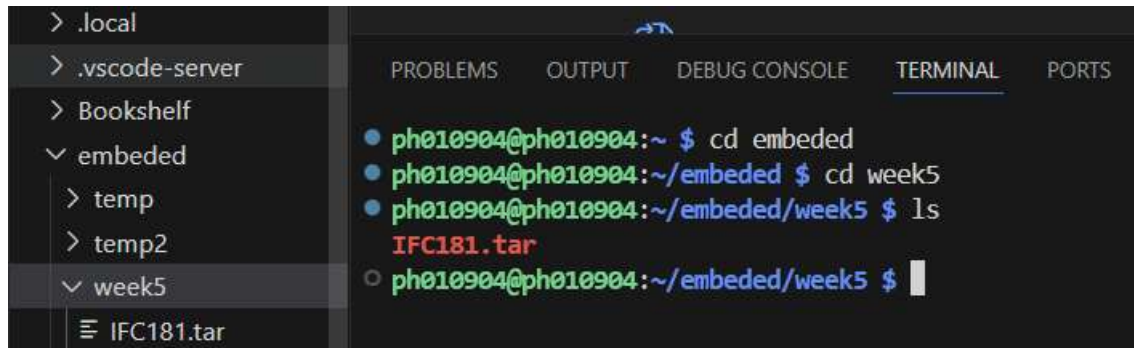


### <파일 압축 해제>

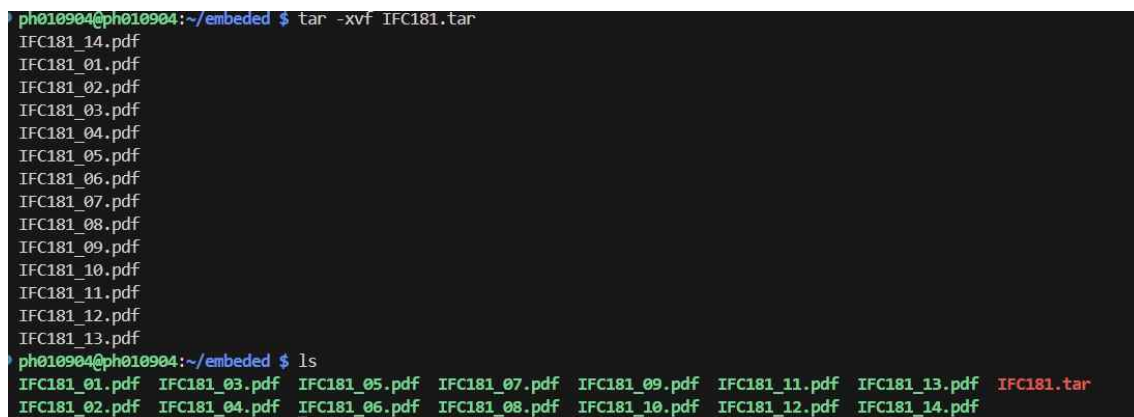
1. IFC181.tar 파일을 받아 ~/embedded/week5 로 옮긴다.



The screenshot shows the VS Code interface. On the left, the file explorer displays a tree structure: > .local, > .vscode-server, > Bookshelf, > embedded (expanded), > temp, > temp2, > week5 (expanded), and IFC181.tar. On the right, the terminal window shows the following commands and output:

```
ph010904@ph010904:~ $ cd embedded
ph010904@ph010904:~/embedded $ cd week5
ph010904@ph010904:~/embedded/week5 $ ls
IFC181.tar
ph010904@ph010904:~/embedded/week5 $
```

