Operating System, Spring 2021 – MP1

Due March 30 at 9:00

When you submit your homework on Gradescope, please select the corresponding page of each problem.

1. Fork-Exec (10pts)

   Write a simple program(main function) which executes the “ls” program using “exec”. After the exec call, place a printf which tells that you have called exec.

   Q: Can we see the output message?

   If not, briefly explain the reason, and how can we modify the code to see the output.

2. Signal Handled? (10pts) Consider the code below:

```
void sighup_handler()
{
   printf("the child has received a SIGHUP\n");
}

int main()
{
   int child_pid = 0;
   child_pid = fork();

   printf("the process id is %d and the child process id is %d\n", getpid(), child_pid);

   if (child_pid == 0) {
      // I am a child
      signal(SIGHUP, sighup_handler);
      printf("the child has registered its handler\n");
      for (;;) { }
   } else {
      // I am the parent
      kill(child_pid, SIGHUP);
      printf("the parent has issued the signal\n");
   }

   return 0;
}
```

   Q: Can we see the message in the “signal_handler”? (1) Yes, (2) No, (3) it depends.
   Select one and briefly describe your thoughts.

3. Fork vs Thread (10pts)

   Q: Compared to fork, what are the benefits using thread? Please give two examples. Each for 5pts.

   Hint: Inter communication, memory usage, etc.