

# Project 4: User-Level Shell CS 416 OS Design

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## KEY FUNCTIONS IMPLEMENTATION

1. sigintHandler  
Signal handler defined for 'ctrl+c'
2. startup-shell  
Greets the user and notifies type to 'exit' terminate the Shell. 'ctrl+c' won't work.
3. takeInput  
Takes input using readline after the 'dir \$ '. must install the following: "sudo apt-get install libreadline-dev"
4. printDir  
Gets the current directory using 'getcwd' function and prints the current directory
5. semicolon input  
In the main function, the total input is divided into by pieces in using 'strtok' functions and executes one command after another at a time until the piece is null.
6. pipe-parse  
Parse the input for pipes and pass to pipe-handler: if no pipes, pass input to io-parse
7. io-parse  
Append flag first and then detects and handles both input and output redirection. Then parse out io files and cmds and calls appropriate function.
8. no-ops-execute  
The parsed input is compared and excuted. The "exit" and change directory command are customized implemented. Rests of the commands are called out by 'execvp' function.
9. pipe-handler  
Loops through pipe commands and fork child to handle cmd. For all but first cmd, connect stdin with pipefd[0]. And for all but last cmd, connect stdout with pipefd[1].

## TESTING

```
#####  
Welcome to PKSH Shell  
#####  
#'exit' to terminate#  
#####  
  
/home/pk/Desktop/project4/v2 $ echo hello  
hello  
  
/home/pk/Desktop/project4/v2 $
```

1.

```
/home/pk/Desktop/project4/v2 $ ls; echo "hello world"  
dir1 dir2 Makefile out2.txt out.txt shell.c test test2 test2.c test.c  
"hello world"  
  
/home/pk/Desktop/project4/v2 $
```

2.

```
home/pk/Desktop/project4/v2 $ ls > out.txt
```

3.

out.txt	
1	dir1
2	dir2
3	Makefile
4	out2.txt
5	out.txt
6	shell.c
7	test
8	test2
9	test2.c
10	test.c

```
/home/pk/Desktop/project4/v2 $ ls | wc -l  
10
```

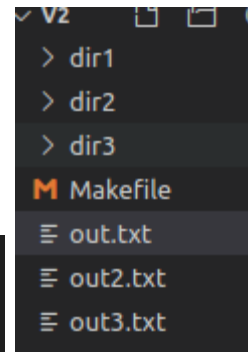
4.

```
/home/pk/Desktop/project4/v2 $ ^CThe shell cannot be terminated using ctrl+c  
But the running command/program was cancelled  
pwd  
/home/pk/Desktop/project4/v2
```

5.

6.

```
/home/pk/Desktop/project4/v2 $ touch out3.txt  
/home/pk/Desktop/project4/v2 $ mkdir dir3
```



7.

```
/home/pk/Desktop/project5/obawolo_obawolo/project4 $ cd dir1  
/home/pk/Desktop/project5/obawolo_obawolo/project4/dir1 $ cd ../
```

8.

```
/home/pk/Desktop/project5/obawolo_obawolo/project4 $ exit  
Goodbye  
pk@PkUbuntu:~/Desktop/project5/obawolo_obawolo/project4$
```