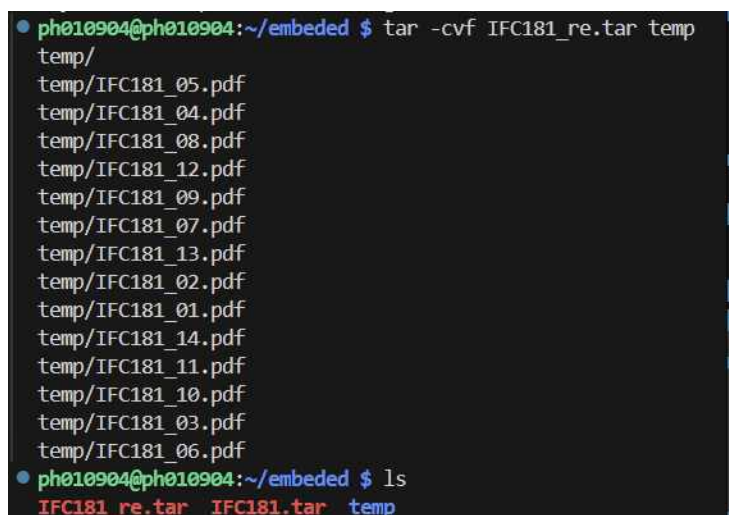
2. tar 명령으로 압축을 해제한다.



The screenshot shows a terminal window with the following commands and output:

```
ph010904@ph010904:~/embedded $ tar -xvf IFC181.tar
IFC181_14.pdf
IFC181_01.pdf
IFC181_02.pdf
IFC181_03.pdf
IFC181_04.pdf
IFC181_05.pdf
IFC181_06.pdf
IFC181_07.pdf
IFC181_08.pdf
IFC181_09.pdf
IFC181_10.pdf
IFC181_11.pdf
IFC181_12.pdf
IFC181_13.pdf
ph010904@ph010904:~/embedded $ ls
IFC181_01.pdf IFC181_03.pdf IFC181_05.pdf IFC181_07.pdf IFC181_09.pdf IFC181_11.pdf IFC181_13.pdf IFC181.tar
IFC181_02.pdf IFC181_04.pdf IFC181_06.pdf IFC181_08.pdf IFC181_10.pdf IFC181_12.pdf IFC181_14.pdf
```

3. 2에서 압축해제된 파일들을 IFC181\_re.tar로 압축한다.



The screenshot shows a terminal window with the following commands and output:

```
ph010904@ph010904:~/embedded $ tar -cvf IFC181_re.tar temp
temp/
temp/IFC181_05.pdf
temp/IFC181_04.pdf
temp/IFC181_08.pdf
temp/IFC181_12.pdf
temp/IFC181_09.pdf
temp/IFC181_07.pdf
temp/IFC181_13.pdf
temp/IFC181_02.pdf
temp/IFC181_01.pdf
temp/IFC181_14.pdf
temp/IFC181_11.pdf
temp/IFC181_10.pdf
temp/IFC181_03.pdf
temp/IFC181_06.pdf
ph010904@ph010904:~/embedded $ ls
IFC181_re.tar IFC181.tar temp
```

4. 2에서 압축해제된 파일들을 zip명령으로 IFC181\_re.zip으로 압축한다.

- 이때 zip 명령을 수행할 수 있도록 zip을 설치한다.

