EAT = (1-p)* memory access time + p *page-fault overhead
= (1-0.001)*100 + 0.001* 16000000 nano seconds
= 16099.9 nanoseconds

# Tutorial 9

1.Code and data locality refers to the fact that in a typical program execution the code tht get executed tends to cluster around a single fragment at a time , and also tends to reference same set of data structure.

## Virtual Memory

Attempt the following questions before you attend tutorial.

1. In your own words, explain what is meant by code and data locality?

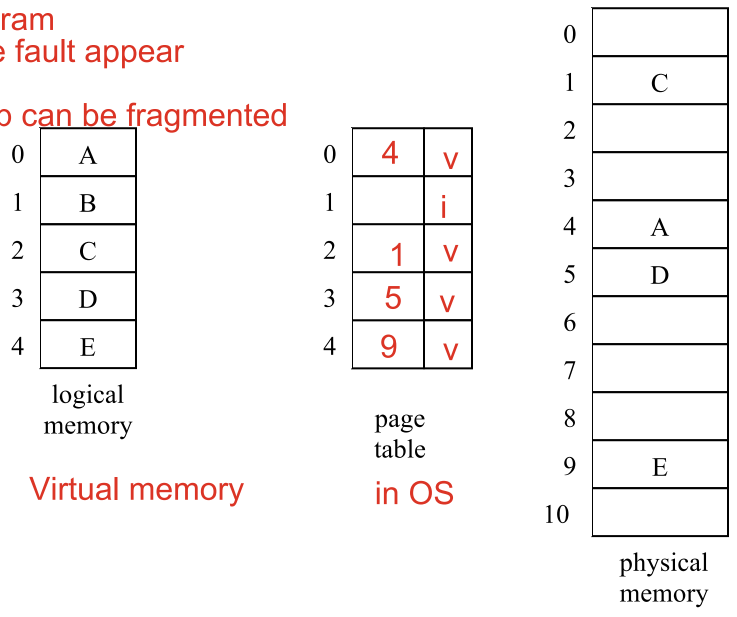
2. Assume we have a demand-paged memory. The page table is held in registers. It takes 16 milliseconds to service a page fault. Memory access time is 100 nanoseconds. Assume that page-fault rate is 0.001. What is the effective access time for this memory system? (Note: 1 millisecond = 1,000 microseconds = 1,000,000 nanoseconds) 1 time in 1000 time is for page fault

3. What is the cause of thrashing? How does the system detect thrashing? Once it detects thrashing, what can the system do to eliminate this problem?

4. Given the following demand paging system, fill in the entries in the page table by writing the appropriate frame number. Enter i or v in the valid/invalid bit. Assuming that each page is 1024 words, write the physical address of the following logical address of the process, in the form (page frame no, offset) format.
   (i) 2056 lines
   (ii) 4500

we did not load the whole program in the ram
that's why page fault appear

example 100 gb can be fragmented



Virtual memory

in OS

RAM

3. Thrashing is caused by under-allocation of the minimum number of pages required by a process, forcing it to continuously page falut.

the system can detect thrashing by evaluting the level of cpu utilization as compared to the level of multiprograming.

it can be eliminated by reducing the lever of multipragramming.

code in vm must be converted into ram in order to run by cpu

i) 2056 is in line 2 page C : 1024 (page A) +1024(page B) +8(in page C)
the physical address is (1,8) frame 1 in RAM, line is 8
ii) 4500 = 1024+1024+1024+1024+404
the physical address is (9,404)
iii) 1500 = 1024+476 in page B so physical address is "page fault" cannot find in ram