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Homework 7

CS 6233
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Problem 1

1. The first similarity between fixed sized partitioning and paging is both the size of memory is fixed and cannot be changed dynamically.

2. The fixed sized partitioning and paging both have the internal fragmentation problem.

Problem 2

1. The first similarity between variable sized partitioning and segmentation is both the size of memory part is variable.

2. The variable sized partitioning and segmentation both have the external fragmentation problem.

Problem 3

1. The first difference between paging and segmentation is, in paging program is divided into fixed or mounted size pages while in segmentation the program is divided into variable size sections.

2. The second difference between paging and segmentation is, paging could result in internal fragmentation problem while segmentation could result in external fragmentation problem.

3. Another difference between paging and segmentation is, the page size is determined by the hardware while the section size in segmentation may varied by the user program.

Problem 4

The screenshot of command line, files and code is listed below.

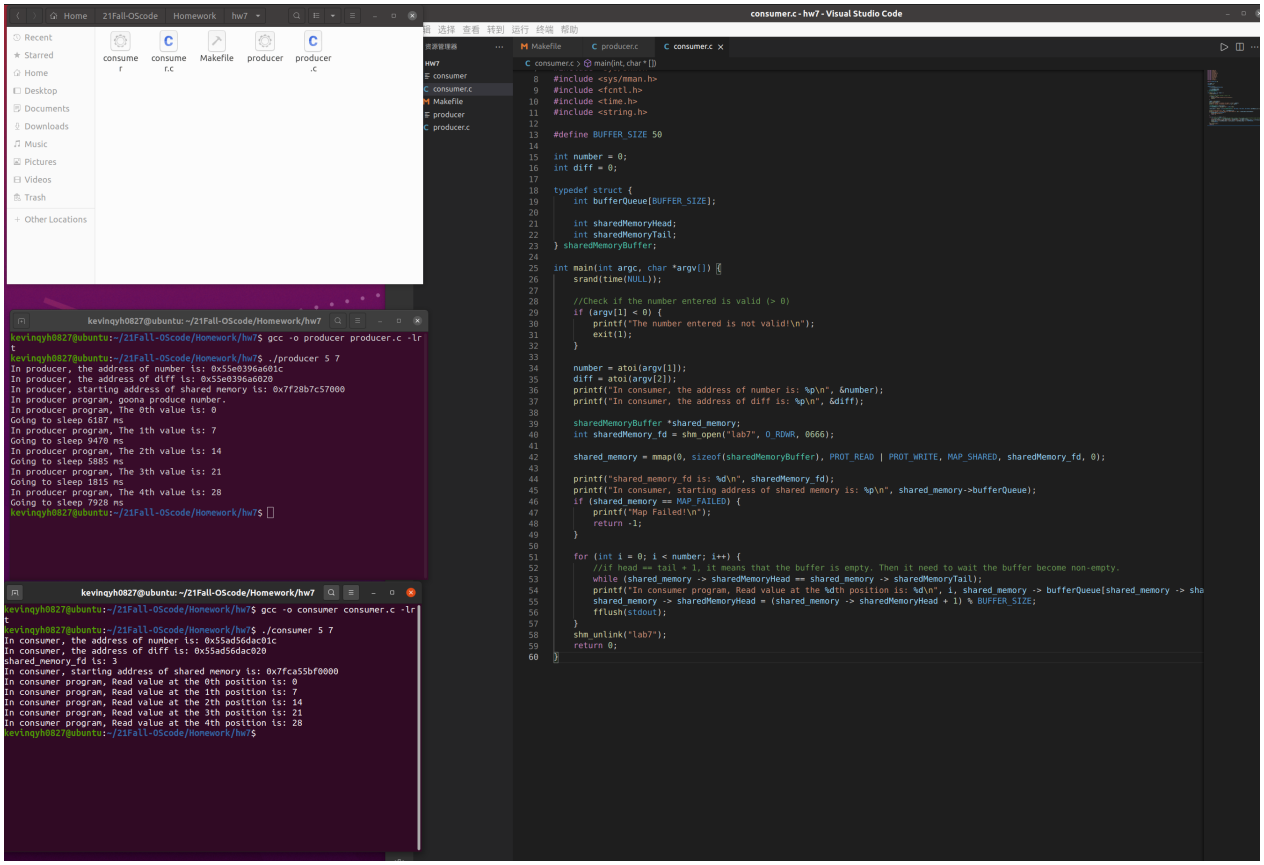

Figure 1: Screenshot of command line and files.

