

# 임베디드 응용 및 실습

- 5주차 과제 -

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### <파일 압축 해제>

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

셸 커맨드	
<pre>wodbs@wodbs:~ \$ mkdir embedded wodbs@wodbs:~ \$ cd embedded/ wodbs@wodbs:~/embedded \$ mkdir week5 wodbs@wodbs:~/embedded \$ cd wodbs@wodbs:~ \$ mv ~/IFC181.tar ~/embedded/week5</pre>	
before	after
<div>▼ wodbs</div> <div><div>&gt; .cache</div><div>&gt; .config</div><div>&gt; .cups</div><div>&gt; .gnupg</div><div>&gt; .local</div><div>&gt; .vnc</div><div>&gt; .vscode-server</div><div>&gt; Bookshelf</div><div>&gt; Desktop</div><div>&gt; Documents</div><div>&gt; Downloads</div><div>&gt; Music</div><div>&gt; Pictures</div><div>&gt; Public</div><div>&gt; temp</div><div>&gt; Templates</div><div>&gt; Videos</div></div>	<div>▼ wodbs</div> <div><div>&gt; .cache</div><div>&gt; .config</div><div>&gt; .cups</div><div>&gt; .gnupg</div><div>&gt; .local</div><div>&gt; .vnc</div><div>&gt; .vscode-server</div><div>&gt; Bookshelf</div><div>&gt; Desktop</div><div>&gt; Documents</div><div>&gt; Downloads</div><div>▼ embedded / <u>week5</u></div><div>≡ IFC181.tar</div><div>&gt; Music</div><div>&gt; Pictures</div><div>&gt; Public</div><div>&gt; temp</div><div>&gt; Templates</div><div>&gt; Videos</div></div>

2. tar 명령으로 압축을 해제한다.

셸 커맨드	
wodbs@wodbs:~/embedded/week5 \$ tar -xvf IFC181.tar	
before	after
<div>▼ wodbs</div> <div>&gt; .cache</div> <div>&gt; .config</div> <div>&gt; .cups</div> <div>&gt; .gnupg</div> <div>&gt; .local</div> <div>&gt; .vnc</div> <div>&gt; .vscode-server</div> <div>&gt; Bookshelf</div> <div>&gt; Desktop</div> <div>&gt; Documents</div> <div>&gt; Downloads</div> <div>▼ embedded / <u>week5</u></div> <div>    ≡ IFC181.tar</div> <div>&gt; Music</div> <div>&gt; Pictures</div> <div>&gt; Public</div> <div>&gt; temp</div> <div>&gt; Templates</div> <div>&gt; Videos</div>	<div>▼ embedded / week5</div> <div>    📄 IFC181_01.pdf</div> <div>    📄 IFC181_02.pdf</div> <div>    📄 IFC181_03.pdf</div> <div>    📄 IFC181_04.pdf</div> <div>    📄 IFC181_05.pdf</div> <div>    📄 IFC181_06.pdf</div> <div>    📄 IFC181_07.pdf</div> <div>    📄 IFC181_08.pdf</div> <div>    📄 IFC181_09.pdf</div> <div>    📄 IFC181_10.pdf</div> <div>    📄 IFC181_11.pdf</div> <div>    📄 IFC181_12.pdf</div> <div>    📄 IFC181_13.pdf</div> <div>    📄 IFC181_14.pdf</div> <div>    ≡ IFC181.tar</div>

3. 2에서 압축 해제된 파일들을 IFC181\_re.tar로 압축한다.

셸 커맨드	
wodbs@wodbs:~/embedded/week5 \$ tar -cvf IFC181_re.tar IFC181*.pdf	
before	after
<div>▼ embedded / week5</div> <div>IFC181_01.pdf</div> <div>IFC181_02.pdf</div> <div>IFC181_03.pdf</div> <div>IFC181_04.pdf</div> <div>IFC181_05.pdf</div> <div>IFC181_06.pdf</div> <div>IFC181_07.pdf</div> <div>IFC181_08.pdf</div> <div>IFC181_09.pdf</div> <div>IFC181_10.pdf</div> <div>IFC181_11.pdf</div> <div>IFC181_12.pdf</div> <div>IFC181_13.pdf</div> <div>IFC181_14.pdf</div> <div>IFC181.tar</div>	<div>▼ embedded / week5</div> <div>IFC181_01.pdf</div> <div>IFC181_02.pdf</div> <div>IFC181_03.pdf</div> <div>IFC181_04.pdf</div> <div>IFC181_05.pdf</div> <div>IFC181_06.pdf</div> <div>IFC181_07.pdf</div> <div>IFC181_08.pdf</div> <div>IFC181_09.pdf</div> <div>IFC181_10.pdf</div> <div>IFC181_11.pdf</div> <div>IFC181_12.pdf</div> <div>IFC181_13.pdf</div> <div>IFC181_14.pdf</div> <div>IFC181_re.tar</div> <div>IFC181.tar</div>



