

Department of Computer Science

Gujarat University



Certificate

Roll No : 40

Seat No :

This is to certify that Mr./Ms. Tanishka Jigish Vadwala 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.

*Date of Submission
10/12/2020*

Internal Faculty

Head of Department

Department Of Computer Science
Rollwala Computer Centre
Gujarat University

MCA - III

Subject: - Operating System (OS)

Name: - Tanishka Vadwala

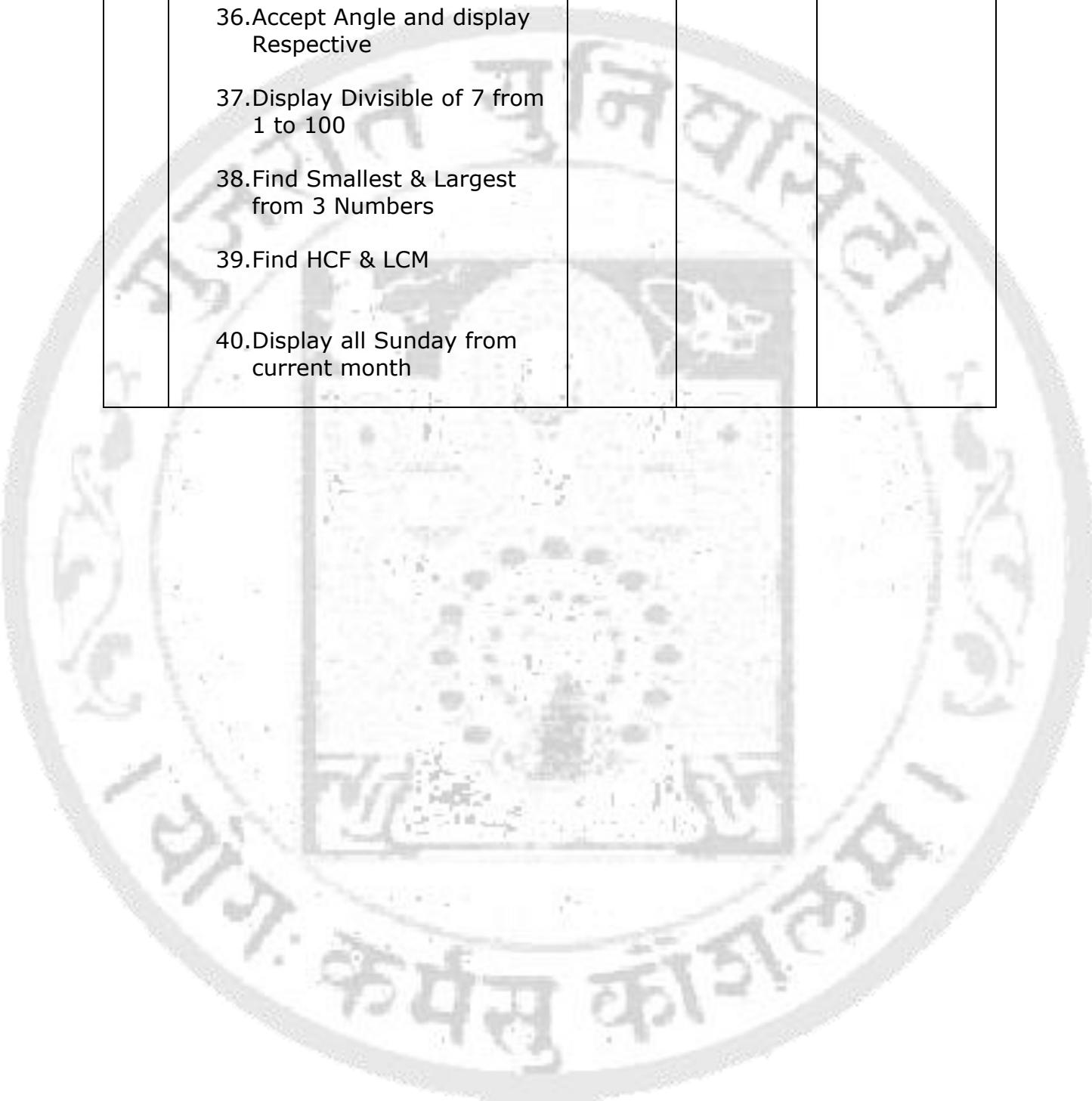
Roll No.: - 40

Exam Seat No.: - _____

Sr. No.	Contents	Pg. No	Date	Signature
1	Glossary(Assignment-1)	1	10-12-20	
2	Numericals(Assignment-2)	30	10-12-20	
3	Shell Scripts 1. Salary counter 2. Distance Finder 3. Area & perimeter 4. Calculate Digit Sum 5. Get information from /etc/passwd 6. Check File details 7. Get Profit or Loss 8. Odd or Even 9. Prime or Not 10. Leap Year or Not 11. Check 2 file are same or Not 12. ----Canceled--- 13. ----Canceled--- 14. Date Format 15. Display the Appropriate Message like Good Morning/Good Evening		10-12-20	

	<p>16.Display menu Driven Interface</p> <p>17.Menu Driven Calculator</p> <p>18.Factorials</p> <p>19.Fibonacci Series</p> <p>20.Input 2 number, find power using both numbers as base and exponent</p> <p>21.Use Similar to Head and Tail</p> <p>22.Display file name and size in descending order</p> <p>23. ---Cancelled---</p> <p>24.Prime number from 1 to 300</p> <p>25.Display combination of 1,2 & 3</p> <p>26.Rename file with shell PID as extension</p> <p>27.Find Occurrence of words from first file in rest of the files.</p> <p>28.Script delete occurrence of word "UNIX"</p> <p>29.Find Occurrence of "unix" word from every file.</p> <p>30.Script Receive file name as argument and copy file content such that file-1 copy to file-2, file-3 copy on file-4 so on.</p> <p>31.Display file which has execute permission</p> <p>32.Check if it's a file or directory</p> <p>33.Check the file name is exist if not then check</p>		
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	<p>"mydir" is exists or not.</p> <p>34.Calculate Percentage & Grade</p> <p>35.Armstrong Numbers</p> <p>36.Accept Angle and display Respective</p> <p>37.Display Divisible of 7 from 1 to 100</p> <p>38.Find Smallest & Largest from 3 Numbers</p> <p>39.Find HCF & LCM</p> <p>40.Display all Sunday from current month</p>		
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Name : Tanishka Vadveala

Roll No : 40

Class : MCA - 03

Subject : Operating System.

Assignments..

Operating System :-

Assignment :-

* Definitions of all chapters

1. Base Address :-

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

2. 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.

3. Binary Semaphore :-

