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Branch : Computer Batch: T4

Subject : System Programming & operating systems

Topic: Assignment 6 (Theory)



Questions:

1. Explaining Thrashing. How to eliminate thrashing.
2. Define Segmentation. Differentiate between Paging and Segmentation.

Answers:

1.



- Thrashing occurs when a process doesn't have enough frames allocated to store the pages it uses repeatedly, the page fault rate will be very high.
- A process is thrashing if it is spending more time for paging in/out than executing.
- If the degree of multiprogramming is increased over a limit, processor utilization falls down considerably because of thrashing.
- The selection of a replacement policy to implement virtual memory plays an important part in the elimination of potential for thrashing.
- Thrashing is solved by using working set model & page fault frequency.

a. Working set model:

We define the working set of information $w(t, z)$ of a process at time t to be collection of information referenced by the process during the process time interval $(t - T, t)$

Divide the process into two groups.

- a. active.
- b. ~~passive~~ inactive.

When a process is active, its entire working set must always be in memory: never execute a thread whose working set is not resident.

When the process becomes inactive, its working set can migrate to disk.

b. Page fault frequency.

Page Fault Frequency is used to prevent thrashing.

Page fault rate is controlled by using the method.

In the per-process replacement policy, each process is allocated a fixed number of physical page frame.

Then monitor the rate at which page faults are occurring for each process.

2.

→ In segmentation, a program's data and instructions are divided into blocks called segments.

A segment is a logical entity in a program.

Logical view: A process consists of a set of segments.



Date : _____

Physical view: It consists of non-adjacent areas of memory allocated to segments.

Segmentation support user view of memory. Segmentation can be implemented with or without paging.

Segmentation	Paging.
a. Programs is divided into variable size segments.	d. Program is divided into fixed size pages.
b. It is a slower process.	b. It is a faster process.
c. It is visible.	c. It is invisible.
d. Segmentation eliminates internal fragmentation.	d. Paging suffers from internal fragmentation.
e. Segmentation suffers from external fragmentation.	e. There is no external fragmentation.
f. OS maintain a list of free holes.	f. OS must maintain a free frame list.

Q. 4/1/23