

Department of Computer Science

Gujarat University



Certificate

Roll No: 23

Seat No: _____

This is to certify that Mr./Ms. Devangi B Pabari student of MCA Semester – III has duly completed his/her term work for the semester ending in December 2020, in the subject of Operating System towards partial fulfillment of his/her Degree of Masters in Computer Applications.

10/12/2020

Date of Submission

Internal Faculty

Head of Department

Department Of Computer Science
Rollwala Computer Centre
Gujarat University

MCA - 3

Subject: - Operating System

Name:- Devangi B Pabari

Roll No.: - 23

Exam Seat No.: -

* Assignment - 1 *

1. API:- A standardized library of programming tools used by software developers to write applications that are compatible with a specific operating system or graphic user interface.

Base address :- An address that is used as the origin in the calculation of addresses in the execution of a computer program.

Batch processing :- pertaining to the technique of executing a set of computer programs such that each is completed before the next program of the set is started.

Cache memory :- A memory that is smaller and faster than main memory and that is interposed between the processor and main memory. The cache acts as a buffer for recently used memory locations.

cluster :- A process that requests services by a group of interconnected, whole computers working together as a unified computing resource that can create the illusion of being one machine. The term whole computer means a system that can run on its own, apart from the cluster.

Deadlock :- (1) An impasse that occurs when multiple processes are waiting for the availability of a resource that will not become available because it is being held by another process that is in a similar wait state. (2) An impasse that occurs when multiple processes are waiting for an action by or a response from another process that is in a similar wait state.

Dead lock prevention :- A technique that guarantees that a deadlock will not occur. Prevention is achieved by assuring that one of the necessary conditions for deadlock is not met.

Demand paging :- The transfer of a page from secondary memory to main memory storage at the moment of need. computer preparing.

DMA :- (Direct Memory Access) :- A form of I/O in which a specific special module, called a DMA module, controls the exchange of data between main memory and an I/O device. The processor sends a request for the transfer of a block of data to the DMA module and is interrupted only after the entire block has been transferred.

Dispatch :- To allocate time on a processor to jobs or tasks that are ready for execution.

Dynamic relocation :- A process that assigns new absolute addresses to a computer program during execution so that the program may be executed from a different area of main storage.

Encryption:- The conversion of plain text or data into unintelligible form by some means of a reversible mathematical computation.

Hashing:- The selection of a storage location for an item of data by calculating the address as a function of the contents of the data. This technique complicates the storage allocation function but results in rapid random retrieval.

Indexed sequential access:- pertaining to the organization and accessing of the records of a storage structure through an index of the keys that are stored in arbitrarily partitioned sequential files.

Indexed sequential file:- A file in which records are ordered according to the values of a key field. The main file that is supplemented with an index file that contains a partial list of key values.

Interrupt :- A suspension of a process, such as the execution of a computer program, caused by an event external to that process and performed in such a way that the process can be resumed.

Job :- A set of computational steps packaged to run as a unit.

Kernel :- A portion of the operating system that includes the most heavily used portions of software. Generally, the kernel is maintained permanently in main memory. The kernel runs in a privileged mode and responds to calls from processes and interrupts from devices.

Logical address :- A reference to a memory location independent of the current assignment of data to memory. A translation must be made to a physical address before the memory access can be achieved.

Mailbox :- A data structure shared among a number of processes that is used as a queue for messages. Messages are sent to the mailbox and retrieved from the mailbox rather than passing directly from sender to receiver.

Multiprocessing :- A mode of operation that provides for parallel processing by two or more processors of a multiprocessor.

Multiprogramming :- A mode of operation that provides for the interleaved execution of two or more computer programs by a single processor. The same as multitasking, using different terminology.

Multitasking :- A mode of operation that provides for the concurrent performance or interleaved execution of two or more computer tasks. The same as multiprogramming, using different terminology.

Page :- In virtual storage, a fixed-length block that has a virtual address and that is transferred as a unit between main memory and secondary memory.

Page fault :- occurs when the page containing a referenced word is not in main memory. This causes an interrupt and requires that the proper page be brought into main memory.

Paging :- The transfer of pages between main memory and secondary memory.

Physical address :- The absolute location of a unit of data in memory.
(e.g., word or byte in main memory, block on secondary memory).

Process :- A program in execution. A process is controlled and scheduled by the operating system. Same as task.

Process control block :- the manifestation of a process in an operating system. It is a data structure containing information about the characteristics and state of the process.

Program counter :- Instruction address register.

Registers :- High-speed memory internal to the CPU. Some registers are user visible - that is, available to the programmer via the machine instruction set. Other registers are used only by the CPU, for control purposes.