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

셸 커맨드	
wodbs@wodbs:~/embedded/week5 \$ zip IFC181_re.zip IFC181*.pdf	
before	after
<div>▼ embedded / week5</div> <div>IFC181_01.pdf</div> <div>IFC181_02.pdf</div> <div>IFC181_03.pdf</div> <div>IFC181_04.pdf</div> <div>IFC181_05.pdf</div> <div>IFC181_06.pdf</div> <div>IFC181_07.pdf</div> <div>IFC181_08.pdf</div> <div>IFC181_09.pdf</div> <div>IFC181_10.pdf</div> <div>IFC181_11.pdf</div> <div>IFC181_12.pdf</div> <div>IFC181_13.pdf</div> <div>IFC181_14.pdf</div> <div>IFC181_re.tar</div> <div>IFC181.tar</div>	<div>▼ embedded / week5</div> <div>IFC181_01.pdf</div> <div>IFC181_02.pdf</div> <div>IFC181_03.pdf</div> <div>IFC181_04.pdf</div> <div>IFC181_05.pdf</div> <div>IFC181_06.pdf</div> <div>IFC181_07.pdf</div> <div>IFC181_08.pdf</div> <div>IFC181_09.pdf</div> <div>IFC181_10.pdf</div> <div>IFC181_11.pdf</div> <div>IFC181_12.pdf</div> <div>IFC181_13.pdf</div> <div>IFC181_14.pdf</div> <div>IFC181_re.tar</div> <div>IFC181_re.zip</div> <div>IFC181.tar</div>



### <find 명령어 연습>

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

셸 커맨드
<pre>wodbs@wodbs:~ \$ cd ~ wodbs@wodbs:~ \$ find embedded -name *.pdf</pre>
결과
<pre>embedded/week5/IFC181_05.pdf embedded/week5/IFC181_04.pdf embedded/week5/IFC181_08.pdf embedded/week5/IFC181_12.pdf embedded/week5/IFC181_09.pdf embedded/week5/IFC181_07.pdf embedded/week5/IFC181_13.pdf embedded/week5/IFC181_02.pdf embedded/week5/IFC181_01.pdf embedded/week5/IFC181_14.pdf embedded/week5/IFC181_11.pdf embedded/week5/IFC181_10.pdf embedded/week5/IFC181_03.pdf embedded/week5/IFC181_06.pdf</pre>

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

① innosm@innosm:~ \$find . -name \*.pdf

셸 커맨드
<pre>wodbs@wodbs:~ \$ find . -name *.pdf</pre>
결과
<pre>./Downloads/IFC181_05.pdf ./Downloads/IFC181_04.pdf ./Downloads/IFC181_08.pdf ./Downloads/IFC181_12.pdf ./Downloads/IFC181_09.pdf ./Downloads/IFC181_07.pdf ./Downloads/IFC181_13.pdf ./Downloads/IFC181_02.pdf ./Downloads/IFC181_01.pdf ./Downloads/IFC181_14.pdf ./Downloads/IFC181_11.pdf ./Downloads/IFC181_10.pdf ./Downloads/IFC181_03.pdf ./Downloads/IFC181_06.pdf ./Bookshelf/BeginnersGuide-4thEd-Eng_v2.pdf ./embedded/week5/IFC181_05.pdf ./embedded/week5/IFC181_04.pdf ./embedded/week5/IFC181_08.pdf ./embedded/week5/IFC181_12.pdf ./embedded/week5/IFC181_09.pdf ./embedded/week5/IFC181_07.pdf ./embedded/week5/IFC181_13.pdf ./embedded/week5/IFC181_02.pdf ./embedded/week5/IFC181_01.pdf ./embedded/week5/IFC181_14.pdf ./embedded/week5/IFC181_11.pdf ./embedded/week5/IFC181_10.pdf ./embedded/week5/IFC181_03.pdf ./embedded/week5/IFC181_06.pdf</pre>
설명
현재의 directory와 현재의 directory의 하위에 있는 directory에서 .pdf로 끝나는 파일을 찾는 것이다.

