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1. Compress a file by compress, gzip, zip commands and decompress it again. State the differences between compress and gzip commands.

```
noorelmobashar@fedora:~/Downloads
noorelmobashar@fedora:~/Downloads$ compress work_life*.pdf
noorelmobashar@fedora:~/Downloads$ ls work_life*
'work_life_balance_presentation (1).pdf.Z'  work_life_balance_presentation.pptx
work_life_balance_presentation.pdf.Z
noorelmobashar@fedora:~/Downloads$ decompress work_life_balance_presentation.pdf.Z
bash: decompress: command not found...
noorelmobashar@fedora:~/Downloads$ uncompress work_life_balance_presentation.pdf.Z
noorelmobashar@fedora:~/Downloads$ ls work_life*.pdf
work_life_balance_presentation.pdf
noorelmobashar@fedora:~/Downloads$
```

```
noorelmobashar@fedora:~/Downloads
noorelmobashar@fedora:~/Downloads$ gzip work_life*.pdf
noorelmobashar@fedora:~/Downloads$ ls work_life*
'work_life_balance_presentation (1).pdf.gz'  work_life_balance_presentation.pptx
work_life_balance_presentation.pdf.gz
noorelmobashar@fedora:~/Downloads$ gunzip work_life*.pdf.gz
noorelmobashar@fedora:~/Downloads$ ls work_life*
'work_life_balance_presentation (1).pdf.Z'  work_life_balance_presentation.pptx
work_life_balance_presentation.pdf
noorelmobashar@fedora:~/Downloads$
```

```
noorelmobashar@fedora:~/Downloads
noorelmobashar@fedora:~/Downloads$ zip pdFile.zip work_life*.pdf
  adding: work_life_balance_presentation.pdf (deflated 46%)
noorelmobashar@fedora:~/Downloads$ unzip pdFile.zip
Archive:  pdFile.zip
replace work_life_balance_presentation.pdf? [y]es, [n]o, [A]ll, [N]one, [r]ename: y
  inflating: work_life_balance_presentation.pdf
noorelmobashar@fedora:~/Downloads$
```

compress uses old LZW algorithm and gzip uses more efficient DEFLATE algorithm LZ77

gzip has a high compression ration than compression

2. What is the command used to view the content of a compressed file.

```
noorelmobashar@fedora:~/Downloads
noorelmobashar@fedora:~/Downloads$ zcat pdFile.zip
%PDF-1.4
% $\diamond\diamond\diamond$  ReportLab Generated PDF document http://www.reportlab.com
1 0 obj
<<
/F1 2 0 R /F2 3 0 R /F3 4 0 R
>>
endobj
2 0 obj
<<
/BaseFont /Helvetica /Encoding /WinAnsiEncoding /Name /F1 /Subtype /Type1 /Type /Font
>>
endobj
3 0 obj
<<
/BaseFont /Helvetica-Bold /Encoding /WinAnsiEncoding /Name /F2 /Subtype /Type1 /Type /Font
```

3. Backup /etc directory using tar utility.

```
noorelmobashar@fedora:~/Downloads
noorelmobashar@fedora:~/Downloads$ sudo tar -cvf /tmp/etc_backup.tar /etc
[sudo] password for noorelmobashar:
tar: Removing leading '/' from member names
/etc/
/etc/favicon.png
/etc/fedora-release
/etc/grub2-efi.cfg
/etc/grub2.cfg
/etc/issue
/etc/issue.net
/etc/opensc-x86_64.conf
/etc/os-release
/etc/redhat-release
/etc/system-release
/etc/system-release-cpe
/etc/.java/
```

4. Starting from your home directory, find all files that were modified in the last two day.

```
noorelmobashar@fedora:~/Downloads
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework/img/glyphicons-halflings.png
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework/img/grid.png
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework/js
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework/js/ajax-form.js
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework/js/bootstrap.min.js
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework/js/coreapi-0.1.1.js
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework/js/csrf.js
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework/js/default.js
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework/js/jquery-3.7.1.min.js
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework/js/load-ajax-form.js
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework/js/prettify-min.js
/home/noorelmobashar/Projects/BakerySystem/build_files.sh
/home/noorelmobashar/.bash_profile
/home/noorelmobashar/.bash_history
/home/noorelmobashar/bakeryNotes.txt
noorelmobashar@fedora:~/Downloads$ find ~ -mtime -2
```

5. Starting from /etc, find files owned by root user.

```
noorelmobashar@fedora:~/Downloads
noorelmobashar@fedora:~/Downloads$ find /etc -user root
/etc
/etc/favicon.png
/etc/fedora-release
/etc/grub2-efi.cfg
/etc/grub2.cfg
/etc/issue
/etc/issue.net
/etc/opensc-x86_64.conf
/etc/os-release
/etc/redhat-release
/etc/system-release
/etc/system-release-cpe
/etc/.java
/etc/.java/.systemPrefs
/etc/ImageMagick-7
```

