report

Task 1

In the normal case, it worked properly but when I copied it over, it did not work saying password unchanged with manipulation error

For chsh, similar results, it is unable to unless it is in the right folder

Task 2

Question 2

This exports a new var, prints it (output is correct), then unsets and reprints which has no output

Question 3

There are no differences, this is because env variables are shared across processes since they are derived from the shell
Output can be found under task2/diff.txt (blank)
Output of child and parent are called child.txt and parent.txt respectively

Question 4

Output when null in my_env_null.txt (blank)
When running it with the 3rd parameter being NULL, nothing happens.

Output when environ in my_env_environ.txt

Then when changing the param to environ, all the env vars are printed

This shows that execve allows you to decide whether the envirornment vars for the syscall are inherited from the env vars of the shell or not. This is useful for changing them temporarily

Question 5

The output of the mysystem program can be seen in mysystem_output.txt

This program just calls the system syscall which calls execl which calls execve. The parameter is /usr/bin/env which prints all the env vars. Since execve was called by system which inherits the env from the shell, the new program eventually ends up inheriting all the enviornment vars from the shell. Thus, the output is all of the env vars that the shell has

Task 3

Q 6

There new var that I created printed as normal

LD_LIBRARY_PATH did not show (surprise, but likely because it is very important)

PATH was printed and changed as expected which also sort of surprised me because PATH is important and shouldn't be messed with too much

Q 7

```
cyber@cyber:~/Desktop/MP3-1/MP3$ nvim myls.c
cyber@cyber:~/Desktop/MP3-1/MP3$ gcc myls.c -o myls_whoami
cyber@cyber:~/Desktop/MP3-1/MP3$ nvim myls.c
cyber@cyber:~/Desktop/MP3-1/MP3$ gcc myls.c -o myls_shadow
cyber@cyber:~/Desktop/MP3-1/MP3$ chmod 4755 myls_shadow
cyber@cyber:~/Desktop/MP3-1/MP3$ chmod 4755 myls_whoami
cyber@cyber:~/Desktop/MP3-1/MP3$ sudo chown root myls_shadow
cyber@cyber:~/Desktop/MP3-1/MP3$ sudo chown root myls_whoami
cyber@cyber:~/Desktop/MP3-1/MP3$ sudo chmod 4755 myls_whoami
cyber@cyber:~/Desktop/MP3-1/MP3$ sudo chmod 4755 myls_shadow
cyber@cyber:~/Desktop/MP3-1/MP3$ ./myls_whoami
cyber
cyber@cyber:~/Desktop/MP3-1/MP3$ ./myls_shadow
cat: /etc/shadow: Permission denied
cyber@cyber:~/Desktop/MP3-1/MP3$ export PATH=$PWD:$PATH
cyber@cyber:~/Desktop/MP3-1/MP3$ ls
cap_leak.c  catall.c  myenv.c  mylib.c  myls.c  myls_shadow  myls_whoami  myp
cyber@cyber:~/Desktop/MP3-1/MP3$ ./myls_shadow
cat: /etc/shadow: Permission denied
cyber@cyber:~/Desktop/MP3-1/MP3$ ./myls_whoami
cyber
cyber@cyber:~/Desktop/MP3-1/MP3$
```

No because it says permission denied and whoami just shows the username not the root so
they aren't running as the root

```
cyber@cyber ~ % echo $0
-zsh
cyber@cyber ~ % sudo ln -sf /bin/zsh /bin/sh
cyber@cyber ~ % ls
Desktop  Documents  Downloads  Music  Pictures  Public  Templates  Videos
cyber@cyber ~ % cd Desktop/MP3-1
cyber@cyber ~/Desktop/MP3-1 % ls
MP3
cyber@cyber ~/Desktop/MP3-1 % cd MP3
cyber@cyber ~/Desktop/MP3-1/MP3
% ls
cap_leak.c  myenv.c  myls.c       myls_whoami  myprog.c     printall
catall.c    mylib.c  myls_shadow  myprintenv.c mysystem.c   printall.c
cyber@cyber ~/Desktop/MP3-1/MP3
% ./myls_shadow
root:!:19081:0:99999:7:::
daemon:*:19046:0:99999:7:::
bin:*:19046:0:99999:7:::
sys:*:19046:0:99999:7:::
sync:*:19046:0:99999:7:::
games:*:19046:0:99999:7:::
man:*:19046:0:99999:7:::
lp:*:19046:0:99999:7:::
mail:*:19046:0:99999:7:::
news:*:19046:0:99999:7:::
uucp:*:19046:0:99999:7:::
proxy:*:19046:0:99999:7:::
www-data:*:19046:0:99999:7:::
backup:*:19046:0:99999:7:::
list:*:19046:0:99999:7:::
irc:*:19046:0:99999:7:::
gnats:*:19046:0:99999:7:::
nobody:*:19046:0:99999:7:::
systemd-network:*:19046:0:99999:7:::
systemd-resolve:*:19046:0:99999:7:::
systemd-timesync:*:19046:0:99999:7:::
messagebus:*:19046:0:99999:7:::
syslog:*:19046:0:99999:7:::
_apt:*:19046:0:99999:7:::
tss:*:19046:0:99999:7:::
uuidd:*:19046:0:99999:7:::
tcpdump:*:19046:0:99999:7:::
avahi-autoipd:*:19046:0:99999:7:::
usbmux:*:19046:0:99999:7:::
rtkit:*:19046:0:99999:7:::
dnsmasq:*:19046:0:99999:7:::
cups-pk-helper:*:19046:0:99999:7:::
speech-dispatcher:!:19046:0:99999:7:::
avahi:*:19046:0:99999:7:::
kernoops:*:19046:0:99999:7:::
saned:*:19046:0:99999:7:::
nm-openvpn:*:19046:0:99999:7:::
hplip:*:19046:0:99999:7:::
whoopsie:*:19046:0:99999:7:::
colord:*:19046:0:99999:7:::
geoclue:*:19046:0:99999:7:::
pulse:*:19046:0:99999:7:::
gnome-initial-setup:*:19046:0:99999:7:::
gdm:*:19046:0:99999:7:::
sssd:*:19046:0:99999:7:::
cyber:$6$IVHplFYIGB7BKJ.P$07nfNLXuArkPM/WXCrw6bUqmGrUDkjYYFXuo8VkqsM8Is0RQwCgcZA74pe.kpqQBOkayUfogZzmTw6PslooiG0:19081:0:99999:7:::
systemd-coredump:!!:19081::::::
sshd:*:19234:0:99999:7:::
research:$6$SnJOFxUeCwwS3.y2$VH8DOOwsBtpJHyBtHTMWzH4C7RkjBNuXQ6LuSHThw5IIWpUzJZJRIZVLsxooMVt.r8eDrub7zRjykUAsSnbqs8:19234:0:99999:7:::
fwupd-refresh:*:19369:0:99999:7:::
cyber@cyber ~/Desktop/MP3-1/MP3
% ./myls_whoami
root
```

When switching to zsh it actually does end up running as the root since whoami prints the root thus we can actually print shadow