



Hacettepe University

Computer Engineering Department

How to Use the Linux Command Line

BBM103 Introduction to Programming Lab I

Fall 2023

The Shell & Terminal

- **The Shell** is a program that takes commands from the keyboard and gives them to the operating system to perform.
- **Terminal Emulator** is a program that opens a window and lets you interact with the shell.

Basic Commands

- When you open a terminal emulator, by default you are in the home directory of the logged in user.
- You will see the name of the logged in user followed by the hostname.
 - **\$** means you are logged in as a regular user
 - **#** means you are logged in as root.

pwd

- **pwd** prints the full path of your current working directory.

```
[bahargezici@rdev ~]$ pwd
/home/akd/bahargezici
[bahargezici@rdev ~]$
```

~ssh config file

Host Dev

HostName dev.cs.hacettepe.edu.tr

User <your_cs_username>

Port 22

ServerAliveInterval 240

ServerAliveCountMax 2

in Terminal:

> ssh Dev

OR

> ssh <your_cs_username>@dev.cs.hacettepe.edu.tr

ls, ll

- You can list all directories and files inside the current directory by using the **ls** (or **ls -l**; **ll** for listings including information such as the owner, size, date last modified and permissions) command.

```
[bahargezici@rdev ~]$ ls
204  cloud  cloud.old  Maildir  public_html
[bahargezici@rdev ~]$ ll
total 20
drwxr-xr-x. 5 bahargezici akd  4096 Oct 18 13:49 204
drwxr-xr-x+ 2 bahargezici akd  4096 Mar 10  2016 cloud
drwxr-xr-x. 2 root        root 4096 Oct  9  2016 cloud.old
drwxr-xr-x+ 9 bahargezici akd  4096 Nov 17  2016 Maildir
drwxr-xr-x+ 2 bahargezici akd  4096 Mar 10  2016 public_html
[bahargezici@rdev ~]$
```

cd

- The **cd** command is used to change the current directory.

```
[bahargezici@rdev 204]$ ls
BBM204-17-B-2  BBM204-17-B-4  deneme4.sh  input1  test
[bahargezici@rdev 204]$ cd test
[bahargezici@rdev test]$
```

- To change to the parent of the current directory use **cd ..**

```
[bahargezici@rdev test]$ cd ..
[bahargezici@rdev 204]$
```

- To return directly to the home directory use a tilde as the argument:

```
[bahargezici@rdev 204]$ cd ~
[bahargezici@rdev ~]$
```

ssh

- **ssh** (Secure Shell client) is a program for logging into a remote machine and for executing commands on a remote machine.

```
C:\Users\bahar>ssh bahargezici@dev.cs.hacettepe.edu.tr
bahargezici@dev.cs.hacettepe.edu.tr's password:
Last login: Thu Oct  7 11:14:59 2021 from 10.199.2.27
[bahargezici@rdev ~]$
```

scp

- **scp** allows files to be copied to, from, or between different hosts. It uses **ssh** for data transfer and provides the same authentication and same level of security as **ssh**.

A simple example that illustrates how to send a file to dev space.

```
scp <localfile> <username>@dev.cs.hacettepe.edu.tr:/home/ogr/b****/<directory>
```

```
C:\Users\bahar\Desktop>scp sonar.txt bahargezici@dev.cs.hacettepe.edu.tr:/home/akd/bahargezici/  
bahargezici@dev.cs.hacettepe.edu.tr's password:
```


Manipulating Files

- [cp](#) - copy files and directories
- [rm](#) - remove files and directories
- [mv](#) - move or rename files and directories
- [mkdir](#) - create directories
- [cat](#) - create new file, concatenate files
- [nano](#) - basic text editor

cp

- **cp** copies files and directories. In its simplest form, it copies a single file:

```
[bahargezici@rdev ~]$ ls
204 cloud cloud.old Maildir public_html pythondersleri.py
[bahargezici@rdev ~]$ cp pythondersleri.py python.py
[bahargezici@rdev ~]$ ls
204 cloud cloud.old Maildir public_html pythondersleri.py python.py
[bahargezici@rdev ~]$
```

cp (cont.)

