# CS 330 - Assignment 5

Step 21:

**When Clone system calls are handled:**

- In HAL9000: when clone statement is executed which caused the call to function Clone(restartInstructionStatusFlag, buffer, result). Inside Clone() function, it will check the restartInstructionStatusFlag. If it is false, the process will be moved back to the backingstore and a message for HALos is set up with the first parameter is “CLONE”. If the action clone is successful, HAL9000 will update information in ram (TOP_FUNCTION_CALL_VALUES_STACK_ADDRESS ) and update kernel variable TOP_FUNCTION_CALL_VALUES_STACK_ADDRESS. Otherwise, clone is fail and coredump.
- In HALos: when HALos receives the system call “CLONE” from HAL9000, it creates a new process by calling the function CloneProcessImage which return a process similar to parent process (except pid, interrupt counters and timing). After that, both processes will be put into ready queue. If the process created by CloneProcessImage is unsuccessful, only parent process is put back to the ready queue.

**When Run system calls are handled:**

- In HAL9000: Run(contents1.value, restartInstructionStatusFlag) will be called when HAL9000 executes run statement. Inside the function Run(), if restartInstructionStatusFlag is false, HAL9000 will build a HALosMessage which contains the system call “RUN”, the command after the run statement (in a .hal program) and parent pid of the current process.
- In HALos: When HALos receives the system call “RUN” from HAL9000, a new process (which will replace the current process) is created by ReplaceProcessImage function. Inside the function, the command after statement run (in a .hal program) will be tokenized and each token will be assigned into appropriate places in the new process. The new process will copy almost everything from the old one (even pid and parent pid) and a backingstore file will be created for the new process. If ReplaceProcessImage function returns successfully, the old process’s action will be set to “PROCESS_DONE”, partition table will be updated and the new process is put into ready queue. Otherwise, the old process will be put back into the ready queue.