmentation?**

* A. Internal
* **B. External**
* C. Both
* D. None

**From the "Paging" Presentation:**

1. **How many bits are required to address a 4096 address space?**
   * a) 10 bits
   * b) **12 bits**
   * c) 14 bits
   * d) 16 bits
2. **In a paging system, each page contains how many locations?**
   * a) 2^8
   * b) 2^6
   * c) **2^4**
   * d) 2^2
3. **What is the total number of pages in a 4096 address space with 16 locations per page?**
   * a) 128
   * b) 512
   * c) **256**
   * d) 64
4. **Which of the following is true about paging?**
   * a) It eliminates external fragmentation
   * b) It eliminates internal fragmentation
   * c) **It divides memory into fixed-size blocks called pages**
   * d) It eliminates the need for a page table
5. **In a page table, which of the following is mapped?**
   * a) Physical addresses to virtual addresses
   * b) **Virtual addresses to physical addresses**
   * c) Program IDs to memory frames
   * d) Logical addresses to page tables
6. **The key advantage of paging is:**
   * a) Simplifying memory allocation
   * b) **Avoiding external fragmentation**
   * c) Making larger programs fit in memory
   * d) Reducing page fault rate
7. **Each page in memory typically has:**
   * a) A variable size
   * b) **A fixed size**
   * c) An adjustable size
   * d) A size determined by the OS
8. **A page fault occurs when:**
   * a) **The page is not found in memory**
   * b) The page is invalid
   * c) The frame is empty
   * d) A process requests a page that is not valid
9. **The number of pages in a system with 4096 bytes and 16-byte pages is:**
   * a) 128
   * b) **256**
   * c) 512
   * d) 1024
10. **The main advantage of paging over segmentation is:**
    * a) Reduced overhead
    * b) **Elimination of external fragmentation**
    * c) Better process scheduling
    * d) Dynamic memory management
11. **In the context of paging, a frame refers to:**
    * a) A data structure
    * b) **A fixed-size block of physical memory**
    * c) The process memory block
    * d) The page table entry
12. **A page table stores mappings from:**
    * a) **Virtual address to physical address**
    * b) Process IDs to virtual addresses
    * c) Memory blocks to page numbers
    * d) Page numbers to frame numbers
13. **The page table is typically stored in:**
    * a) The CPU
    * b) **Main memory**
    * c) Secondary storage
    * d) Cache memory
14. **What is the impact of increasing the page size?**
    * a) **Increases internal fragmentation**
    * b) Reduces external fragmentation
    * c) Reduces the page fault rate
    * d) Improves memory efficiency
15. **A page table entry contains:**
    * a) The address of the page
    * b) **The frame number and status bits**
    * c) The process ID
    * d) The page size
16. **Which of the following occurs in a paging system?**
    * a) Physical memory is allocated to segments
    * b) **Virtual memory is divided into equal-sized pages**
    * c) Address spaces are always contiguous
    * d) Programs are loaded completely into memory
17. **Which method does the paging system use to manage memory?**
    * a) Logical partitioning
    * b) **Fixed-size pages**
    * c) Dynamic segmentation
    * d) Fixed-size segments
18. **The page fault rate increases if:**
    * a) More pages are loaded into memory
    * b) **There is insufficient physical memory**
    * c) Pages are kept in secondary storage
    * d) Memory is properly managed
19. **When a page fault occurs, the operating system must:**
    * a) Immediately terminate the process
    * b) **Load the page from secondary storage**
    * c) Deallocate memory
    * d) Swap processes out of memory
20. **Which of the following is a disadvantage of paging?**
    * a) **Increased overhead in managing page tables**
    * b) Reduced memory utilization
    * c) Larger memory segments
    * d) Increased process execution time
21. **How many frames are there in the memory with a total size of 1024 bytes and page size of 16 bytes?**
    * a) 32
    * b) 64
    * c) **64**
    * d) 128
22. **A page table entry's status bits typically include:**
    * a) Page number
    * b) **Valid and dirty bits**
    * c) Frame address
    * d) Frame status
23. **Which of the following best describes paging in terms of memory management?**
    * a) **Dividing memory into fixed-size chunks**
    * b) Dividing memory into variable-size chunks
    * c) Allocating memory dynamically
    * d) Allocating memory based on process needs
24. **Which of the following is a typical size for a page?**
    * a) 1 KB
    * b) **4 KB**
    * c) 2 MB
    * d) 64 KB
25. **A page fault increases:**
    * a) CPU utilization
    * b) **Memory access time**
    * c) Process performance
    * d) Process response time
26. **Which component of the system generates a page fault?**
    * a) **Page table**
    * b) CPU
    * c) Frame
    * d) Disk
27. **A page table mapping from a virtual address to a physical address allows:**
    * a) **The virtual address to be translated to a real memory address**
    * b) Memory protection
    * c) High-speed data transfer
    * d) Contiguous memory allocation
28. **Which term refers to a block of physical memory allocated to a page?**
    * a) Segment
    * b) **Frame**
    * c) Block
    * d) Page table entry
29. **Paging helps reduce the overhead of:**
    * a) **External fragmentation**
    * b) Internal fragmentation
    * c) Disk access times
    * d) CPU scheduling
30. **What happens when a page is not in memory?**
    * a) The process is suspended
    * b) **A page fault is triggered**
    * c) The process terminates
    * d) The memory is immediately swapped

