

Department of Computer Science

Gujarat University



Certificate

Roll No: 02

Seat No: _____

This is to certify that Mr./Ms. Awasthi Pratik Ajaykumar 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(OS) towards partial fulfillment of his/her Degree of Masters in Computer Applications.

Date of Submission
10 - December - 2020

Internal Faculty

Head of Department

Department Of Computer Science
Rollwala Computer Centre
Gujarat University

MCA – III

Subject: - Operating System (OS)

Name: - AWASTHI PRATIK AJAYKUMAR

Roll No.: - 02 **Exam Seat No.: -** _____

OSAssignment

c) Define the following keywords

→ Base address

An address that is used as a origin in the calculation of address 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

→ Binary Semaphore

A semaphore that takes on only the values 0 & 1. A binary semaphore always only one process at a time has access to a shared critical resource.

Block

is collection of contiguous records as a unit. The units are separated by interblock gaps.

Tree

IS technique for organising indices in order to keep access time to a minimum. It starts from data key which is a balanced hierarchy that continually balances hierarchy that itself as items are inserted and deleted. Thus all nodes always have a similar number of keys.

Busy waiting

The repeated executions of a loop of code while waiting for an event to occur.

Cache memory

A memory that is smaller and faster than main memory and that is shared between the processes.

and main memory. The cache acts as a buffer for recently used memory location.

Central Processing Unit

That part of computer that fetches the execution instructions. It consists of an arithmetic and logic unit (ALU) a control unit and registers often simply referred to as a processor.

Clusters

A group of interconnected whole computers working together as a unified computing resource that can create the illusions of being one machine. The term whole computer means a system that can run as its own a part from the clusters.

Concurrent

Pertaining to process at once.

that take place within a common interval of time during which they have to alternate phase common resources

Consumable resources

A raw source that can be created and destroyed when a resource is required by a process the resource

Database

is collection of interrelated data often with controlled redundancy organized according to scheme to run any or most applications

Deadline

An input that occurs when multiple process are waiting for the availability of a resource that will not become available because it is being used by the another process that is similar to last state

Demand Paging

The transfer of page from secondary memory to main memory happens at the moment of use compare preparing

Device Direct

An operating system module that deals directly with a device or I/O module

Direct Access

The capability to obtain data from a storage device or to enter data into a storage device in a certain process.

Direct memory address

A form of I/O which a special module called a DMA module entails the exchange of data b/w main memory & I/O devices in masses sends a request for the transfer of a block of data to the DMA

Disable Interrupt

A condition usually created by the OS during which the processes will ignore interrupt request signal of specified class

Disk allocation table

A table that indicates which blocks of secondary storage are free & available for allocation to files

Distributed Operating System

A common operating system should be network of computers. The distributed operating system provides support for interprocess communication, process migration, mutual exclusion and monitors as well as other mechanisms.

Dynamic Relocation

A process that assigns new absolute address to a computer program during execution so

that the program may be executed from a different area of main storage

Enable Interrupt

A condition usually created by the operating system during which the process will respond to interrupt request signals of specific class

External fragmentation

Occurs when memory is divided into a variable size partitions corresponding to the blocks of data assigned to the memory. As segments are moved into and out of the memory will be occurs between the occupied partitions of the memory.

File

A set of related records treated as a unit.

- field
 - Define logical data that are part of record
 - The elementary unit of a record that may contain a data item a data aggregates to a pointer or a link

file allocation table

- A table that indicates the physical location and storage of the space allocated to a file. There is one file allocation table for each file

file management system

- A set of system software that provides services to users and applications in the use of files access directory maintenance and access control

file organization

The physical order of records is a file as determined by the access method used to store and retrieve them

First is First out

i.e. queuing technique is which
the next item to be retrieved
is the item that has been in the
queue for the longest time

first come first served

Same as FIFO

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

Hashing

The selection of a storage locations
of an item of data by
calculating the address as a
function of the elements of the
contents of the data this technique
complicates the storage allocates
functions

Hit Ratio

In a two level memory the fraction of all memory access that are found in the faster memory

Indexed access

Referring to the organization and accessing of the records of a storage structure through a separate index to the location of a record.

