System Programming
(ELEC462)

Lab #10

Dukyun Nam

HPC Lab@KNU

Lab #10-1: Writing `smsh4`

- Write `smsh4`
  - Source code for submission
    - `smsh4.c, splitline.c, execute2.c, process2.c, controlflow.c, builtin.c, varlib.c`
  - Make sure that your code must work properly

Lab #10-2: Multiple commands

- Write `smsh1-1`
  - Modify some code related to `smsh1` to accept *multiple commands* on a line
  - Hint)
    - The easy way to do this is to modify `next_cmd`
  - Source code for submission
  - Include a **screenshot** of your result
  - Make sure that your code must work properly

Lab #10: Submission

- Deadline: Tomorrow 11:59pm
  - Create a directory name (`lab10`) to another using a series of the following commands:
    - `mkdir lab10_s<Your_Student_ID>`
      - Assume your ID is 2022000000.
  - Zip your folder:
    - `zip -r lab10_s2022000000.zip lab10_s2022000000`
- Upload the zipped directory (`lab10_s2022000000.zip`) into LMS

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HW #2

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HW #2: Writing `df`

- Write `df` and support options
  - Source code for submission: `df0.c`
  - Calculate ‘Blocks’, ‘Used’, ‘Available’ and ‘MyUse’.
  - Options
    - `$ ./df0 .` `# Default(kilobyte)`
    - `$ ./df0 . -b` `# Byte unit -bB`
    - `$ ./df0 . -k` `# Kilobyte unit -kK`
    - `$ ./df0 . -m` `# Megabyte unit -mM`
    - `$ ./df0 . -g` `# Gigabyte unit -gG`
- TA
  - 양희성 (leibniz21c at gmail.com)

What is "`df` (disk free)"

```
yang@bclab:~/workspaces$ df
Filesystem      1K-blocks      Used  Available Use% Mounted on
udev             16332620         0   16332620   0% /dev
tmpfs             3281236      1588    3279648   1% /run
/dev/sda3       478046984  91321428  362368592  21% /
tmpfs            16406160        16   16406144   1% /dev/shm
```

- A standard Unix command used to display the amount of disk space available for a file system
  - Filesystem : Device name
  - 1K-blocks : Total number of blocks
  - Used : Number of used blocks
  - Available : Number of available blocks
  - Use : Percentage of used capacity to total allocated capacity
  - Mounted on : Mounted point

What is "`df` (disk free)" (cont.)

- Using the `statfs` system call
- See '`$ man 2 statfs`'

```
STATFS(2)              Linux Programmer's Manual              STATFS(2)

NAME
       statfs, fstatfs - get filesystem statistics

SYNOPSIS
       #include <sys/vfs.h>    /* or <sys/statfs.h> */

       int statfs(const char *path, struct statfs *buf);
       int fstatfs(int fd, struct statfs *buf);

DESCRIPTION
       The  statfs()  system  call  returns information about a mounted
       filesystem.  path is the pathname of any file within the mounted
       filesystem.   buf is a pointer to a statfs structure defined ap-
       proximately as follows:
```

HW #2: Submission

- Deadline: The day before the next class
  - Create a directory name (`hw2`) to another using a series of the following commands:
    - `mkdir hw2_s<Your_Student_ID>`
      - Assume your ID is 2022000000.
    - Include a **screenshot** of your output
  - Zip your folder:
    - `zip -r hw2_s2022000000.zip hw2_s2022000000`
- Upload the zipped directory (`hw2_s2022000000.zip`) into LMS