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This OS Best OS

Known bugs:

- Deleting files
    - You can only delete files with name length of exactly 6 or 1.
    - A strcmp function was created to fix this when we processed directory lookup, but it was overlooked in the deleting functionality.
- Listing directory sizes
    - If the directory size is bigger than 9 sectors it will not correctly show when using dir
    - This is caused becaused the number is interpreted as a char, when it shoul have had its digits divided into separate chars.
- Multiprocessing
    - Sometimes when multiprocessing, the new process will never get time on the cpu
        - It is unknown what causes this.
    - Sometimes when multiprocessing, “thisOSBestOS>” will print twice to the console and the system will hang.
        - It is unknown what causes this.

Implementation Techniques:

- MACROS
    - Our goal was to completely purge the existence of magic numbers in our system
    - There were several magic numbers, but that is because we could not come up with a proper name for them

Special Features:

- Directory Sector Sizes
    - Whenever the function “dir” is called, not only is the directory displayed, but also the size of the files in sectors is displayed as well.
- Background Color Changer

    - When “SetBG” is called with a number 0-9 the background of the terminal will change.
- Help Menu
    - Whenever “help” is typed, a menu with all the commands for the kernel are displayed.
- NSA Mode
    - When “NSA” is typed into console, the entire floppya.img gets wiped and the kernel will exit.
- Auto Complete On Tab
    - When beginning to type a command into shell, if TAB is pressed, then the command will be autocompleted very similar to how Linux auto completes on Tab.
- Clear Screen
    - On typing “cls” the screen will clear the screen and place the terminal at the top of the screen.
- List PIDS
    - On typing “listpids” the kernel will print out all running processes. It will also display the location of the process so it is easier to kill processes.

Lessons learned:

- Jim Gildersleeve
    - Operating systems are really cool/ghetto
    - Without an operating system, development is much more difficult
    - system calls are nice to have
    - also GDB
- Brian Suchy
    - Like many things in the computing world, Operating Systems are ghetto but all of the ghettoness of every aspect of programming/manufacturing make an enormously cool machine.
    - It is much less time consuming to make an Operating System than a processor, but the Operating System can do much more in my opinion, because it utilizes a more advanced CPU.
    - How nice it is to have a debugging tool, such as GDB.
- Guilherme Simas
    - Although there is an essential assembly part to the OS’s code, most of the coding is done in a higher level (C for example).
    - When stripped of a debugging tool (GDB for example), it is important to modularize the code and be sure that each command and code implemented works as intended, as to minimize the number of possible locations for the error.

    - Well documented code is vital when more than one person are sharing and coding the same section of code.

Technical things learned:

- Jim Gildersleeve
    - How to use the dd tool
    - How interrupts work
    - How to actually use a compiler (linking and combining assembly with c)
- Brian Suchy
    - How to write effective C code.
    - How to compile/make an executable program through the use of makefiles and bash files.
    - How to use interrupts that interact with BIOS
- Guilherme Simas
    - How BIOS interrupts work
    - How stack manipulation works when multiprocessing
    - How the File System works up to the binary level (understanding it theoretically, manipulating it using C code, checking the modified file using hexedit).