Response time :- In a data system, the elapsed time between the end of transmission of an enquiry message and the beginning of the receipt of a response message, measured at the enquiry terminal.

Round robin :- A scheduling alg. algorithm in which processes are activated in a fixed cyclic order; that is, all processes are in a circular queue.

Scheduling :- To select jobs or tasks that are to be dispatched. In some operating systems, other units of work, such as input output operations, may also be scheduled.

Segment :- In virtual memory, a block that has a virtual address. The blocks of a program may be of unequal length and may even be of dynamically varying lengths.

Segmentation :- The division of a program or application into segments as part of a virtual memory scheme.

Sequential file :- A file in which records are ordered according to the values of one or more key fields and processed in the same sequence from the beginning of the file.

Shell starvation:-

Shell :- The portion of the operating system that interprets interactive user commands and job control language commands. It functions as an interface between the user and the operating system.

Starvation:- A condition in which a process is indefinitely delayed because other processes are always given preference.

Symmetric multiprocessing :- (SMP) :- A form of Multiprocessing that allows the operating system to execute on any available processor or on several available processors simultaneously.

Synchronization :- Situation in which two or more processes coordinate their activities based on a condition.

Thread :- A dispatchable unit of work. It includes a processor context (which includes the program counter and stack pointer) and its own data area for a stack (to enable subroutine branching). A thread executes sequentially and is interruptible so that the processor is interruptible so that it can turn to another thread. A process may consist of multiple threads.

Trojan Horse :- Secret undocumented routine embedded within a useful program. Execution of the program results in execution of the secret routine.

Virtual address :- The address of a storage location in virtual memory.

Virtual Memory :- the storage space that may be regarded as addressable main storage by the user of a computer system in which virtual addresses. The size of virtual storage is limited by the addressing scheme of the computer system and by the amount of secondary

Virtual Memory :- Memory may be stored, transmitted, or operated on within a given computer. Typically, if a processor has a fixed-length instruction set, then the instruction length equals the word length.

Virus :- Secret undocumented routine embedded within a useful program. Execution of the program results in execution of the secret routine.

Access Method :- The method that is used to find a file, a record; or a set of records.

Asynchronous operation :- An operation that occurs without a regular or predictable time relationship to a specified event. For example, the calling of an error diagnostic routine that may receive control at any time during the execution of a computer program.

Binary Semaphore :- A semaphore that makes on only the values 0 and 1. A binary semaphore allows only one process or thread to have access to a shared critical resource at a time.

B-tree :- A technique for organization indexes. In order to keep access time to a minimum, it stores the data keys in a balanced hierarchy that continually realigns itself as items are inserted and deleted. Thus, all nodes always have a similar number of keys.

compaction :- A technique used when memory is divided into variable-size partitions. From time to time, the operating system shifts the partitions so that they are contiguous and so that all of the free memory is together in one block. See external fragmentation.

Critical section :- In an asynchronous procedure of a computer program, a part that cannot be executed simultaneously with an associated critical section of another asynchronous procedure.
See mutual exclusion.

Device driver :- An operating system module (usually in the kernel) that deals directly with a device or I/O module.

Disk allocation table :- A table that indicates which blocks on secondary storage are free and available for allocation to file.

Enable interrupt :- A condition usually created by the operating system, during which the processor will respond to interrupt request signals of a specified class.

Execution context :- Same as process state.

Field:- (1) defined logical data that are part of a record. (2) The elementary unit of a record that may contain a data item, a data aggregate, a pointer, or a link.

File Management system:- A set of system software that provides services to users and applications in the use of files, including file access, directory maintenance, and access control.

Group scheduling :- The scheduling of a set of related threads to run on a set of processors at the same time, on a one-to-one basis.

Hash file :- A file in which records are accessed according to the values of a key field. Hashing is used to locate a record on the basis of its key value.

Job:- A set of computational steps packaged to run as a unit.

Hit ratio:- In a two-level memory, the fraction of all Memory access that are found in the faster memory. (e.g. the cache)

Indexed access:- pertaining to the organization and accessing of the records of a storage structure through a separate index to the locations of the stored records.

Internal fragmentation:- occurs when memory is divided into fixed-size partitions. If a block of data is assigned to one or more partitions, then there may be wasted space in the last partition. This will occur if the last portion of data is smaller than the last partition.

Last in first out (LIFO) :- A queuing technique in which the next item to be retrieved is the item most recently placed in the queue.

Macrokernell :- A large operating system core that provides a wide range of services.