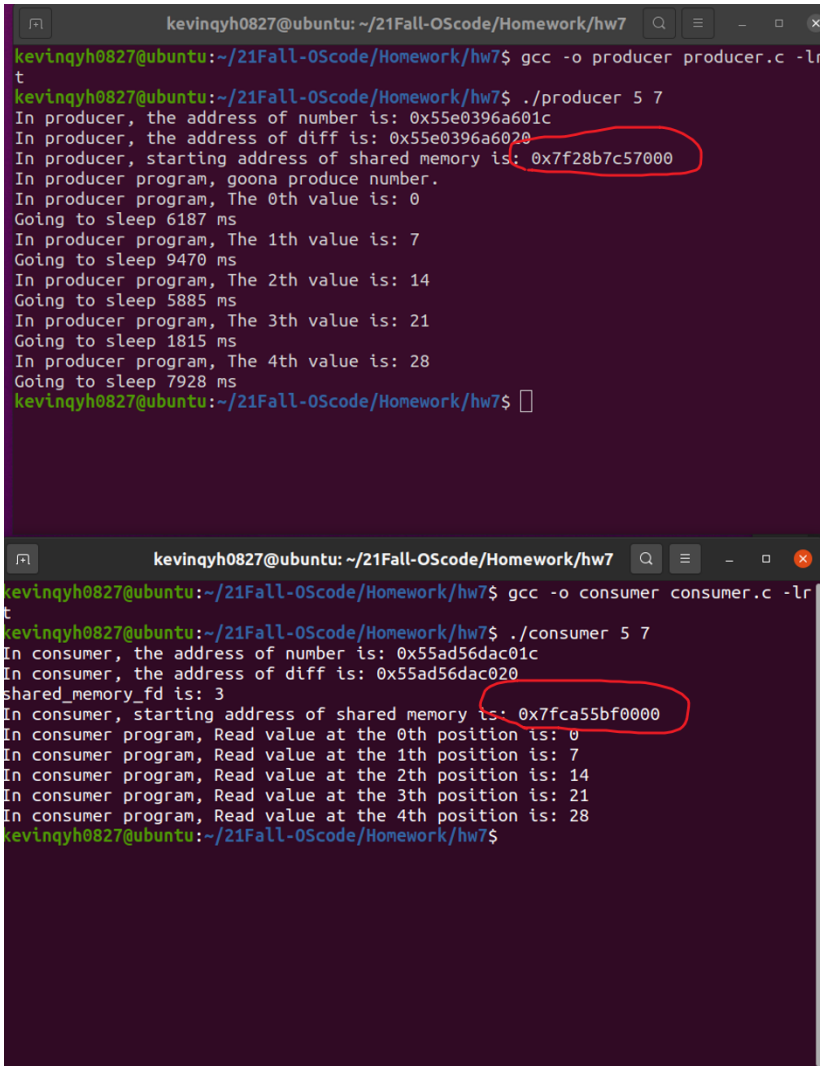

Figure 2: Screenshot of starting address of shared memory in different running processes.

a. i. The printed address of the start address of the shared buffer is not similar from both process. Because of the MMU (Memory management unit), the printed value of a pointer in C language is always the virtual memory address. Since each process has its independent virtual memory space, this printed value of starting address of the shared buffer is different with each other.

ii. The printed address is virtual memory address.

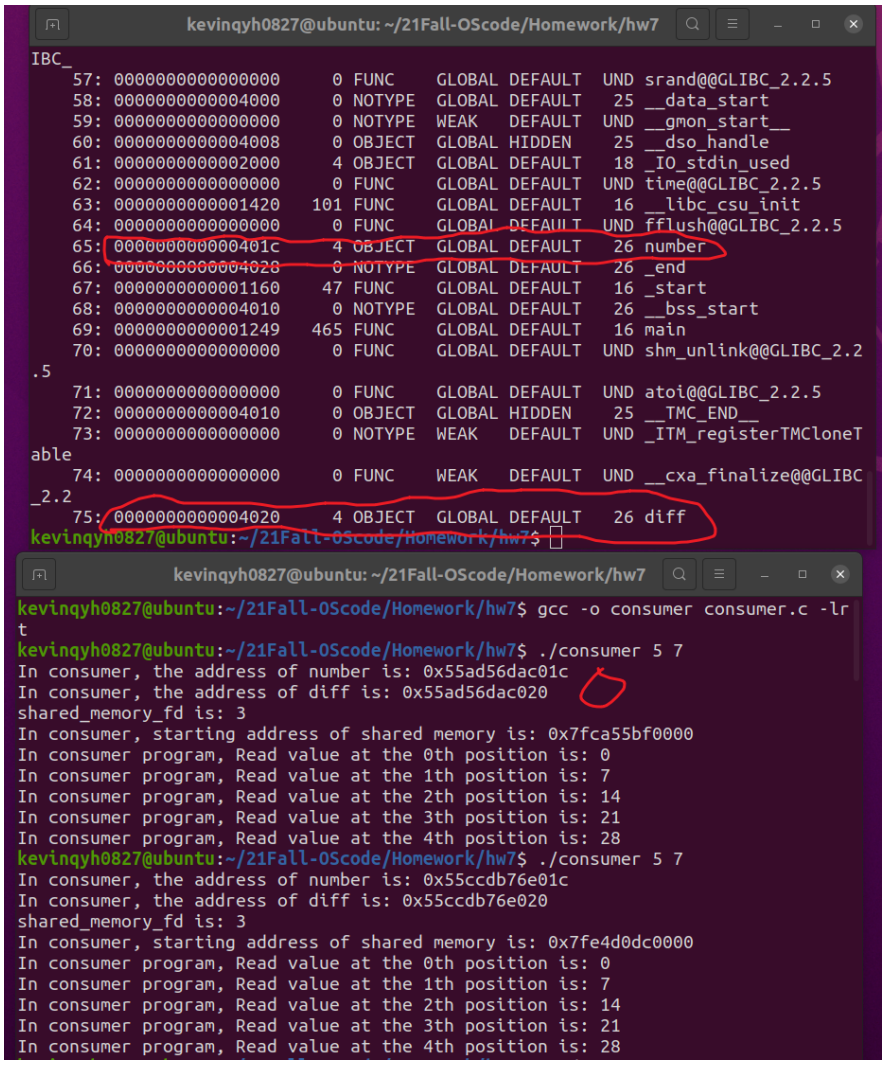

Figure 3: Screenshot of address in absolute module and virtual memory of running process.

b. i. The address of variable "number" and "diff" is not matched in running program and in the absolute module. But the relative offset of these two variables keeps same in absolute module and running process.

ii. The reason is when the absolute module is loaded to the main memory, it typically be remapped to a physical address which is not necessarily be matched with the address in absolute module.