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1) Code: In q1.c
   Output:

```
sista@ubuntu:~/NP/lab/ex4$ gcc -o q1 -L . q1.c libapue.a
sista@ubuntu:~/NP/lab/ex4$ ./q1
shell>ls
apue.h       libapue.a  q1.c  q2.c  q3.c  q4.c
input.txt  q1           q2    q3    q4    sorted_output.txt
shell>ls > input.txt
shell>sort < input.txt > sorted_output.txt
shell>cat sorted_output.txt
apue.h
input.txt
libapue.a
q1
q1.c
q2
q2.c
q3
q3.c
q4
q4.c
sorted_output.txt
shell>exit
sista@ubuntu:~/NP/lab/ex4$
```

2) Code: In q2.c
   Output:

```
sista@ubuntu:~/NP/lab/ex4$ gcc -o q2 -L . q2.c libapue.a
sista@ubuntu:~/NP/lab/ex4$ ./q2
shell> ls
apue.h  libapue.a  q1  q1.c  q2  q2.c  q3  q3.c  q4  q4.c
shell> ls>input.txt
shell> sort<input.txt>sorted_output.txt
shell> cat sorted_output.txt
apue.h
input.txt
libapue.a
q1
q1.c
q2
q2.c
q3
q3.c
q4
q4.c
shell> ls | grep q
q1
q1.c
q2
q2.c
q3
q3.c
q4
q4.c
shell> ls | grep q | wc -l
8
shell> exit
sista@ubuntu:~/NP/lab/ex4$ 
```

3) Code: In q3.c
   Output:

```
sista@ubuntu:~/NP/lab/ex4$ gcc -o q3 -L . q3.c libapue.a
q3.c: In function 'handler':
q3.c:4:8: warning: implicit declaration of function 'waitpid' [-Wimplicit-function-declaration]
    4 |   while(waitpid( -1, NULL, WNOHANG) > 0);
      |         ^~~~~~~
sista@ubuntu:~/NP/lab/ex4$ ./q3
Hello from parent
Hello from child
F S   UID     PID    PPID  C PRI  NI ADDR SZ WCHAN   TTY          TIME CMD
4 S   1000    2037    2034  4  80   0 - 107482 ep_pol tty2     00:07:41 Xorg
0 S   1000    2088    2034  0  80   0 - 47055 do_sys tty2     00:00:00 gnome-session-b
0 S   1000    8354    2628  0  80   0 -   624 do_wai pts/0    00:00:00 q3
0 S   1000    8356    8354  0  80   0 -   654 do_wai pts/0    00:00:00 sh
4 R   1000    8357    8356  0  80   0 -  2854 -      pts/0    00:00:00 ps
sista@ubuntu:~/NP/lab/ex4$
```

4) Code: In q4.c
   Output:

```
sista@ubuntu:~/NP/lab/ex4$ gcc -o q4 -L . q4.c libapue.a
sista@ubuntu:~/NP/lab/ex4$ ./q4
parent is incrementing from 0
child is incrementing from 1
parent is incrementing from 2
child is incrementing from 3
parent is incrementing from 4
child is incrementing from 5
sista@ubuntu:~/NP/lab/ex4$
```