

## Shell Emulator Diagrams

main.c diagram

```
start_shell()
do
    print_prompt
    get_line
    int exit = process_line(line)
while(input != exit)

process_line()
int exit = check_exit
if(!exit){
    char *token = tokenize(" ")
    process_exec(token)
}
return exit;
}
```

## main.c diagram 2

```
int not_exit;  
char line[BUFFER];  
int num_of_exec;
```

```
do {
```

```
    void get_input(char *line);
```

```
    not_exit = check_exit();
```

```
    if(not_exit){
```

```
        num_of_exec = get_num_of_exec(char *line);
```

```
        if(num_of_exec > 0){
```

```
            struct executable exec[num_of_exec];
```

```
            process_line(char *line, struct executable *exec,
```

```
                process_execs(exec, num_of_exec);
```

```
        }
```

```
    }
```

```
} while(not_exit);
```

## micro shell command parse

$e_1 \ a_1 \mid e_2 \ a_1 \ a_2$

$\text{token}(" \mid ") = \{ "e_1 \ a_1", "e_2 \ a_1 \ a_2" \}$

$\text{token}(\text{index}0, " \mid ") = "e_1 \ a_1"$

possible shell commands

e1			
e2	a1		
e3	a1	a2	
e4	a1	a2	a3

## shell command pipe management

```
msh% ls /bin /usr/bin | sort | uniq |
```

2D array = { {ls, /bin, /usr/bin},  
              {sort},  
              {uniq},  
              {less}  
            }

## processing pipe commands

% ls -l | sort -fi | grep ms

2 args      2 args      2 args

3 executables

$\text{exec}[0].\text{arg-list} = \{ "ls", "-l" \}$   
 $\text{exec}[1].\text{arg-list} = \{ "sort", "-fi" \}$   
 $\text{exec}[2].\text{arg-list} = \{ "grep", "ms" \}$

## processing pipe commands with their arguments

% ls -l | sort -fi | grep ms

2 args      2 args      2 args

3 executables

exec[0].arg-count = 2

exec[1].arg-count = 2

exec[2].arg-count = 2



processing pipe commands along with their arguments

% ls -l | sort -fi | grep msh.cpp

2 args      2 args      2 args

3 executables

exec[0].arg-list = {"ls", "-l"}

exec[1].arg-list = {"sort", "-fi"}

exec[2].arg-list = {"grep", "msh.cpp"}

exec[3].arg-list = {'/'}



## processing pipe commands 2

% ls -l | sort -fi | grep msh.c

2 args      2 args      2 args

3 executables

exec[0].arg-list = {"ls", "-l", "/0"}  
exec[1].arg-list = {"sort", "-fi", "/0"}  
exec[2].arg-list = {"grep", "msh.cpp"}