Kwame Nkrumah University of Science and Technology

Department of Computer Science

Operating Systems

Group Assignment

Group 7

Name	**Index Number**
• Appiah Kubi Philip (Group Leader)	2562114
• Lucky Botty	2563714
• Asamoah Gloria	2562414
• Abeiku	2272314
• Hansen Emmanuel	2565314
• Tettey Divine Sedem	2569614
• Boakye Bernard	2563214
• Anita Enyonam Tey	2569214
• Ronald Boateng	2563314
• Afankwah Papa Jeffrey	1126813

Botty Lucky

2563714

Chapter 1

1) A program that acts as an intermediary between a user of a computer and the computer hardware is called
   - **a) Kernel**
   - b) Bootstrap
   - c) Operating System
   - d) Grub
   - e) Exception
2) Computer system can be divided into four components. These components are
   - **a) Hardware, operating system, application programs and users.**
   - b) Software, operating system, users' programs and kernel.
   - c) Hardware, bootstrap program, operating system and kernel.
   - d) Software, hardware, users and bootstrap program.
   - e) Hardware, bootstrap program, operating system and interrupt.

3) All the following goals of the operating system except
   - a) Execute user programs and make solving user problems easier
   - b) Make the computer system convenient to use
   - c) Use the computer hardware in an efficient manner
   - **d) Enhance the performance by 5% every year**
   - e) Controls execution of programs to prevent errors and improper use of the computer

4) The one program running at all times on the computer" is the
   - a) Grub
   - b) Init
   - **c) Kernel**
   - d) Bootstrap program
   - e) Interrupt

5) Bootstrap program is loaded at power-up or reboot. Typically stored in the
   - **a) EEPROM**
   - b) RAM
   - c) Firmware
   - d) Middleware
   - e) Cache

6) A software-generated interrupt caused either by an error or a user request is termed
   a) Interrupt
   b) Exception
   c) Polling
   d) Vector
   e) Trap

7) Interrupt transfers control to the interrupt service routine generally, through the ……., which contains the addresses of all the service routines
   a) Interrupt driven
   b) Firmware
   c) Init
   d) Interrupt vector
   e) Trap

8) Dual-mode operation allows OS to protect itself and other system components. These modes include
   a) User mode and kernel mode
   b) Bit mode and user mode
   c) Kernel mode and bit mode
   d) System mode and kernel mode
   e) Bit mode and system mode

9) What is the correct order for Storage-Device Hierarchy is
   a) Register, cache, main memory, solid state disk, hard disk, optical disk and magnetic tape
   b) Cache, main memory, register, solid state disk, hard disk, optical disk and magnetic tape
   c) Register, cache, main memory, hard disk, solid state disk, optical disk and magnetic tape
   d) Main memory, register, cache, solid state disk, hard disk, optical disk and magnetic tape
   e) Hard disk, optical disk and magnetic tape, register, cache, main memory, solid state disk

10) A logical extension in which CPU switches jobs so frequently that users can interact with each job while it is running, creating interactive computing occurred as a result of.
   a) swapping
   b) Multiprogramming
   c) Batch system
   d) Virtual memory
   e) Timesharing

Gloria Asamoah

2562414

CHAPTER 2

1. In a …… commands and directives to control those commands are entered into files, and those files are executed.
    a) Time sharing
    b) Multiprogramming
    c) Batch Interface
    d) Shell

2. …… allows users to directly enter commands to be performed by the operating system.
    a) User Interface
    b) Command Interpreter
    c) Debugger
    d) Ports

3. ..……. provide an interface to the services made available by an operating system. These calls are generally available as routines written in C and C++, although certain low-level tasks (for example, tasks where hardware must be accessed directly) may have to be written using assembly-language instructions.
    a) System calls
    b) Interrupts
    c) Traps
    d) None of the above

4. For most programming languages, the run-time support system (a set of functions built into libraries included with a compiler) provides a ……. that serves as the link to system calls made available by the operating system.
    a) Command Interface
    b) System-call interface
    c) Shell interface
    d) CMD

5. System calls can be grouped roughly into six major categories: process control, file manipulation, device manipulation, information maintenance, device manipulation, communications and ……....
    a) Protection
    b) Multimedia
    c) Graphics
    d) Shell

6. A ……. lists each system call as it is executed.
    a) Interrupt vector
    b) Protection
    c) Program Counter
    d) Program trace

7. Each computer in a network has a ……... by which it is commonly known.
    a) Port number
    b) Host name
    c) Protocol
    d) Domain name

8. Most processes that will be receiving connections are special-purpose …….. which are system programs provided for that purpose.
    a) Connections
    b) Interrupts
    c) Daemons
    d) System calls

