KWAME NKRUMAH UNVIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF SCIENCE

DEPARTMENT OF COMPUTER SCIENCE

CSM 483: OPERATING SYSTEM

GROUP MEMBERS

BAAH EMMANUEL KWESI	2562914
JOHN DAG ADDY	4700015
AIDOO JAMES EISSAH	2561414
ESSILFIE ANTHONY SAM	1131813
GIDEON PIESIE	2568414
SEFA AYIM	2571614
JULIANA ACKON	2560514
EMMANUEL NKETSIA YAWSON	2570014
MERCY KAI YESU-NO TETTEY	2569714
ABDALLA RAZAK	2560314

OPERATING SYSTEM ASSIGNMENT

CHAPTER 1: INTRODUCTION

1. A program that acts as an intermediary between a user and a computer and the computer hardware is ………………………..
A. Application System
B. **Operating System**
C. Information System
D. Process
E. API

2. Computer systems can be divided into hardware, operating system, application system and …………..
A. CPU
B. Web browsers
C. Computers
D. **Users**
E. Software

3. To access the services of operating system, the interface is provided by the

A. system calls

B. **API**

C. library

D assembly instructions "The one program running at all times on the computer" is the

   E.Kernel

4. …………… program is loaded at power-up or reboot.

A. System

B.Bootstrap

C. User

D. Kernel

E. OS

5. Which one of the following is not true?
A. kernel is the program that constitutes the central core of the operating system
B. kernel is the first part of operating system to load into memory during booting
C. **kernel is made of various modules which cannot be loaded in running operating system**
D. kernel remains in the memory during the entire computer session.

E. Kernel is the core of the OS.

6. ……………………….is logical extension in which CPU switches jobs so frequently that the user can interact with each job while it is running.

A. **Multiprogramming**

B. Job scheduling

C. Timesharing

D. CPU scheduling

E. Processing

7. The following systems allows only one process execution at a time except
A. Uniprogramming systems
B. Uniprocessing systems
C. Unitasking

D. **Multitasking systems**

E. Job Scheduling systems

8. Example of proprietary OS is

A. Red Hat

B. Ubuntu

C. KaliLinux

D. **Windows**

E. UNIX

9. In Unix, Which system call creates the new process?
A. **Fork**
B. Create
C. New

D. Make

E. Htop

10. What is the ready state of a process?
A. **When process** is **scheduled** to **run after some execution**
B. When process is unable to run until some task has been completed
C. When process is using the CPU

D. When a process is waiting for an input.

E. When a process is running.

CHAPTER 2 : OPERATING SYSTEM STRUCTURES
1. There are two types of fragmentation;

a) Dynamic and static

b) Internal and external

c) Common and Uncommon

d) Dynamic and Uncommon

e) None of the above

2.   The type of frSagmentation depends on;

a) The location of the wasted space

b) The size of the wasted space

c) The capacity of the wasted space

d) Only a and b

e) None of the above

3. This phenomenon of partial usage of fixed partitions and the coinciding creation of unused spaces within the partition is called;

a) Dynamic fragmentation

b) External fragmentation

c) Internal fragmentation

d)Uncommon fragmentation

e) None of the above

4. First-fit memory allocation is;

a) Last partition fitting the requirement

b) First partition fitting the requirement

c) Smallest partition meeting the requirement

d) None of the above

e)Both b and c

5. Best fit memory allocation is;

a) Last partition fitting the requirement

b) First partition fitting the requirement

c) Smallest partition meeting the requirement

d) Just a and b

e) None of the above

6. A number that designates a particular memory location is;

a) Address

b) Index

c) Register

d)Memory Number

d) None of the above

7. A register used to store the highest location in memory legally accessible by each program is;

a) Address Number

b) Index Register

c) Unbound Register

d) Address Register

e) Bound register

8. A non-preemptive process scheduling policy that handles jobs according to their arrival time; the first job in the READY queue is processed first is known as;

a) Last come last served (LCLS)

b) First come first served (FCFS)

c) Last come first served (LCFS)

d) Round-Robin

e) None of the above

9. The process of adjusting address references in a program, by either software or hardware means, to allow the program to execute correctly when loaded in different sections of memory is called;