A semaphore that takes on only the values 0 and 1. A binary semaphore allows only one process/thread to have access to a shared critical resource at a time.

4. Block :-

A collection of contiguous records that are recorded as a unit; the units are separate by interblock gaps.

5. B-tree :-

A technique for organizing 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 & deleted.
 Thus all the nodes always have a similar number of keys.

6. Busy-waiting :-

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

7. Cache memory :-

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

8. CPU :- (Central processing unit)

That portion of a computer that fetches & executes instructions. It consists of an ALU, a control unit & registers.
 Often simply referred to as a processor.

9. Cluster :-

A group of interconnected, whole computer working together as a unified computing resource that can create the illusion of being one machine.

10. Concurrent :-

Pertaining to processes or threads that take place within a common interval of time during which they may have to alternatively share common resources.

11. Consumable Resources :-

A resource that can be created & destroyed when a process is acquired by a process, the resource leaves to exists.

Eg:- of consumable resources are interrupts, signal messages & info.

12. Database :-

A collection of interrelated data, free with controlled redundancy, organized according to scheme to serve one/more applications. The data are stored so that they can used in

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different programs without concern for the data structures or org. A common approach is used to add new data & to modify & retrieve existing data.

13. Deadlock :-

1. An impasse that occurs when multiple processes are waiting for the availability of a resource that will not become available because it's being held by another process that's 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's in a similar wait state.

14. Deadlock Avoidance :-

A dynamic technique that examines each new resource request for deadlock.

If the new request for deadlock, or if the new request could lead to a deadlock, the request is denied.

15. Deadlock Detection :-

A technique in which requested resources are always granted when available, periodically, the OS looks for deadlock.

16. Deadlock Prevention :-

A technique that guarantees that a deadlock won't occur. Prevention is achieved by assuring that one of the necessary

17. Demand Paging :-

The transfer of a page from secondary memory to main memory storage at the moment of need. Compare prepaging.

18. Device Driver :-

An OS module that deals directly with a device or I/O module.