- You can specify the full path to where you want to copy your file:

```
[bahargezici@rdev ~]$ cp pythondersleri.py 204/pythondersler.py
[bahargezici@rdev ~]$ cd 204
[bahargezici@rdev 204]$ ls
BBM204-17-B-2  BBM204-17-B-4  deneme4.sh  input1  pythondersler.py  test
[bahargezici@rdev 204]$
```

rm

If you want to delete any file or directory the command is '**rm**' (for files) and '**rm -r**' (for directories).

```
[bahargezici@rdev ~]$ ls
204 cloud cloud.old Maildir public_html pythondersleri.py python.py
[bahargezici@rdev ~]$ rm python.py
[bahargezici@rdev ~]$ ls
204 cloud cloud.old Maildir public_html pythondersleri.py
[bahargezici@rdev ~]$
```

mv

- **mv** command moves or renames files and directories depending on how it is used.

```
[bahargezici@rdev ~]$ mv pythondersleri.py 204
[bahargezici@rdev ~]$ ls
204  cloud  cloud.old  Maildir  public_html
[bahargezici@rdev ~]$ cd 204
[bahargezici@rdev 204]$ ls
BBM204-17-B-2  deneme4.sh  pythondersleri.py  test
BBM204-17-B-4  input1     pythondersler.py
[bahargezici@rdev 204]$
```

```
[bahargezici@rdev 204]$ ls
BBM204-17-B-2  deneme4.sh  pythondersleri.py  test
BBM204-17-B-4  input1     pythondersler.py
[bahargezici@rdev 204]$ mv pythondersleri.py python.py
[bahargezici@rdev 204]$ ls
BBM204-17-B-2  deneme4.sh  pythondersler.py  test
BBM204-17-B-4  input1     python.py
[bahargezici@rdev 204]$
```

mkdir

- If you want to create new directories the command is **mkdir**.

```
[bahargezici@rdev ~]$ ls
204 cloud cloud.old Maildir public_html
[bahargezici@rdev ~]$ mkdir bbml03
[bahargezici@rdev ~]$ ls
204 bbml03 cloud cloud.old Maildir public_html
[bahargezici@rdev ~]$
```

cat

cat stands for **Concatenate (birleştirmek)**. It is used to **create new file** (with or without content), **concatenate files** and **display the output of files on the standard output**.

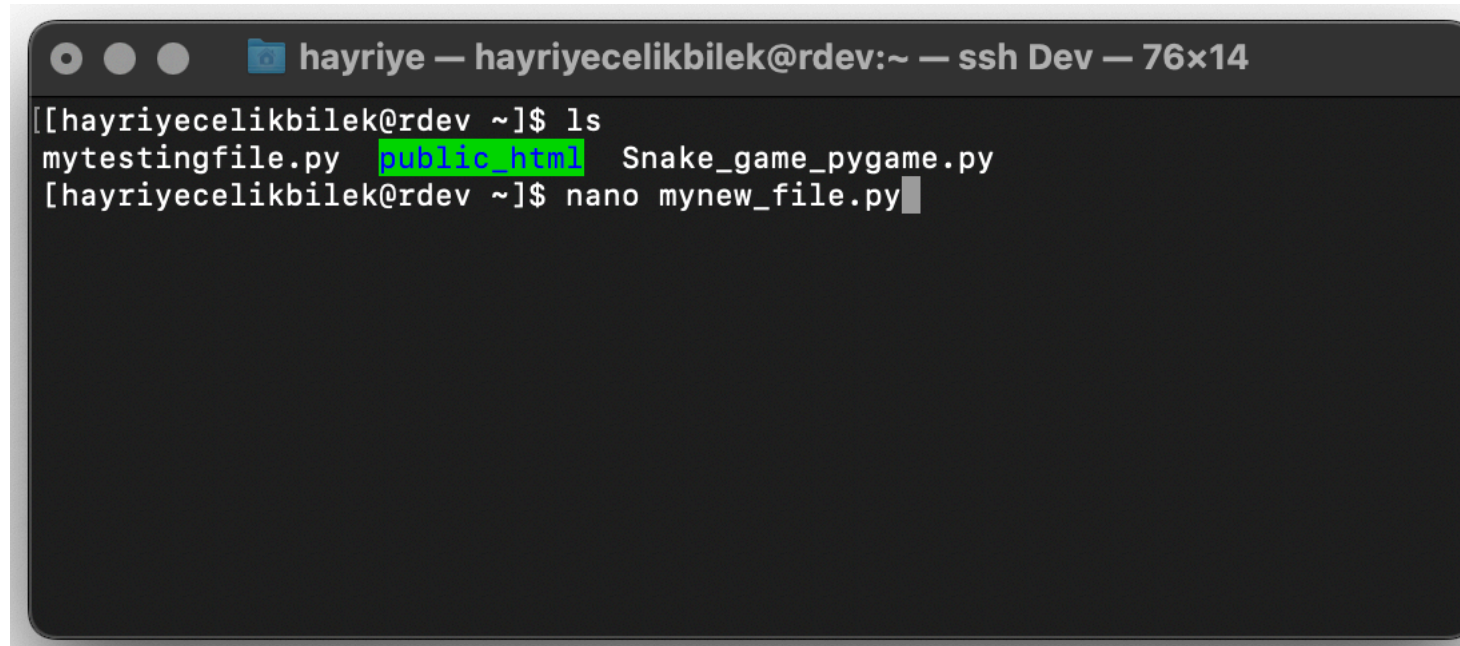
```
[bahargezici@rdev ~]$ cat >newFile.txt
This file is created to show how we can create file.
You must type Ctrl+D to quit
[bahargezici@rdev ~]$
```

```
[bahargezici@rdev ~]$ ls
204  bahar  bbml03  cloud  cloud.old  Maildir  newFile.txt  public_html
[bahargezici@rdev ~]$ cat <newFile.txt
This file is created to show how we can create file.
You must type Ctrl+D to quit
[bahargezici@rdev ~]$
```

```
[bahargezici@rdev ~]$ cat newFile.txt text1.txt <final.txt
This file is created to show how we can create file.
You must type Ctrl+D to quit.
Content2 is here.
[bahargezici@rdev ~]$
```

