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CS 450 – Duan Yue

## Lab 2

### exit() to exitStatus(int status)

Rather than just changing the existing exit system call and thereby, update all the code that used exit(), I just created a new exit call, named exitStatus(int status). The following files were changed: proc.c,

For proc.c, It’s the same code as the original exit() but I just saved the exit status to the curproc. This saves the exit status of the current process.

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For proc.h, I then added int status in the struct.

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I then declared exitStatus in user level in user.h



I also updated usys.S to have exitStatus.



In syscall.c, I then added sys\_exitStatus.



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Same thing in syscall.h



In sysproc.c, I just used a similar structure as sys\_exit() and passed in an integer, status.

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I then defined it in defs.h



Now, exitStatus should be all implemented and what’s left is testing …

### wait() -> int wait(int \*status) and adding int waitpid(int pid, int \*status, int options)

Now, for updating wait and adding waitpid, its very similar to the process I did previously. Similar to exit, I made a new system call rather than updating wait, as I would have to update all the other instances of wait in xv6, which isn’t that much compared to exit, but still.

For wait, I added int waitStatus, which was just the same code as the original wait, but I added code to pass back the status.

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For waitpid, its similar to wait, but waits for a process with the given pid. Also, must wait for any process, meaning it doesn’t have to be a child process.

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I also modified sysproc.c for waitStatus and waitpid.

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Similar to exit, for waitStatus and waitpid, I modified user.h, usys.S, syscall.c, syscall.h, defs.h

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### Testing

For testing, I first used the given usertests by xv6. Running it gave no errors and outputs “ALL TESTS PASSED”, so I then started to make my own tests for the above functions, using test.c

To be able to run the test file, I needed to update the makefile.

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For test.c, this is my code.

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Running these tests in xv6, results in:

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Aside from overlap from print statements, due to running at the same time, the outputs are correct and show that the methods exitStatus(int status), waitStatus(int \*status), and waitpid(int pid, int \*status, int options) I implemented are working.

In the picture above, the parent is waiting for child (pid = 13) to exit and doesn’t run any code until it does. Once that the pid = 13 exits, can see it print above, overlapping with the parent, then the parent resumes execution and prints out that the child exited and then proceeds to wait for the next child.

I also ran diff -r original\_xv6 lab2\_xv6 to show all my code changes. That file, lab2diff.txt, is included in the submission.