

## Operating System Lab

### Assignment#1

Keep in mind the utility of `fork()` and `exec()` system calls in process creation. Exec is used to load a process and `fork()` creates a child process.

- In the xv6 directory, type "make qemu-gdb", to start qemu along with GNU Debugger.
- Open another terminal window, type "gdb" while in the same xv6 directory. Enter "source .gdbinit". Now gdb is connected to the xv6 operating system.
- In the same terminal (gdb), add a breakpoint for exec system call by typing "break exec". Then type "continue" to reach the first instance where `exec()` is called. Typing continue again takes us to the next point where the `exec()` is invoked. Type continue the third time, and in the xv6 OS window run any shell command (ls, cat etc.)

Examine the contents of what gdb reports in all the three instances when breakpoint `exec()` is reached in the above example. Write with as much details as possible an explanation of what for the `exec()` is being used by the operating system to do,

1. initially,
2. At the second breakpoint,
3. and why is no breakpoint reached the third time until we execute any of the commands in xv6 operating system.