

Lab1

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1- Main()

```
3 void main()
4 {
5     signal(SIGCHLD, on_child_exit);
6     setup_environment();
7     shell();
8 }
```

2- On child exit() :- it release zombie processes and append child terminated to the file

```
// to release zombie process
void on_child_exit()
{
    //pid_t pid;
    waitpid(-1, NULL, WNOHANG);
    FILE *fptr;
    fptr = fopen("/home/hager101/OS1/Lab1/child_exit.txt", "a");
    fprintf(fptr, "Child terminated\n");
    fclose(fptr);
}
```

3- Setup_environment() :- default path is home/hager101

```
//default path
void setup_environment()
{
    chdir("/home/hager101");
}
```

4- Shell():- read command from user and remove leading and trailing spaces

```
void shell()
{
    int n;
    char read_input[100];
    do
    {
        fgets(read_input, sizeof(read_input), stdin);
        n = strlen(read_input);
        int start = 0;
        //removing leading zeros
        for (int i = 0; i < strlen(read_input) - 1; i++)
        {
            if (!isspace(read_input[i]))
                break;
            start++;
        }
        //removing trailing zeros
        for (int i = strlen(read_input) - 2; i >= 0; i--)
        {
            if (!isspace(read_input[i]))
                break;
            n--;
        }
        read_input[n - 1] = '\0';
        evaluate_expression(read_input, n, start);
    } while (1);
}
```

5- Evaluate expression():- check existence of one or more variable and replace it by its value

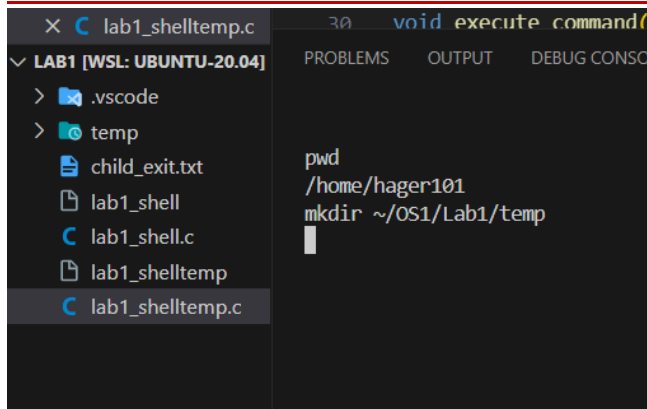
6- Determine command():-

- Echo():- to print the part after echo
- Export():- to save the variable and its value
- Exit():- to exit from the parent process
- Cd():- to change the current path
- Execute command():- to fork the parent process and execute other commands:-
(Parent wait for its child if there is not &)
(replace ~ by /home/hager101)
 - 1- Pwd():- to get the current path
 - 2- Ls():- to get existing files and folders
 - 3- Mkdir():- make directory
 - 4- Rm():- remove file or folder
 - 5- Cp():- to copy folder or file from path to another
 - 6- Mv():- to move folder or file from path to another
 - 7- Chmod():- to change permission of file/folder
 - 8- Firefox():- to open firefox

Samples Run:-

```
pwd
/home/hager101
echo "hager"
hager
export x="OS"
echo $x
OS
echo $y

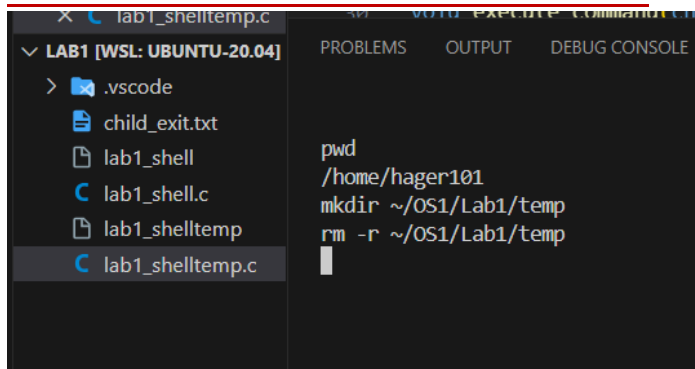
cd ..
pwd
/home
cd ~/OS1
pwd
/home/hager101/OS1
exit
[1] + Done                               "/usr/bin/gdb" --interpreter=mi
hager101@DESKTOP-F90AJ05:~/OS1/Lab1$
```



```
void execute_command()

PROBLEMS  OUTPUT  DEBUG CONSOLE

pwd
/home/hager101
mkdir ~/OS1/Lab1/temp
```



```
void execute_command()

PROBLEMS  OUTPUT  DEBUG CONSOLE

pwd
/home/hager101
mkdir ~/OS1/Lab1/temp
rm -r ~/OS1/Lab1/temp
```

```
mv ~/OS1/Lab1/$x ~/OS1/temp2
ls -l
total 12
drwxr-xr-x 3 hager101 hager101 4096 Mar  8 18:05 Lab1
drwxr-xr-x 2 hager101 hager101 4096 Mar  8 18:04 temp
drwxr-xr-x 2 hager101 hager101 4096 Mar  8 18:03 temp2
```

```
cp ~/OS1/Lab1/$x ~/OS1/$x
cp: -r not specified; omitting directory '/home/hager101/OS1/Lab1/temp'
cp -r ~/OS1/Lab1/$x ~/OS1/$x
cd ~/OS1
pwd
/home/hager101/OS1
ls -l
total 8
drwxr-xr-x 4 hager101 hager101 4096 Mar  8 18:03 Lab1
drwxr-xr-x 2 hager101 hager101 4096 Mar  8 18:04 temp
```