Main Memory :- Memory that is internal to the computer system, is program addressable, and can be loaded into registers for subsequent execution or processing.

Memory cycle time :- The time it takes to read one word from or write one word to memory. This is the rate at which words can be read from or written to memory.

Mutex :- Similar to a binary semaphore. A key difference between the two is that the process that locks the mutex

Nonprivileged state :- An execution context that does not allow sensitive hardware instructions to be executed. Such as the halt instruction and I/O instructions.

object request broker:- An entity in an object-oriented system that acts as an intermediary for requests sent from a client to a server.

Prepaging:- The retrieval of pages other than the one demanded by a page fault. The hope is that the additional pages will be needed in the near future. conserving disk I/O. compare demand Paging.

Priority inversion:- A circumstance in which the operating system forces a higher-priority task to wait for a lower-priority task.

privileged instruction:- An instruction that can be executed only in a specific mode, usually by a supervisory program.

process image:- All of the ingredients of a process, including program, data, stack, and process control block.

Process spawning :- The creation of a new process by another process.

Process switch :- An operation that switches the processor from one process to another, by saving all the process control block, registers, and other information for the first and replacing them with the process of information for the second.

Process I/O :- A form of I/O in which the CPU issues an I/O command to an I/O module and must then wait for the operation to be complete before proceeding.

Race condition :- Situation in which multiple processes access and manipulate shared data with the outcome dependent on the relative timing of the processes.

Real-time task :- A task that is executed in connection with some process or function or set of events external to the computer system and that must meet one or more deadlines to interact effectively and correctly with the external environment.

Reentrant procedure :- A routine that may be entered before the completion of a prior execution of the same routine and execute correctly.

Rendezvous :- In message passing, a condition in which both the sender and receiver of a message are blocked until the message is delivered.

Resident set :- That portion of a process that is actually in main memory at a given time. compare working set.

Reusable resource :- A resource that can be safely used by only one process at a time and is not depleted by the use. processes obtain reusable resource medium in the same sequence as the data are ordered, or to obtain data in the same order as they were entered.

System bus :- A bus used to interconnect major computer components (CPU, Memory, I/O).

Spin lock:- Mutual exclusion mechanism in which a process executes in an infinite loop waiting for the value of a lock variable to indicate availability.

Spooling:- The use of secondary memory as buffer storage to reduce processing delays when transferring data between the peripheral equipment and the processors of a computer.

Thrashing:- A phenomenon in virtual memory schemes in which the processor spends most of its time swapping pieces rather than executing instructions.

Thread switch:- The act of switching processor control from one thread to another within the same process.

available and not by the actual number of main storage locations.

Time sharing:- The concurrent use of a device by a number of users.

Time slice :- The maximum amount of time that a process can execute before being exec interrupted.

Time slicing :- A mode of operations in which two or more processes are assigned quanta of time on the same processors.

Trace :- A sequence of instructions that are executed when a process is running.

Translation lookaside buffer :- (TLB) A high-speed cache used to hold recently referenced Page table entries as part of a Paged virtual memory scheme. The TLB reduces the frequency of access to main memory to retrieve page table entries.

Trap door :- secret undocumented entry point into a program, used to grant access without normal methods of access authentication.

Trusted system:- A computer and operating system that can be verified to implement a given security policy.

User mode:- The least -privileged mode of execution. Certain regions of main memory and certain machine instructions cannot be used in this mode.

weak semaphore:- A semaphore in which all processes waiting on the same semaphore proceed in an unspecified order (i.e., the order is unknown or indeterminate).

working set:-

working set:- The working set with parameter Δ for a process at virtual time t , $W(t, \Delta)$ is the set of pages of that process that have been referenced in the last Δ time units. compare resident set.

Address space:- The range of addresses available to a computer program.

Beowulf :- Defines a class of clustered computing that focuses on minimizing the price to performance ratio of the overall system without compromising its ability to perform the computation work for which it is being built. Most Beowulf systems are implemented on Linux computers.

communications architecture:- The hardware and software structure that implements the communications function.

Concurrent :- pertaining to processes or threads that takes place within a common interval of time during which they may have to alternately share common resource.

consumable resource :- A resource that can be created (produced) and destroyed (consumed). When a resource is acquired by a process, the resource ceases to exist. Examples of consumable resources are interrupts, signals, messages, and information in I/O buffers.

criticized section:-

External Fragmentation :- occurs when memory is divided into variable-size partitions corresponding to the blocks of data assigned to the memory (e.g. segments in main memory). As segments are moved into and out of the memory, gaps will occur between the occupied portions of memory.

Frame :- In paged virtual storage, a fixed-length block of main memory that is used to hold one page of virtual memory.