: sudo apt-get install zip

```
ph010904@ph010904:~/embedded $ mkdir temp
ph010904@ph010904:~/embedded $ ls
IFC181_01.pdf IFC181_03.pdf IFC181_05.pdf IFC181_07.pdf
IFC181_09.pdf IFC181_11.pdf IFC181_13.pdf IFC181.tar
IFC181_02.pdf IFC181_04.pdf IFC181_06.pdf IFC181_08.pdf
IFC181_10.pdf IFC181_12.pdf IFC181_14.pdf temp
ph010904@ph010904:~/embedded $ mv IFC*.pdf
mv: target 'IFC181_14.pdf' is not a directory
ph010904@ph010904:~/embedded $ mv IFC*.pdf temp
ph010904@ph010904:~/embedded $ ls
IFC181.tar temp
```

```
ph010904@ph010904:~/embedded/temp $ zip temp.zip IFC*.pdf
adding: IFC181_01.pdf (deflated 20%)
adding: IFC181_02.pdf (deflated 5%)
adding: IFC181_03.pdf (deflated 22%)
adding: IFC181_04.pdf (deflated 19%)
adding: IFC181_05.pdf (deflated 13%)
adding: IFC181_06.pdf (deflated 15%)
adding: IFC181_07.pdf (deflated 13%)
adding: IFC181_08.pdf (deflated 15%)
adding: IFC181_09.pdf (deflated 10%)
adding: IFC181_10.pdf (deflated 21%)
adding: IFC181_11.pdf (deflated 15%)
adding: IFC181_12.pdf (deflated 18%)
adding: IFC181_13.pdf (deflated 17%)
adding: IFC181_14.pdf (deflated 19%)
ph010904@ph010904:~/embedded/temp $ unzip -l temp.zip
Archive: temp.zip
  Length      Date    Time    Name
-----
124163  2022-09-16  01:44  IFC181_01.pdf
594510  2022-09-16  01:44  IFC181_02.pdf
1476482 2022-09-16  01:44  IFC181_03.pdf
73542   2022-09-23  01:52  IFC181_04.pdf
128128  2022-09-30  02:04  IFC181_05.pdf
139047  2022-10-07  01:56  IFC181_06.pdf
251918  2022-10-14  02:03  IFC181_07.pdf
116709  2022-10-21  01:59  IFC181_08.pdf
257288  2022-10-28  02:04  IFC181_09.pdf
162374  2022-11-04  01:11  IFC181_10.pdf
285736  2022-11-11  01:02  IFC181_11.pdf
236753  2022-11-18  01:01  IFC181_12.pdf
204332  2022-12-02  01:01  IFC181_13.pdf
111088  2022-12-09  01:01  IFC181_14.pdf
-----
4162070                14 files
```

5. 4에서 나온 IFC181\_re.zip 파일을 unzip 명령을 통해 압축해제 한다.

```
ph010904@ph010904:~/embedded $ unzip temp/temp.zip
Archive: temp/temp.zip
  inflating: IFC181_01.pdf
  inflating: IFC181_02.pdf
  inflating: IFC181_03.pdf
  inflating: IFC181_04.pdf
  inflating: IFC181_05.pdf
  inflating: IFC181_06.pdf
  inflating: IFC181_07.pdf
  inflating: IFC181_08.pdf
  inflating: IFC181_09.pdf
  inflating: IFC181_10.pdf
  inflating: IFC181_11.pdf
  inflating: IFC181_12.pdf
  inflating: IFC181_13.pdf
  inflating: IFC181_14.pdf
```

<find 명령어 연습>

6. ~ (home) 디렉토리로 이동하고 find 명령을 통해 embedded폴더에서(하위폴더 포함) .pdf 파일을 찾는 명령을 수행해본다.

```
ph010904@ph010904:~ $ find embedded -name *.pdf
embedded/IFC181_05.pdf
embedded/IFC181_04.pdf
embedded/IFC181_08.pdf
embedded/IFC181_12.pdf
embedded/IFC181_09.pdf
embedded/IFC181_07.pdf
embedded/IFC181_13.pdf
embedded/IFC181_02.pdf
embedded/IFC181_01.pdf
embedded/IFC181_14.pdf
embedded/IFC181_11.pdf
embedded/IFC181_10.pdf
embedded/IFC181_03.pdf
embedded/IFC181_06.pdf
embedded/temp/IFC181_05.pdf
embedded/temp/IFC181_04.pdf
embedded/temp/IFC181_08.pdf
embedded/temp/IFC181_12.pdf
embedded/temp/IFC181_09.pdf
embedded/temp/IFC181_07.pdf
embedded/temp/IFC181_13.pdf
embedded/temp/IFC181_02.pdf
embedded/temp/IFC181_01.pdf
embedded/temp/IFC181_14.pdf
embedded/temp/IFC181_11.pdf
embedded/temp/IFC181_10.pdf
embedded/temp/IFC181_03.pdf
embedded/temp/IFC181_06.pdf
```