9. Typically, system calls providing protection include set permission () and ……. which manipulate the permission settings of resources such as files and disks.
    a) Create ()
    b) Get permission ()
    c) Start ()
    d) Begin ()

10. These programs create, delete, copy, rename, print, dump, list, and generally manipulate files and directories.
    a) Scheduler
    b) Task Management
    c) File Management
    d) None of the above

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Abeiku
2272314

Chapter 3

1. The situation in which two or more process wait for other set to complete and operation in order to proceed but none of the member is able to proceed refers to _

a) starvation
b) concurrency
c) deadlock
d) failure

2. The situation in which a process is ready to execute but is continuously denied access to processor Is called

a) Deadlock
b) Starvation
c) Failure
d) Concurrency

3. Which of the following is dealt with as a scheduling issue
   a) Ready state
   b) process
   c) failure
   d) starvation

4. _____ refers to program in execution
   a) Programming
   b) waiting state
   c) process
   d) data

5. Information in preceding list are stored in typical data structure called
   a) Process control block
   b) identifier block
   c) State block
   d) priority block

6. The process of characterizing individual behavior by listing sequence of instruction that execute for that process is known as
    a) Trace of the process
    b) listing the process
    c) group of process
    d) line of process

7. The process of creating process as an explicit request of another process is called
    a) Processing
    b) mimic of process
    c) process spawning
    d) explicating process

8. The process that is currently being executed is referred to as running
    a) True
    b) False

9. Which of the following is not part of the five state model
    A. Running
    B. ready
    C. stop
    D. waiting

10. The process in main memory and available for execution is referred to as
    a) Running state
    b) waiting
    c) ready
    d) exit

Appiah Kubi Philip
2562114

Chapter 4

1. What is the basic unit of CPU utilization?
    a) Program
    b) Thread
    c) Code
    d) Stack
    e) Counters

2. A thread comprises which of the following?
    a) Thread id, CPU, Key loggers, Stack
    b) Thread id, Memory, Data, Queue
    c) Thread id, Program Counter, Register set, Stack
    d) Thread id, PC, Exceptions, Code
    e) Thread id, Locations, Data, Pointers

3. Threads belonging to the same process share which of the following?
    a) **Code section, data section, files**
    b) Name, Thread id, DMA
    c) Hard drive, id, thread
    d) Servers, Keystrokes, RPC
    e) Client, server, keyboard

4. What is RPC?
    a) Remote Personal Computer
    b) **Remote Procedure Call**
    c) Remote Process Communication
    d) Remote Program Counter
    e) Remote Process Control

5. It is possible to have concurrency without parallelism
    a) **True**
    b) False

6. The three main thread libraries in use today are,
    a) **POSIX Pthreads, windows, java**
    b) Linux, Solaris, c++
    c) C#, threadmain, stack
    d) GNU, CMD, shell
    e) C, scheduler, linker

7. _____ provides a programmer with an API for creating and managing thread
    a) Scheduler
    b) Invoker
    c) Timer
    d) **Thread library**
    e) File manager

8. In java multi-threading, which of these methods creates a new thread in the program?
    a) **Start ();**
    b) Create ();
    c) Stop ();
    d) Begin ();
    e) Run ();

9. What are the two types of parallelism in multicore programming?
    a) Stack and queue
    b) **Data and task**
    c) Single and multiple
    d) User and system
    e) None of the above

10. _____ system supports more than one task by allowing all the tasks to make progress.
    a) **Concurrent**
    b) Parallel
    c) Dual
    d) Single
    e) None of the above

Anita Enyonam Tay
2569214

Chapter 5

1. Which process can be affected by other processes executing in the system?
a) **cooperating process**
b) child process
c) parent process
d) init process

2. When several processes access the same data concurrently and the outcome of the execution depends on the particular order in which the access takes place, is called
a) dynamic condition
b) **race condition**
c) essential condition
d) critical condition

3. If a process is executing in its critical section, then no other processes can be executing in their critical section. This condition is called
a) **mutual exclusion**
b) critical exclusion
c) synchronous exclusion
d) asynchronous exclusion

4. Which one of the following is a synchronization tool?
a) thread
b) pipe
c) **semaphore**
d) socket

5. A semaphore is a shared integer variable
a) **that cannot drop below zero**
b) that cannot be more than zero
c) that cannot drop below one
d) that cannot be more than one

6. Mutual exclusion can be provided by the
a) mutex locks
b) binary semaphores
c) **both (a) and (b)**
d) none of the mentioned

7. When high priority task is indirectly preempted by medium priority task effectively inverting the relative priority of the two tasks, the scenario is called
a) **priority inversion**
b) priority removal
c) priority exchange
d) priority modification

