Xilinx Zynq FPGA, TI DSP, MCU 기반의 프로그래밍 및 회로 설계 전문가 과정

강사 – Innova Lee (이상훈)
gcccompil3r@gmail.com
학생-김민주
alswnqodrl@naver.com

01

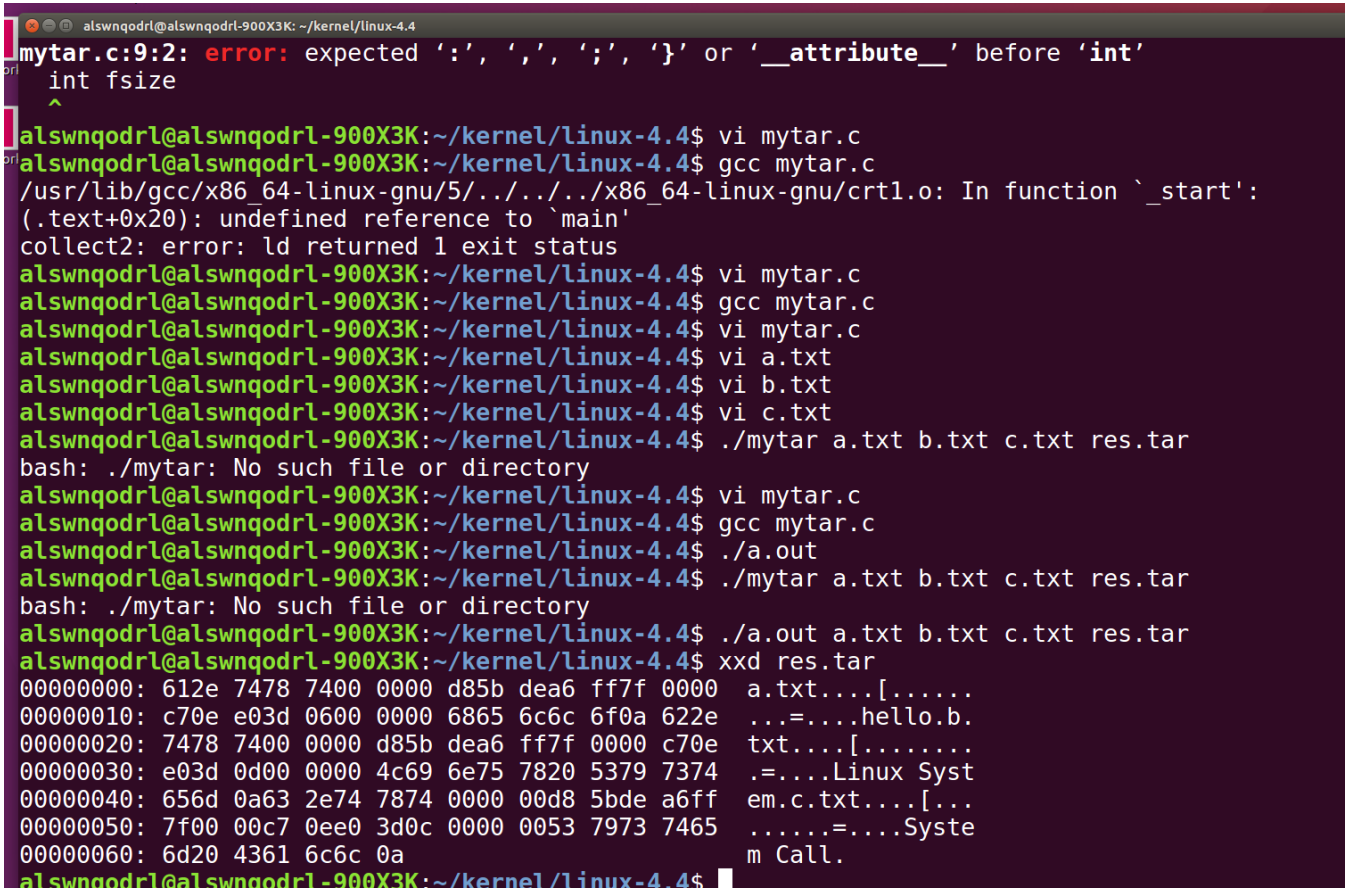
19일차 내용 복습

<vim 환경설정 및 커널구조>

task_struct
- Driver: 하드웨어를 동작시킴
- fs: 파일 시스템
- include { => 파일 정의

01

19일차 내용 복습


alswnqodrl@alswnqodrl-900X3K: ~/kernel/linux-4.4
mytar.c:9:2: error: expected ':', ',', ';', '}' or '__attribute__' before 'int'
int fsize
^
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ vi mytar.c
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ gcc mytar.c
/usr/lib/gcc/x86_64-linux-gnu/5/../../../x86_64-linux-gnu/crt1.o: In function `_start':
(.text+0x20): undefined reference to `main'
collect2: error: ld returned 1 exit status
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ vi mytar.c
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ gcc mytar.c
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ vi mytar.c
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ vi a.txt
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ vi b.txt
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ vi c.txt
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ ./mytar a.txt b.txt c.txt res.tar
bash: ./mytar: No such file or directory
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ vi mytar.c
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ gcc mytar.c
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ ./a.out
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ ./mytar a.txt b.txt c.txt res.tar
bash: ./mytar: No such file or directory
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ ./a.out a.txt b.txt c.txt res.tar
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ xxd res.tar
00000000: 612e 7478 7400 0000 d85b dea6 ff7f 0000 a.txt....[......
00000010: c70e e03d 0600 0000 6865 6c6c 6f0a 622e ...=....hello.b.
00000020: 7478 7400 0000 d85b dea6 ff7f 0000 c70e txt....[........
00000030: e03d 0d00 0000 4c69 6e75 7820 5379 7374 .=....Linux Syst
00000040: 656d 0a63 2e74 7874 0000 00d8 5bde a6ff em.c.txt....[...
00000050: 7f00 00c7 0ee0 3d0c 0000 0053 7973 7465 ......=....Syste
00000060: 6d20 4361 6c6c 0a m Call.
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$

