Nombre: <u>Ricardo Gabriel Rodríguez González</u>
Matricula <u>17001433</u>

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670263   Sistemas Operativos
Dr. Carlos González Flores

Second Partial Exam – November 8, 2021

1. - (25 points) If you work in the computer center of a business, what is the measurement that you should be more worried about? Why? How do you measure it?

   The best security measure for a company could be to work in the cloud, since it is a good backup of information that does not compromise the components of a company computer, and can be protected by means of software with cyber security and more aspects by the style, as well as protect the software with more protection measures

2. - (25 points) You have a process that is executing inside a "Critical Region". Suddenly this process dies (or gets killed). Can this condition happen? If so, what do you do (and how) with the processes waiting to get into the "Critical Region"?

If the process can die, and the critical region can only store a single process, and what you do is let the waiting process pass to continue working, there are procedures for errors in the critical region, for example:
Mutual exclusion: no two processes are simultaneously in the critical region
Progress: no process outside a critical region can cause another process to hang
Limited: no process should wait forever to enter its critical region

There is also a method known as semaphore, what it does is that for one to enter the critical region, they first must finish the previous process

3. - (25 points) If the page selected to be removed from memory is requested again by the process what happens?

When a running process references a page, it first looks in main memory. If it is not present in main memory, a page fault occurs.
When the page that was selected for replacement is paged and referenced again, it needs to be read from the hard drive. This process determines the quality of the page replacement algorithm: the shorter the wait time, the better it is considered. algorithm optimization.
Replacement algorithms decide which memory pages to extract, also known as swapping or writing to disk, when a memory page needs to be allocated.

4. - (25 points) When a process is being loaded into memory. At what time are the addresses in the user program changed to memory addresses, and how.

Binding of instruction and data addresses to memory addresses can occur in the following stages.
Compilation time: if the memory location is known a priori, an absolute code can be generated; you must recompile the code if you change the startup location.
Load time: You should generate relocatable code if the memory location is not known at compile time.
Execution time: binding delayed until execution time if the process can move during its execution from one memory segment to another. You need hardware support for address maps (for example, base and boundary registers).

Dynamic loading: the routine is not loaded until it is called.
Better utilization of memory space; The unused routine is never loaded.
Useful when large amounts of code are needed to handle infrequent cases.
No special operating system support is required; implemented through program design.
Dynamic link: link postponed until execution time.
Small piece of code, stub, used to locate the appropriate memory-resident library routine.
Stub replaces itself with the address of the routine and executes the routine.
Operating system required to verify if the routine is in the memory address of the processes.
Overlays: Save only the instructions and data that are needed at any given time in memory.
Required when the process is larger than the amount of memory allocated.
User-deployed, no special operating system support is required; The overlay structure programming design is complex.