LAB1 [WSL: UBUNTU-20.04]

> .vscode
> temp
child_exit.txt
lab1_shell
lab1_shell.c
lab1_shelltemp
lab1_shelltemp.c

pwd
/home/hager101
mkdir ~/OS1/Lab1/temp
rm -r ~/OS1/Lab1/temp
export x=temp
mkdir ~/OS1/Lab1/\$x

```
drwxr-xr-x 2 hager101 hager101 4096 Mar  8 18:03 temp2
firefox
[GFX1-]: glxtest: ManageChildProcess failed

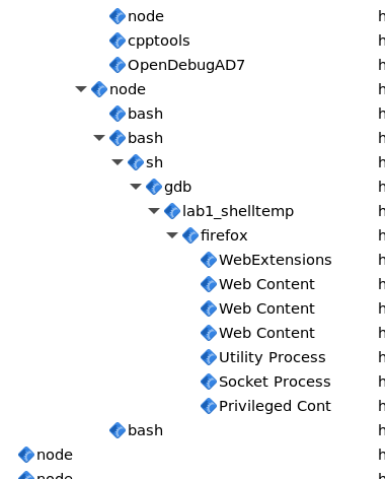
[GFX1-]: glxtest: libEGL missing
ls -l
pwd
```

```

firefox &
[GFX1-]: glxtest: ManageChildProcess failed

[GFX1-]: glxtest: libEGL missing
pwd
/home/hager101/OS1
ls -l
total 12
drwxr-xr-x 3 hager101 hager101 4096 Mar  8 18:05 Lab1
drwxr-xr-x 2 hager101 hager101 4096 Mar  8 18:04 temp
drwxr-xr-x 2 hager101 hager101 4096 Mar  8 18:03 temp2

```



```

cd ~/OS1
pwd
/home/hager101/OS1
ls -a
. .. Lab1 file temp temp2
ls -l
total 12
drwxr-xr-x 3 hager101 hager101 4096 Mar  8 18:14 Lab1
-rw-r--r-- 1 hager101 hager101    0 Mar  8 18:14 file
drwxr-xr-x 2 hager101 hager101 4096 Mar  8 18:04 temp
drwxr-xr-x 2 hager101 hager101 4096 Mar  8 18:03 temp2
export x=666
export y=file
chmod $x ~/OS1/$y
ls -l
total 12
drwxr-xr-x 3 hager101 hager101 4096 Mar  8 18:14 Lab1
-rw-rw-rw- 1 hager101 hager101    0 Mar  8 18:14 file
drwxr-xr-x 2 hager101 hager101 4096 Mar  8 18:04 temp
drwxr-xr-x 2 hager101 hager101 4096 Mar  8 18:03 temp2

```

▼ node	nager101	0.75	10%
node	hager101	0.00	10%
cpptools	hager101	0.00	10%
OpenDebugAD7	hager101	0.03	10%
▼ node	hager101	0.00	10%
bash	hager101	0.00	10%
bash	hager101	0.00	4%
sh	hager101	0.00	10%
gdb	hager101	0.00	10%
lab1_shelltemp	hager101	0.00	10%
bash	hager101	0.00	4%
node	hager101	0.00	9%
node	hager101	0.00	9%
▼ firefox	hager101	0.15	9%
WebExtensions	hager101	0.00	9%
Web Content	hager101	0.00	9%