a) Relocation

b) Deallocation

c) Allocation

d)Fragmentation

e) None of the above

10. The process of collecting fragments of available memory space into contiguous blocks by moving programs and data in a computer's memory or disk is known as;

a) Relocation

b) Deallocation

c) Compaction

d) Decompaction

d) None of the above

CHAPTER 3 PROCESSES

1. When a process creates a new process using the fork() operation, which of the following state is shared between the parent process and the child process?
   a. Stack
   b. Heap
   c. Shared memory process
   d. Get
   e. text
2. Which of the states is a process in when instructions are being executed
   a. New
   b. Running
   c. Waiting
   d. Ready
   e. Terminated
3. In Unix, which system creates a new process?
   a. Fork
   b. Create
   c. New
   d. Mount
   e. None of the above
4. Switching the CPU to another process requires performing a state save of the current process and a state restore of a different process. This task is known as
   a. Synchronization
   b. Buffering
   c. CPU scheduling
   d. Context switch
   e. Modularity
5. A process can be terminated due to
   a. Normal exit
   b. Fatal error
   c. Killed by another process
   d. All of the above
   e. None of the above
6. In priority scheduling algorithm
   a. CPU is allocated to the process with highest priority
   b. CPU is allocated to the process with lowest priority
   c. Equal priority processes cannot be scheduled
   d. CPU is allocated to processes with shortest job first
   e. Allocation of CPU is done by first come, first served
7. CPU fetches the instruction from memory according to the value of
   a. Instruction register
   b. Program counter
   c. Program state word

d. Status word
e. CPU registers

8. Which of the buffering queues has a limited number of messages that can reside in it?
   a. Zero capacity
   b. Bounded capacity
   c. Unbounded capacity
   d. Limited capacity
   e. Rounded capacity
9. Which of the following cannot be scheduled by the kernel?
   a. Process
   b. Kernel level thread
   c. User level thread
   d. Page level thread
   e. Linear context
10. The state of a process is defined by:
    a. The activity just executed by the process
    b. The final activity of the process
    c. The current activity of the process
    d. The activity of next be executed by the process
    e. The previous activity of the process

CHAPTER 4: THREADS

1. Multithreaded programming enable multithreaded processes, offers much benefits than a single-threaded process. All the following are benefits of multithreaded programming except:
   A. Easy of Programming
   B. Resource Sharing
   C. Economy
   D. Responsiveness
   E. Scalability
2. One can distinguish a concurrent system from a parallel system by:
   A. Concurrency allow more than task simultaneously, while parallelism supports many task by allowing the tasks to make progress.
   B. Concurrency supports more than one tasks by allowing the tasks to make progress, while parallelism allows more than one task simultaneously.
   C. Concurrency is impossible without parallelism.
   D. Parallelism many task by allowing more than one task to make progress.
3. A thread library provides the programmer with an API for creating and managing threads. Which of the following is/are the main thread libraries in use today:
   A. POSIX Pthreads
   B. Windows
   C. Java

D. **All of the above**
E. None of the above

4. Pthreads refers to the POSIX standard (IEEE 1003.1c) defining an API for thread creation and synchronization. What is the purpose of this?
   A. Implementation for thread behaviour
   B. Synchronization for thread execution
   C. **Specification for thread behaviour**
   D. Synchronization for thread execution
   E. Implementation for thread execution

5. All the following systems supports Pthread specification except:
   A. Linux
   B. Ubuntu
   C. Mac OS X
   D. **Windows**
   E. Solaris

6. Data sharing **occurs easily** in these threads libraries because shared data are simply declared globally.
   A. Java, Pthreads and Windows
   B. **Windows and Pthreads**
   C. Pthreads and Java
   D. Java and Windows
   E. None of these

7. Implicit threading is one effective way of addressing the difficulties programmers face such as data dependency, testing and debugging among others as well as ensuring the program correctness. To better support the design of multithreaded applications. What does implicit threading seek to do?
   A. **Transfer the creation and management of threading from application developers to compilers and run-time libraries.**
   B. Transfer the management of threading from the application developers to compilers.
   C. Transfer the creation of threading from the application developers to run-time libraries.
   D. Transfer the creation of threading from the application developers to run-time libraries.
   E. Transfer the management of threading from the application developers to compilers and run-time libraries.