Indexed file

A file in which records are accessed using the value of key field. An index is required that indicates the location of each record on the basis of each key value.

Indexed sequential access

Referring to the organization and accessing of the records of a storage structure through an index of the keys.

Inverted Sequential file

A file is 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 lookup capability to quickly locate vicinity of a desired record.

Instruction cycle

The time period during which an instruction is fetched from memory and executed when a computer is given task.

Internal fragmentation

occurs when memory is divided into a fixed size partition. If a block of data is assigned to one or more partitions. This will occur if the last partition of data is smaller than the last partition.

Interrupt

A suspension of process such as the execution of computer program caused by an event internal to the process so the process is performed in such way that the process can be resumed.

Interrupt handler

is usually part of operating system when an interrupt occurs control is transferred to the corresponding interrupt which takes some action in response to condition that caused the interrupt.

Task

A set of compilational steps packaged to run as a unit

Kernel

A portion of operating system that includes most heavily used functions is retained permanently in main memory

Kernel mode

A privilege mode of execution reserved for the kernel of the operating system typically Kernel mode allows access to regions of main memory that are unavailable to process executing a less privileged mode and also enables execution of certain machine instructions that are restricted to the kernel mode. Also referred as system mode or privilege mode.

LIFO

A queuing technique is where the next item to be returned is the item most recently placed in queue.

Unlock

A condition in which two or more processes continuously change their state in response to changes allows progress without doing any useful work. This is similar to deadlock in that no progress is made.

Logical Address

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

logical record

A record independent of its physical environment: partition of one logical record may be located in different physical record or several logical records as parts of logical record may be located in one physical record.

Main memory

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

Malicious Software

Any software designed to cause of a target computer damage to or use up the resources of a target computer

Memory Cycle time

The time it takes to read and write from as well as write to memory. This is the inverse of the rate at which words can be read as written to memory.

Memory Partitioning

The subdividing of storage into dependent sections

Microkernel

A small privileged operating system that provides process scheduling, memory management and communication services to other processes to perform some of the function

Multiplexing

is mode of operation that provides for parallel processing by two or more processes of multiprocessor

Multiprogramming

is mode of operation that mainly for interleaved execution of two or more computer programs by a single processor the same as multitasking using diff terminology

Multiprogramming level

The number of process that are partially or fully executed in main memory

Multitasking

A mode of operation that provides for concurrent performance of interleaved execution of two or more computer tasks the same as multiprogramming

Mutual exclusion

A condition in which there is set of processes only one of which is able to access a given resource or perform a given function at any time.

Operating system

Software that controls the execution of programs and that provides resources such as resource allocation, scheduling, input / output control & data management.

Page

In virtual memory a fixed length block that has a virtual address and that is transferred from main memory to second memory.

Page fault

occurs when the page fault reported was in main memory. This causes the internal and requires that proper pages be brought into memory.

Page frame

Is fixed size contiguous block of main memory used to hold a page

Paging

The transfer of pages from main memory to secondary memory

Physical address

The absolute location of a unit of data is memory (eg word as well) is memory block in secondary memory

Pipes

A circular buffer allowing two process to communicate in the producer consumer model thus it is a first in first out queue written by one process and read by another is known as pipe. The pipe is generalized to allow any items in the queue to be scheduled for consumption.

Presumptions

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

Prepaging

The retrieval of pages other than the one demanded by a page fault. The hope is that the additional page will be needed in the near future, conserving disk I/O's caused by demand paging.

Process

A program is executing. A process is composed and scheduled by operating system.

Process control block

The manifestation of process is an operating system. It is a data structure containing information about the characteristics and state of the process.