② innosm@innosm:~ \$find ./ -name \*.pdf

셸 커맨드
<pre>wodbs@wodbs:~ \$ find ./ -name *.pdf</pre>
결과
<pre>./Downloads/IFC181_05.pdf ./Downloads/IFC181_04.pdf ./Downloads/IFC181_08.pdf ./Downloads/IFC181_12.pdf ./Downloads/IFC181_09.pdf ./Downloads/IFC181_07.pdf ./Downloads/IFC181_13.pdf ./Downloads/IFC181_02.pdf ./Downloads/IFC181_01.pdf ./Downloads/IFC181_14.pdf ./Downloads/IFC181_11.pdf ./Downloads/IFC181_10.pdf ./Downloads/IFC181_03.pdf ./Downloads/IFC181_06.pdf ./Bookshelf/BeginnersGuide-4thEd-Eng_v2.pdf ./embedded/week5/IFC181_05.pdf ./embedded/week5/IFC181_04.pdf ./embedded/week5/IFC181_08.pdf ./embedded/week5/IFC181_12.pdf ./embedded/week5/IFC181_09.pdf ./embedded/week5/IFC181_07.pdf ./embedded/week5/IFC181_13.pdf ./embedded/week5/IFC181_02.pdf ./embedded/week5/IFC181_01.pdf ./embedded/week5/IFC181_14.pdf ./embedded/week5/IFC181_11.pdf ./embedded/week5/IFC181_10.pdf ./embedded/week5/IFC181_03.pdf ./embedded/week5/IFC181_06.pdf</pre>
설명
현재의 directory와 현재의 directory의 하위에 있는 directory에서 .pdf로 끝나는 파일을 찾는 것이다.

③ innosm@innosm:~ \$find -name \*.pdf

셸 커맨드
<pre>wodbs@wodbs:~ \$ find -name *.pdf</pre>
결과
<pre>./Downloads/IFC181_05.pdf ./Downloads/IFC181_04.pdf ./Downloads/IFC181_08.pdf ./Downloads/IFC181_12.pdf ./Downloads/IFC181_09.pdf ./Downloads/IFC181_07.pdf ./Downloads/IFC181_13.pdf ./Downloads/IFC181_02.pdf ./Downloads/IFC181_01.pdf ./Downloads/IFC181_14.pdf ./Downloads/IFC181_11.pdf ./Downloads/IFC181_10.pdf ./Downloads/IFC181_03.pdf ./Downloads/IFC181_06.pdf ./Bookshelf/BeginnersGuide-4thEd-Eng_v2.pdf ./embedded/week5/IFC181_05.pdf ./embedded/week5/IFC181_04.pdf ./embedded/week5/IFC181_08.pdf ./embedded/week5/IFC181_12.pdf ./embedded/week5/IFC181_09.pdf ./embedded/week5/IFC181_07.pdf ./embedded/week5/IFC181_13.pdf ./embedded/week5/IFC181_02.pdf ./embedded/week5/IFC181_01.pdf ./embedded/week5/IFC181_14.pdf ./embedded/week5/IFC181_11.pdf ./embedded/week5/IFC181_10.pdf ./embedded/week5/IFC181_03.pdf ./embedded/week5/IFC181_06.pdf</pre>
설명
현재의 directory와 현재의 directory의 하위에 있는 directory에서 .pdf로 끝나는 파일을 찾는 것이다.



