Thrashing

- A process should have some minimum number of frames to support active pages which are in memory. It helps to reduce the number of page faults. If these numbers of frames are not available to the process then it will quickly page fault.

- To handle this page fault, it is necessary to to replace the existing page from memory. Since all the pages of the process are active, it will also need in future. So any replaced page will cause page fault again & again.

- Since in paging, pages are transferred between main main memory and disk, this has an enormous overhead. Because of this frequent movement of pages between main memory and disk, system throughput reduces.

- This frequent paging activity causing the reduction in system throughput called as thrashing.

- Although many processes are in memory, due to thrashing, cpu utilization goes low. When o.s. monitors this CPU utilization, it introduces new process in memory to increase the degree of multiprogramming.

- Now it is needed that the existing pages should be replaced for this new process. If global page replacement algorithm is used, it replaces the pages of other process & allocates

frames to this newly introduced process. so other processes whose pages are replaced are also causes page faults.

- All these faulting processes go in wait state and waits for paging device. In this case again CPU utilization goes low.

- when cpu scheduler observes the low CPU utilization, it introduces new processes again in system to improve degree of multiprogramming. This also results in page faults of running processes.

- Again the waiting queue of paging device becomes long causing further drop in cpu utilization. In this way page fault rate further increases and CPU utilization decreases.
  There is no actual work getting done and processes spend time only in paging.

- This thrashing can be limited by using local page replacement algorithm instead of global page replacement algorithm.
  Local page replacement algorithm replaces the pages of same process instead of other process.
  Therefore frames of the other processes will not be taken and these processes will not thrash.