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 State

All the information that operating systems need to manage a process and that the processes need to be properly executed. The process has various states include the controls of various processor registers such as the program counter and data registers. It also includes information of uses to operating system such as the priority of the process or when the process is waiting for the completion of a particular I/O unit such as memory content.

Program Counter

Instructions address registers of program

Processors

In a computer a functional unit that interprets and executes instructions
A processor consists of atleast one instruction control unit and one arithmetic unit

Programmed 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

Real time System

An operating system that must schedule and manage real time things

Real time tasks

A task that is executed in connection with some process as function as set of events internal to the computer system and that must run many cycles.

Registers

high speed memory interval or
the CPU same registers are
easier visible that is available to
the programmes via the machine
instructions but other registers are
used by the CPU for control purposes

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 & semantics. Both the calling
& called program behaves as if no
partner program were running on the
same machine.

Response time

In a data system the logical times
between end of transmission of
an enquiry message and the beginning of
the receipt of a response from message

Round Robin

A scheduling algorithm in which processes are scheduled in a fixed circular order that all processes are in a waiting for an event. They荒 input / output operation return control to the scheduler.

Scheduling

To select jobs or tasks that are to be completed in some operating system other units of work, such as input / output operations may also be scheduled.

RoundRobin

Memory located outside the compiler system itself that it cannot be processed directly by the processor. It first must be copied into main memory example includes disks & tapes

Segment

In virtual memory a block that has virtual address the blocks of a program may be unequal length and may even be of dynamically varying lengths.

Segmentation

The division of program in application into fragments a part of virtual memory scheme

Semaphores

An integer value used for signalling among processes only pure operations may be performed on a semaphore all of which are atomic i.e. increment and decrement. Depending on the exact operations of the semaphore the decrement operation may in result in the blocking of process and the increment operation may result in the unblocking of a process.

Segmented file

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

Session

The collection of one or more processes that represents a single interactive user application together with its input and output. It is equivalent to the foreground session it is attached to and sharing some shell.

The portion of OS that interacts operating system to interact with commands & jobs control language commands it function as an interface between the user and operating system

Stack

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

Semaphores

A condition is which a process is indefinitely delayed because the other processes are always greater preferences.

Shared semaphores

A semaphore is which all processes waiting on the same semaphore are queued and will eventually proceed in the same order as they entered the wait.

Swapping

A process that interchanges the contents of an area of main storage with the contents of an area in secondary memory

Symmetric multiprocessor

A form of multiprocessing that allows the operating system to switch on any available processor as on several available processors simultaneously

Synchronous Operations

An operations that occurs regularly or predictably with respect to the occurrences of specified event in another process
for example: the calling of an input/output routine that receives central all needed data is the computer program

Synchronizer

situation in which two or more process coordinate their activities

System bus

A bus used to interconnect major computer components (CPU, memory, I/O)

Task

Same as process

Thashing

A phenomenon is virtual memory schemes in which one processor spends most of its time swapping pieces rather than executing instructions

Thread

A dispatchable unit of work it includes processor context (which includes the program counter & stack and its own data area for stack (to enable subroutine branching)) A thread executes sequentially and is interruptible so that one processor can go to another thread

Thread Switch

The act of switching processes
control from thread to another
within the same process

Time Sharing

The concurrent use of devices
by a number of users

Time Slice

The maximum amount of time
that a process can execute
before being interrupted

Time Slicing

is made of an operation in
which two or more processes
are assigned quota of time
on the same processor

Free

A sequence of instructions that
are executed when a process is
running

Trap

An unprogrammed conditional jump
to a specific address
That is automatically activated
by the hardware: In break
form 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

Trojan horse

Secret undocumented failure
embedded within a useful
program executes as the
program results in failure
of target unit

Useless code

The chart presented made of
useless regions of memory
and certain machine

Trap

An unprogrammed conditional jump
to a specific address
that is automatically activated
by the 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.