19. Direct Access :-

The capability to obtain data from a storage device or to enter data into a storage device in a sequence independent of

their relative position, by means of address that indicate the physical location of the data.

20. DMA :-

A form of I/O in which a 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 & is unprompted only after the entire block has been transferred.

21. Disabled Interrupt :-

A condition, usually created by OS, during which the processor will ignore interrupt requests signals of a specified class.

22. Disk Allocation Table :-

A table that indicates which block on secondary storage are free & available for allocation to files.

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23. Dispatch :-

To allocate time on a processor to jobs or tasks that ready for execution.

24. Distributed Operating System :-

A common OS shared by a network of computers. The Distb OS provides support for interprocess communication, process migration, mutual exclusion & the prevention / detection of deadlock.

25. 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.

26. Enabled Interrupt :-

A condition, usually created by the OS during which the processor will respond to interrupt request signals of a specified class.

27. External Fragmentation :-

Occurs when memory is divided into variable-size partitions corresponding to the blocks of data assigned to the memory. As segments are moved into & out of the memory, gaps will occur between the occupied portions of memory.

28. 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.

29. File :-

A set of related records treated as a unit.

30. File Allocation Table :-

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

31. File Organisation :-

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

32. FCFS, FIFO :-

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

33. 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.

34. Hashing :-

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

35. Hit Ratio :-

In a 2-level memory, the fraction of all memory addresses that are found in the faster memory.

36. Indexed Access :-

Pertaining to the org & accessing of the records of a storage structure through a separate index to the locations of the stored records.

37. Indexed Files :-

A file in which records are accessed according to the value of key fields.

An index is required that indicates the location of each record on the basis of each key value.

38. Indexed Sequential Access :-

Pertaining to the org & accessing of the records of a storage structure through an index of the keys that are stored in arbitrarily partitioned sequential files.

39. Indexed Sequential Files :-

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

40. Instruction Cycle :-

The time period during which one instruction is fetched from memory and executed when a computer is given an inst in machine language.

41. Internal Fragmentation :-

Occurs when memory is divided into fixed-sized 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 that last partition of data is smaller than last partition.

42. Interrupt :-

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

43. Interrupt Handler :-

A routine, generally part of the OS. When an interrupt occurs, control is transferred to corresponding interrupt handler which takes some action in response to the conditions that caused the interrupt.

44. Job :-

A set of computational steps or packages to run as a unit

45. Kernel :-

A kernel of OS that includes the most heavily used portions of software. Generally kernel is maintained permanently in main memory. The kernel runs in a privileged mode & responds to calls from processes & interrupts from devices.

46. Kernel Mode :-

A privileged mode of execution reserved for the kernel of the OS. Typically Kernel mode allows access to regions of main memory that are unavailable to processes executing in a less-privileged mode.

47. LIFO :-

A queuing technique in which the next item to be retrieved is the item most recently placed in a queue.

48. Line lock :-

A condition in which 2 or more process continuously change their state in response to changes in the other processes without doing any useful work. This is similar to deadlock, but it differs from that, neither process is blocked or waiting for anything.

49. Logical Address :-

A reference to a memory location independent of the current assignment of data to memory.

50. Logical Record :-

A record independent of its physical env, portions of one logical record may be located in different physical records or several logical records.

51. Main Memory :-

Memory that's internal to the computer system, is program addressable & can be loaded into registers for subsequent execution.

52. Malicious Software :-

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

Malicious software is frequently concealed within or masquerades as legitimate software.

53. Memory Cycle Time :-

The time it takes to read one word from or write one word to memory.

54. Memory Partitioning :-

The subdividing of storage into independent sections.

55. Micro-Kernel :-

A small privileged OS core that provides process scheduling, memory management & communication services & relies on other processes to perform some functions traditionally.

56. Multi-processing :-

A mode of operation that provides for parallel processing by 2 or more processors of a multi-processor.

57. Multi-Programming :-

A mode of operation that provides for the interleaved execution of 2 or more computer programs by a single processor.

58. Multi programming level :-

The number of processes that are partially or fully resident in memory.

59. MultiTasking :-

A mode of operation that provides for the concurrent performance of inter-leaved execution of 2 or more computer tasks.

60. Mutual Exclusion :-

A condition in which there's a set of processes only one of which is able to access a given.

61. Operating System :-

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

62. Page :-

In virtual storage, a fixed length block that has a virtual address & that's transferred as a unit between main memory & secondary memory.

