

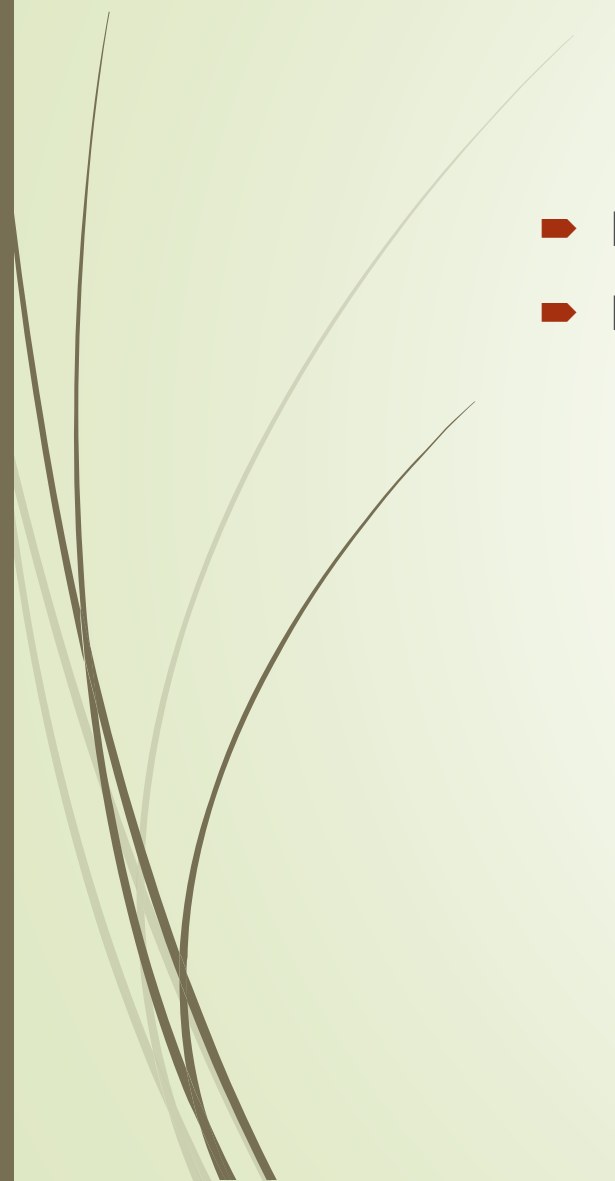


Issue 12: Identification of possible errors and error handling

VE482 Group1



Outline

- Error Type – by p1_specifications.pdf
 - Error Handling
- 



Error Type



- Non-existing program
- Non-existing file in input redirection
- Fail to open the file in output redirection
- Duplicated input redirection
- Duplicated output redirection
- Syntax Error
- Missing program
- Cd to non-existing directory

Non-existing program

- Occurs when we use **execvp()** system call.
- execvp()** returns -1 if it fails to execute
- Example:

```
int a = execvp(args[0], args);  
if(a < 0){  
    fprintf(stdout, "%s: command not found\n", args[0]);  
    fflush(stdout);  
    exit(1);  
}
```

```
jiaying-xu@jiayingxu-VirtualBox:~/Desktop/482lab3demo$ ./mumsh  
mumsh $ some argument  
some: command not found
```

Non-existing file/ Fail to open file

- Occurs when use **open()**, **fopen()**, **dup()/dup2()**
- Example:
 - Open()

```
*output_desc = open(file_output, O_WRONLY | O_CREAT | O_TRUNC, 0777);  
if(*output_desc < 0) {  
    fprintf(stderr, "Failed to open the output file: %s\n", file_output);  
    return 0;  
}
```



Duplicated I/O redirection

- Occurs when multiple file I/O redirection
- Example:
 - Input: `echo abc < 1.txt < 2.txt`
 - Input: `echo abc | grep abc<1.txt`
 - Output: error: duplicated input redirection



Syntax Error

- Occurs when mismatch in I/O redirection, missing arguments
- Example:
 - Input: `echo abc > > > >`
 - Output: syntax error near unexpected token '>'



Missing Program

- Occurs when no argument between pipes
- Example:
 - Input: `> abc | | grep 123`
 - Output: error: missing program



Cd to non-existing directory

- Occurs when use cd
- Error handling:
 - add error handler when implement built-in cd command



Error Handling

- `perror()`
- `printf()`
- `fprintf(stderr)`



perror()

- Description:
 - Prints a descriptive error message to stderr.
- Declaration:
 - `void perror(const char *str)`
- No return value;



perror() example

- Code:

- `perror("command not found\n");`

- Output:

- command not found

- Limitation:

- Cannot print %s format, so programmer must first concat the printing string, then use this function.



printf()

- Description:
 - Sends formatted output to stdout
- Declaration:
 - `int printf(const char* format, ...)`



fprintf()

- Description:
 - Sends formatted output to a stream
- Declaration:
 - `int fprintf(File* stream, const char* format, ...)`
- Example:

fprintf()

➤ Code:

```
int a = execvp(ind_args[0], ind_args);
if(a < 0){
    fprintf(stderr, "%s: command not found\n", ind_args[0]);
    // fflush(stdout);
    exit(1);
}
exit(0);
```

➤ Output:

```
jiaying-xu@jiayingxu-VirtualBox:~/Desktop/482lab3demo$ ./mumsh
mumsh $ some argument
some: command not found
```



Reference

- C library reference:

- https://www.tutorialspoint.com/c_standard_library/index.htm