④ innosm@innosm:~ \$find ~ -name \*.pdf

셸 커맨드
<pre>wodbs@wodbs:~ \$ find ~ -name *.pdf</pre>
결과
<pre>/home/wodbs/Downloads/IFC181_05.pdf /home/wodbs/Downloads/IFC181_04.pdf /home/wodbs/Downloads/IFC181_08.pdf /home/wodbs/Downloads/IFC181_12.pdf /home/wodbs/Downloads/IFC181_09.pdf /home/wodbs/Downloads/IFC181_07.pdf /home/wodbs/Downloads/IFC181_13.pdf /home/wodbs/Downloads/IFC181_02.pdf /home/wodbs/Downloads/IFC181_01.pdf /home/wodbs/Downloads/IFC181_14.pdf /home/wodbs/Downloads/IFC181_11.pdf /home/wodbs/Downloads/IFC181_10.pdf /home/wodbs/Downloads/IFC181_03.pdf /home/wodbs/Downloads/IFC181_06.pdf /home/wodbs/Bookshelf/BeginnersGuide-4thEd-Eng_v2.pdf /home/wodbs/embedded/week5/IFC181_05.pdf /home/wodbs/embedded/week5/IFC181_04.pdf /home/wodbs/embedded/week5/IFC181_08.pdf /home/wodbs/embedded/week5/IFC181_12.pdf /home/wodbs/embedded/week5/IFC181_09.pdf /home/wodbs/embedded/week5/IFC181_07.pdf /home/wodbs/embedded/week5/IFC181_13.pdf /home/wodbs/embedded/week5/IFC181_02.pdf /home/wodbs/embedded/week5/IFC181_01.pdf /home/wodbs/embedded/week5/IFC181_14.pdf /home/wodbs/embedded/week5/IFC181_11.pdf /home/wodbs/embedded/week5/IFC181_10.pdf /home/wodbs/embedded/week5/IFC181_03.pdf /home/wodbs/embedded/week5/IFC181_06.pdf</pre>
설명
home directory와 home directory의 하위에 있는 directory에서 .pdf로 끝나는 파일을 찾는 것이다.

⑤ innosm@innosm:~ \$find /home/innosm -name \*.pdf

셸 커맨드
<pre>wodbs@wodbs:~ \$ find /home/wodbs -name *.pdf</pre>
결과
<pre>/home/wodbs/Downloads/IFC181_05.pdf /home/wodbs/Downloads/IFC181_04.pdf /home/wodbs/Downloads/IFC181_08.pdf /home/wodbs/Downloads/IFC181_12.pdf /home/wodbs/Downloads/IFC181_09.pdf /home/wodbs/Downloads/IFC181_07.pdf /home/wodbs/Downloads/IFC181_13.pdf /home/wodbs/Downloads/IFC181_02.pdf /home/wodbs/Downloads/IFC181_01.pdf /home/wodbs/Downloads/IFC181_14.pdf /home/wodbs/Downloads/IFC181_11.pdf /home/wodbs/Downloads/IFC181_10.pdf /home/wodbs/Downloads/IFC181_03.pdf /home/wodbs/Downloads/IFC181_06.pdf /home/wodbs/Bookshelf/BeginnersGuide-4thEd-Eng_v2.pdf /home/wodbs/embedded/week5/IFC181_05.pdf /home/wodbs/embedded/week5/IFC181_04.pdf /home/wodbs/embedded/week5/IFC181_08.pdf /home/wodbs/embedded/week5/IFC181_12.pdf /home/wodbs/embedded/week5/IFC181_09.pdf /home/wodbs/embedded/week5/IFC181_07.pdf /home/wodbs/embedded/week5/IFC181_13.pdf /home/wodbs/embedded/week5/IFC181_02.pdf /home/wodbs/embedded/week5/IFC181_01.pdf /home/wodbs/embedded/week5/IFC181_14.pdf /home/wodbs/embedded/week5/IFC181_11.pdf /home/wodbs/embedded/week5/IFC181_10.pdf /home/wodbs/embedded/week5/IFC181_03.pdf /home/wodbs/embedded/week5/IFC181_06.pdf</pre>
설명
home/wodbs directory와 home/wodbs directory의 하위에 있는 directory에서 .pdf로 끝나는 파일을 찾는 것이다.

- find . -name \*.pdf, find ./ -name \*.pdf, find -name \*.pdf는 현재의 directory와 그 하위 directory에서 .pdf 파일을 찾는 것이기 때문에, 결과가 같다. 하지만 find ~ -name \*.pdf는 home directory와 home directory의 하위 directory에서 .pdf 파일을 찾는 것이기 때문에 결과가 다를 수 있다. 또한, find /home/wodbs -name \*.pdf도 home/wodbs directory와 home/wodbs의 하위 directory에서 .pdf 파일을 찾는 것이기 때문에 결과가 다를 수 있다. 하지만 현재 home directroy와 home/wodbs directory, 각각의 하위 directory에 다른 .pdf 파일이 없어 결과는 같다고 할 수 있다.

