LINUX SHELL

- In this project, I have made 6 C programs. One program is the main shell program, in which I have executed 3 internal commands and from there, I have called other 5 external C programs(which handle the external commands). I have called external programs/commands in 2 different ways:
  - ❖ Using fork()/exec() family of commands
  - ❖ Using pthread_create()/system() family of commands

  I have also attached 1 Makefile which executes and runs all the files.

- The commands which I have handled are:
  - (Internal commands)
    - ➔ echo command(Prints the given text to the console)
      - ☐ echo -n(Does not print newline at the end)
      - ☐ echo -E(disable interpretation of backslash escapes)
      - ☐ echo --help(shows what this command does)

    - ➔ cd command(Change the current working directory). Options:
      - ☐ cd ..(goes to home directory)
      - ☐ cd   (goes to home directory)
      - ☐ cd ~ (goes to home directory)
    - ➔ pwd command(Shows the present working directory).Options :

☐ pwd -L (use PWD from environment, even if it contains symlinks)
☐ pwd -P(avoid all symlinks)

- External commands:
  - ❖ mkdir (makes a directory in the current path).Options:
    - ☐ mkdir -v(Prints a message for each created directory)
    - ☐ mkdir -p(no error if existing, make parent directories as needed)

  - ❖ rm(Removes files or directories)
    - ☐ rm -i (Gives a prompt before deleting files)
    - ☐ rm -v(Prints a message after deleting files)

  - ❖ cat(Shows content and concatenates the files)
    - ☐ cat -n(Prints line no. before every line)
    - ☐ cat -E(Prints '$' after every line)

  - ❖ ls (lists directory contents)
    - ☐ ls -a (Shows hidden files(files starting with '.'))
    - ☐ ls -m(Shows contents separated by ',')

  - ❖ date(shows date and time and also sets it)
    - ☐ date -- help(shows what date command does)
    - ☐ date -I (shows date in yyyy-mm-dd format)

ERRORS and ASSUMPTIONS I MADE

- File does not exist (like in cd,cat,rm)

- Directory does not exist
- Not able to open file
- File already exists (like in mkdir)
- User gives input and a prompt is provided until exit command is given
- Wrong command given
- Wrong option to a command given
- All other errors which all commands can give during their implementation.
- rm cannot delete a directory by default

TEST CASE
1. Using pthread_create() and system()
   - ls &t
   - ls -a &t
   - ls -m &t
   - pwd
   - pwd -L
   - pwd -P
   - echo hello
   - echo -n hello
   - echo -E hello
   - echo --help
   - cd --
   - cd Files
   - ls &t
   - cd Shell
   - date &t
   - date -I &t
   - date --help &t
   - mkdir -v RAJ RPS &t
   - mkdir ABC &t
   - mkdir -p first/second &t
   - rm a &t
   - rm -v a &t
   - rm -i a a.txt &t
   - cat a.txt &t
   - cat -n a.txt b.txt &t
   - cat -E a.txt &t

2. Using fork() and execvp()

- ls
- ls -a
- ls -m
- pwd
- pwd -L
- pwd -P
- echo hello
- echo -n hello
- echo -E hello
- echo --help
- cd --
- cd Files
- ls
- cd Shell
- date
- date -I
- date --help
- mkdir -v RAJ RPS
- mkdir ABC
- mkdir -p first/second
- rm a
- rm -v a
- rm -i a a.txt
- cat a.txt
- cat -n a.txt b.txt
- cat -E a.txt