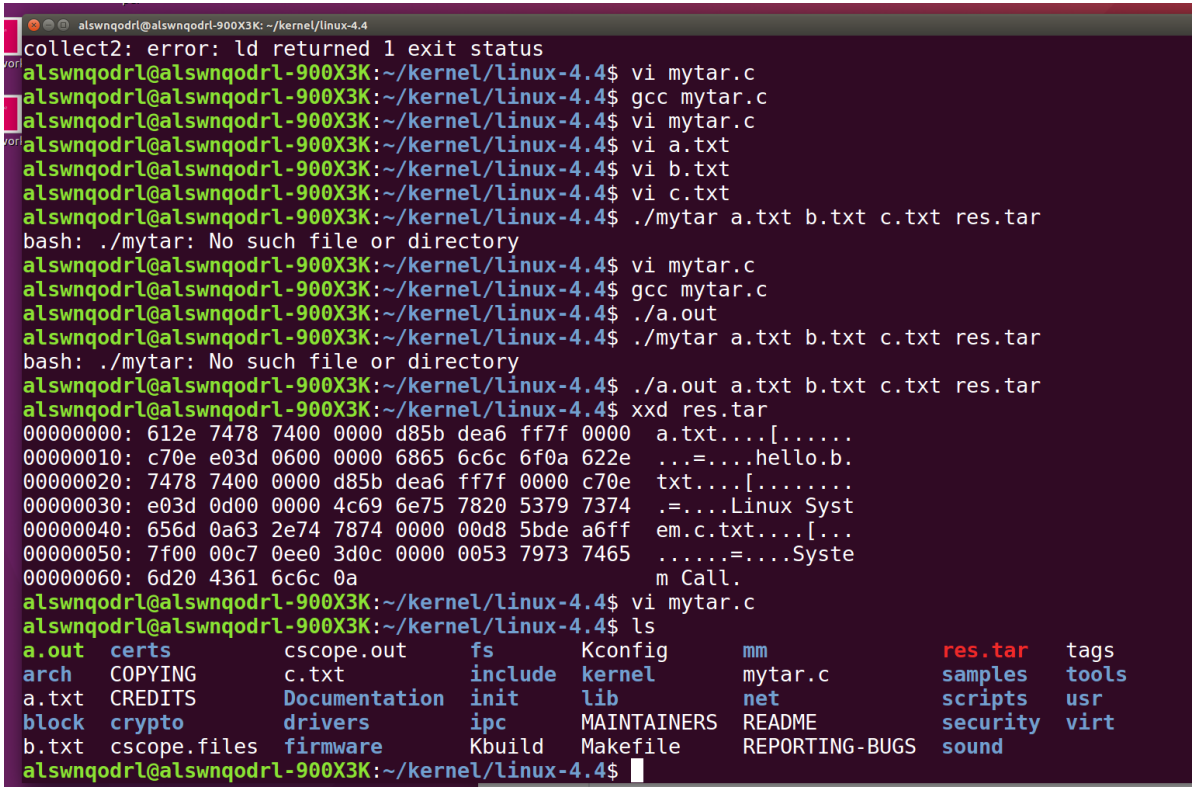
01

19일차 내용 복습

```
Terminal File Edit View Search Terminal Help
#include <fcntl.h>
#include <unistd.h>
#include <stdlib.h>
#include <string.h>

typedef struct
{
        char fname[20];
        int fsize;
} F_info;

int file_size(int fd)
{
        int fsize, old;
        old = lseek(fd, 0, SEEK_CUR);
        fsize = lseek(fd, 0, SEEK_END);//전체 파일의 사이즈가 결정됨
        lseek(fd, old, SEEK_SET);//fd 를 old로 바꿔라(원상복귀 시켜라)
        return fsize;//파일 전체 사이즈가 리턴됨
}

int main(int argc, char *argv[])
{
        int src, dst, ret;
        char buf[1024];
        F_info info;
        int i;
        dst = open(argv[argc-1], O_WRONLY|O_CREAT|O_TRUNC, 0644);//가장 마지막에 들어온 인자, 마지막에는 모든 파일을 묶어둘 파일명
        for(i=0; i<argc-2; i++)//맨 마지막 전까지 돌아야 함
        {
        src=open(argv[i+1], O_RDONLY);//실행파일을 제외하고 묶겠다
        strcpy(info.fname, argv[i+1]);//파일의 이름을 info.fname에 복사함
        info.fsize=file_size(src);
        write(dst, &info, sizeof(info));
        while(ret=read(src, buf, sizeof(buf)))
                write(dst, buf, ret);
        close(src);
}
close(dst);
return 0;
}
~
```