Troyan horse

Secret undocumented feature
embedded within a useful
program. Execution of the
program results in execution
of secret unit

User mode

The start procedure made of
instructions contain means of main
memory and contain machine

instructions cannot be used
in this mode

Virtual address

The address of storage locations
is virtual memory

Virtual memory

The storage space that
may be regarded as addressable
main storage by the user
of computer systems is called
virtual address. The size of
virtual storage is limited by
the addressing scheme of the
computer system and by the
amount of secondary memory
available and not by the
actual number of main
storage locations. The size of
the computer system and
by the amount of secondary
memory available and not
by the actual number of main
storage locations.

Virus

Secret documented routine
imbedded within useful program
function of the program,
results in execution of the
secret routine

Weak Smapham

A Smapham is when all
processes waiting on the
same Smapham are processed
in an unspecified order (i.e.
the order is unknown or
intermixed)

Word

An ordered set of bytes or
bits that is the normal
unit of transmitted or operated
on within a given computer
Typically if processor bus
a fixed length instruction
length is equals word length

Working set

The working set with par
for a process at virtual time
 t , $w(t, s)$ is the set of pages
of that process that have
been referred in the last s
time units

Worm

Program that can travel from
computer to computer across
network connections may contain
a virus or backdoor

File Allocation Table

A table that indicates
the physical locations on
secondary storage of the space
allocated to a file

There is one file allocation table
for each file

File management system

A set of system software that provides services to user and applications in the form of file including file access directly maintenance and access control

Encryption

The conversion of plain text or data into unintelligible form by means of a reversible mathematical computation

Multilevel security

A capability that enforces access control across multiple levels of classification of data

Object request broker

An entity in an object oriented system acts as an intermediary for request sent from a client to server

File management system

A set of system software that provides services to user and applications in the form of file. Including file access directly, maintenance and access control.

Encryption

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

Multilevel security

A capability that enforces access control across multiple levels of classification of data.

Proxy request breaker

An entity in an object oriented system acts as an intermediary for request sent from a client to servers.

Priority inversion

A circumstance in which an operating system denies a higher priority task to wait for lower priority task

Process description

Same as process control block (PCB)

Process image

All of the ingredients of a process excluding memory ^{data}, stack and process control block

Server

A process that responds to request from clients via message

In a network a data function that provides facilities to other stations

for ex a file server a print server, mail server etc

Assignment - 2Banerjee's Algorithm

Process	Allocation	Max	Availability	Need
	A B C	A B C	A B C	A B C
P ₀	0 1 0	7 5 3	8 32	7 4 3
P ₁	2 0 0	3 2 2		1 2 2
P ₂	3 0 2	9 0 2		6 0 0
P ₃	2 1 1	2 2 2		0 1 1
P ₄	0 0 2	4 3 3		4 3 1