7. 아래의 명령 결과가 동일한지 아닌지 결과를 보이고 동작 결과를 설명하시오

innosm@innosm:~ \$find . -name \*.pdf

```
ph010904@ph010904:~$ find . -name *.pdf
./Bookshelf/BeginnersGuide-4thEd-Eng_v2.pdf
./embedded/IFC181_05.pdf
./embedded/IFC181_04.pdf
./embedded/IFC181_08.pdf
./embedded/IFC181_12.pdf
./embedded/IFC181_09.pdf
./embedded/IFC181_07.pdf
./embedded/IFC181_13.pdf
./embedded/IFC181_02.pdf
./embedded/IFC181_01.pdf
./embedded/IFC181_14.pdf
./embedded/IFC181_11.pdf
./embedded/IFC181_10.pdf
./embedded/IFC181_03.pdf
./embedded/IFC181_06.pdf
./embedded/temp/IFC181_05.pdf
./embedded/temp/IFC181_04.pdf
./embedded/temp/IFC181_08.pdf
./embedded/temp/IFC181_12.pdf
./embedded/temp/IFC181_09.pdf
./embedded/temp/IFC181_07.pdf
./embedded/temp/IFC181_13.pdf
./embedded/temp/IFC181_02.pdf
./embedded/temp/IFC181_01.pdf
./embedded/temp/IFC181_14.pdf
./embedded/temp/IFC181_11.pdf
./embedded/temp/IFC181_10.pdf
./embedded/temp/IFC181_03.pdf
./embedded/temp/IFC181_06.pdf
```

innosm@innosm:~ \$find ./ -name \*.pdf

```
ph010904@ph010904:~$ find ./ -name *.pdf
./Bookshelf/BeginnersGuide-4thEd-Eng_v2.pdf
./embedded/IFC181_05.pdf
./embedded/IFC181_04.pdf
./embedded/IFC181_08.pdf
./embedded/IFC181_12.pdf
./embedded/IFC181_09.pdf
./embedded/IFC181_07.pdf
./embedded/IFC181_13.pdf
./embedded/IFC181_02.pdf
./embedded/IFC181_01.pdf
./embedded/IFC181_14.pdf
./embedded/IFC181_11.pdf
./embedded/IFC181_10.pdf
./embedded/IFC181_03.pdf
./embedded/IFC181_06.pdf
./embedded/temp/IFC181_05.pdf
./embedded/temp/IFC181_04.pdf
./embedded/temp/IFC181_08.pdf
./embedded/temp/IFC181_12.pdf
./embedded/temp/IFC181_09.pdf
./embedded/temp/IFC181_07.pdf
./embedded/temp/IFC181_13.pdf
./embedded/temp/IFC181_02.pdf
./embedded/temp/IFC181_01.pdf
./embedded/temp/IFC181_14.pdf
./embedded/temp/IFC181_11.pdf
./embedded/temp/IFC181_10.pdf
./embedded/temp/IFC181_03.pdf
./embedded/temp/IFC181_06.pdf
```

innosm@innosm:~ \$find -name \*.pdf

```
ph010904@ph010904:~$ find -name *.pdf
./Bookshelf/BeginnersGuide-4thEd-Eng_v2.pdf
./embedded/IFC181_05.pdf
./embedded/IFC181_04.pdf
./embedded/IFC181_08.pdf
./embedded/IFC181_12.pdf
./embedded/IFC181_09.pdf
./embedded/IFC181_07.pdf
./embedded/IFC181_13.pdf
./embedded/IFC181_02.pdf
./embedded/IFC181_01.pdf
./embedded/IFC181_14.pdf
./embedded/IFC181_11.pdf
./embedded/IFC181_10.pdf
./embedded/IFC181_03.pdf
./embedded/IFC181_06.pdf
./embedded/temp/IFC181_05.pdf
./embedded/temp/IFC181_04.pdf
./embedded/temp/IFC181_08.pdf
./embedded/temp/IFC181_12.pdf
./embedded/temp/IFC181_09.pdf
./embedded/temp/IFC181_07.pdf
./embedded/temp/IFC181_13.pdf
./embedded/temp/IFC181_02.pdf
./embedded/temp/IFC181_01.pdf
./embedded/temp/IFC181_14.pdf
./embedded/temp/IFC181_11.pdf
./embedded/temp/IFC181_10.pdf
./embedded/temp/IFC181_03.pdf
./embedded/temp/IFC181_06.pdf
```