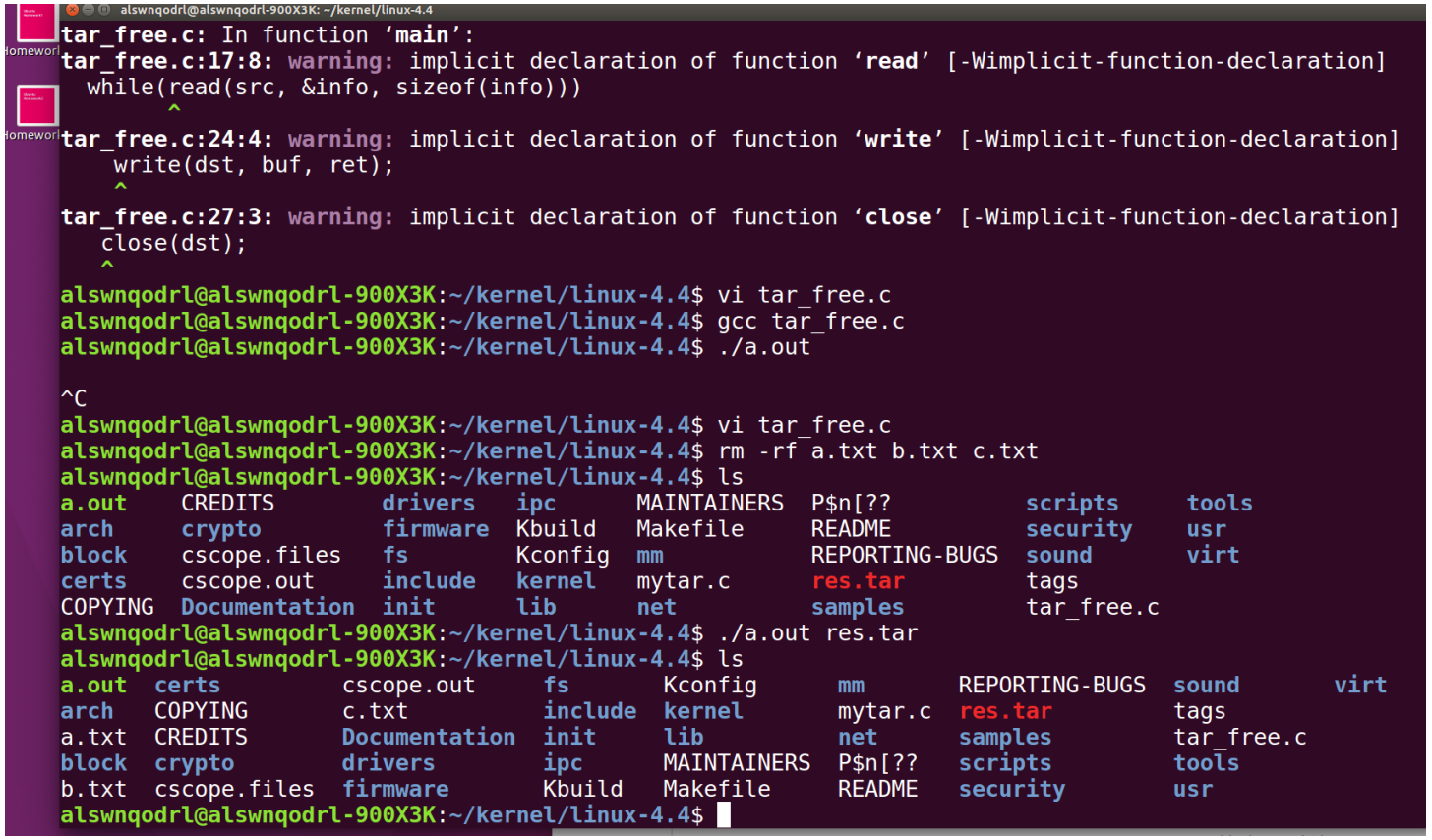
01

19일차 내용 복습


alswnqodrl@alswnqodrl-900X3K: ~/kernel/linux-4.4
collect2: error: ld returned 1 exit status
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ vi mytar.c
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ gcc mytar.c
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ vi mytar.c
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ vi a.txt
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ vi b.txt
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ vi c.txt
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ ./mytar a.txt b.txt c.txt res.tar
bash: ./mytar: No such file or directory
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ vi mytar.c
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ gcc mytar.c
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ ./a.out
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ ./mytar a.txt b.txt c.txt res.tar
bash: ./mytar: No such file or directory
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ ./a.out a.txt b.txt c.txt res.tar
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ xxd res.tar
00000000: 612e 7478 7400 0000 d85b dea6 ff7f 0000 a.txt....[......
00000010: c70e e03d 0600 0000 6865 6c6c 6f0a 622e ...=....hello.b.
00000020: 7478 7400 0000 d85b dea6 ff7f 0000 c70e txt....[........
00000030: e03d 0d00 0000 4c69 6e75 7820 5379 7374 .=....Linux Syst
00000040: 656d 0a63 2e74 7874 0000 00d8 5bde a6ff em.c.txt....[...
00000050: 7f00 00c7 0ee0 3d0c 0000 0053 7973 7465 ......=....Syste
00000060: 6d20 4361 6c6c 0a m Call.
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ vi mytar.c
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ ls
a.out certs cscope.out fs Kconfig mm res.tar tags
arch COPYING c.txt include kernel mytar.c samples tools
a.txt CREDITS Documentation init lib net scripts usr
block crypto drivers ipc MAINTAINERS README security virt
b.txt cscope.files firmware Kbuild Makefile REPORTING-BUGS sound
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$

