

# Assignment 1

CAOS

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# Supported Commands

# History

Desc : Shows history of commands used in the current shell session.

There are 2 types of history-

One is in buffer which can be accessed by arrow keys while in shell

Second is by typing "history" in shell.

# Exit

Desc : Makes the user close the shell process.

# Echo

Desc : displays the keywords as it is after the echo token

Echo is handled simply by displaying the token after the “echo” keyword.

Improper spacing is handled as well.

Flags handled: -E, -n

Problems faced : input with quotes will be printed with quotes unlike in the normal shell.

# Pwd

Desc : Shows the present working directory

Flags handled: all of the possible flags.

# cd

Desc : lets the user go into or out of an existing directory.

Implementation of cd is through chdir, and thus it handles all possible inputs which can be used against the token cd.

# ls

Desc : lists all the files in the current directory

All possible flags are handled. As well as token for displaying contents of a location is also handled.

Problems faced: one of the major problems was to show the contents of a specific location. And showing files in the current location also is one of the problems.



# cat

Desc : cat helps to see contents of the file which is passed as a token.

The cat works with all flags.

Problems faced: the cat command can only access one file ,meaning we cannot use cat as a command for two files, this is due to the limitation of execl() command.

# date

Desc : shows the current system time.

Problems: if only the date command is passed.

# rm

Desc : removes the passed files

Flags: all handled.

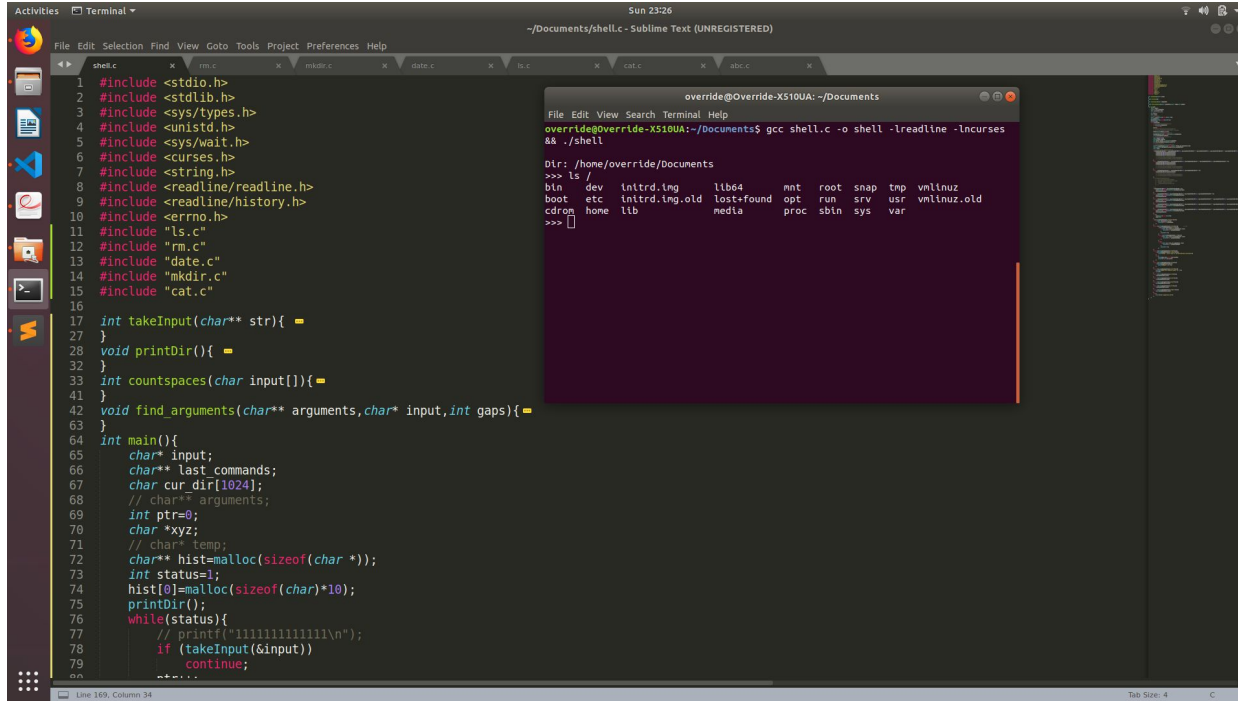
# mkdir

Desc : creates a directory by the passed name.