8. ~ (home) 디렉토리로 이동하고, week5 폴더가 있는지 검색하려고 한다. 적절한 명령을 수행하여 week5 폴더를 검색하고 결과를 보이시오.

셸 커맨드
<pre>wodbs@wodbs:~ \$ cd ~ wodbs@wodbs:~ \$ find ~ -type d -name week5</pre>
결과
<pre>/home/wodbs/embedded/week5</pre>

### <파일 용량 확인>

9. 아래 명령을 수행한 결과를 보이시오.

df -h

셸 커맨드
<pre>wodbs@wodbs:~ \$ df -h</pre>
결과
<pre>Filesystem      Size  Used Avail Use% Mounted on /dev/root        15G   3.7G   10G   27% / devtmpfs         1.8G     0   1.8G    0% /dev tmpfs            1.9G     0   1.9G    0% /dev/shm tmpfs            1.9G   25M   1.9G    2% /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    1% /run/user/1000</pre>

10. 아래 명령을 수행한 결과를 보이시오.

cd ~ → cd embedded → du -h

셸 커맨드
<pre>wodbs@wodbs:~ \$ cd ~ wodbs@wodbs:~ \$ cd embedded wodbs@wodbs:~/embedded \$ du -h</pre>
결과
<pre>16M  ./week5 16M  .</pre>

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

- 16MB

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

1) df .

셸 커맨드					
● wodbs@wodbs:~ \$ cd embedded/week5					
● wodbs@wodbs:~/embedded/week5 \$ df .					
결과					
Filesystem	1K-blocks	Used	Available	Use%	Mounted on
/dev/root	14986204	3845844	10478852	27%	/

2) 이 폴더에 temp\_file 파일 생성하고 파일에 1을 기록

셸 커맨드	
● wodbs@wodbs:~/embedded/week5 \$ echo 1 > temp_file	
before	
● wodbs@wodbs:~/embedded/week5 \$ ls	
IFC181_01.pdf IFC181_06.pdf IFC181_11.pdf IFC181_re.zip	
IFC181_02.pdf IFC181_07.pdf IFC181_12.pdf IFC181.tar	
IFC181_03.pdf IFC181_08.pdf IFC181_13.pdf	
IFC181_04.pdf IFC181_09.pdf IFC181_14.pdf	
IFC181_05.pdf IFC181_10.pdf IFC181_re.tar	
after	
● wodbs@wodbs:~/embedded/week5 \$ ls	
IFC181_01.pdf IFC181_06.pdf IFC181_11.pdf IFC181_re.zip	
IFC181_02.pdf IFC181_07.pdf IFC181_12.pdf IFC181.tar	
IFC181_03.pdf IFC181_08.pdf IFC181_13.pdf temp_file	
IFC181_04.pdf IFC181_09.pdf IFC181_14.pdf	
IFC181_05.pdf IFC181_10.pdf IFC181_re.tar	

3) stat temp\_file 명령을 통해 파일의 크기를 확인

셸 커맨드	
● wodbs@wodbs:~/embedded/week5 \$ stat temp_file	
결과	
File: temp_file	
Size: 2                      Blocks: 8                      IO Block: 4096      regular file	
Device: b302h/45826d      Inode: 261656              Links: 1	
Access: (0644/-rw-r--r--) Uid: ( 1000/   wodbs)      Gid: ( 1000/   wodbs)	
Access: 2024-10-05 13:15:09.672813493 +0100	
Modify: 2024-10-05 13:15:09.672813493 +0100	
Change: 2024-10-05 13:15:09.672813493 +0100	
Birth: -	

4) df .

셸 커맨드					
● wodbs@wodbs:~/embedded/week5 \$ df .					
결과					
Filesystem	1K-blocks	Used	Available	Use%	Mounted on
/dev/root	14986204	3845840	10478856	27%	/

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

- 1)과 4)에서 줄어든 용량 : 4Kbyte
- 3)에서 확인한 용량 : 2byte
- 실제 용량은 2byte지만, 파일 시스템에서 블록 크기는 일반적으로 4KB이기 때문에, 파일이 2byte여도 파일 시스템에서는 최소 1개의 블록을 할당하기 때문에 4KB의 공간을 차지하는 것이다.

#### <cpu architecture>

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

셸 커맨드	
● wodbs@wodbs:~ \$ uname -m	
결과	
armv7l	

- 32비트 시스템이다.