6. Find all directories in your home directory.

```
noorelmobashar@fedora:~/Downloads
~/Downloads
/home/noorelmobashar/Projects/BakerySystem/staticfiles/admin/js/vendor
/home/noorelmobashar/Projects/BakerySystem/staticfiles/admin/js/vendor/jquery
/home/noorelmobashar/Projects/BakerySystem/staticfiles/admin/js/vendor/select2
/home/noorelmobashar/Projects/BakerySystem/staticfiles/admin/js/vendor/select2/i18n
/home/noorelmobashar/Projects/BakerySystem/staticfiles/admin/js/vendor/xregexp
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework/css
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework/docs
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework/docs/css
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework/docs/img
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework/docs/js
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework/fonts
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework/img
/home/noorelmobashar/Projects/BakerySystem/staticfiles/rest_framework/js
/home/noorelmobashar/.ssh
noorelmobashar@fedora:~/Downloads$ find ~ -type d
```

7. Write a command to search for all files on the system that, its name is “.profile”.

```
noorelmobashar@fedora:~/Downloads
~/Downloads
noorelmobashar@fedora:~/Downloads$ find / -name ".profile"
find: '/boot/efi': Permission denied
find: '/boot/lost+found': Permission denied
find: '/boot/grub2': Permission denied
find: '/boot/loader/entries': Permission denied
find: '/home/islam': Permission denied
find: '/proc/tty/driver': Permission denied
find: '/proc/1/task/1/fd': Permission denied
find: '/proc/1/task/1/fdinfo': Permission denied
find: '/proc/1/task/1/ns': Permission denied
find: '/proc/1/fd': Permission denied
find: '/proc/1/map_files': Permission denied
find: '/proc/1/fdinfo': Permission denied
find: '/proc/1/ns': Permission denied
find: '/proc/2/task/2/fd': Permission denied
find: '/proc/2/task/2/fdinfo': Permission denied
```

8. Identify the file types of the following: /etc/passwd, /dev/pts/0, /etc, /dev/sda

```
noorelmobashar@fedora:~/Downloads
noorelmobashar@fedora:~/Downloads$ file /etc/passwd /dev/pts/0 /etc /dev/sda
/etc/passwd: ASCII text
/dev/pts/0:  cannot open `/dev/pts/0' (No such file or directory)
/etc:       directory
/dev/sda:   cannot open `/dev/sda' (No such file or directory)
noorelmobashar@fedora:~/Downloads$
```

9. List the inode numbers of /, /etc, /etc/hosts.

```
noorelmobashar@fedora:~/Downloads
noorelmobashar@fedora:~/Downloads$ ls -ld / /etc /etc/hosts
256 /      273 /etc 2489 /etc/hosts
noorelmobashar@fedora:~/Downloads$
```

10. Copy /etc/passwd to your home directory, use the commands diff and cmp, and Edit in the file you copied, and then use these commands again, and check the output.

```
noorelmobashar@fedora:~  
noorelmobashar@fedora:~$ cp /etc/passwd ~  
noorelmobashar@fedora:~$ ls passwd  
passwd  
noorelmobashar@fedora:~$ diff /etc/passwd ~/passwd  
noorelmobashar@fedora:~$ cmp /etc/passwd ~/passwd  
noorelmobashar@fedora:~$ nano ~/passwd  
noorelmobashar@fedora:~$ diff /etc/passwd ~/passwd  
1c1  
< root:x:0:0:Super User:/root:/bin/bash  
---  
> droot:x:0:0:Super User:/root:/bin/bash  
noorelmobashar@fedora:~$ cmp /etc/passwd ~/passwd  
/etc/passwd /home/noorelmobashar/passwd differ: byte 1, line 1  
noorelmobashar@fedora:~$
```

11. Create a symbolic link of /etc/passwd in /boot.

```
noorelmobashar@fedora:~  
noorelmobashar@fedora:~$ sudo ln -s /etc/passwd /boot/passwd_symlink  
^C[sudo] password for noorelmobashar:  
  
noorelmobashar@fedora:~$ ls /boot/passwd*  
ls: cannot access '/boot/passwd*': No such file or directory  
noorelmobashar@fedora:~$ sudo ls /boot/passwd*  
^C[sudo] password for noorelmobashar:  
  
noorelmobashar@fedora:~$
```

12. Create a hard link of /etc/passwd in /boot. Could you? Why?

```
noorelmobashar@fedora:~  
noorelmobashar@fedora:~$ sudo ln /etc/passwd /boot/passwd_hardlink  
ln: failed to create hard link '/boot/passwd_hardlink' => '/etc/passwd': Invalid cross-device link  
noorelmobashar@fedora:~$
```

I can't, because hard links cannot span across different filesystems, as /boot is a different partition than /root