8. Process synchronization can be done on
a) hardware level
b) software level
c) **both (a) and (b)**
d) none of the mentioned

9. A monitor is a module that encapsulates
a) shared data structures
b) procedures that operate on shared data structure
c) synchronization between concurrent procedure invocation
d) **all of the mentioned**

10. To enable a process to wait within the monitor,
a) **a condition variable must be declared as condition**
b) condition variables must be used as boolean objects
c) semaphore must be used
d) all of the mentioned

Ronald Boateng
2563314

Chapter 6

1. In CPU Scheduling, process execution alternates between the following two processes, which continues this way until it ends with a system request to terminate the execution.
    a. Execution & waiting
    b. CPU Burst & I/O Burst
    c. Processor Burst & Input Burst
    d. None of the above

2. Whenever the CPU becomes idle, the operating system must select one of the processes in the ready queue to be executed. The selection process is carried out by the…
    a. Scheduler
    b. Short-term scheduler
    c. Long-term scheduler
    d. None of the above

3. CPU-scheduling decisions may take place under all of the following circumstances except…
    a. At the point of process termination
    b. When a process switches from the running state to the waiting state
    c. At the point of process switching
    d. When a process switches from the running state to the ready state

4. The two types of scheduling are the nonpreemtive and cooperative scheduling.
    a. True
    b. False

5. Preemptive scheduling can result in race conditions when data are shared among several processes.
    a. True
    b. False

6. …….. is a component that is also involved in the CPU-Scheduling
    a. Dispatcher
    b. Kernel
    c. Scheduler
    d. None of the above

7. Which of the following criteria is **not** used for comparison of CPU-Scheduling algorithms.
    - **a. Algorithm utilization**
    - **b.** Turnaround time
    - **c.** Waiting time
    - **d.** Throughput

8. It is **not necessarily** desirable to maximize CPU utilization and throughput and to minimize turnaround time, waiting time, and response time.
    - a. True
    - **b. False**

9. In this scheduling algorithm, the process that requests the CPU first is allocated the CPU first.
    - **a. FCFS**
    - b. FIFO
    - c. FCFO
    - d. None of the above

10. The SJF algorithm is a special case of the general priority-scheduling algorithm.
    - **a. True**
    - **b.** False

Emmanuel Hansen

2565314

Chapter 7

Questions

1. In a _____, processes never finish executing, and system resources are tied up, preventing other jobs from starting.
    a) mutex lock
    b) deadlock
    c) semaphore
    d) flag
    e) scheduler

2. How many conditions are necessary for deadlocks to occur in a system?
    a) 5
    b) 1
    c) 8
    d) 3
    e) 4

3. Most Operating System usually _____ when dealing with deadlocks.
    a) ignore the problem altogether and pretend that deadlocks never occur in the system
    b) allow the system to enter a deadlocked state, detect it, and recover
    c) use a protocol to prevent or avoid deadlocks, ensuring that the system will never enter a deadlocked state
    d) throw a system exception and shut down to recover from a locked state
    e) aborts the process that caused the deadlock

4. Deadlock prevention provides a set of methods to ensure that one of following conditions do not occur.
    a) Hold and Wait
    b) Progress
    c) Bounded Waiting
    d) Preemption
    e) Resource Request

5. A direct method of deadlock prevention is to prevent occurrence of a Bounded
    a) Data
    b) Process
    c) Movement
    d) Wait
    e) Loop

6. A useful tool in characterizing and allocating of resources to process is the
    a) User Allocation Graph
    b) Time Allocation Graph
    c) Resource Allocation Graph
    d) Location Allocation Graph
    e) Priority Allocation Graph

7. Deadlock involves reusable
    a) Resources
    b) Users
    c) Time
    d) Cost
    e) Power

8. In one of the deadlock prevention methods, impose a total ordering of all resource types, and require that each process requests resources in an increasing order of enumeration. This violates the _____ condition of deadlock.
    a) Mutual exclusion
    b) Hold and Wait
    c) Bounded Wait
    d) No Preemption
    e) Starvation

9. A set of resources' allocations such that the system can allocate resources to each process in some order, and still avoid a deadlock is called _____.
    a) Unsafe state
    b) Safe state
    c) Starvation
    d) Greedy allocation
    e) Locked state

10. A process is starved
    a) if it is permanently waiting for a resource
    b) if semaphores are not used
    c) if a queue is not used for scheduling
    d) if demand paging is not properly implemented
    e) it not enough processing power is supplied.