File allocation table (FAT) :- A table that indicates the physical location on secondary storage of the space allocated to a file. There is one file allocation table for each file.

File organization :- The physical order of records in a file, as determined by the access method used to store and retrieve them.

Microkernel :- A small privileged operating system core that provides process scheduling, memory management, and communication services and relies on other processes to perform some of the functions traditionally associated with the operating system kernel.

Multilevel security :- A capability that enforces access control across multiple levels of classification of data.

Micato:

Multiprocessing:- A computer that has two or more processors that have common access to a main storage.

Multiprogramming level:- The number of processors that are partially or fully resident in main memory.

Mutual exclusion:- A condition in which there is set of processes, only one of which is able to access a given function at any time. see critical section.

Nonuniform memory access (NUMA) multi processing:- A shared - memory multiprocessor in which the access time from a given processor to a word in memory varies with the location of the memory word.

operating system:- Software that controls the execution of programs and that provides services such as resource allocation, scheduling, input / output control, and data management.

page frame:- A fixed-size contiguous block of main memory used to hold a page.

pipe:- A circular buffer allowing two processes to communicate on the producer-consumer model. Thus, it is a first-in-first-out queue, written by one system process and read by another. In some system, the pipe is generalized to allow any item in the queue to be selected for consumption.

Preemption:- Reclaiming a resource from a process before the process has finished using it.

process image:- All of the ingredients of a process, including program, data, stack, and process control block.

process migration:- The transfer of a sufficient amount of the state of a process from one machine to another for the process to execute on the target machine.

process descriptor:- Same as process control block.

program counter word (psw) :- A register or set of registers that contains condition codes, execution mode, and other status information that reflects the state of a proceeding.

Real-time system:- An operating system that must schedule and manage real-time tasks.

Relative address:- An address calculated as a displacement from a base address.

Remote procedure call:- (RPC):- A technique by which two programs on different machines interact using procedure call/return syntax and semantics. Both the called and calling program behave as if the partner

Program were running on the same machine.

Secondary memory:- Memory located out-side the computer system itself; that is, it cannot be processed directly by the processor. It must first be copied into main memory. Examples include disk and tape.

Sequential access:- The capability to enter data into a storage device or a data medium in the same sequence as the data are ordered, or to obtain data in the same order as they were entered.

Server:- (1) A process that responds to request from clients via messages. (2) In a network, a data station that provides facilities to other stations; for example, a file server, a print server, a print server, a mail server.

Stack:- An ordered list in which items are appended to end deleted from the same end of the list, known as the top. That is, the next item appended to the list is put on the top, and the next time item to be removed from the list the shortest time. This method is characterized as last in first out.

Swapping:- A process that interchanges the contents of an area of main storage with the contents of an area in secondary memory.

Trap:- An unprogrammed conditional jump to a specified address that is automatically activated by hardware; the location from which the jump was made is recorded.

Trap door:- Secret undocumented entry point into a program, used to grant access without normal methods of access authentication.

Busy waiting:- The repeated execution at a loop of code while waiting for an event to occur.

Central processing unit (CPU):- That portion of a computer that fetches and executes instructions. It consists of an Arithmetic and logic unit (ALU), a control unit, and registers. often simply referred used memory executions.

Chained list:- A list in which data items may be dispersed but in which each item contains an identifier for locating the next item.

Compaction:- pertaining to process A technique used when memory is divided into variable size partitions. From time to time, the operating system shifts the partitions so that they are contiguous

and so that all of the free memory is together in one block. see external fragmentation.

Consumable Resource:- A resource that can be created (produced) and destroyed (consumed). When a resource is acquired by a process, the resource ceases to exist. Examples of consumable resources are interrupts, signals, messages, and information in I/O buffers.

Deadlock attack avoidance:- A dynamic technique that examines each new resource request for deadlock. If the new request could lead to a deadlock, then the request is denied.

Deadlock prevention:- A technique that guarantees that a deadlock will not occur. Prevention is achieved by assuring that one of the necessary conditions for deadlock is not met.

Disk cache :- A buffer, usually kept in main memory, that functions as a cache of disk blocks between disk memory and the rest of main memory.

First in first out :- A queueing technique in which the next item to be retrieved is the item that has been in the queue for the longest time.

Frame :- In paged virtual storage, a fixed-length block of main memory that is used to hold one page of virtual memory.

Index sequential file :- A file in which records are ordered according to the values of a key field. The main file is supplemented with an index file that contains a partial list of key values; the index provides a lookup capability to quickly reach the vicinity of a desired record.