innosm@innosm:~ \$find ~ -name \*.pdf

```
ph010904@ph010904:~ $ find ~ -name *.pdf
/home/ph010904/Bookshelf/BeginnersGuide-4thEd-Eng_v2.pdf
/home/ph010904/embedded/IFC181_05.pdf
/home/ph010904/embedded/IFC181_04.pdf
/home/ph010904/embedded/IFC181_08.pdf
/home/ph010904/embedded/IFC181_12.pdf
/home/ph010904/embedded/IFC181_09.pdf
/home/ph010904/embedded/IFC181_07.pdf
/home/ph010904/embedded/IFC181_13.pdf
/home/ph010904/embedded/IFC181_02.pdf
/home/ph010904/embedded/IFC181_01.pdf
/home/ph010904/embedded/IFC181_14.pdf
/home/ph010904/embedded/IFC181_11.pdf
/home/ph010904/embedded/IFC181_10.pdf
/home/ph010904/embedded/IFC181_03.pdf
/home/ph010904/embedded/IFC181_06.pdf
/home/ph010904/embedded/temp/IFC181_05.pdf
/home/ph010904/embedded/temp/IFC181_04.pdf
/home/ph010904/embedded/temp/IFC181_08.pdf
/home/ph010904/embedded/temp/IFC181_12.pdf
/home/ph010904/embedded/temp/IFC181_09.pdf
/home/ph010904/embedded/temp/IFC181_07.pdf
/home/ph010904/embedded/temp/IFC181_13.pdf
/home/ph010904/embedded/temp/IFC181_02.pdf
/home/ph010904/embedded/temp/IFC181_01.pdf
/home/ph010904/embedded/temp/IFC181_14.pdf
/home/ph010904/embedded/temp/IFC181_11.pdf
/home/ph010904/embedded/temp/IFC181_10.pdf
/home/ph010904/embedded/temp/IFC181_03.pdf
/home/ph010904/embedded/temp/IFC181_06.pdf
```

innosm@innosm:~ \$find /home/innosm -name \*.pdf

```
ph010904@ph010904:~ $ find /home/ph010904 -name *.pdf
/home/ph010904/Bookshelf/BeginnersGuide-4thEd-Eng_v2.pdf
/home/ph010904/embedded/IFC181_05.pdf
/home/ph010904/embedded/IFC181_04.pdf
/home/ph010904/embedded/IFC181_08.pdf
/home/ph010904/embedded/IFC181_12.pdf
/home/ph010904/embedded/IFC181_09.pdf
/home/ph010904/embedded/IFC181_07.pdf
/home/ph010904/embedded/IFC181_13.pdf
/home/ph010904/embedded/IFC181_02.pdf
/home/ph010904/embedded/IFC181_01.pdf
/home/ph010904/embedded/IFC181_14.pdf
/home/ph010904/embedded/IFC181_11.pdf
/home/ph010904/embedded/IFC181_10.pdf
/home/ph010904/embedded/IFC181_03.pdf
/home/ph010904/embedded/IFC181_06.pdf
/home/ph010904/embedded/temp/IFC181_05.pdf
/home/ph010904/embedded/temp/IFC181_04.pdf
/home/ph010904/embedded/temp/IFC181_08.pdf
/home/ph010904/embedded/temp/IFC181_12.pdf
/home/ph010904/embedded/temp/IFC181_09.pdf
/home/ph010904/embedded/temp/IFC181_07.pdf
/home/ph010904/embedded/temp/IFC181_13.pdf
/home/ph010904/embedded/temp/IFC181_02.pdf
/home/ph010904/embedded/temp/IFC181_01.pdf
/home/ph010904/embedded/temp/IFC181_14.pdf
/home/ph010904/embedded/temp/IFC181_11.pdf
/home/ph010904/embedded/temp/IFC181_10.pdf
/home/ph010904/embedded/temp/IFC181_03.pdf
/home/ph010904/embedded/temp/IFC181_06.pdf
```

실행결과, 모두 동일한 결과가 나왔다. 이들은 home 디렉토리에 있는 .pdf 파일을 찾는 명령어이다.