8. All the following are threading issues in designing multithreaded programs except:
   A. The fork() and exec() calls
   B. Thread Cancellation
   C. Scheduler Activation
   D. Thread-Local Storage
   E. **Grand Central Dispatch**

9. In ensuring the multithreaded programs can take advantage of multicore processors through implicit threading, all the following are various approaches available except:
   A. Thread pools
   B. OpenMP
   C. Grand Central Dispatch

D. Threading Building Block(TBB)
E. **Implicit Threading**
10. Multicore or multiprocessor systems puts pressure on programmers. Which of these challenges seeks to ensure that tasks perform equal work of equal value.
    A. Dividing activities
    B. **Balance**
    C. Data Splitting
    D. Data Dependency
    E. Testing and Debugging

CHAPTER 5: PROCESS SYNCHRONIZATION

1.   A ……………………is one that can affect or be affected by other processes executing in the system.

A. **cooperating process**

B. Process Synchronization

C Threading

D Process coordination

E. Multi Processes

2.   A situation where several processes access and manipulate the same data concurrently and the outcome of the execution depends on the particular order in which the access takes place, is called a…………………………...

A. **race condition**

B. Concurrency

C. Multitasking

D. Threading

E. Condition

3. Two general approaches are used to handle critical sections in operating systems:

A. **Preemptive kernels** and **Non-preemptive kernels**.

B. Threading and kernel mode

C. User mode and Preemptive kernels

D. race condition and

E. None of the above

4. A **semaphore** S is an integer variable that, apart from initialization, is

accessed only through two standard atomic operations:

A. wait() and signal().

B.Wait() and receive()
C.acquire() and wait()

D.signal() and receive()

E.wait() and signal()

5. All of the following best describes the software tool built by designers in solving critical selection proble execept.

A.The mutex lock to protect critical regions and thus prevent race conditions.

B. A mutex lock has a boolean variable available whose value indicates if the lock is available or not.
C.A process that attempts to acquire an unavailable lock is blocked until the lock is released.
D.While a process is in its critical section, any other process that
tries to enter its critical section must loop continuously in the call to acquire().

E. Mutex lock implementation does not require busy waiting.

6. The implementation of a semaphore with a waiting queue may result in a
situation where two or more processes are waiting indefinitely for an event
that can be caused only by one of the waiting processes. Such state reached is termed as

A. Deadlock

B. Mutex Lock

C. Waiting State

D. Critical State

E. Starving state

7. A situation in which processes wait indefinitely within the semaphore.

A. Starvation

B. Blocking

C.Mutex Lock

D. Binary semaphore

E. Counting semaphore

8. While a process is in its critical section, any other process that tries to enter its critical section must loop continuously in the call to `acquire()`. This type of mutex lock is also called a ………..
A. **spinlock**

B. Deadlock

C. Call to aquire().

D. Busy waiting

E.For ever loop

9. Each process has a segment of code, called a …………………,
in which the process may be changing common variables, updating a table and writing a file.

A. **critical section**,

B. Global variable

C. Process coordination

D. Exit section

E. Entry section

10. Each process must request permission to enter its critical section. The section of code implementing this request is the……………………...

A. **entry section**
B. Exit section
C. request handler
D. Remainder section
E. Coordination

CHAPTER 6: CPU SCHEDULING

1. In CPU scheduling, the scheduling depends on an observed set of property of processes: The process execution consists of a cycle of CPU execution and I/O wait. What is the order of alternation between these states?
   A. I/O Burst, CPU Burst, …CPU Burst
   B. **CPU Burst, I/O Burst, …CPU Burst**
   C. CPU Burst, CPU Burst, …I/O Burst
   D. I/O Burst, CPU Burst, …CPU Burst
   E. CPU Burst, CPU Burst, CPU Burst
2. The ready queue is not necessarily a…..

