MODIFICATION CODE

1. Makefile (line 3-5)

```
CS333_PROJECT ?= 1
PRINT_SYSCALLS ?= 0
CS333_P1 ?= 1
```

menambahkan `_date\` pada variabel `UPROGS` (line 235)

```
...
    _wc\
    _zombie\
    _date\
```

Dan terakhir menghapus komentar pada `CS333_UPROGS +=` menjadi `_date` (line 16)

```
ifeq ($(CS333_PROJECT), 1)
CS333_CFLAGS += -DCS333_P1
CS333_UPROGS += _date
Endif
```

2. System Call Tracing
   - File syscall.c (line 191-194)

```
// task 2
    #ifdef PRINT_SYSCALLS
       cprintf("%s -> %d\n", syscallnames[num], curproc->tf-
>eax);
    #endif //CS333_P1
```

3. The `date()` System Call
   - Pada file user.h (Line 30-33)

```
...
// task 3
#ifdef CS333_P1
int date(struct rtcdate*);
#endif //CS333_P1
...
```

   - Pada file usys.s (Line 33)

```
...
SYSCALL(date)
```

   - Pada file syscall.h (Line 25)

```
...
// student system calls begin here. Follow the existing pattern.
#define SYS_date    SYS_halt + 1
```

   - Pada file syscall.c
     (Line 111-114)

```
...

// task 3 add new syscall date
#ifdef CS333_P1
extern int sys_date(void);
#endif //  CS333_P1
...
```

     (Line 144-147)

```
...
// task 3
#ifdef CS333_P1
[SYS_date]    sys_date,
#endif // CS333_P1
};
...
```

(Line 176-179)

```
...
#ifdef CS333_P1
  [SYS_date]    "date",
#endif // CS333_P1
};
#endif // PRINT_SYSCALLS
...
```

- Pada file sysproc.c (Line 103-112)

```
...
// task 3
#ifdef CS333_P1
int sys_date(void)
{
  struct rtcdate *d;
  if(argptr(0, (void*)&d, sizeof(struct rtcdate)) < 0)
    return -1;
  cmostime(d);
  return 0;
}
#endif //CS333_P1
```

4. `Control-P`
   - Pada file proc.h (line 53)

     ```
     uint start_ticks;
     ```

   - Pada file proc.c

     (line 125)

     ```
     if (!found) {
         release(&ptable.lock);
         p->start_ticks = ticks;
         return p;
       }
     ```

     (lne 570-575)

     ```
     // task 4
       int elapsed_ms = ticks - p->start_ticks;
       int elapsed_sec = elapsed_ms/1000;
       int mod_elapsed = elapsed_ms % 1000;
       cprintf("%d\t%s\t\t%d.%d\t%s\t%d\t", p->pid, p-
     >name, elapsed_sec, mod_elapsed, state_string, p->sz);
       #endif
     ```