nano

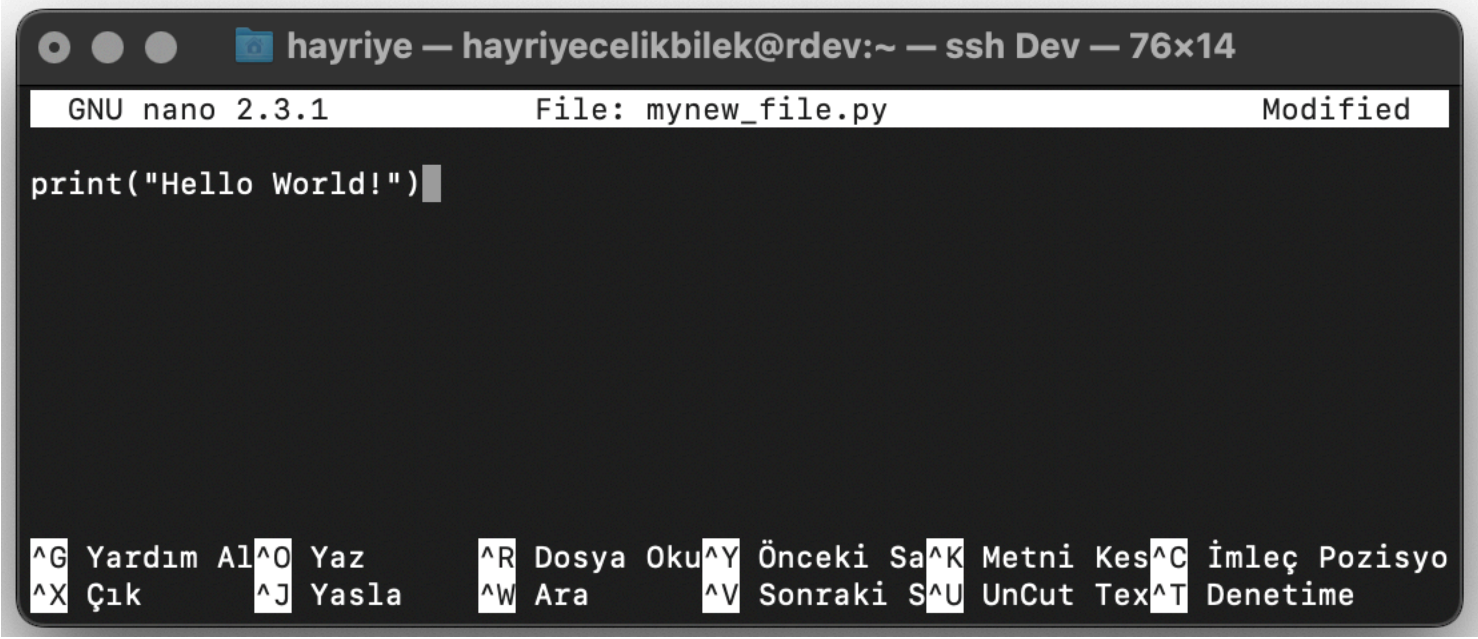
- If you want to create or manipulate text files the command is **nano**.