Need \leq work \rightarrow marks = work + allocations

P₀ 743 \leq 332 $\leftarrow \times$ condition fails

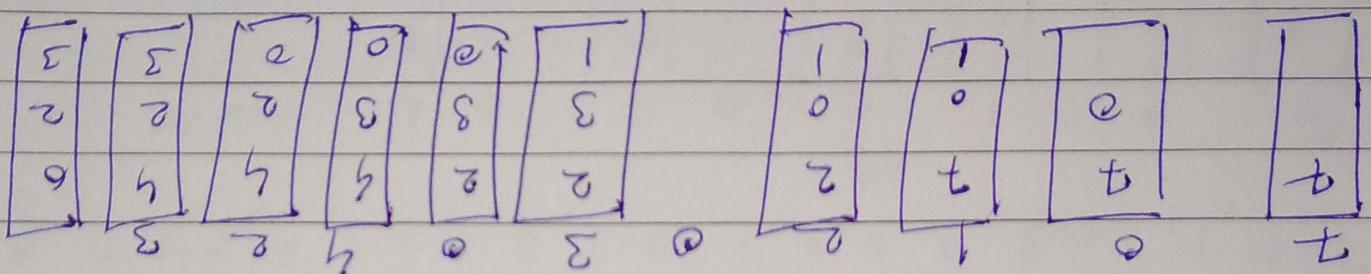
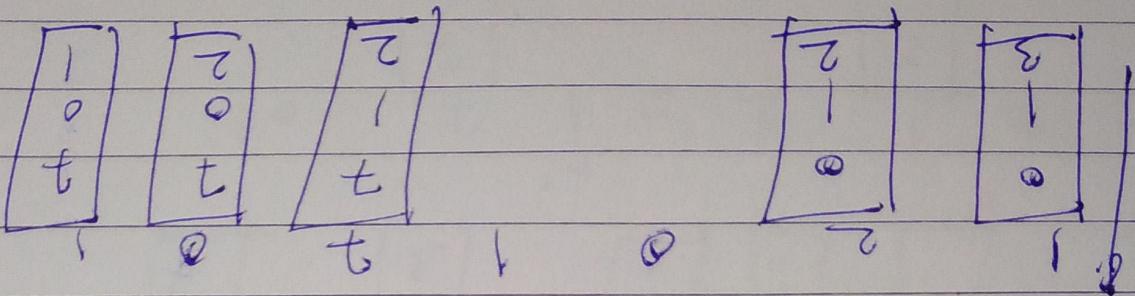
P₁ 122 < 332 Condition fails
 $w =$ work allocation
 $w = 332 + 200$
 $= 532$

