

*,Final Term Assignment
Operating System Concepts*

Time Allowed: 6 hours

Marks: 50

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Subject *operating system concepts*

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Note: Attempt all questions. Copying from Internet and one another is strictly prohibited. Such answers will be marked zero.

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Q1. In deadlock prevention strategy do you think it is necessary to check that either safe state exists or not? Give reason to support your answer.

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ANS

State is protected if a framework can designate assets to each procedure up to its greatest in some request and still keep away a stop .
all the more officially , a framework is in a sheltered state in particular if there exisets a protected grouping .

A sheltered state is anything but s gridlocked state . on the other hand , a stopped state is a perilous state . not every single risky stste are gridlocks .

If a system alredy is in a safe state , we can try to stay away from an unsafe state and avoid dealockd . deadlock cannot be avoided in an unsafe .

a system can be considered to be in safe state if it is not in a stste of deadlocked and can allocate resuourse upto the maxium avabile .

as safe sequence of processes and alloction of resource a safe state . a resourse allocation graph is gernerly used to avoid deadlocked . if there are cycle there may be a deadlocked .

Q2. Differentiate between Dynamic loading and Dynamic Linking with the help of examples.

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ANS

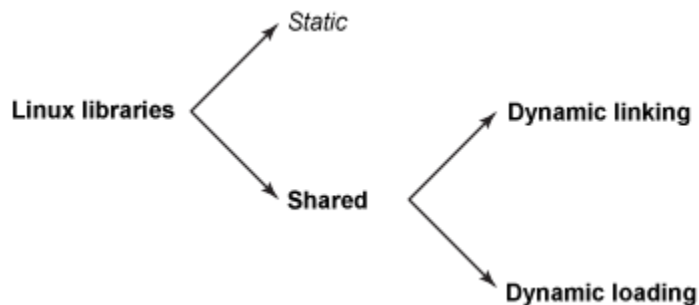
Dynamic loading

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mean loading the library (or any other binary for that matter) into the memory during load or run-time.

Dynamic loading can be imagined to be similar to plugins , that is an exe can actually execute before the dynamic loading happens(The dynamic loading for example can be created using Load Library call in C or C++). Suppose our program that is to be executed consist of various modules. Of course its not wise to lode all the models into man memory together at once in some case might not be even possible . because of limited main memory so basically what we do here is we load the main module . first and then during execution we load some other module only when its required and the execution cannot proceed further without loading .

Example



Dynamic loading

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System library or other routine is a linked during run time and its supported by OS . Dynamic linker is a run time program that loads and binds all of the dynamic dependencies of a program before starting to execute that program. Dynamic linker will find what dynamic libraries a program requires, what libraries those libraries require and so on, then it will load all those libraries and make sure that all references to functions then correctly point to the right place. Suppose our program is function whose definition.

example,

even the most basic “hello world” program will usually require the C library to display the output and so the dynamic linker will load the C library before loading the hello world program and will make sure that any calls to printf() go to the right code.

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Q3. Which component of an operating system is best suited to ensure fair, secure, orderly, and efficient use of memory? Also identify some more tasks managed by that component.

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ANS

- ❖ Memory management system is most suitable component of an operating system that ensure fair, secure, orderly and efficient use of memory .
 - ❖ The task managed by memory management system include keeping track of where, when, and so much memory allocated and free .
 - ❖ It also keeps track of used and free memory space .
 - ❖ Memory management system is responsible for the processes swapping and in out from primary main memory .
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Q4. Differentiate between Symmetric and A-Symmetric encryption with the help of example.

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ANS

- ❖ System encryption uses a single key that needs to be shared among the people who need to receive the message while asymmetrical encryption uses a pair of public key and a private key to encrypt messages when communicating .
- ❖ Symmetric encryption is an old technique while asymmetric encryption is relatively new.
- ❖ Asymmetric encryption was introduced to complete the inherent problem of the need to share the key in asymmetric encryption model, eliminating the need to share the key using a pair of public private keys .
- ❖ Asymmetric encryption takes relative more time than the symmetric encryption .

Q5. Describe the difference between external and internal fragmentation. Why should they be avoided?

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ANS

KEY DIFFERENCE BETWEEN EXTERNAL AND INTERNAL FRAGMENTATION

- ❖ The basic reason behind the occurrences of internal and external fragmentation is that internal fragmentation occurs when memory is partitioned into fixed sized blocks whereas external fragmentation occurs when memory is partitioned into variable size blocks.
- ❖ When the memory block allotted to the process comes out to be slightly larger than requested memory . then the free space left in the allotted memory block cause internal fragmentation . on the other hands when the process is removed from the memory it creates free space causing a hole in the memory which is called external fragmentation .
- ❖ The problem of internal fragmentation can be solved by partitioning the memory into variable sized blocks and assing the best fit block to the requesting process . however the process must be allowed to acquire physical memory in a non -contiguous manner to achives this the tecaunic of paging and segmentation is introduced .

- ❖ **Internal Fragmentation**

1 When there is a difference between required memory space vs allotted memory space, problem is termed as Internal Fragmentation.

2 Internal Fragmentation occurs when allotted memory blocks are of fixed size.

3 Internal Fragmentation occurs when a process needs more space than the size of allotted memory block or use less space.

External Fragmentation

1 When there are small and non-contiguous memory blocks which cannot be assigned to any process, the problem is termed as External Fragmentation.

2 External Fragmentation occurs when allotted memory blocks are of varying size.

3 Compaction is the solution for external fragmentation.



Q6. List and describe the four memory allocation algorithms covered in lectures. Which two of the four are more commonly used in practice?

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ANS four memory allotment calculations in the plan of dynamic apportioning situation are first – fit - in the connected rundown of accessible memory address , we place the information in the principle section that will accommodate its information .

its point is to limit the measure of looking yet prompts outer discontinuity later on . next fit – like orginally fit yet as opposed ti looking form the earliest starting point each time , it look form the last fruitful portion .

first-fit most regularly utlize as it is simpler to actualize and truns out to be better .

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Q7. Why is the context switch overhead of a user-level threading as compared to the overhead for processes? Explain .

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ANS

- ❖ This undertaking is know as a setting switch . setting switch time is undertaking overhade .
- ❖ in light of the fact that the framework accomplishes no valuable work while exchanging setting exchainging is overhead since it is cycle (time) that the process is benging utilized no client code is excuting .
- ❖ so no legitimately ganful registering is completing .

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