CS 340

Assignment 4

Due: 12/13/2020

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For this project, I made a program that how the memory allocation works using worst fit. In the variable partition scheme, the operating system keeps a table indicating which parts of memory are available and which are occupied. At the beginning of the process, all memory is available and is considered one large block. It is called a hole. Regarding the Idea from the Chapter 9.2.2 Memory Allocation, the procedure of allocating memory could occur the dynamic storage allocation problem, which concerns how to satisfy a request of size n from a list of free holes. Among solutions such as first-fit, best-fit, and worst-fit, assignment was asked to do worst-fit process for programming. Worst-fit is that allocates the largest hole in the entire list which is sorted by size. The strategy produces the largest leftover hole, which may be more useful than the smaller left-over hole from a best-fit approach.

I made a program with array and structure. After the program read the user input, it goes to the while loop until the allocation ends. In the while loop by using RQ, RL, STAT, C, QUIT commands, memory allocates the memory in the largest empty space, erasing process in the memory, showing the current status of memory, combining the partial empty spaces, and finish the program. For RQ, searching for the biggest hole was needed so I made a function to search the big hole and return to the main function for RQ. Once the biggest hole was found, that is the place the memory of process will be allocated. If the size of memory is bigger than empty space, than error message will be printed. I used index if index is -1 that means array is empty. So, every time RL was executed, size of array will be changed to 0 and its index will be -1. For “C”, compacting, just re-sort of arrays and combine the empty spaces. And QUIT command ends the program. I faced the problem after release the process and using STAT. it prints process in random order but I resolved the problem to work on the for loops for the STAT. also tokenizing the input data was kind of challenging for me.

Advantages of worst fit is that since the worst fit allocation technique finds the biggest hole, therefore there will be large internal fragmentation. The internal fragmentation will be quite big so that other small processes can also be placed in that left over partition. For using “C” command in the program, internal fragmentation was solved. The Disadvantage of worst fit allocation is that this process is slow process because it traverses all the partitions in the memory and then selects the largest partition among all the partitions, which is a time-consuming process.