Flags: handled all.

Problems faced : cannot handle multiple directories name due to the limitation of `exec()` command.

# Snaps



The screenshot shows a Linux desktop environment. The main window is a Sublime Text editor (version 3.1.2) with a dark theme. It has multiple tabs open, with the active tab being 'shell.c'. The code in the editor is a C program that includes standard headers, defines macros for file operations, and implements a simple shell-like functionality using a loop and a buffer. The code is as follows:

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 #include <sys/types.h>
4 #include <unistd.h>
5 #include <sys/wait.h>
6 #include <csd.h>
7 #include <string.h>
8 #include <readline/readline.h>
9 #include <readline/history.h>
10 #include <errno.h>
11 #include "ls.c"
12 #include "rm.c"
13 #include "date.c"
14 #include "mkdir.c"
15 #include "cat.c"
16
17 int takeInput(char** str){
18 }
19 void printDir(){
20 }
21 int countspaces(char input[]){
22 }
23 void find_arguments(char** arguments, char* input, int gaps){
24 }
25
26 int main(){
27     char* input;
28     char** last_commands;
29     char cur_dir[1024];
30     // char** arguments;
31     int ptr=0;
32     char *xyz;
33     // char* temp;
34     char** hist=malloc(sizeof(char *));
35     int status=1;
36     hist[0]=malloc(sizeof(char)*10);
37     printDir();
38     while(status){
39         // printf("111111111111\n");
40         if (takeInput(&input))
41             continue;
42     }
43 }
```

In the background, a terminal window is open, showing the output of the program. The terminal prompt is 'override@Override-XS10UA: ~/Documents'. The user has entered 'gcc shell.c -o shell -lreadline -lncurses' and the output is 'ls /'. The terminal also shows the output of 'ls /' which is a directory listing of the root directory.

Activities Terminal Sun 23:27  
~/Documents/shell.c - Sublime Text (UNREGISTERED)

File Edit Selection Find View Goto Tools Project Preferences Help

shell.c x rm.c x mkdir.c x date.c x ls.c x cat.c x abc.c x

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 #include <sys/types.h>
4 #include <unistd.h>
5 #include <sys/wait.h>
6 #include <urses.h>
7 #include <string.h>
8 #include <readline/readline.h>
9 #include <readline/history.h>
10 #include <errno.h>
11 #include "ls.c"
12 #include "rm.c"
13 #include "date.c"
14 #include "mkdir.c"
15 #include "cat.c"
16
17 int takeInput(char** str){
18 }
19
20 void printDir(){
21 }
22
23 int countspaces(char input[]){
24 }
25
26 void find_arguments(char** arguments, char* input, int gaps){
27 }
28
29 int main(){
30     char* input;
31     char** last_commands;
32     char cur_dir[1024];
33     // char** arguments;
34     int ptr=0;
35     char *xyz;
36     // char* temp;
37     char** hist=malloc(sizeof(char *));
38     int status=1;
39     hist[0]=malloc(sizeof(char)*10);
40     printDir();
41     while(status){
42         // printf("11111111111111\n");
43         if (takeInput(&input))
44             continue;
45     }
46 }
```

override@Override-X510UA: ~/Documents

File Edit View Search Terminal Help

```
override@Override-X510UA:~/Documents$ gcc shell.c -o shell -lreadline -lncurses
&& ./shell

Dir: /home/override/Documents
>>> ls /
bin      dev      initrd.img  lib64      mnt      root     snap     tmp      vmlinuz
boot     etc      initrd.img.old  lost+found  opt      run      srv      usr      vmlinuz.old
cdrom    home     lib         media       proc     sbin     sys      var

>>> mkdir a
mkdir: cannot create directory 'a': File exists
>>> mkdir b
>>> 
```