**From "Demand Paging - Page Faults - Page Replacement" PDF:**

1. **Demand paging is a memory management technique that:**
   * a) Loads the entire program into memory at once
   * b) **Loads only the required pages on demand**
   * c) Uses static memory allocation
   * d) Reduces the need for a page table
2. **A page fault occurs when:**
   * a) **A page is not found in memory**
   * b) A page is invalid
   * c) Memory access is denied
   * d) A process is swapped out
3. **The first step in handling a page fault is to:**
   * a) Restart the process
   * b) **Send a page fault trap to the OS**
   * c) Clear the page table
   * d) Increase the page size
4. **What does the page replacement algorithm determine?**
   * a) Which page to swap into memory
   * b) **Which page to remove from memory**
   * c) Which page is the most frequently accessed
   * d) Which page to allocate to a process
5. **The FIFO (First-In, First-Out) page replacement algorithm works by:**
   * a) Replacing the least recently used page
   * b) Replacing the most recently used page
   * c) **Replacing the oldest page in memory**
   * d) Replacing the page with the least access time
6. **The LRU (Least Recently Used) page replacement algorithm replaces:**
   * a) **The least recently accessed page**
   * b) The page that is most frequently accessed
   * c) The first loaded page
   * d) The page with the least physical address
7. **The optimal page replacement algorithm aims to:**
   * a) **Minimize the number of page faults**
   * b) Increase memory usage
   * c) Decrease page size
   * d) Reduce the page table size

 **Demand paging is a technique used to:**

* a) Load all pages into memory at once
* b) **Load only required pages as needed**
* c) Use contiguous memory allocation
* d) Optimize CPU scheduling

 **What is generated when a process tries to access a page not in memory?**

* a) Interrupt
* b) **Page fault**
* c) Error
* d) Buffer overflow

 **Which component handles a page fault?**

* a) The page table
* b) CPU
* c) **Operating system**
* d) Virtual memory manager

 **The main advantage of demand paging is that it:**

* a) **Optimizes memory usage**
* b) Requires no page table
* c) Increases memory size
* d) Speeds up page retrieval

 **When a page fault occurs, the operating system must:**

* a) **Retrieve the required page from secondary storage**
* b) Restart the process
* c) Ignore the fault
* d) Terminate the process

 **In a demand paging system, what does the page replacement algorithm determine?**

* a) The number of pages to load
* b) **Which page to evict from memory**
* c) The size of the page table
* d) Which processes to prioritize

 **The FIFO page replacement algorithm operates by replacing the:**

* a) Least recently used page
* b) Most frequently used page
* c) **Oldest page in memory**
* d) Newest page