P₂ and 8 work
 600 \leq 532 condition fails

P₃ = need \leq work
 0 11 \leq 532
 Condition fails

$w =$ w allocations
 $= 532 + 211$
 $= 743$

Pen found = 15



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

F1F2

the show in 15P1f3, Ra1P0, P27

= 10 5 7

= 15 5 + 3 4

and small - small - small - small - small - small

= 7 5 5

= 14 5 + 1 4

as small - small - small - small - small - small

short < short

for: small words

- 12 -

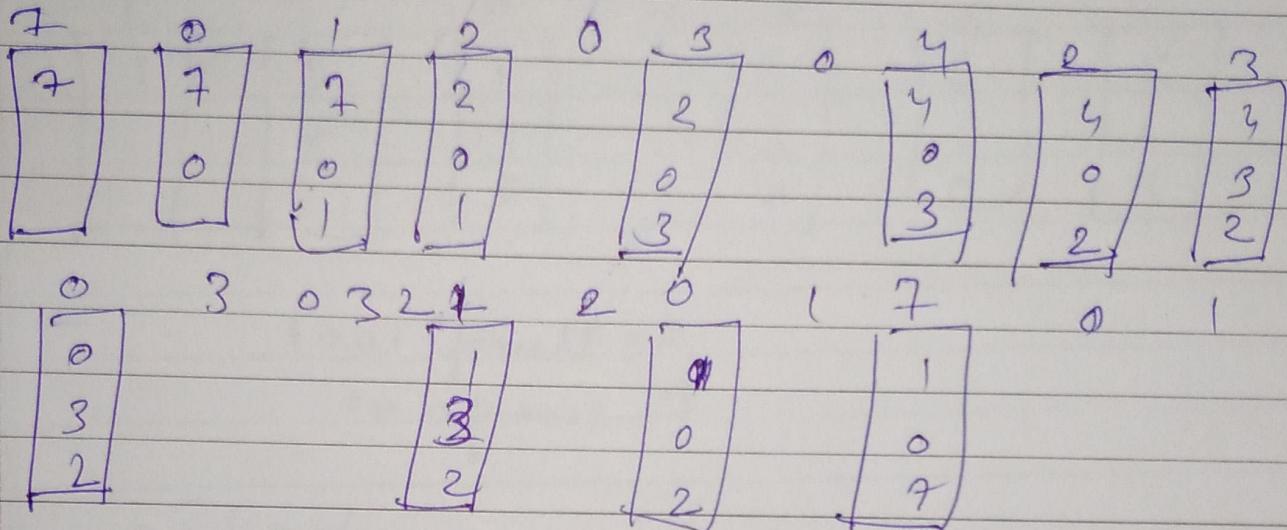
= 8 4 3 2 4 3

and small words

big: 4 3 1 > 1 8 4

LRU

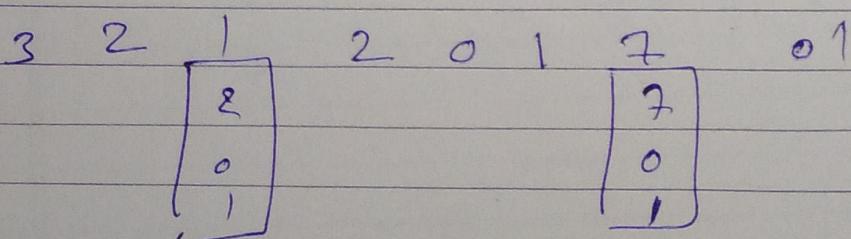
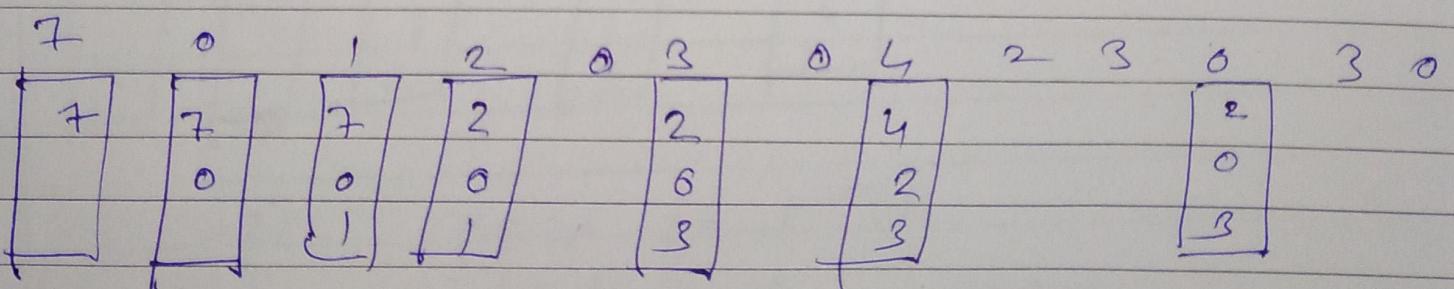
7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1



No of pages = 3 Page fault = 12

optimal

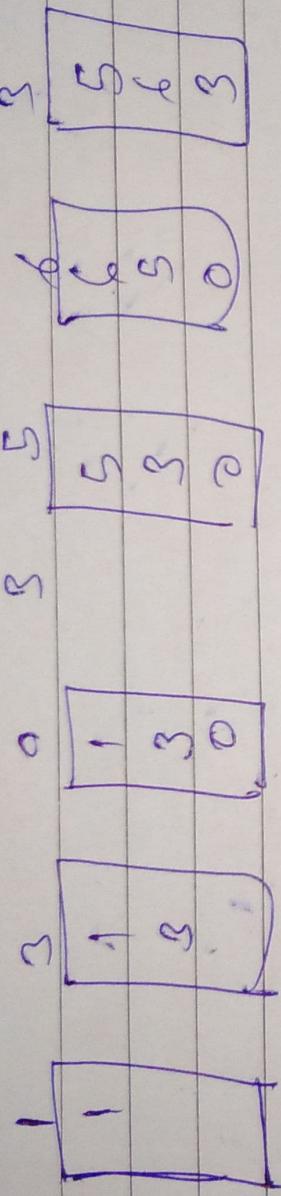
7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 1, 0, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1