Instruction cycle:- the time period during which one instruction is fetched from memory and executed when a computer is given an instruction in machine language.

7. Interrupt handler:- A routine, generally part of the operating system. When an interrupt occurs, control is transferred to the corresponding interrupt handler, which takes some action in response to the condition that caused the interrupt.

D. Worm:- program that can travel from computer to computer across network connections. May contain a virus or bacteria.

Assignment - 2

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Banker's Algorithm

Q

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P ₀	0	1	0	7	5	3	3	3	2
P ₁	2	0	0	3	2	2			
P ₂	3	0	2	9	0	2			
P ₃	2	1	1	2	2	2			
P ₄	0	0	2	4	3	3			

5

Ans. Need (Max - allocation)

$$\begin{array}{ccc}
 A & B & C \\
 7 & 4 & 3 \\
 1 & 2 & 2 \\
 6 & 0 & 0 \\
 0 & 1 & 1 \\
 4 & 3 & 1
 \end{array}$$

\Rightarrow Need \leq Work \Rightarrow Work = Work + Allocation

$$P_0 \quad 7 \ 4 \ 3 \leq \ 3 \ 3 \ 2 \quad \leftarrow \times \text{ condition fails.}$$

$$P_1 \quad 1 \ 2 \ 2 \leq \ 3 \ 3 \ 2 \quad \text{condition true}$$

$$\begin{aligned}
 W &= \text{Work} + \text{allocation} \\
 &= 3 \ 3 \ 2 + 2 \ 0 \ 0 \\
 &= 5 \ 3 \ 2
 \end{aligned}$$

$$P_2 \quad \text{Need} \leq \text{Work}$$

$$6 \ 0 \ 0 \leq 5 \ 3 \ 2 \quad \text{condition false}$$

$$P_3 \quad \text{Need} \leq \text{Work} \quad \text{condition true}$$

$$0 \ 1 \ 5 \leq 5 \ 3 \ 2$$

$$\begin{aligned} \text{W} &= W + \text{Allocation} \\ &= 532 + 211 \\ &= 743 \end{aligned}$$

$$\Rightarrow P_4 \quad \text{Need} \leq \text{WORK} \quad \Rightarrow \text{WB} = W + \text{allocation}$$

$$433 \leq 743 \quad = 743 + 002$$

$$= 745$$

$$\Rightarrow P_0 \text{ Need } \leq \text{ Work} \Rightarrow W = W + \text{ allocation}$$

$$743 \leq 745$$

$$= 745 + 010$$

$$= 755$$

$$\Rightarrow P_2 \text{ Need} \leq \text{WORK} \Rightarrow W_0 = W + \text{Allocation}$$

$$600 \leq 755$$

$$= 755 + 342$$

$$= 1097$$

Safe Sequence is $\rightarrow \langle p_1, p_3, p_4, p_0, p_2 \rangle$

Q FIFO

200

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 0, 3, 2, 1, 2, 0, 1, 7,
0, 1

7	0	1	9	0	3	0	4	2	3	0	3	0	3	2	1	2	0
7	7	7	2		2	2	4	4	4	0				0	0		
7	0	0	0		3	3	3	2	2	2				1	1		
0	1	1			1	0	0	0	3	3				3	2		

1 7 0 1

7	7	7
1	0	0
2	2	1

Page fault = 15

No of frames = 3

Q

LRU

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0,

7	0	1	2	0	3	0	4	9	3	0	3	0	3	2	1	2	0
7	7	7	2		2		4	4	4	0				1	1		
0	0	0			0		0	0	3	3				3	0		
			1	1	3		3	2	2	2				2	2		

1 7 0 1

No of frames = 3

Page fault = 12

1
0
7

Q

Optimal

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1

7	0	1	2	0	3	0	4	2	3	0	3	0	3	2	1	2	0	1
7	7	7	2		2	9		2						2				
0	0	0			0	4		0						0				
			1	1	3	3		3						1				

No of frames = 3

Page fault = 9

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FIFO

1, 3, 0, 3, 5, 6, 3

1	3	0	3	5	6	3
1	1	1		5	5	5
	3	3		3	6	6
		0		0	0	3

Page fault = 6

no of frame = 3

Optimal

7, 0, 1, 2, 0, 3, 0, 4, 2, 0, 3, 2, 3

7	0	1	2	0	3	0	4	2	3	0	3	2	3
7	7	7	7		3		3						
	0	0	0		0		0						
		1	1		1		9						
			2		2		2						

