**VASAVI COLLEGE OF ENGINEERING**

**Ibrahimbagh, Hyderabad-500 031**

Department of Information Technology

**HAND OUT FOR B.E 1II/IV Students: 2017-18**

Sub: **Operating Systems**

**Name of the faculty: J.Suneetha Section: IT**

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**UNIT-II**

**Memory Management:** Background, Swapping, Contiguous Memory Allocation, Paging, Segmentation. Virtual Memory Management:Demand Paging, Page replacement algorithms, Thrashing, Allocating Kernel Memory.

**Memory Management:**

Main Memory refers to a physical memory that is the internal memory to the computer. Main memory is also known as RAM. Therefore, every program we execute and every file we access must be copied from a storage device into main memory.

#### Swapping:

Swapping is the process of bringing in each process in main memory, running it for a while and then putting it back to the disk.

**Contiguous Memory Allocation:**

The main memory must accommodate both the operating system and the various user processes. The memory is usually divided into two partitions: one for the resident operating system, and one for the user processes.

There are two ways for memory allocation as given below:

* **Single Partition Allocation**
* **Multiple Partition Allocation**
* **Fixed Partition Scheme**
* **Variable Partition Scheme**

**Paging:**

Paging permits a program to allocate noncontiguous blocks of memory. The OS divide programs into pages which are blocks of small and fixed size. Then, it divides the physical memory into frames which are blocks of size equal to page size. The OS uses a page table to map program pages to memory frames. Page size (S) is defined by the hardware.

**Segmentation:**

Segmentation is a memory management technique in which each job is divided into

several segments of different sizes, one for each module that contains pieces that perform

related functions. Each segment is actually a different logical address space of the program.

**Virtual memory:**

Virtual memory is a technique that allows the execution of process that may not be completely in memory. The main visible advantage of this scheme is that programs can be larger than physical memory.

**Demand Paging**

A demand paging system is quite similar to a paging system with swapping where

processes reside in secondary memory and pages are loaded only on demand, not in

advance.

**Page Replacement Algorithm:**

Page replacement algorithms are the techniques using which an Operating System decides

which memory pages to swap out, write to disk when a page of memory needs to be allocated. Paging happens whenever a page fault occurs and a free page cannot be used for allocation purpose accounting to reason that pages are not available.

There are many different page replacement algorithms.

* FIFO Algorithm
* Optimal
* LRU
* MRU
* LFU
* MFU
* Second-Chance

**Thrashing:**

A process is thrashing if it is spending more time in paging than executing.