No of page = 3
Page fault = 9

FIFO

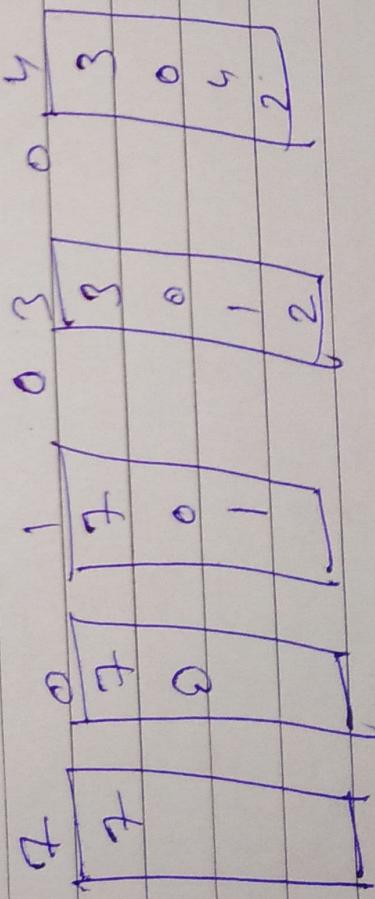
1, 3, 0, 3, 5, 6, 3



Poor fault \Rightarrow
No outliers \Rightarrow

optimized

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



Poor fault \Rightarrow
No outliers \Rightarrow

**DEPARTMENT OF COMPUTER SCIENCE
ROLLWALA COMPUTER CENTRE
GUJARAT UNIVERSITY
M.C.A. – III**

ROLL NO : 02

NAME : AWASTHI PRATIK AJAYKUMAR

SUBJECT : Operating System (OS)

NO .	TITLE	PAGE NO.	DATE	SIGN
1	Calculate Gross Salar		10-Dec-20	
2	Distance between two cities		10-Dec-20	
3	Area of Rectancle & Circle		10-Dec-20	
4	Sum of digits of a number		10-Dec-20	
5	Lognames		10-Dec-20	
6	File details		10-Dec-20	
7	Profit/ Loss		10-Dec-20	
8	Odd/ Even		10-Dec-20	
9	Prime or No		10-Dec-20	
10	Leap Year		10-Dec-20	
11	Similar Files		10-Dec-20	
12	--Cancelled--		10-Dec-20	
13	--Cancelled--		10-Dec-20	
14	Date Display		10-Dec-20	
15	Greeting		10-Dec-20	
16	Menu Driven Interface		10-Dec-20	
17	Arithmetic Calculator		10-Dec-20	
18	Factorial		10-Dec-20	
19	Fibonacci		10-Dec-20	
20	Power of yraised to x		10-Dec-20	
21	Similar to Head/Tail Command		10-Dec-20	
22	Files > 1000		10-Dec-20	
23	--Cancelled--		10-Dec-20	
24	Prime numbers 1-2=300		10-Dec-20	
25	Combinations of 1, 2, 3		10-Dec-20	
26	Rename each file with extension .PID		10-Dec-20	

**DEPARTMENT OF COMPUTER SCIENCE
ROLLWALA COMPUTER CENTRE
GUJARAT UNIVERSITY
M.C.A. – III**

R O L L N O : 02

N A M E : AWASTHI PRATIK AJAYKUMAR

S U B J E C T : Operating System (OS)

27	Occurrence of each word in file		10-Dec-20	
28	Delete lines with word “unix”		10-Dec-20	
29	Stop at the first file that encounter word “unix”		10-Dec-20	
30	Copy even files		10-Dec-20	
31	All files in current directory with read, write & execute permissions		10-Dec-20	
32	File or Directory?		10-Dec-20	
33	File exists or not? If not create in mydi		10-Dec-20	
34	Calculate Percentage & Grades		10-Dec-20	
35	Armstrong numbers between 1 to 500		10-Dec-20	
36	Acute / Right / Obtuse Angle		10-Dec-20	
37	Numbers divisible by 7 in 1-100		10-Dec-20	
38	Smallest & Largest of 3 numbers		10-Dec-20	
39	HCF & LCM		10-Dec-20	
40	Dates falling on Sunday of current month		10-Dec-20	