A. LIFO queue
B. **FIFO queue**
C. Stack
D. Array
E. Stack

3. CPU-scheduling decisions may take place under the following four circumstances except:
   A. When a process switches from the running state to the waiting state (for example, as the result of an I/O equest or an invocation of wait() for the termination of a child process)
   B. When a process switches from the running state to the ready state (for example, when an interrupt occurs)
   C. When a process switches from the waiting state to the ready state (for example, at completion of I/O)
   D. When a process terminates
   E. **When a newly created process joins the ready state (for example, when the initial process fails)**

4. Dispatch latency defined as……
   A. **The time taken for the dispatcher to stop one process and start another running.**
   B. The delay is caused in stopping an already running process.
   C. The time taken for the dispatcher to start a new processing.
   D. The delay caused in waiting in the ready queue before entering the running state.
   E. The time taken for the dispatcher to stop the whole process from running.

5. Many criteria have been suggested for comparing CPU-scheduling algorithms. All but one of the following is the criteria used for making a substantial difference in which the algorithm is judged best.
   A. Turnaround time
   B. Waiting time
   C. **Context switch time**
   D. Response time
   E. Throughput

6. Comparing the various scheduling algorithms, which of them these is not preemptive in any way?
   A. Shortest-Job-First Scheduling
   B. Priority Scheduling
   C. Round-Robin Scheduling
   D. Multilevel Queue Scheduling
   E. **First-Come, First-Served Scheduling**

7. The SJF algorithm is a special case of the general……..algorithm.
   A. Shortest-Job-First Scheduling
   B. Priority Scheduling
   C. Round-Robin Scheduling
   D. Multilevel Queue Scheduling
   E. **First-Come, First-Served Scheduling**

8. Priorities can be defined either internally or externally. Which priority is use some measurable quantity or quantities to compute the priority of a process.
   A. **Internally defined priorities**

B. Externally defined priorities
C. Single defined priorities
D. Group defined priorities
E. None of the above

9. One major problem with priority scheduling algorithms is
    A. Priority Inversion
    B. Priority Inheritance
    C. Indefinite Blocking
    D. Convey Effect
    E. Admission-Control

10. With...............................algorithm, hat is unusual about this form of scheduling is that a
    process may have to announce its deadline requirements to the scheduler.
    A. Shortest-Job-First Scheduling
    B. Priority-Based Scheduling
    C. Round-Robin Scheduling
    D. Multilevel Queue Scheduling
    E. First-Come, First-Served Scheduling

CHAPTER SEVEN: DEADLOCKS

1. All of the following under Deadline characterization are considered under Necessary Conditions
   except:
   A. Mutual Exclusion
   B. Hold and wait
   C. Request and wait
   D. No preemption
   E. Circular wait.

2. In handling deadlocks, there are one of three ways of dealing with deadlock problems. All but except
   one of the following is used:
   A. We can use a protocol to prevent or avoid deadlocks.
   B. We can allow the system to enter a deadlocked state, detect it, and recover.
   C. We must ensure that the system reduces the challenges of entering a deadlocked state.
   D. We must ensure that the system will enter never enter a deadlocked state.
   E. We can ignore the problem altogether and pretend that deadlocks never occur in the
       system.

3. ………………… provides a set of methods to ensure that at least one of the necessary conditions
cannot hold.
A. Deadlock Inheritance
B. Deadlock Avoidance
C. Deadlock Detection
D. Deadlock Prevention
E. Deadlock Delay

4. ………. requires that the operating systembe given additional information in advance
   concerning which resources a process will request and use during its lifetime.
   A. Deadlock Inheritance

B. Deadlock Avoidance
C. Deadlock Detection
D. Deadlock Prevention
E. Deadlock Delay

5. Which of the following is not associated with Deadline Avoidance?
    A. Current state
    B. Safe state
    C. Resource-Allocation-Graph Algorithm
    D. Banker's algorithm
    E. Claim edge
6. An algorithm that examines the state of the system to determine whether
a deadlock has occurred. An algorithm to recover from the deadlock. All these algorithms are
concerned with:
    A. Deadlock Inheritance
    B. Deadlock Avoidance
    C. Deadlock Detection
    D. Deadlock Prevention
    E. Deadlock Delay

7. In recovery from deadlock using process terminiation, of the following must be filled.
    A. Abort all deadlocked processes.
    B. Abort any process at a time until the deadlock cycle is eliminated.
    C. Abort some deadlocked processes
    D. Abort any deadlocked processes
    E. Abort some processes at a time until the deadlock cycle is eliminated.

