**Lab-7 Assignment Short Report**

Title : To compare fifo ,rand and custom(give second chance) policy for different program

Demand Paging

According to the concept of Virtual Memory, in order to execute some process, only a part of the process needs to be present in the main memory which means that only a few pages will only be present in the main memory at any time.However, deciding, which pages need to be kept in the main memory and which need to be kept in the secondary memory, is going to be difficult because we cannot say in advance that a process will require a particular page at particular time.Therefore, to overcome this problem, there is a concept called Demand Paging is introduced. It suggests keeping all pages of the frames in the secondary memory until they are required.

* For Sort program

We have randomy choosen 24 different value of number of frame and tested different policy such as

Rand, Fifo, Custom .

For creating graph choosen 24 different frame taken at a time from

{a1, a2, a3………………………………………ai, ……………….an}

where 2 <= ai <= 100.

* Graph for policy **rand**

To check the total number of fault occur , total disk write and total disk read.

Use command : **./virtmem <number of page> <number of frame> rand sort**

x- axis represent serial number

y-axis represent either of page\_fault, disk\_read or disk\_write

* Graph for policy **fifo**

To check the total number of fault occur , total disk write and total disk read.

Use command : **./virtmem <number of page> <number of frame> fifo sort**

x- axis represent serial number

y-axis represent either of page\_fault, disk\_read or disk\_write

* Graph for policy **custom(give a second chance)**

To check the total number of fault occur , total disk write and total disk read.

Use command : **./virtmem <number of page> <number of frame> custom sort**

x- axis represent serial number

y-axis represent either of page\_fault, disk\_read or disk\_write

* For Focus program

We have randomy choosen 24 different value of number of frame and tested different policy such as

Rand, Fifo, Custom .

For creating graph choosen 24 different frame taken at a time from

{a1, a2, a3………………………………………ai, ……………….an}

where 2 <= ai <= 100

* Graph for policy **rand**

To check the total number of fault occur , total disk write and total disk read.

Use command : **./virtmem <number of page> <number of frame> rand focus**

x- axis represent serial number

y-axis represent either of page\_fault, disk\_read or disk\_write

* Graph for policy **fifo**

To check the total number of fault occur , total disk write and total disk read.

Use command : **./virtmem <number of page> <number of frame> fifo focus**

x- axis represent serial number

y-axis represent either of page\_fault, disk\_read or disk\_write

* Graph for policy **custom**

To check the total number of fault occur , total disk write and total disk read.

Use command : **./virtmem <number of page> <number of frame> custom focus**

x- axis represent serial number

y-axis represent either of page\_fault, disk\_read or disk\_write

* For Scan program

We have randomy choosen 24 different value of number of frame and tested different policy such as

Rand, Fifo, Custom .

For creating graph choosen 24 different frame taken at a time from

{a1, a2, a3………………………………………ai, ……………….an}

where 2 <= ai <= 100.

* Graph for policy **rand**

To check the total number of fault occur , total disk write and total disk read.

Use command : **./virtmem <number of page> <number of frame> rand scan**

x- axis represent serial number

y-axis represent either of page\_fault, disk\_read or disk\_write

* Graph for policy **fifo**

To check the total number of fault occur , total disk write and total disk read.

Use command : **./virtmem <number of page> <number of frame> fifo scan**

x- axis represent serial number

y-axis represent either of page\_fault, disk\_read or disk\_write

* Graph for policy **custom**

To check the total number of fault occur , total disk write and total disk read.

Use command : **./virtmem <number of page> <number of frame> custom scan**

x- axis represent serial number

y-axis represent either of page\_fault, disk\_read or disk\_write

* Although FIFO is simple and easy, it is not always optimal, or even efficient.
* An interesting effect that can occur with FIFO is ***Belady's anomaly***, in which increasing the number of frames available can actually ***increase*** the number of page faults that occur!

The ***second chance algorithm*** is essentially a FIFO, except the reference bit is used to give pages a second chance at staying in the page table.

* When a page must be replaced, the page table is scanned in a FIFO ( circular queue ) manner.
* If a page is found with its reference bit not set, then that page is selected as the next victim.
* If, however, the next page in the FIFO **does** have its reference bit set, then it is given a second chance:
  + The reference bit is cleared, and the FIFO search continues.
  + If some other page is found that did not have its reference bit set, then that page will be selected as the victim, and this page ( the one being given the second chance ) will be allowed to stay in the page table.
  + If , however, there are no other pages that do not have their reference bit set, then this page will be selected as the victim when the FIFO search circles back around to this page on the second pass.

**Conclusion –**  
Various factors substantially affect the number of page faults, such as reference string length and the number of free page frames available. Anomalies also occurs due to the small cache size as well as the reckless rate of change of the contents of cache. Also, the situation of fixed number of page faults even after increasing the number of frames can also be seen as an anomaly. Often algorithms like **Random page replacement algorithm** are also susceptible to Belady’s Anomaly, because it **may behave like first in first out (FIFO)** page replacement algorithm.

Custom (second chance algoritm) is approximation of LRU . It is also susceptible to Belady’s anomaly but it as number of frame increases it behave like LRU .

Hence, second chance algorithm is some how better than rand and fifo algorithm

Thanks