Page fault = 6

No of frames = 9

**DEPARTMENT OF COMPUTER SCIENCE
ROLLWALA COMPUTER CENTRE
GUJARAT UNIVERSITY
M.C.A. -3**

ROLL NO : 23

NAME : Devangi B Pabari

SUBJECT : Operating System

NO.	TITLE	PAGE NO.	DATE	SIGN
1	Basic salary of a person is input through the keyboard. His dearness allowance is 40% of basic salary and house rent is 20% of basic salary. Write a program to calculate the gross pay.	1	10/12/2020	
2	The distance between two cities is input through the keyboard. (in km). Write a program to convert this distance into metres, feet, inches and centimeters and display the results.	2	10/12/2020	
3	The length and breadth of a rectangle and radius of a circle are entered through the keyboard, calculate the perimeter and area of rectangle and area and circumference of the circle.	3	10/12/2020	
4	If a five digit number is entered through the keyboard, calculate the sum of its digits.	4	10/12/2020	
5	The file /etc/passwd contains info about all users. Write a program which would receive the logname during execution, obtain information about it from the file and display the information on screen in some appropriate format. (Hint : use cut) eg. Logname : , UID : , GID : , Default working directory : , Default working shell :	5	10/12/2020	
6	The script will receive the filename or filename with its full path, the script should obtain information about this file as given by "ls -l" and display it in proper format. eg. Filename : , File access permissions : , Number of links : , Owner of the file : , Group to which belongs : Size of file : , File modification date : , File modification time :	6	10/12/2020	
7	If cost price and selling price of an item are entered through the keyboard, write a program to determine whether the seller has made profit or loss. Also determine how much profit/loss is made.	7	10/12/2020	
8	Check whether the entered no. is odd or even.	8	10/12/2020	
9	Check whether the entered no. is prime or not.	9	10/12/2020	

D E P A R T M E N T O F C O M P U T E R S C I E N C E
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GUJARAT UNIVERSITY
M.C.A. -3

R O L L N O : 23

N A M E : Devangi B Pabari

S U B J E C T :Operating System

10	Check whether the entered year is a leap year or not.	10	10/12/2020	
11	The script receives two file names as arguments, the script must check whether the files are same or not, if they are similar then delete the second file.	11	10/12/2020	
14	Write a shell script to display the date with the format :- 25th October 2005 is a Tuesday.	12	10/12/2020	
15	Write a shell script to display the appropriate message like : Good Morning / Good Afternoon / Good Evening	13	10/12/2020	
16	Write a shell script to display the menu driven interface :- 1) list all files of the current directory 2) print the current directory 3) print the date 4) print the users otherwise display "Invalid Option".	14	10/12/2020	
17	Create a menu driven calculator which asks for two integers and perform basic arithmetic operations.	15	10/12/2020	
18	Find the factorial of any number.	16	10/12/2020	
19	Display the fibonacci series upto some number.	17	10/12/2020	
20	Two numbers are entered through the keyboard, find the power, one number raised to another.	18	10/12/2020	
21	Write a script which has the functionality similar to head and tail commands.	19	10/12/2020	
22	Write a script which reports name and size of all files in a directory. whose sizes exceed 1000. The filenames should be printed in the descending order of their sizes. The total no. of files must be reported.	20	10/12/2020	
24	Print the prime nos. from 1 to 300.	21	10/12/2020	
25	Program must display all the combinations of 1, 2, and 3.	22	10/12/2020	
26	Write a script for renaming each file in the directory such that it will have the current shell PID as an extension. The shell script should ensure that the directories do not get renamed.	23	10/12/2020	
27	A file called wordfile consists of several words. Write a shell script which will receive a list of filenames, the first of which would be wordfile. The shell script should report all occurrences of each word in wordfile in the rest of the files supplied as arguments.	24	10/12/2020	
28	Write a shell script which deletes all the lines containing the word "unix" in the files supplied as arguments to it.	25	10/12/2020	
29	The word "unix" is present in only some of the files supplied as arguments to the shell script. You script should search each	26	10/12/2020	