8. ……………… occurs when two or more processes are waiting indefinitely for an event that
    can be caused only by one of the waiting processes.
    A. Starvation
    B. Deadlock
    C. Process Termination
    D. Process Execution
    E. Deadline Monotmic
9. A method for avoiding deadlocks, rather than preventing them, requires that the ………
    have a priori information about how each process will utilize system resources.
    A. Resource Allocator
    B. Memory
    C. CPU
    D. Operating System
    E. Scheduler
10. When condisering factors that affect which deadlock process to be should be terminated, all
    but one of the following is not included:
    A. What the priority of the process is

B. How long the process has computed and how much longer the process will compute before completing its designated task.

C. How many and what types of resources the process has used (for example, whether the resources are simple to preempt)

D. How many more resources the process needs in order to complete

E. When the processes be terminated

CHAPTER EIGHT: MAIN MEMORY

1. Which register holds the smallest legal physical memory address?
   a. Limit register
   b. Internal CPU register
   c. Cache register
   d. Base register
   e. Swap register

2. The processes on the disk that are waiting to be brought into memory for execution form the ……………………
   a. Disk queue
   b. Waiting queue
   c. Input queue
   d. Execution queue
   e. Output queue

3. The run-time mapping from virtual to physical addresses is done by a hardware device called the …………………………..
   a. Memory-addressing unit
   b. Memory-mapping unit
   c. Memory-management unit
   d. Memory-relocation unit
   e. Memory-referencing unit

4. ……………………… is a small piece of code that indicates how to locate the appropriate memory-resident library routine or how to load the library if the routine is not already present with regards to dynamic linking.
   a. Stub
   b. Stud
   c. Swap
   d. Stall
   e. Bind

5. …………………………… involves moving processes between main memory and a backing store.
   a. Dynamic loading
   b. Standard swapping
   c. Dynamic linking
   d. Paging
   e. Fragmentation

6. The memory-management scheme that supports the programmer's view of memory is called ………………………………………

   a. Swapping
   b. Fragmentation
   c. Paging
   d. Segmentation
   e. Compaction

7. On a Linux system, the page size varies according to architecture, and there are several ways of obtaining the page size. One approach is to enter the following command on the command line:

   a. get PAGESIZE
   b. getconf PAGESIZE
   c. getconfig PAGESIZE
   d. showconfig PAGESIZE
   e. show PAGESIZE

8. Some of the most common techniques for structuring the page table include the following except ………………………………

   a. Centralized page table
   b. Hierarchical paging
   c. Inverted page table
   d. Hashed page table
   e. Forward-mapped page table

9. The basic method for implementing paging involves breaking physical memory into fixed-sized blocks called …………………………………..

   a. Pages
   b. Frames
   c. Tables
   d. Segments
   e. Fragments

10. The basic method for implementing paging involves breaking logical memory into blocks of the same size called …………………….

    a. Pages
    b. Frames
    c. Tables
    d. Segments
    e. Fragments

CHAPTER NINE: VIRTUAL MEMORY.

1. Swap space exists in
   a) Primary memory
   b) Secondary memory

c) Shared memory
d) CPU
e) None of the above.

2. 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) Page out of bounds error occurs
e) No error occurs

3. Because of virtual memory, the memory can be shared among
a) Users
b) Processes
c) Threads
d) Instructions
e) None of the above

4. _____ 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
e) Process Transfer

5. The pager concerns with the
a) Individual page of a process
b) Address of process in memory
c) Entire process
d) Entire thread
e) First page of a process

6. Working set model for page replacement is based on the assumption of
a) Modularity
b) Locality
c) Globalization

d) Random access

e) Process

7. 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
   e) It is interrupted

8. Effective access time is directly proportional to
   a) Page-fault rate
   b) Hit ratio
   c) Memory access time
   d) Process size
   e) None of the above