A terminal window with a dark background and light text. The window title bar shows 'hayriye — hayriyecelikbilek@rdev:~ — ssh Dev — 76x14'. The terminal content shows a user running 'ls' to list files, which outputs 'mytestingfile.py', 'public_html', and 'Snake_game_pygame.py'. The 'public_html' directory is highlighted in green. Then, the user runs 'nano mynew_file.py' to create a new file.

```
[[hayriyecelikbilek@rdev ~]$ ls  
mytestingfile.py public_html Snake_game_pygame.py  
[[hayriyecelikbilek@rdev ~]$ nano mynew_file.py
```


nano

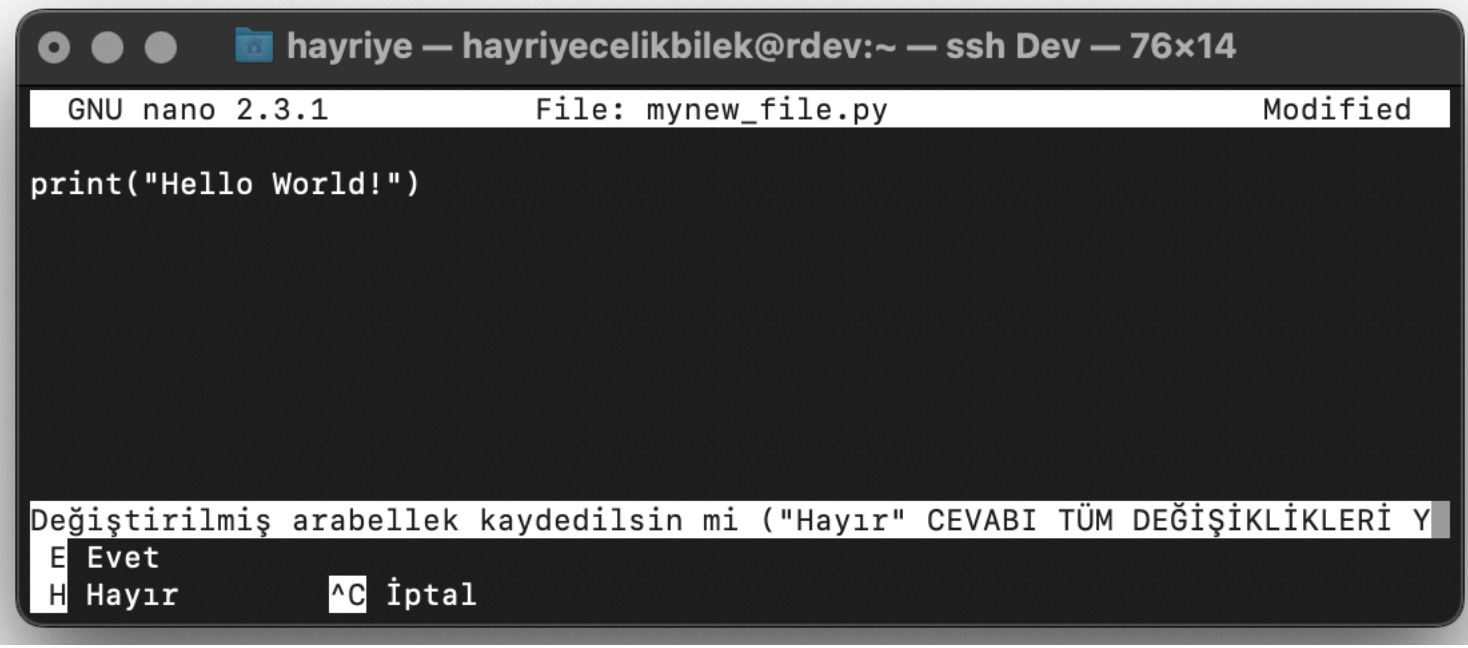
- If you want to create or manipulate text files the command is **nano**.