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R O L L N O : 23

N A M E : Devangi B Pabari

S U B J E C T :Operating System

	of these files in turn and stop at the first file that it encounters containing the word unix. The filename should be displayed on the screen.			
30	The word "unix" is present in only some of the files supplied as arguments to the shell script. You script should search each of these files in turn and stop at the first file that it encounters containing the word unix. The filename should be displayed on the screen.	27	10/12/2020	
31	The script displays a list of all files in the current directory to which you have read, write and execute permissions.	28	10/12/2020	
32	The script receives any number of filenames as arguments. It should check whether every argument supplied is a file or directory. If it is a directory it should be reported. If it is a filename then name of the file as well as the number of lines present in it should be reported.	29	10/12/2020	
33	A script will receive any number of filenames as arguments. It should check whether such files already exist. If they do, then it should be reported, if not then check if a subdirectory "mydir" exists or not in the current directory, if it doesn't exist then it should be created and in it the files supplied as arguments should be created.	30	10/12/2020	
34	Accept the marks of 5 subjects and calculate the percentage and grade.	31	10/12/2020	
35	Print armstrog nos. from 1 to 500.	32	10/12/2020	
36	Accept the measure (angles) of a triangle and displa the type of triangle. (eg. acute, right, obtuse)	33	10/12/2020	
37	Display all the numbers from 1 to 100 which are divisible by 7.	34	10/12/2020	
38	Find the largest and smallest of 3 different numbers.	35	10/12/2020	
39	Find HCF and LCM of a given no.	36	10/12/2020	
40	Display the dates falling on Sundays of the current month.	37	10/12/2020	
41	Write a shell script to list the students according to their choice of games ... Eg. Cricket : Aamir Football : Ajay Tennis : Sharukh, Salman	38	10/12/2020	
42	Write a shell script to generate summary from the sales.dat file. Sales made by 3 salesman by selling 3 products are entered in a file. Add atleast10 records. The format is as shown below: Salesman:Product1:Product2:Product3	39	10/12/2020	

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	<p>Sample data: Mr. Abhishek Sharma:21:29:12 Mr. Akash Srivastava:11:15:28 Mr. Abhilash Dwivedi:31:04:13</p> <p>Calculate the followings :</p> <ul style="list-style-type: none"> • Total sales of the company • Highest sold product • Best salesman (who sold the most) • Worst salesman (who sold the least) 																										
43	<p>Create a file “medals.dat” which contains the details of medals won by each country in Olympics. The data in the file may be as given below :</p> <p>(Country name is Primary key.)</p> <table border="0"> <tr> <th>Country</th> <th>Gold</th> <th>Silver</th> <th>Bronze</th> </tr> <tr> <td>India</td> <td>21</td> <td>12</td> <td>15</td> </tr> <tr> <td>Pakistan</td> <td>12</td> <td>10</td> <td>08</td> </tr> <tr> <td>USA</td> <td>10</td> <td>14</td> <td>19</td> </tr> <tr> <td>Srilanka</td> <td>00</td> <td>09</td> <td>07</td> </tr> <tr> <td>.....and so on.....</td> <td></td> <td></td> <td></td> </tr> </table> <ul style="list-style-type: none"> • Write a shell script which will ask the user to enter the Country name, further modify the no. of medals for that country. • Delete all the countries who get zero Gold medals. • Calculate the total no. of medals won by each country. • Find the country with highest Gold medals. 	Country	Gold	Silver	Bronze	India	21	12	15	Pakistan	12	10	08	USA	10	14	19	Srilanka	00	09	07and so on.....				40	10/12/2020
Country	Gold	Silver	Bronze																								
India	21	12	15																								
Pakistan	12	10	08																								
USA	10	14	19																								
Srilanka	00	09	07																								
.....and so on.....																											
44	<p>Write a shell script to generate summary from a file : “student.dat” with following format :</p> <p>Student_no : student_name : gender : marks1 : marks2 :marks3</p> <p>Each field must be separated by a delimiter ‘-‘</p> <p>Process the following queries:</p> <ul style="list-style-type: none"> • Calculate the total marks of each student • Calculate the percentage of marks for each student • Count the total number of male and female students • Count the total number of students who pass and those who fail. 	41	10/12/2020																								
45	A reputed MCA institute of Gujarat has students from various states. A sample file “students.dat” is shown as under :	42	10/12/2020																								

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State	M	F
Gujarat	18	12
Maharashtra	12	04
M.P.	08	04
U.P.	05	00
Rajasthan	07	00

Total Male candidates are 50 and Female are 20. Write a shell script to generate a Statewise Candidate Distribution Report as under :

STATEWISE CANDIDATES LISTING

%FEMALE	STATE TOTAL	%MALE
30	GUJARAT	36
16	MAHARASHTRA	24

..... and so on.....