9. 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) A computation is performed to reveal which page to choose
   e) None of the above

10. Which algorithm chooses the page that has not been used for the longest period of time whenever the page is required to be replaced?
    a) First in first out algorithm
    b) Last in first out algorithm
    c) Additional reference bit algorithm
    d) Least recently used algorithm
    e) Counting based page replacement algorithm

CHAPTER 10: MASS-STORAGE STRUCTURE

1. The positioning time involves the time necessary for the disk arm to move to the desired cylinder. This is known as the
   a. Search time   **b. seek time**   c. arm-positioning time   d. moving time   e. relevant time

2. Data transfer at the disk drive happens between the cache and the
   a. disk surface b. disk storage   c. surface storage   d. platter   e. none of the above

3. PCI stands for
a. Peripheral Component Input   b. Peripheral Component Interface **c. Peripheral Component Interconnect** d. Peripheral Component intermediary   e. none of the above

4. The amount of time required to read a block of data from a disk into memory is composed of seek time, rotational latency, and transfer time. Rotational latency refers to

   a. the time it takes for the platter to make a full rotation
   b. the time it takes for the platter to rotate the correct sector under the head
   c. the time it takes for the read-write head to move into position over the appropriate track
   d. the time it takes for the read-write head to move into position under the appropriate track
   e. none of the above

5. The splitting of bits of each byte across multiple disks is termed
   a. Data striping   b. data-level striping **c. bit-level striping**   d. bit striping e. none of the above

6. Which RAID level refers to disk mirroring?

   a. 0   **b. 1**   c. 2   d. 3   e. 5

7. Which RAID level refers to bit-interleaved parity?
   a. 0   b. 1   c 2   **d.3**   e. 5

8. The _____ then sends the command via messages to the disk
Controller, and the disk controller operates the disk-drive hardware to carry
Out the command.

   a) Guest Controller
   b) Invitee Controller
   c) Data Transfer
   d) Cache Controller
   e) Host Controller

9. Computers access disk storage in two ways. What are they?

   a) Host-attached Storage & Network-attached storage
   b) Guest-attached storage & Lan-attached storage
   c) Invitee-attached storage & Host-attached storage

d) Guest-attached storage & Network-attached storage

e) None of the above

10. The following are types of Buses except;
    a) **C/A Bus**
    b) SATA
    c) USB
    d) FC
    e) eSATA

EXTRA QUESTIONS FROM CHAPTER 10:

1. *A read–write head "flies" just above each surface of every platter. The heads are attached to a ……….*
   that moves all the heads as a unit.
   A. *Tracks*
   B. *Sectors*
   C. *Cylinder*
   D. Disk arm
   E. *Platter*

2. *The data transfers on a bus are carried out by special electronic processors called…………*
   A. *I/O Bus*
   B. *Blu-ray discs*
   C. *SSDs*
   D. *Flash Drives*
   E. Controllers

3. *SSD (Solid-State Disk) is nonvolatile memory that is used like a hard drive. Which of the following is*
   not associated with SSDs?
   A. *Some SSDs are designed to connect directly to the system bus.*
   B. *Some systems use them as a direct replacement for disk drives.*
   C. *Some systems use them as a new cache tier, moving data between magnetic disks, SSDs, and*
   memory to optimize performance.
   D. SSDs have disk head, disk-scheduling algorithms largely apply.
   E. *SSDs can be much faster than magnetic disk drives, standard bus interfaces can cause a major*
   limit on throughput.

4. *Host-attached storage is storage accessed through local I/O ports. These ports use several technologies.*
   The typical desktop PC uses an I/O bus architecture called…
   A. *IDE*
   B. *SANs*
   C. *Fibre Channel*
   D. *NAS*

  E. *Iscsi*
5. *A storage-area network (SAN)*
  A. *A private network (using storage protocols rather than networking protocols) connecting servers and storage units.*
  B. *Storage accessed through local I/O ports.*
  C. *A special-purpose storage system that is accessed remotely over a data network.*
  D. *A high-speed serial architecture that can operate over optical fiber or over a four-conductor copper cable.*
  E. *The latest network-attached storage protocol.*
6.