**OS Assignment# 12**

**Write a memory allocator simulator that implements following memory allocation scheme:**

**The calling processes requests memory chunks of needed sizes.   
           The returned chunk is treated as contiguous by the process (logical addresses),   
                        but they may be physically distributed/scattered in main memory.  
            The process may free an allocated chunk.**

**The above has been expressed in terms of a few system calls as below.**

**(1) void initialize (int x)    
                        - creates x bytes of free main memory from which further allocate/free requests are to be handled**

**(2) int alloc (int x)  
                       - allocates  x bytes and returns the starting logical address to the caller**

**(3) void printPhysicalDistribution ()  
                        - prints the physical distribution of the various logical segments**

**(4) void free (int logicalstartaddress)  
                        - frees the chunk identified by the start logical address**

**Assume that logical address always monotonically increase  
Your program should provide a command prompt to accept any sequence of the above commands one by one like  
  an interpreter.**

**Sample Test case**

**initialize 100**

**alloc 20 --> it should return 0 (logical space:0..19)**

**alloc 30 --> it should return 20 (logical space:20..49)**

**alloc 4 --> it should return 50 (logical space:50..53)**

**free 20 --> frees the second chunk starting from**

**logical 20**

**allocate 35 --> it should return 54 (logical space:54..83)**

**printPhysicalDistribution --> one possible output of this is given below**

**logical start address chunk size physical distribution**

**in main memory**

**0 20 0..19**

**50 4 50..53**

**54 35 20..49,54..57**