Line 169, Column 34 Tab Size: 4 C

Activities Terminal Sun 23:27  
~/Documents/shell.c - Sublime Text (UNREGISTERED)

File Edit Selection Find View Goto Tools Project Preferences Help

shell.c x rm.c x mkdir.c x date.c x ls.c x cat.c x abc.c x

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 #include <sys/types.h>
4 #include <unistd.h>
5 #include <sys/wait.h>
6 #include <curses.h>
7 #include <string.h>
8 #include <readline/readline.h>
9 #include <readline/history.h>
10 #include <errno.h>
11 #include "ls.c"
12 #include "rm.c"
13 #include "date.c"
14 #include "mkdir.c"
15 #include "cat.c"
16
17 int takeInput(char** str){
18 }
19
20 void printDir(){
21 }
22
23 int countspaces(char input[]){
24 }
25
26 void find_arguments(char** arguments, char* input, int gaps){
27 }
28
29 int main(){
30     char* input;
31     char** last_commands;
32     char cur_dir[1024];
33     // char** arguments;
34     int ptr=0;
35     char *xyz;
36     // char* temp;
37     char** hist=malloc(sizeof(char *));
38     int status=1;
39     hist[0]=malloc(sizeof(char)*10);
40     printDir();
41     while(status){
42         // printf("11111111111111\n");
43         if (takeInput(&input))
44             continue;
45     }
46 }
```

override@Override-X510UA: ~/Documents

File Edit View Search Terminal Help

```
override@Override-X510UA:~/Documents$ gcc shell.c -o shell -lreadline -lncurses
&& ./shell

Dir: /home/override/Documents
>>> ls /
bin    dev    initrd.img    lib64    mnt    root    snap    tmp    vmlinuz
boot   etc    initrd.img.old  lost+found  opt    run    srv    usr    vmlinuz.old
cdrom  home  lib          media    proc   sbin   sys    var

>>> mkdir a
mkdir: cannot create directory 'a': File exists
>>> mkdir b
>>> cd b
>>> pwd
/home/override/Documents/b
>>>
```

Line 169, Column 34 Tab Size: 4 C

Activities Terminal ▾ Sun 23:27  
~/Documents/shell.c - Sublime Text (UNREGISTERED)

File Edit Selection Find View Goto Tools Project Preferences Help

shell.c x rm.c x mkdir.c x date.c x ls.c x cat.c x abc.c x

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 #include <sys/types.h>
4 #include <unistd.h>
5 #include <sys/wait.h>
6 #include <csurses.h>
7 #include <string.h>
8 #include <readline/readline.h>
9 #include <readline/history.h>
10 #include <errno.h>
11 #include "ls.c"
12 #include "rm.c"
13 #include "date.c"
14 #include "mkdir.c"
15 #include "cat.c"
16
17 int takeInput(char** str){
18 }
19 void printDir(){
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21 int countspaces(char input[]){
22 }
23 void find_arguments(char** arguments, char* input, int gaps){
24 }
25
26 int main(){
27     char* input;
28     char** last_commands;
29     char cur_dir[1024];
30     // char** arguments;
31     int ptr=0;
32     char *xyz;
33     // char* temp;
34     char** hist=malloc(sizeof(char *));
35     int status=1;
36     hist[0]=malloc(sizeof(char)*10);
37     printDir();
38     while(status){
39         // printf("llllllllllll\n");
40         if (takeInput(&input))
41             continue;
42     }
43 }
```

override@Override-X510UA: ~/Documents

File Edit View Search Terminal Help

```
override@Override-X510UA:~/Documents$ gcc shell.c -o shell -lreadline -lncurses
&& ./shell

Dir: /home/override/Documents
>>> ls /
bin    dev    initrd.img    lib64    mnt    root    snap    tmp    vmlinuz
boot   etc    initrd.img.old  lost+found  opt    run    srv    usr    vmlinuz.old
cdrom  home  lib           media     proc   sbin    sys    var

>>> mkdir a
mkdir: cannot create directory 'a': File exists
>>> mkdir b
>>> cd b
>>> pwd
/home/override/Documents/b
>>> cd ..
>>> pwd
/home/override/Documents
>>> 
```