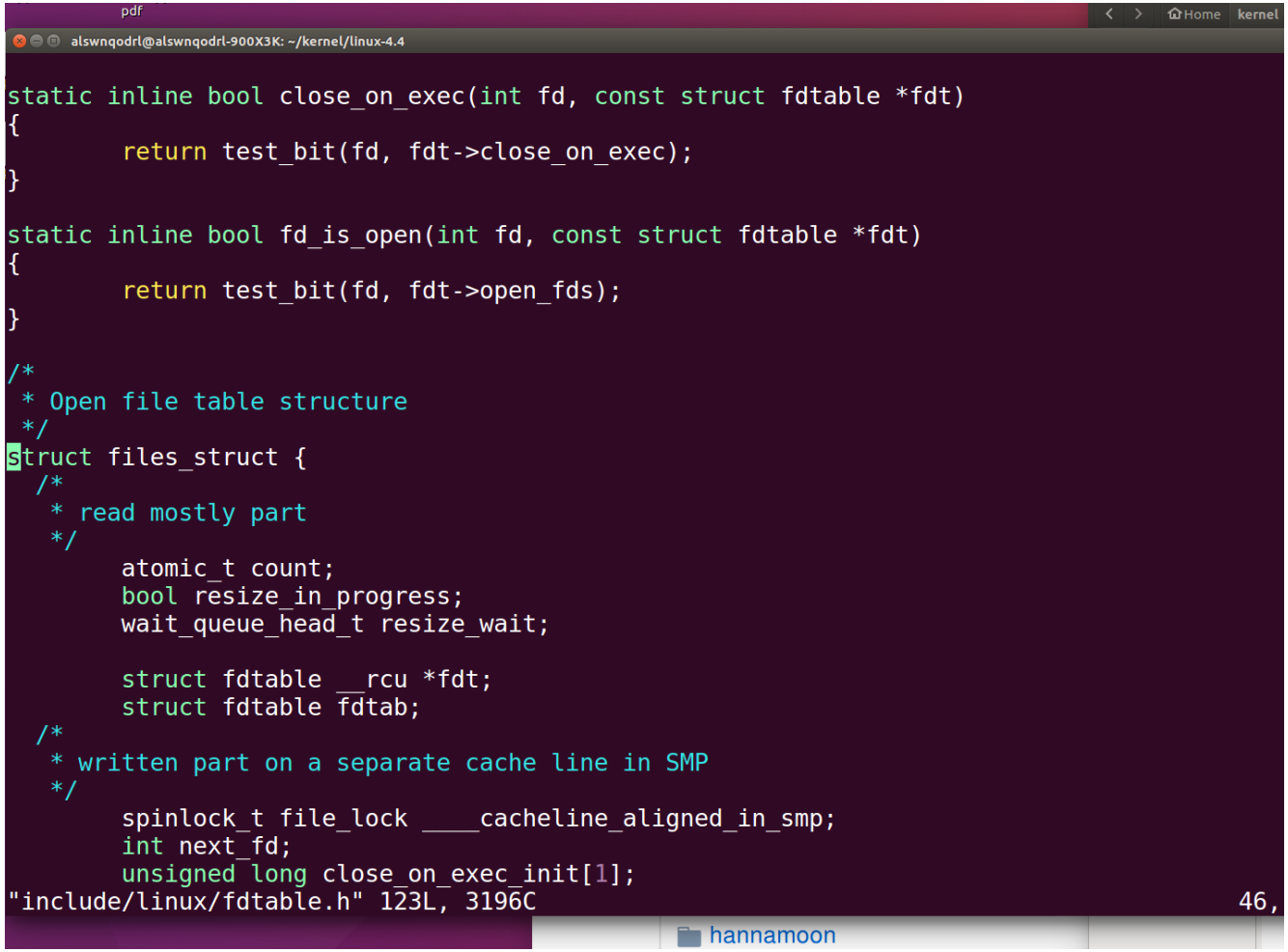
01

19일차 내용 복습


alswnqodrl@alswnqodrl-900X3K: ~/kernel/linux-4.4
tar_free.c: In function ‘main’:
tar_free.c:17:8: warning: implicit declaration of function ‘read’ [-Wimplicit-function-declaration]
while(read(src, &info, sizeof(info)))
tar_free.c:24:4: warning: implicit declaration of function ‘write’ [-Wimplicit-function-declaration]
write(dst, buf, ret);
tar_free.c:27:3: warning: implicit declaration of function ‘close’ [-Wimplicit-function-declaration]
close(dst);
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ vi tar_free.c
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ gcc tar_free.c
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ ./a.out
^C
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ vi tar_free.c
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ rm -rf a.txt b.txt c.txt
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ ls
a.out CREDITS drivers ipc MAINTAINERS P$n[?? scripts tools
arch crypto firmware Kbuild Makefile README security usr
block cscope.files fs Kconfig mm REPORTING-BUGS sound virt
certs cscope.out include kernel mytar.c res.tar tags
COPYING Documentation init lib net samples tar_free.c
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ ./a.out res.tar
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$ ls
a.out certs cscope.out fs Kconfig mm REPORTING-BUGS sound virt
arch COPYING c.txt include kernel mytar.c res.tar tags
a.txt CREDITS Documentation init lib net samples tar_free.c
block crypto drivers ipc MAINTAINERS P$n[?? scripts tools
b.txt cscope.files firmware Kbuild Makefile README security usr
alswnqodrl@alswnqodrl-900X3K:~/kernel/linux-4.4$

