

Pertama, melakukan perubahan pada file Makefile

## Makefile

- Line 3 – 4

```
CS333_PROJECT ?= 1      (diubah sesuai kebutuhan, 0 atau 1)
PRINT_SYSCALLS ?= 0     (diubah sesuai kebutuhan, 0 atau 1)
```

- Line 16

```
CS333_UPROGS += _date   (menghapus tanda #)
```

Kemudian, menambah potongan kode pada beberapa file berikut:

## syscall.c

- Line 110 – 113

```
#ifdef CS333_P1
// The function prototype must be 'int' not 'uint' for sys_date()
extern int sys_date(void);
#endif // CS333_P1
```

### **syscalls[]**

- Line 141 – 143

```
#ifdef CS333_P1
[SYS_date]    sys_date,
#endif // CS333_P1
```

### **syscallnames[]**

- Line 173 – 176

```
// Hint syscallnames: Use this structure to add information for any
// new system calls that created
#ifdef CS333_P1
[SYS_halt]    "date",
#endif // CS333_P1
```

## **syscall(void)**

- Line 190 – 194

```
#ifdef PRINT_SYSCALLS
    cprintf("%s -> %d\n", syscallnames[num], curproc->tf->eax);
#endif // PRINT_SYSCALLS
```

## **user.h**

- Line 47 – 49

```
#ifdef CS333_P1
int date(struct rtcdate*);
#endif // CS333_P1
```

## **usys.S**

- Line 34

```
SYSCALL(date)
```

## **syscall.h**

- Line 26

```
#define SYS_date    SYS_halt+1
```

## **sysproc.c**

- Line 101 – 115

```
#ifdef CS333_P1
int
sys_date(void)
{
    struct rtcdate *d;

    if(argptr(0, (void*)&d, sizeof(struct rtcdate)) < 0){
        return -1;
    }
}
```

```

    }
    else{
        cmostime(d);
        return 0;
    }
}
#endif // CS333_P1

```

## proc.h

**proc{}**

- Line 53 – 55

```

#ifdef CS333_P1
uint start_ticks;
#endif // CS333_P1

```

## proc.c

**alloproc(void)**

- Line 152 – 154

```

#ifdef CS333_P1
p->start_ticks = ticks;
#endif // CS333_P1

```

**procdumpP1(struct proc \*p, char \*state\_string)**

- Line 570 – 581

```

int elapsed = 0;

int second = 0;
int millisecond = 0;

elapsed = ticks - p->start_ticks;

second = elapsed/1000;

```

```
millisecond = elapsed%1000;
```

```
cprintf("%d\t%s\t\t\t\t\t%d.%d\t%s\t%d\t", p->pid, p->name, second,  
millisecond, state_string, p->sz);
```