Description of the system:
The system is a command-line interface for executing various commands provided by the user. It shows the output o f the result on the terminal itself. It is essentially a shell program for linux based systems. This shell executes various other programs according to the input provided by the user to the shell program. The various commands that the she ll can handle are as below:
Internal commands-

1. cd
options available:
a. -L: symlinks are not resolved
b. ~: changes the directory to home directory
errors handled:
a. no such directory found
b. format not valid
c. invalid option
d. no option/path provided

2. pwd
optons:
a. -L
b. -P
errors handled:
a. invalid option
b. invalid format

3. echo
assumptions:
it is required to pass an option with the command
options available:
a. -n: Doesn't output the trailing new line.
b. -E: Doesn't interprets the backslash escapes
errors handled:
a. invalid format
b. invalid option

External command:
1. ls
assumption:
it is required to pass an option with the command
options available:
a. -a,--all: Doesn't ignore the files starting with '.'
b. -i,--inode: prints the files with their index number
errors handled:
a. option not valid
b. option not provided as input in command

2. cat
assumption:
it is required to pass an option with the command
options available:
a. -n: numbers all output lines
b. -b: ignores blank lines while numbering the lines
errors handled:
a. invalid option

b. path provided doesn't point to a regular file
c. option not provided
d. path not provided

3. date
assumptions:
it is required to pass an option with the command
options available
a. -u,--universal,--utc: prints the Universal time(UTC)
b. -r: prints the last modified time of any file/directory specified
errors handled:
a. invalid option provided
b. if input doesn't math the required format, "invalid format" is printed

4. rm
assumption:
it is required to pass an option with the command
options available:
a. -i: asks for confirmation before every removal of a file
b. -v: displays what is being done
errors handled:
a. Path provided doesn't point to a regular file for its deletion
b. invalid option provided for confirmation regarding deletion of the file under the option '-i'
c. invalid option
d. option not provided
e. path not provided

5. mkdir
assumption:
it is required to pass an option with the command
options available:
a. -v: displays what is being done
b. -p,--parent: makes parent directories if not already existing
errors handled:
a. Directory already exists
b. Not a valid path for a directory. For example a path that requires parent directories to be created first but the optio
n chosen as input is not "-p" or "--parent"
c. invalid option
d. option not provided in the input
e. path not provided in the input

The shell itself runs by two seperate implementations:
1. using system calls: fork(),execl() and wait() in order to handle external commands
2. using API function calls: system() and POSIX Pthread family of functions i.e., pthread create() in order to handle external commands
In order to run through second type of implementation, the user is required to provide "&t" in the end of each comm
and, for example,"date -u" would be executed using first type of implentation while "date&t -u" would be executed u
sing second type of implemenatation.
Assumption "test" folder should be present in the working directory in order to run the test case successfully.
TEST CASE:
ls -a
ls&t -i
cat&t -b ./test/testfile
cat -n ./test/testfile
date -u

```
date&t -r ./test
rm -i ./test/testfile
rm&t -v ./test/testfile
mkdir -v ./fold1
mkdir&t -p ./fold2/fold1
cd ~
pwd -P
cd -L ..
pwd -L
echo -n hello there
echo -E hi there
```