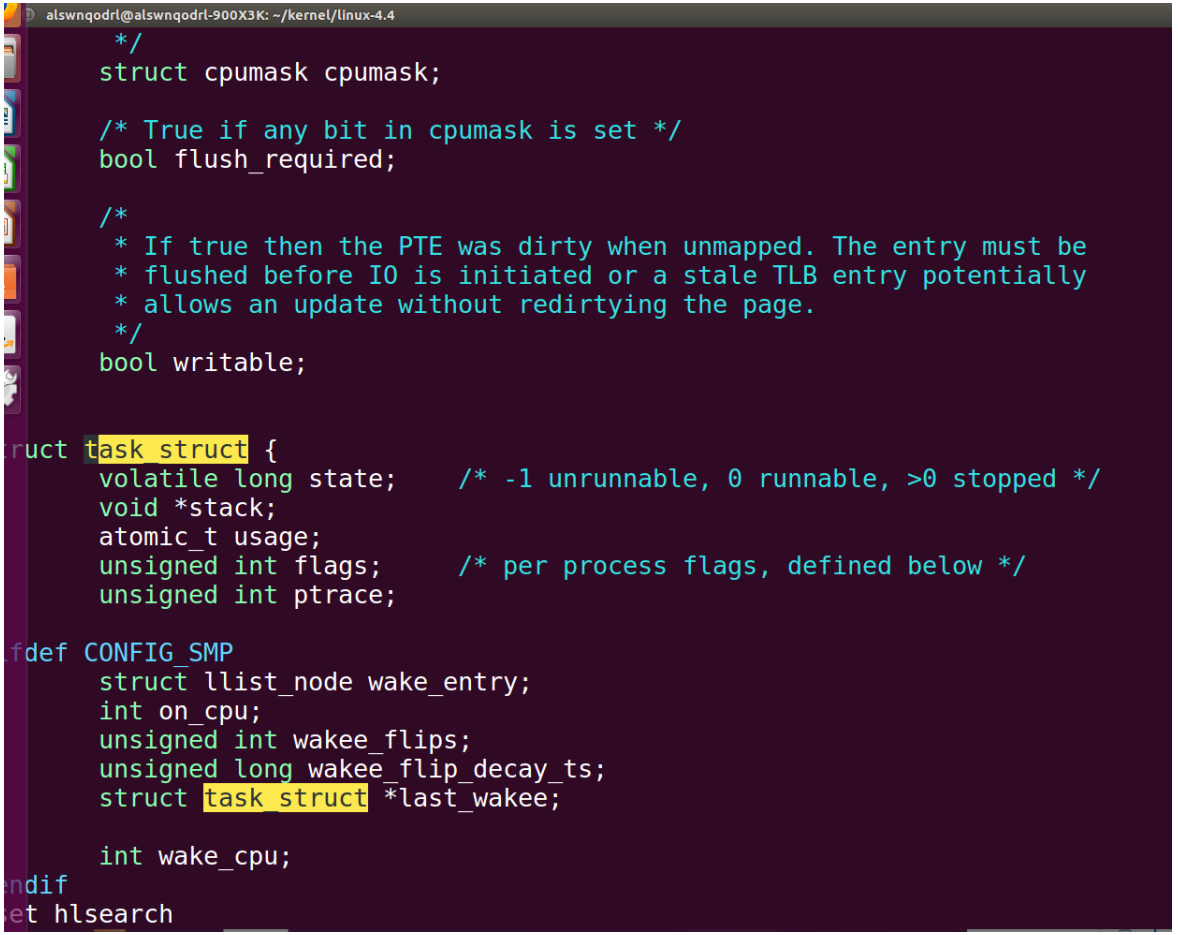
01

19일차 내용 복습


pdf
Home
kernel
alswnqodrl@alswnqodrl-900X3K: ~/kernel/linux-4.4
static inline bool close_on_exec(int fd, const struct fdtable *fdt)
{
return test_bit(fd, fdt->close_on_exec);
}
static inline bool fd_is_open(int fd, const struct fdtable *fdt)
{
return test_bit(fd, fdt->open_fds);
}
/*
* Open file table structure
*/
struct files_struct {
/*
* read mostly part
*/
atomic_t count;
bool resize_in_progress;
wait_queue_head_t resize_wait;
struct fdtable __rcu *fdt;
struct fdtable fdtab;
/*
* written part on a separate cache line in SMP
*/
spinlock_t file_lock ____cacheline_aligned_in_smp;
int next_fd;
unsigned long close_on_exec_init[1];
"include/linux/fdtable.h" 123L, 3196C
46,
hannamoon

01

19일차 내용 복습


alswnqodrl@alswnqodrl-900X3K: ~/kernel/linux-4.4
*/
struct cpumask cpumask;
/* True if any bit in cpumask is set */
bool flush_required;
/*
* If true then the PTE was dirty when unmapped. The entry must be
* flushed before IO is initiated or a stale TLB entry potentially
* allows an update without redirtying the page.
*/
bool writable;
ruct task_struct {
volatile long state; /* -1 unrunnable, 0 runnable, >0 stopped */
void *stack;
atomic_t usage;
unsigned int flags; /* per process flags, defined below */