Tettey Divine Sedem

2569614

Chapter 8

1. CPU fetches the instruction from memory according to the value of

a) **program counter**
b) status register
c) instruction register
d) program status word

2. A memory buffer used to accommodate a speed differential is called

a) stack pointer

b) **cache**
c) accumulator
d) disk buffer

3. Which one of the following is the address generated by CPU?

a) physical address
b) absolute address
c) **logical address**
d) none of the mentioned

4. Run time mapping from virtual to physical address is done by

a) **memory management unit**
b) CPU
c) PCI
d) none of the mentioned

5. Memory management technique in which system stores and retrieves data from secondary storage for use in main memory is called

a) fragmentation

b) **paging**
c) mapping
d) none of the mentioned

6. The address of a page table in memory is pointed by

a) stack pointer
b) **page table base register**
c) page register
d) program counter

7. Program always deals with

a) **logical address**
b) absolute address
c) physical address
d) relative address

8. The page table contains

a) **base address of each page in physical memory**
b) page offset
c) page size
d) none of the mentioned

9. What is compaction?

a) a technique for overcoming internal fragmentation
b) a paging technique
c) **a technique for overcoming external fragmentation**
d) a technique for overcoming fatal error

10. Operating System maintains the page table for

a) **each process**
b) each thread
c) each instruction
d) each address

Boakye Bernard
2563214

Chapter 9

1. Because of virtual memory, the memory can be shared among
   a) processes
   b) threads
   c) instructions
   d) none of the mentioned

2. _____ is the concept in which a process is copied into main memory from the secondary memory according to the requirement.
   a) Paging
   b) Demand paging
   c) Segmentation
   d) Swapping

3. The pager concerns with the
   a) individual page of a process
   b) entire process
   c) entire thread
   d) first page of a process

4. Swap space exists in
   a) primary memory
   b) secondary memory
   c) CPU
   d) none of the mentioned

5. When a program tries to access a page that is mapped in address space but not loaded in physical memory, then
   a) segmentation fault occurs
   b) fatal error occurs
   c) page fault occurs
   d) no error occurs

6. Effective access time is directly proportional to
   a) page-fault rate
   b) hit ratio
   c) memory access time
   d) none of the mentioned

7. In FIFO page replacement algorithm, when a page must be replaced
   a) oldest page is chosen
   b) newest page is chosen
   c) random page is chosen
   d) none of the mentioned

8. Which algorithm chooses the page that has not been used for the longest period of time whenever the page required to be replaced?
   a) first in first out algorithm
   b) additional reference bit algorithm
   c) least recently used algorithm
   d) counting based page replacement algorithm

9. A process is thrashing if
   a) it is spending more time paging than executing
   b) it is spending less time paging than executing
   c) page fault occurs
   d) swapping cannot take place

10. Working set model for page replacement is based on the assumption of
    a) modularity
    b) locality
    c) globalization
    d) random access

Afankwah Papa Jeffry
1126813

Chapter 10

1. What is the shape of a magnetic disk platter?
    a. Round cylinder
    b. Circle
    c. Flat circular
    d. Rectangle
    e. Plate

2. Which of the following is/are true about platters?
    I. The two surfaces of the platter are covered with magnetic materials
    II. It ranges from 1.8-3.5 meters
    III. Information are stored on the stored on the platter
    IV. Its range is measured in inches
    V. It has a flat cylinder surface
        a. I only
        b. I, II, III, IV, V
        c. I and IV
        d. IV, I, III
        e. None of the above

3. The rate at which data flow between the drives is known as …….
    a. Transfer rate
    b. Position time
    c. Rational latency
    d. Seek time
    e. Head crash

4. The time necessary to move the disk arm to the desired cylinder is called ……
    a. Transfer rate
    b. Position time
    c. Rational latency
    d. Seek time
    e. Head crash

5. The time necessary for the desired sector to rotate to the disk head is called the …….
    a. Transfer rate
    b. Position time
    c. rational latency
    d. seek time
    e. head crash

6. The accident that occurs between head and the disk is known as ……..
    a. seek time
    b. rational latency
    c. transfer rate
    d. position time
    e. head crash

7. All the following are time scheduling algorithm in disk scheduling except?
    a. FCFS scheduling
    b. SSTF scheduling
    c. SCAN scheduling
    d. C-SCAN scheduling
    e. Partitioning scheduling

8. The drive that is attached to computer by a set of wires are called?
    a. Output push
    b. Input/output push
    c. Input/output bus
    d. Device port
    e. Networking device

9. All the following are type of buses except ……..
    I. ATA
    II. eSATA
    III. USB
    IV. SATA
    V. SATAN
        a. I, IV and V
        b. V only
        c. All the above
        d. II and I
        e. I, II, and III

10. The data transfer on a bus are carried out by a special electronic processor called …….
    a. Joy stick
    b. Port
    c. Controller
    d. Moveable connect
    e. Transfer bus