63. Page Fault :-

Occurs when the page containing a referenced word is not in the main memory.

64. Page Frame :-

A fixed size contiguous block of main memory used to hold page.

65. Paging :-

The transfer of pages between main memory & secondary memory.

66. Physical Address :-

The absolute location of a unit of data in memory.

67. Pipe :-

A circular buffer allowing 2 processes to communicate on the producer-consumer model. Thus it's a first-in-first-out queue, written by one process & read by another.

68. Preemption :-

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

69. 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.

70. Process :-

A program in execution. A process is controlled & scheduled by the OS same as task.

71. PCB :-

The manifestation of a process in an OS. It's a data structure containing info about characteristic & state of the process.

72. Process State :-

All of the information that the OS needs to manage a process & that the process needs to properly execute the process.

The process state includes the contents of the various processor registers, such as the program counter & data register. It also includes info. of use to OS, such as the priority of process & whether

the process is waiting for the completion of the particular I/O event. Same as Execution context.

73. Processor :-

In a computer, a functional unit that interprets & executes instructions. A processor consists of atleast one Inst. control unit & an arithmetic Unit.

74. Program Counter :-

Instruction address Register.

75. Programmed I/O :-

A form of I/O in which the CPU issues an I/O commands to an I/O module & must then wait for the operation to be complete before proceeding.

76. Real Time System :-

An OS that must schedule & manage real-time tasks.

77. Real-time tasks :-

A task that's executed in connection with some process / function or set of events external to the computer system & that must meet one or more deadlines to interact effectively & correctly with external environment.

78. Registers :-

High-speed memory internal to the CPU.
Some registers are user-visible that's available to the programmer via the machine instruction set.

79. Relative Address :-

An address calculated as displacement from a base address.

80. Response time :-

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

81. Round Robin :-

A scheduling algorithm in which processes are activated in a fixed cyclic order that's all processes are in a circular queue.

82. Scheduling :-

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

83. Secondary Memory :-

Memory located outside the computer system itself; that's can't be processed directly by processor.

It must be copied into main memory.

84. Segment :-

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

85. Segmentation :-

The division of a program or applications into segments as a part of virtual memory schemes.

86. Semaphore :-

An integer value used for signaling among processes only 3 operations may be performed on a semaphore, all of which are atomic :

Initialize, decrement & increment.

Depending on the exact definition of semaphore, the decrement operation may result in blocking of a process.

Also known as a counting semaphore or a general semaphore.

87. Sequential file :-

A file in which records are ordered according to the value of the key fields & processed in same sequence from the beginning of file.

88. Shell :-

The portion of OS that interprets interactive user commands & job control language commands. It functions as an interface between the user & the OS.

89. Stack :-

An ordered list in which items are appended to & deleted from the same end of the list, known as the top, i.e. the next item appended to the list is put on the top & the next item is removed from the list is the item that has been in the list the shortest time.

This is also known as Last In First Out.

90. Starvation :-

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

91. Strong Semaphore :-

A semaphore in which all processes waiting on the same semaphore are

queued & will eventually proceed in the same order as they executed the wait operations.

92. Swapping :-

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

93. SMP :-

A form of multiprocessing that allows the OS to execute on any available processor or on several available processors simultaneously.

94. Synchronous Operations :-

An operation that occurs regularly or predictable with respect to occurrence of a specified event in another event
 eg:- the calling of an I/O routine that received control of pre-coded location in a computer program.

95.

Synchronization :-

Situation in which 2 or more processes co-ordinate their activities based on condition.

96.

System Bus :-

A bus used to interconnect major computer components.

97.

Thread :-

A dispatchable unit of work. It includes a processor context & its own data area for a task.

A process may consist of multiple threads.

98.

Thread Switch :-

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

99.

Time Sharing :-

The concurrent use of a device by no. of users

100. Time Slice :-

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

101. 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.

102. Trojan Horse :-

Secret undocumented runtime embedded within a useful program. Execution of a program results in execution of secret runtime.

103. User mode :-

The least privileged mode of execution. Certain regions of main memory & certain machine instructions can't be used in this mode.

104. Virtual address :-

The address of a storage location
in virtual memory.

105. Virtual Memory :-

The storage space that may be regarded as addressable main storage by the user of a computer in which virtual addresses are mapped into real addresses. The size of virtual storage is limited by the addressing schema of the computer system & by the amt of secondary memory available.