Line 169, Column 34 Tab Size: 4 C



Activities Terminal ▾ Sun 23:27  
~/Documents/shell.c - Sublime Text (UNREGISTERED)

File Edit Selection Find View Goto Tools Project Preferences Help

shell.c x rm.c x mkdir.c x date.c x ls.c x cat.c x abc.c x

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 #include <sys/types.h>
4 #include <unistd.h>
5 #include <sys/wait.h>
6 #include <urses.h>
7 #include <string.h>
8 #include <readline/readline.h>
9 #include <readline/history.h>
10 #include <errno.h>
11 #include "ls.c"
12 #include "rm.c"
13 #include "date.c"
14 #include "mkdir.c"
15 #include "cat.c"
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17 int takeInput(char** str){
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19
20 void printDir(){
21 }
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23 int countspaces(char input[]){
24 }
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26 void find_arguments(char** arguments, char* input, int gaps){
27 }
28
29 int main(){
30     char* input;
31     char** last_commands;
32     char cur_dir[1024];
33     // char** arguments;
34     int ptr=0;
35     char *xyz;
36     // char* temp;
37     char** hist=malloc(sizeof(char *));
38     int status=1;
39     hist[0]=malloc(sizeof(char)*10);
40     printDir();
41     while(status){
42         // printf("111111111111\n");
43         if (takeInput(&input))
44             continue;
45     }
46 }
```

override@Override-X510UA: ~/Documents

File Edit View Search Terminal Help

Dir: /home/override/Documents

```
>>> ls /
bin    dev    initrd.img  lib64      mnt      root    snap    tmp    vmlinuz
boot   etc    initrd.img.old  lost+found  opt      run     srv     usr     vmlinuz.old
cdrom  home   lib         media      proc    /sbin   sys     var

>>> mkdir a
mkdir: cannot create directory 'a': File exists
>>> mkdir b
>>> cd b
>>> pwd
/home/override/Documents/b
>>> cd ..
>>> pwd
/home/override/Documents
>>> history
ls /
mkdir a
mkdir b
cd b
pwd
cd ..
pwd
history
>>>
```

Line 169, Column 34 Tab Size: 4 C

Activities Terminal

Sun 23:28

~/Documents/shell.c - Sublime Text (UNREGISTERED)

File Edit Selection Find View Goto Tools Project Preferences Help

shell.c x rm.c x mkdir.c x date.c x ls.c x cat.c x abc.c x

```
147     else{
148         xyz=malloc(sizeof(char));
149         xyz="#";
150     }
151     if(strcmp(arguments[0],"history")==0){
152         for(int i=1;i<ptr+1;i++){
153             printf("%s \n",hist[i]);
154         }
155     }
156     else if(strcmp(arguments[0],"echo")==0){ // echo
157         if(strcmp(arguments[1],"-E")==0){
158             for(int i=2; i<(no_of_arguments); i++){
159                 printf("%s ",arguments[i]);
160             }
161             printf("\n");
162         }
163         else if(strcmp(arguments[1],"-n")==0){
164             for(int i=2; i<(no_of_arguments); i++){
165                 printf("%s ",arguments[i]);
166             }
167         }
168         else{
169             for(int i=1; i<(no_of_arguments); i++){
170                 printf("%s ",arguments[i]);
171             }
172             printf("\n");
173         }
174     }
175     else if(strcmp(arguments[0],"pwd")==0){
176         if(strcmp(arguments[1],"--help")==0){
177             printf("pwd - print name of current/working directory");
178         }
179         else{
180             getcwd(cur_dir,sizeof(cur_dir));
181             printf("%s\n",cur_dir);
182         }
183     }
184     else if(strcmp(arguments[0],"cd")==0){
185         if(chdir(arguments[1])!=0){
186             perror("Bash : cd :");
187         }
188     }
```

override@Override-X510UA: ~/Documents

File Edit View Search Terminal Help