The screenshot shows a terminal window titled "hayriye — hayriyecelikbilek@rdev:~ — ssh Dev — 76x14". Inside the terminal, the GNU nano 2.3.1 text editor is open, editing a file named "mynew_file.py". The editor's status bar at the top indicates "GNU nano 2.3.1", "File: mynew_file.py", and "Modified". The main editing area contains the text `print("Hello World!")` followed by a cursor. At the bottom of the terminal, a help menu is displayed, listing various keyboard shortcuts and their functions in Turkish: `^G` Yardım Al, `^O` Yaz, `^R` Dosya Oku, `^Y` Önceki Sayfa, `^K` Metni Kes, `^C` İmleç Pozisyonu, `^X` Çık, `^J` Yasla, `^W` Ara, `^V` Sonraki Sayfa, `^U` UnCut, `^T` Denetime.

nano

- If you want to create or manipulate text files the command is **nano**.



```
hayriye — hayriyecelikbilek@rdev:~ — ssh Dev — 76x14
GNU nano 2.3.1      File: mynew_file.py      Modified

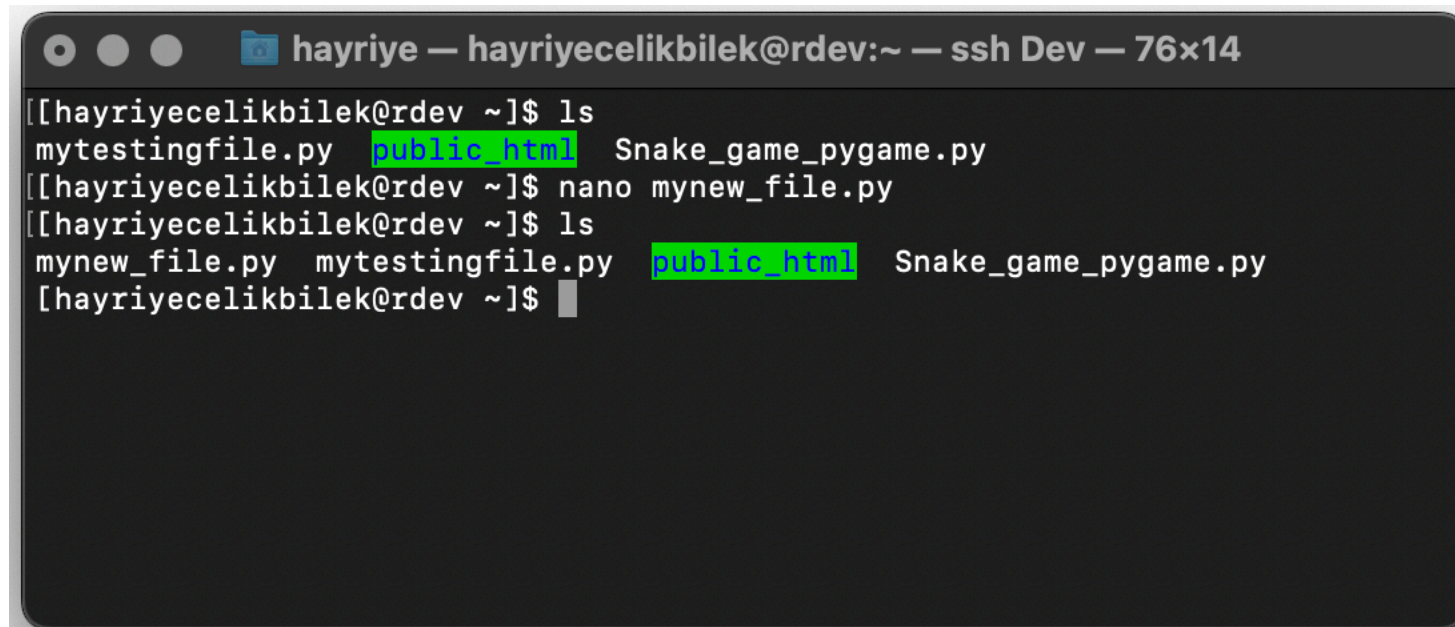
print("Hello World!")

Değiştirilmiş arabellek kaydedilsin mi ("Hayır" CEVABI TÜM DEĞİŞİKLİKLERİ Y
E Evet
H Hayır      ^C iptal
```

YES
Enter

nano

- If you want to create or manipulate text files the command is **nano**.