 **The LRU (Least Recently Used) algorithm replaces the page:**

* a) **That has not been accessed for the longest time**
* b) With the smallest address
* c) That is used most frequently
* d) At the front of the page queue

 **Belady’s Anomaly describes a situation where:**

* a) Page faults decrease with more frames
* b) **Page faults increase with more frames**
* c) The system runs out of pages
* d) LRU is better than FIFO

 **The optimal page replacement algorithm:**

* a) Uses the least amount of memory
* b) **Minimizes page faults theoretically**
* c) Uses the most frequently accessed page
* d) Replaces the newest page

 **A process is said to be thrashing when it:**

* a) Completes quickly
* b) **Experiences a high rate of page faults**
* c) Uses too much CPU
* d) Is terminated prematurely

 **Page replacement is required when:**

* a) Memory is unlimited
* b) **There is no free frame for a new page**
* c) The CPU is idle
* d) Thrashing occurs

 **What does the term "page fault rate" refer to?**

* a) The number of pages in memory
* b) **Frequency of page faults in a system**
* c) The number of frames available
* d) The speed of memory access

 **Increasing the number of frames can:**

* a) Increase CPU utilization
* b) Decrease memory access time
* c) **Reduce page faults in some cases**
* d) Increase process execution time

 **The hit ratio is the ratio of:**

* a) Page faults to total memory
* b) Frames to pages
* c) **Pages found in memory to total pages referenced**
* d) Misses to pages

 **Thrashing occurs due to:**

* a) **Excessive page faults**
* b) High CPU load
* c) Too few processes
* d) Low memory utilization

 **One method to reduce thrashing is to:**

* a) **Reduce the degree of multiprogramming**
* b) Increase page size
* c) Increase page faults
* d) Decrease memory size

 **Which of the following is NOT a page replacement algorithm?**

* a) FIFO
* b) **Round Robin**
* c) LRU
* d) Optimal

 **If a process accesses a page that is not in memory, this is called:**

* a) **A page fault**
* b) A segmentation fault
* c) A memory violation
* d) Page hit

 **The Most Recently Used (MRU) replacement algorithm evicts:**

* a) The page with the smallest size
* b) **The page accessed most recently**
* c) The oldest page
* d) The least frequently accessed page

 **To prevent thrashing, the operating system might:**

* a) Increase page table size
* b) **Limit the number of active processes**
* c) Allocate more frames
* d) Decrease page size

 **A high page fault rate can cause:**

* a) Increased CPU utilization
* b) Faster memory access
* c) **Lower system performance**
* d) Reduced memory size

 **In FIFO, the page to be replaced is selected from:**

* a) **The front of the page queue**
* b) The rear of the page queue
* c) The most frequently accessed page
* d) The page with the largest address

 **In demand paging, pages are stored initially in:**

* a) Cache memory
* b) **Secondary storage**
* c) Main memory
* d) The CPU

 **Which of the following is an advantage of demand paging?**

* a) Reduced CPU utilization
* b) **Efficient use of memory**
* c) No page faults
* d) Increased memory fragmentation

 **Page faults affect system performance by:**

* a) Increasing CPU speed
* b) **Increasing memory access time**
* c) Reducing the number of processes
* d) Increasing process priority

 **The purpose of a page replacement algorithm is to:**

* a) Increase CPU utilization
* b) **Select a page to remove from memory**
* c) Reduce memory size
* d) Increase process speed

 **The LRU replacement algorithm is based on:**

* a) Most frequently accessed page
* b) Random page selection
* c) **Principle of locality**
* d) Least memory allocation

 **The hit ratio can be improved by:**

* a) **Reducing page faults**
* b) Increasing page size
* c) Reducing CPU utilization
* d) Increasing process execution time

 **A demand paging system that constantly experiences thrashing may need to:**

* a) Increase page faults
* b) **Increase the amount of RAM**
* c) Increase the number of frames
* d) Decrease swap space