```
boot etc initrd.img.old lost+found opt run srv usr vmlinuz.old
cdrom home lib media proc sbin sys var
>>> mkdir a
mkdir: cannot create directory 'a': File exists
>>> mkdir b
>>> cd b
>>> pwd
/home/override/Documents/b
>>> cd ..
>>> pwd
/home/override/Documents
>>> history
ls /
mkdir a
mkdir b
cd b
pwd
cd ..
pwd
history
>>> echo -n this is echo command with multiple spcaes
this is echo command with multiple spcaes >>> echo -E echo again
echo again
>>>
```

Line 169, Column 34

Tab Size: 4 C

```
185     if(chdir(argument) != 0) {
186         perror("Bad argument");
187     }
188 }
189 else if(strcmp(argument, "ls") == 0) {
190     printf("Thanks for using my shell\n");
191     exit(0);
192 }
193 else if(strcmp(argument, "rm") == 0) {
194     ls(arguments[1]);
195 }
196 else if(strcmp(argument, "cat") == 0) {
197     cat(arguments[1]);
198 }
199 else if(strcmp(argument, "date") == 0) {
200     date(arguments[1]);
201 }
202 else if(strcmp(argument, "mkdir") == 0) {
203     mkdir(arguments[1], 0755);
204 }
205 else if(strcmp(arguments[0], "mkdir") == 0) {
206     mkdir(arguments[1], xyz);
207 }
208 else {
209     printf("Not Supported yet");
210 }
211 }
212 }
213 }
```

File Edit View Search Terminal Help

override@Override-XS10UA:~\$ cd Documents/

override@Override-XS10UA:~/Documents\$ gcc shell.c -o shell -lreadline -lncurses &amp;&amp; ./shell

Dir: /home/override/Documents

&gt;&gt;&gt; ls /home/override/Documents/

a abc abc.c b cat.c dat.c date.c ls.c mkdir.c rm.c shell shell.c

&gt;&gt;&gt; rm -m dat.c

&gt;&gt;&gt; ls /home/override/Documents/

a abc abc.c b cat.c date.c ls.c mkdir.c rm.c shell shell.c

&gt;&gt;&gt; []

Activities Terminal Sun 23:31 ~/Documents/shell.c - Sublime Text (UNREGISTERED)

File Edit Selection Find View Goto Tools Project Preferences Help

```
185     if(chdir(argument) != 0)
186         perror("Bad directory");
187     }
188 }
189 else if(strcmp(argument, "cd") == 0) {
190     printf("Thanks for using my shell :)\n");
191     exit(0);
192 }
193 else if(strcmp(argument, "ls") == 0) {
194     ls(arguments[1]);
195 }
196 else if(strcmp(argument, "cat") == 0) {
197     cat(arguments[1]);
198 }
199 else if(strcmp(argument, "date") == 0) {
200     date(arguments[1]);
201 }
202 else if(strcmp(argument, "rm") == 0) {
203     rm(arguments[1]);
204 }
205 else if(strcmp(arguments[0], "mkdir") == 0) {
206     mkdir(arguments[1], 0755);
207 }
208 else {
209     printf("Not Supported yet");
210 }
211 }
212 }
213 }
```

override@Override-X510UA: ~/Documents

```
File Edit View Search Terminal Help
override@Override-X510UA:~$ cd Documents/
override@Override-X510UA:~/Documents$ gcc shell.c -o shell -lreadline -lnurses
&& ./shell
dir: /home/override/Documents
>>> ls /home/override/Documents/
a abc abc.c b cat.c dat.c date.c ls.c mkdir.c rm.c shell shell.c
>>> rm -m dat.c
>>> ls /home/override/Documents/
a abc abc.c b cat.c date.c ls.c mkdir.c rm.c shell shell.c
>>> exit
Thanks for using my shell :)
override@Override-X510UA:~/Documents$
```

Line 169, Column 34 Tab Size: 4 C

# Test Case

Ls /

Mkdir b

Cd b

Pwd

Cd ..

Pwd

history

Echo -n this is echo command with improper spaces

Echo -E echo again

ls /home/override/Documents/

rm -m dat.c

ls /home/override/Documents/

Exit