unsigned int ptrace;
fdef CONFIG_SMP
struct llist_node wake_entry;
int on_cpu;
unsigned int wakee_flips;
unsigned long wakee_flip_decay_ts;
struct task_struct *last_wakee;
int wake_cpu;
ndif
et hlsearch

02

퀴즈1

alswnqodrl@alswnqodrl-900X3K: ~/Homework/minjukim

```c
#include <time.h>
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <stdbool.h>

#include <unistd.h>
#include <fcntl.h>

int extract_idx;

typedef struct __queue
{
        int data;
        struct __queue *link;
} queue;

bool is_dup(int *arr, int cur_idx)
{
        int i, tmp = arr[cur_idx];

        for(i = 0; i < cur_idx; i++)
                if(tmp == arr[i])
                        return true;

        return false;
}

void init_rand_arr(int *arr, int size)
{
        int i;

        for(i = 0; i < size; i++)
        {
redo:
                arr[i] = rand() % 10 + 1;

                if(is_dup(arr, i))
                {
                        printf("%d dup! redo rand()\n", arr[i]);
                        goto redo;
                }
        }
}

void print_arr(int *arr, int size)
{
        int i;

        for(i = 0; i < size; i++)
                printf("arr[%d] = %d\n", i, arr[i]);
}

queue *get_queue_node(void)
{
        queue *tmp;
```