A terminal window titled "hayriye — hayriyecelikbilek@rdev:~ — ssh Dev — 76x14". The terminal shows a sequence of commands and their outputs. First, the user runs "ls", which lists "mytestingfile.py", "public_html", and "Snake_game_pygame.py". Then, the user runs "nano mynew_file.py". Finally, the user runs "ls" again, which now lists "mynew_file.py", "mytestingfile.py", "public_html", and "Snake_game_pygame.py". The terminal text is as follows:

```
[[hayriyecelikbilek@rdev ~]$ ls  
mytestingfile.py public_html Snake_game_pygame.py  
[[hayriyecelikbilek@rdev ~]$ nano mynew_file.py  
[[hayriyecelikbilek@rdev ~]$ ls  
mynew_file.py mytestingfile.py public_html Snake_game_pygame.py  
[[hayriyecelikbilek@rdev ~]$
```

zip & unzip

- **zip** and **unzip** commands create and extract zip archive files respectively.
- The ***** character serves as a "wild card" for filename expansion. By itself, it matches every filename in a given directory.

```
[bahargezici@rdev ~]$ ls
204    bbml03  cloud.old  Maildir    public_html
bahar  cloud     final.txt  newFile.txt text1.txt
[bahargezici@rdev ~]$ zip bahar.zip *
  adding: 204/ (stored 0%)
  adding: bahar/ (stored 0%)
  adding: bbml03/ (stored 0%)
  adding: cloud/ (stored 0%)
  adding: cloud.old/ (stored 0%)
  adding: final.txt (deflated 13%)
  adding: Maildir/ (stored 0%)
  adding: newFile.txt (deflated 14%)
  adding: public_html/ (stored 0%)
  adding: text1.txt (stored 0%)
[bahargezici@rdev ~]$ ls
204    bahar.zip  cloud     final.txt  newFile.txt  text1.txt
bahar  bbml03      cloud.old  Maildir    public_html
[bahargezici@rdev ~]$
```

```
[bahargezici@rdev ~]$ unzip bahar.zip -d baharg
Archive:  bahar.zip
   creating: baharg/204/
   creating: baharg/bahar/
   creating: baharg/bbml03/
   creating: baharg/cloud/
   creating: baharg/cloud.old/
  inflating: baharg/final.txt
   creating: baharg/Maildir/
  inflating: baharg/newFile.txt
   creating: baharg/public_html/
  extracting: baharg/text1.txt
[bahargezici@rdev ~]$ cd baharg
[bahargezici@rdev baharg]$ ls
204    bbml03  cloud.old  Maildir    public_html
bahar  cloud     final.txt  newFile.txt text1.txt
[bahargezici@rdev baharg]$
```

- Most executable programs intended for command line use provide a formal piece of documentation called a *manual* or *man page*. A special paging program called **man** is used to view them.

```
[bahargezici@rdev ~]$ clear
[bahargezici@rdev ~]$ man ls
LS(1)                                User Commands                                LS(1)

NAME
    ls - list directory contents

SYNOPSIS
    ls [OPTION]... [FILE]...

DESCRIPTION
    List information about the FILES (the current directory by default).
    Sort entries alphabetically if none of -cftuvSUX nor --sort is speci-
    fied.

    Mandatory arguments to long options are mandatory for short options
    too.

    -a, --all
        do not ignore entries starting with .

    -A, --almost-all
        do not list implied . and ..
```

About chmod

- **chmod** is used to change the permissions of files or directories.
- Example: `chmod 700 myFile`

#	Permission	rwX
7	read, write and execute	rwX
6	read and write	rw-
5	read and execute	r-x
4	read only	r--
3	write and execute	-wX
2	write only	-w-
1	execute only	--X
0	none	---

Quiz 1

- All tasks must be performed using linux commands:
 - 1) Make a new directory named `playing_with_linux_cmd`
 - 2) Change your current working directory to the newly created one.
 - 3) List the contents of this directory to see that it is empty.
 - 4) Create a new text file `jibberish.txt` and write something funny in it before closing it.
 - 5) Create another new text file `README.txt` and write your life motto in it.
 - 6) Copy `jibberish.txt` into a text file named `wise_sayings.txt`
 - 7) Delete `jibberish.txt`
 - 8) Print out the content of `wise_sayings.txt`
 - 9) Create a new directory named `my_precious` and move `wise_sayings.txt` into that newly created directory. List the content of the current working directory to make sure that you have successfully moved the file.
 - 10) Change the permission of the file `wise_sayings.txt` to `read, write and execute`.
 - 11) Change your working directory to the parent directory of `playing_with_linux_cmd`
 - 12) Zip `playing_with_linux_cmd` as `gameover.zip`
 - 13) Use `scp` command to copy this zipped folder from your local computer to your home directory on our remote server `dev.cs.hacettepe.edu.tr`
- Save **all the commands** what you have used for these 13 questions inside a **Q1.txt** file line by line.
- Send your answers to [submit webpage](#).