106. Virus :-

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

107. Weak Semaphore :-

A semaphore in which all process waiting on the same semaphore proceed in an unspecified order.

108. Word :-

An ordered set of bytes / bits that is normal unit in which information may be stored, transmitted or operated on within a given computer.

109. Worm :-

Program that can travel from computer to computer across network connections, & may contain viruses or bacteria.

Name : Tanishka Vadewala

Roll No : 40

Class : MCA - 3

Subject : Operating System

Assignment : 2.

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OS.

Assignment : 2.* Banker's Algorithm :-

process	Allocation			MAX			Available			Need		
	A	B	C	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	5	3	3	3	2	7	4	3
P1	2	0	0	3	2	2				1	2	2
P2	3	0	2	9	0	2				6	0	0
P3	2	1	1	2	2	2				0	1	1
P4	0	0	2	4	3	3				4	3	1

⇒

process	Allocation			MAX			Available			Need		
	A	B	C	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	5	3	3	3	2	7	4	3
P1	2	0	0	3	2	2				1	2	2
P2	3	0	2	9	0	2				6	0	0
P3	2	1	1	2	2	2				0	1	1
P4	0	0	2	4	3	3				4	3	1

$$\Rightarrow \text{Need} \leq \text{Work} \Rightarrow \text{Work} = \text{Work} + \text{Allocation}$$

$$P0 \Rightarrow 743 \leq 332 \rightarrow \times \text{ condition fails}$$

$$P1 \Rightarrow 122 \leq 322 \rightarrow \checkmark \text{ Condition true}$$

$$W = \text{Work} + \text{allocation}$$

$$= 322 + 200 = 532$$

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P2 \Rightarrow Need \leq Work

$$600 \leq 532 \rightarrow \text{Condition false.}$$

P3 \Rightarrow Need \leq Work

$$011 \leq 532 \rightarrow \text{Condition true}$$

$$W = W + \text{allocation}$$

$$532 + 011$$

$$743.$$

P4 \Rightarrow Need \leq Work

$$431 \leq 743 \rightarrow \text{Condition true}$$

$$W = W + \text{allocation}$$

$$= 743 + 002$$

$$= 745$$

P0 \Rightarrow Need \leq Work

$$743 \leq 745 \rightarrow \text{Condition true}$$

$$= 745 + 010$$

$$= 755$$

P2 \Rightarrow Need \leq Work

$$600 \leq 755 \rightarrow \text{Condition true}$$

$$755 + 302$$

$$1057.$$

① Sale Sequence :-

(P1, P3, P4, P0, P2)

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* FIFO :-

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	2	1	2	0	1		
0	2		1	1	1	X	0	0	0	3	3	3	3	3	3	3	2	2	2
0	1		0	0	0	0	3	3	3	2	2	2	2	2	2	2	1	1	1
0	0		7	7	7	2	2	2	2	4	4	4	0	0	0	0	0	0	0
*	*	*	*	*	*	h	*	*	*	*	*	*	h	h	h	*	*	h	h

7	0.	1
2	2	1
X	0	0
7	7	7

* * *

page fault : 15 faults

page hit : 7 hits

No. of frames : 3.

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* CRU :-

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
f2		1	1	1	3	3	3	3	2	2	2	2	2	2	2	2	2
f1	0	0	0	0	0	0	0	0	3	3	3	3	3	3	3	3	3
f0	7	7	7	2	2	2	2	4	4	4	0	0	0	0	0	1	1
	*	*	*	h	h	h	*	*	*	*	h	h	h	h	*	h	

	0	1	7	0	1
f2	2	2	7	7	7
f1	0	0	0	0	0
f0	1	1	1	1	1
	*	h	*	h	h

no. of frames = 3

page fault = 12

* Optional :-

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
f2	7	7	7	2	2	2	2	2	2	2	2	2	2	2	2	2
f1	0	0	0	0	0	0	0	4	4	4	0	0	0	0	0	0
f0	1	1	1	+	3	3	3	3	3	3	3	3	3	3	3	1
	*	*	*	*	h	*	h	*	h	h	*	h	h	h	h	*

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	2	0	1	7	0	1	
f0	2	2	2	7	7	7	
f1	0	0	0	0	0	0	
f0	1	1	1	1	1	1	
	h	h	h	*	h	h	

No. of frames - 3

page fault - 9

— x — x — ü — x — x — x —