02

퀴즈1

alswnqodrl@alswnqodrl-900X3K: ~/Homework/minjukim

```
        queue *tmp;
        tmp = (queue *)malloc(sizeof(queue));
        tmp->link = NULL;
        return tmp;
}

void enqueue(queue **head, int data)
{
        if(*head == NULL)
        {
                *head = get_queue_node();
                (*head)->data = data;
                return;
        }

        enqueue(&(*head)->link, data);
}

void extract_even(queue *head, int *extract)
{
        queue *tmp = head;

        while(tmp)
        {
                if(!(tmp->data % 2))
                        extract[extract_idx++] = tmp->data;
                tmp = tmp->link;
        }
}

int main(void)
{
        int i, fd, len, sum = 0;
        char *convert[10] = {0};
        int arr[11] = {0};
        char tmp[32] = {0};
        int extract[11] = {0};
        int size = sizeof(arr) / sizeof(int) - 1;
        queue *head = NULL;

        srand(time(NULL));

        init_rand_arr(arr, size);
        print_arr(arr, size);

        for(i = 0; i < size; i++)
                enqueue(&head, arr[i]);

        extract_even(head, extract);
        printf("\nExtract:\n");
        print_arr(extract, extract_idx);

        fd = open("log.txt", O_CREAT | O_WRONLY | O_TRUNC, 0644);

        for(i = 0; i < extract_idx; i++)
                sum += extract[i];
```

02

퀴즈1

```
        for(i = 0; i < size; i++)
                enqueue(&head, arr[i]);

        extract_even(head, extract);
        printf("\nExtract:\n");
        print_arr(extract, extract_idx);

        fd = open("log.txt", O_CREAT | O_WRONLY | O_TRUNC, 0644);

        for(i = 0; i < extract_idx; i++)
                sum += extract[i];

        sprintf(tmp, "%d", sum);
        write(fd, tmp, strlen(tmp));
        close(fd);

#if 0
        for(i = 0; i < extract_idx; i++)
        {
                int len;
                char tmp[32] = {0};

                sprintf(tmp, "%d", extract[i]);
                len = strlen(tmp);
                convert[i] = (char *)malloc(len + 1);
                strcpy(convert[i], tmp);
                printf("tmp = %s\n", tmp);
        }
#endif

        return 0;
}
```

03

퀴즈2

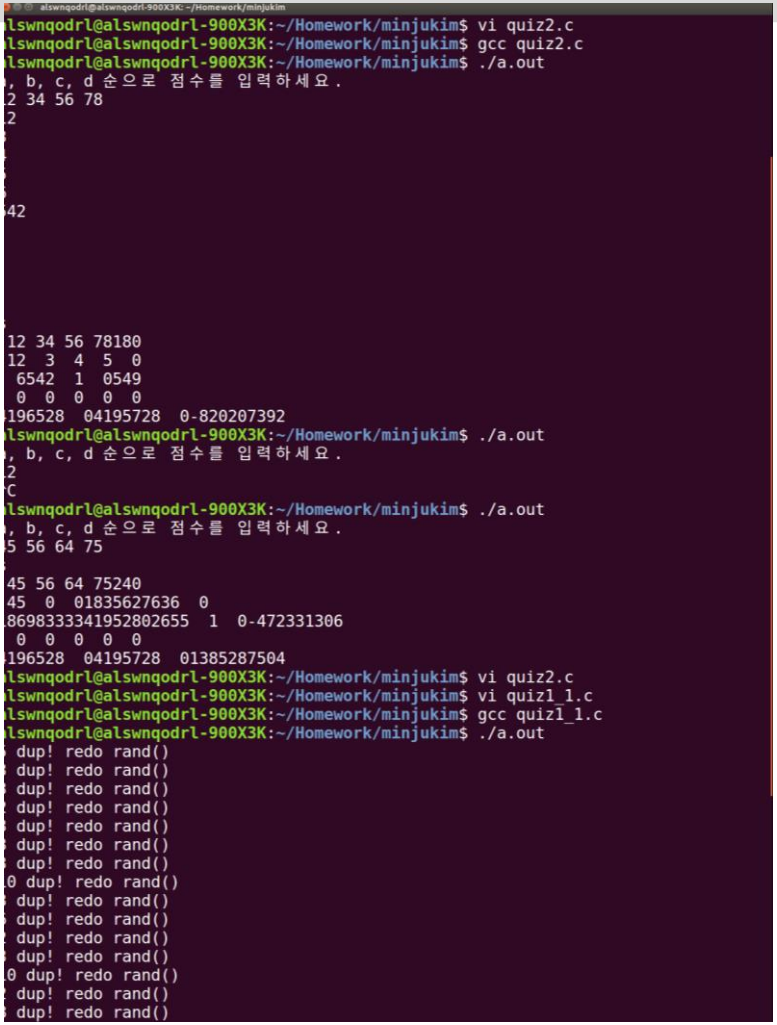
alswnqodrl@alswnqodrl-900X3K: ~/Homework/minjukim

```c
#include <stdio.h>

int main(void){

    int arr[5][5];
    int sum = 0;

     printf("a, b, c, d 순으로 점수를 입력하세요.\n");

    //사용자로부터 점수를 입력받음
    for (int i = 0; i < 4; i++)
         for (int j = 0; j < 4; j++)
              scanf("%d", &arr[i][j]);

    //학생총점을 계산하여 저장
    for (int i = 0; i < 4; i++){
         sum = 0;
         for (int j = 0; j < 4; j++){
              sum += arr[i][j];
              arr[i][4] = sum;//각 행의 마지막 인덱스에 학생의 총점을 저장
         }
    }

    //과목총점을 계산하여 저장
    for (int i = 0; i < 1; i++){
         sum = 0;
         for (int j = 0; j < 1; j++){
              sum += arr[j][i];//반복문을 통해 배열위치를 적절히 설정
              arr[1][i] = sum;//각 열의 마지막 인덱스에 과목의 총점을 저장
         }
    }

    //배열의 마지막 값을 0으로 하여 null값을 입력
    arr[1][4] = 0;//0으로 해주지 않을경우 쓰레기 값으로 초기화 됨

/배열전체 출력
for (int i = 0; i < 5; i++){
     for (int j = 0; j < 5; j++){

          //%3d는 %d를 출력할 때 띄어쓰기(스페이스바)를 3번하고 출력하겠다는 의
          printf("%3d", arr[i][j]);
     }
     printf("\n");
}

return 0;
```