8. ~ (home) 디렉토리로 이동하고, week5 폴더가 있는지 검색하려고 한다.

적절한 명령을 수행하여 week5 폴더를 검색하고 결과를 보이시오.

```
ph010904@ph010904:~ $ find ~ -name week5
/home/ph010904/embedded/week5
```

```
ph010904@ph010904:~ $ find . -type d -name week5
./embedded/week5
```

<파일 용량 확인>

9. 아래 명령을 수행한 결과를 보이시오.

df -h

```
ph010904@ph010904:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/root        15G  3.2G   11G  23% /
devtmpfs         1.8G     0  1.8G   0% /dev
tmpfs            1.9G     0  1.9G   0% /dev/shm
tmpfs            1.9G  8.5M  1.9G   1% /run
tmpfs            5.0M  4.0K  5.0M   1% /run/lock
tmpfs            1.9G     0  1.9G   0% /sys/fs/cgroup
/dev/mmcblk0p1   253M   49M  204M  20% /boot
tmpfs            384M     0  384M   0% /run/user/1000
```

10. 아래 명령을 수행한 결과를 보이시오.

cd ~

cd embedded

du -h

```
ph010904@ph010904:~$ cd ~
ph010904@ph010904:~$ cd embedded
ph010904@ph010904:~/embedded$ du -h
7.4M    ./temp2
4.0M    ./week5
7.4M    ./temp
27M     .
```

11. 10번에서 현재 embedded 폴더의 총 사용량은(하위폴더 포함, 단위 표시)?

27MB

12. cd embedded/week5 를 수행하여 위치를 이동하고, 아래 명령을 차례로 수행하시오

1) df .

```
ph010904@ph010904:~/embedded/week5$ df .
Filesystem      1K-blocks    Used Available Use% Mounted on
/dev/root        14986204 3286048  11038648  23% /
```

2) 이 폴더에 temp\_file 파일 생성하고 파일에 1을 기록

```
ph010904@ph010904:~/embedded/week5$ echo 1 > temp_file
```

3) stat temp\_file 명령을 통해 파일의 크기를 확인

```
ph010904@ph010904:~/embedded/week5$ stat temp_file
File: temp_file
Size: 2          Blocks: 8          IO Block: 4096   regular file
Device: b302h/45826d Inode: 265261       Links: 1
Access: (0644/-rw-r--r--)  Uid: ( 1000/ph010904)   Gid: ( 1000/ph010904)
Access: 2024-10-08 03:21:09.997759644 +0100
Modify: 2024-10-08 03:21:09.997759644 +0100
Change: 2024-10-08 03:21:09.997759644 +0100
Birth: -
```

4) df .

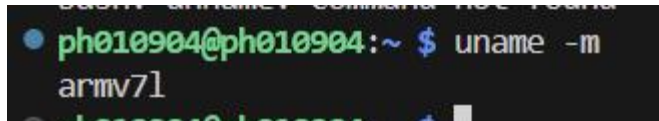
```
ph010904@ph010904:~/embedded/week5$ df .
Filesystem      1K-blocks    Used Available Use% Mounted on
/dev/root        14986204 3286052  11038644  23% /
```

1)과 4)에서 줄어든 용량과 3)에서 확인한 용량이 다르다면 그 이유는?

파일 시스템에서 데이터를 저장할 때, 파일 크기 외에도 메타데이터와 블록 크기 등으로 인해 실제로 더 많은 공간을 사용할 수 있다. 따라서 줄어든 용량과 파일 크기가 다를 수 있다.

<cpu architecture>

13. 현재 사용하는 라즈비언 OS가 몇비트 시스템인지 확인하고 결과를 첨부하시오.

A terminal window screenshot with a black background. The prompt is 'ph010904@ph010904:~ \$'. The command 'uname -m' has been entered and executed. The output 'armv7l' is displayed on the next line. The cursor is at the end of the output line.

```
ph010904@ph010904:~ $ uname -m
armv7l
```

32비트이다.