1. Compile and setup 3000userlogin as described above. Create a new user account. Verify that you can use 3000userlogin to login as the new user without typing the password of the new user.
   * + Verified and was able to login with the first block of code and created a new user. Didn’t have to type the new password when running and logging in.
2. What is returned as the user's password by getpwnam()? Is this what you expected?
   * + Doesn’t print out the users pass word using print line on line 67. Not what I expected thought it should print out even before exec the bash shell
3. Compare the uid, gid, euid, egid when running 3000userlogin as a regular user, running it setuid root, and running it as root (i.e., running it from a root shell without the setuid bit set). Also check to see what happens when you set the setgid bit (with different group IDs on the file).
   * + The uid,gid,euid, and egid are all the same for regular and setuid root but running it without the setuid bit set results in failed to change to gid 0, and and euid is 1000.
     + Fails to change gid or uid 0 for root or my own user log , but works with student
4. Why does 3000userlogin change its gid before changing its uid? What happens if you switch the order of these operations?
   * + Looking at exit codes it goes -2,-3,-4,-5 for failed exits. Most likely how its how the instructions are set that theres a specific order in setting IDs, don’t look at exit codes they mean nothing
     + Failed to change to gid 1002 would occur if uid is set before
5. Make 3000userlogin use the shell that is specified in the user's password entry. Check by making a new user and setting its shell to a new shell and then see if that new shell runs when you run 3000userlogin. You can change a user's shell with the chsh command.
   * + Changed new users shell to /bin/sh and runs
6. Can you set 3000shell to be a user's default shell? What changes do you have to make for chsh to accept 3000shell? Does anything obvious break when running 3000shell this way, and how can you change 3000userlogin to fix it?
   * + Cant at first try since 3000shell isn’t one of the valid login shells
     + the shell still works however you cant change the shell after that using chsh. I edited the /etc/passwd file with nano to set the login shell back to /bin/bash.
7. Does a user's default shell have to be a regular shell? Could it instead be an arbitrary program? How do you know?
   * + No it cant the default shell has to be one of the listed valid login shells in /etc/shells
8. How important is each of the environment variables that is set by 3000userlogin? Are these the only environment variables that are set after you successfully login?
   * + Not too important path are still set to the defaults and works mostly normal, noticeable diff is home directory shows path as well.
     + PWD, SHLVL, XDG\_DATA\_DIRS, PATH env are set after as well so no not the only ones.
9. Note that 3000userlogin uses environ not envp (as an argument to main) to access environment variables. Why not use envp? (Try changing the code to use envp and see what happens.)
   * + That’s because envp is a read only file so wont be able to access the environment variables and change them, so it outputs an error and exits.
10. Setup password-less login to your local system between the student and other account (or any two other accounts), following the above instructions. Note that the "local" account is the one you are running the ssh command on.
    * + Done and setup, passphrase is “passphrase”.
11. Setup password-less login to access.scs.carleton.ca, following the instructions above.
    * + Same instructions but used isaklaguan as user then @access.scs.carleton.ca instead of @localhost
      + Overwritten other user however since used the same file name for key generation so its back to needing a password
12. Secure shell can be used to directly run a command on another program rather than the default shell. For example, try "ssh student@localhost bc -l" and see that bc is run. When you do this, does ssh directly run the specified command or does it first run a shell and have the shell run the command? Use opensnoop.bt or execsnoop.bt to verify.
13. What files in /etc does bash access when you login via 3000userlogin? How does this compare to what bash opens when you log in via ssh?