1,1 All

04

퀴즈결과


alswnqodrl@alswnqodrl-900X3K: ~/Homework/minjukim
alswnqodrl@alswnqodrl-900X3K:~/Homework/minjukim$ vi quiz2.c
alswnqodrl@alswnqodrl-900X3K:~/Homework/minjukim$ gcc quiz2.c
alswnqodrl@alswnqodrl-900X3K:~/Homework/minjukim$ ./a.out
, b, c, d 순으로 점수를 입력하세요.
2 34 56 78
2
42
12 34 56 78180
12 3 4 5 0
6542 1 0549
0 0 0 0 0
196528 04195728 0-820207392
alswnqodrl@alswnqodrl-900X3K:~/Homework/minjukim$ ./a.out
, b, c, d 순으로 점수를 입력하세요.
2
C
alswnqodrl@alswnqodrl-900X3K:~/Homework/minjukim$ ./a.out
, b, c, d 순으로 점수를 입력하세요.
5 56 64 75
45 56 64 75240
45 0 01835627636 0
8698333341952802655 1 0-472331306
0 0 0 0 0
196528 04195728 01385287504
alswnqodrl@alswnqodrl-900X3K:~/Homework/minjukim$ vi quiz2.c
alswnqodrl@alswnqodrl-900X3K:~/Homework/minjukim$ vi quiz1_1.c
alswnqodrl@alswnqodrl-900X3K:~/Homework/minjukim$ gcc quiz1_1.c
alswnqodrl@alswnqodrl-900X3K:~/Homework/minjukim$ ./a.out
dup! redo rand()
dup! redo rand()
dup! redo rand()
dup! redo rand()
dup! redo rand()
dup! redo rand()
dup! redo rand()
0 dup! redo rand()
dup! redo rand()
dup! redo rand()
dup! redo rand()
dup! redo rand()
0 dup! redo rand()
dup! redo rand()
dup! redo rand()

04

퀴즈결과

```
lswnqodrl@alswnqodrl-900X3K:~/Homework/minjukim$ vi quiz1_1.c
lswnqodrl@alswnqodrl-900X3K:~/Homework/minjukim$ gcc quiz1_1.c
lswnqodrl@alswnqodrl-900X3K:~/Homework/minjukim$ ./a.out
 dup! redo rand()
 dup! redo rand()
 dup! redo rand()
 dup! redo rand()
 dup! redo rand()
 dup! redo rand()
 dup! redo rand()
0 dup! redo rand()
 dup! redo rand()
 dup! redo rand()
 dup! redo rand()
 dup! redo rand()
0 dup! redo rand()
 dup! redo rand()
 dup! redo rand()
 dup! redo rand()
rr[0] = 2
rr[1] = 3
rr[2] = 5
rr[3] = 8
rr[4] = 6
rr[5] = 9
rr[6] = 7
rr[7] = 1
rr[8] = 10
rr[9] = 4

xtract:
rr[0] = 2
rr[1] = 8
rr[2] = 6
rr[3] = 10
rr[4] = 4
lswnqodrl@alswnqodrl-900X3K:~/Homework/minjukim$
```