- 46** Write a Shell script to generate summary from a file "books.dat" which contains the following details :

Field	Description
No	Numeric (4) – uniquely identifies each book.
Title	Alphanumeric(30) – title of the book
Author	Character(20) – Author of the book
Publisher	Character(20) – Publisher (PHI , TMH,BPB...)
Edition	Numeric (2)

Sample Data:

**b1001 Programming in Java Balaguruswamy
Second**

**b1002 Computer Networks Tanenbaum Pearson Fifth
b1003 Operating Systems Chaudhari Jaico First**

After creating the file do the followings :

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	<ul style="list-style-type: none"> • Your script must replace all the BPB publisher with TMH. • List the titles with the name ‘Java’. • List the books written ‘Balaguruswamy • List the books which are not the first edition 															
47	<p>Create a file “election.dat” which contains the Election details for a specific city.</p> <table> <thead> <tr> <th>Field</th><th>Description</th></tr> </thead> <tbody> <tr> <td>Idno</td><td>Numeric - Unique</td></tr> <tr> <td>Name</td><td>Character – Voter’s Name</td></tr> <tr> <td>Sex</td><td>Character – M / F</td></tr> <tr> <td>Age</td><td>Numeric</td></tr> <tr> <td>Ward</td><td>Numeric – Ward no. / Division no. of the city.</td></tr> </tbody> </table> <p>Sample data:</p> <p>e101 - abhishek - M - 35 - 44 e102 - ashutosh - M - 97 - 14 e103 - anamika - F - 21 - 50</p> <p>Suppose the same file is to be modified after 4 years. Write a shell script to simulate this process.</p> <p>Your program must update the age of all People (Add 4 years to age). In case if the age exceeds 99 then delete the record from the file, assuming that the person is dead.</p> <p>Display the election.dat and final output of your program.</p>	Field	Description	Idno	Numeric - Unique	Name	Character – Voter’s Name	Sex	Character – M / F	Age	Numeric	Ward	Numeric – Ward no. / Division no. of the city.	44	10/12/2020	
Field	Description															
Idno	Numeric - Unique															
Name	Character – Voter’s Name															
Sex	Character – M / F															
Age	Numeric															
Ward	Numeric – Ward no. / Division no. of the city.															
48	<p>In a college, students are allowed to select any one elective subject during his studies. Create two files by entering the data as mentioned below (you may skip the heading line if required) :</p> <p>File : elective.dat</p> <table> <thead> <tr> <th>Code</th><th>Game</th></tr> </thead> <tbody> <tr> <td>101</td><td>AI</td></tr> <tr> <td>102</td><td>Computer Graphics</td></tr> <tr> <td>103</td><td>Parallel Processing</td></tr> </tbody> </table>	Code	Game	101	AI	102	Computer Graphics	103	Parallel Processing	45	10/12/2020					
Code	Game															
101	AI															
102	Computer Graphics															
103	Parallel Processing															

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104 Data Mining

File : students.dat

RollNo. Name Code

**1 Sonal 101
 2 Madhu 101
 3 Mahim 103
 4 Esha 104**

Write a shell script to list the students according to their choice of electives ...

Eg. AI :- Sonal, Madhu

Computer Graphics: -

Parallel Processing :- Mahim

Data Mining :- Esha

49	<p>Create two files: subjects.dat and students.dat containing the subject details and the student details.</p> <p>Sample data is as shown below:</p>	46	10/12/2020	
	<p>subjects.dat</p> <p>Course_id-Semester_id-Subject_id-Subject_name</p> <p>CS-1-1-FCO</p> <p>CS-1-2-FOP</p> <p>CS-1-3-SL</p> <p>CS-2-1-DS</p> <p>CS-2-2-DBMS</p> <p>CS-3-1-OS</p> <p>CS-3-2-JAVA</p> <p>faculty.dat</p> <p>Faculty_id:Semester_id:Subject_id</p> <p>F1-2-1</p> <p>F2-3-2</p> <p>F3-1-3</p> <p>F1-1-1</p> <p>Write a shell script to list the faculties and their respective subjects. Sample Output will be :</p>			

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	F1 : FCO, DS F2 : JAVA F3 : SL			
50	<p>Create two files employee.dat and departments.dat and add atleast 10 records in the following format :</p> <p>employee.dat</p> <p>emp_id:department_id:birthdate</p> <p>e101:M1:11-01-1960</p> <p>e102:C1:21-03-1973</p> <p>e103:M2:21-03-1973</p> <p>e104:C1:21-03-1973</p> <p>e105:B1:08-10-1965</p> <p>e101:M1:11-11-1964</p> <p>departments.dat</p> <p>departmend_id:department_name</p> <p>B1:Botany</p> <p>C1:Chemistry</p> <p>M1:Mathematics</p> <p>M2:Management</p> <p>Write a shell script to do the followings:</p> <p>1) List all the employee_ids department-wise</p> <p>2) List the employee_ids born after 1970</p> <p>3) List the employee_ids according to birthdate in sorted order</p>	47	10/12/2020	

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