

CSC209H Worksheet: Select

Consider the man page of an imaginary system call `office_hours`. Type `ps_set` is a defined type, similar to type `fd_set` that you used with `select`.

OFFICE_HOURS(2)	BSD System Calls Manual	OFFICE_HOURS(2)
NAME PS_CLR, PS_ISSET, PS_SET, PS_ZERO, office_hours		
SYNOPSIS void PS_CLR(ps, ps_set *psset); int PS_ISSET(ps, ps_set *psset); void PS_SET(ps, ps_set *psset); void PS_ZERO(ps_set *psset); int officehours(ps_set *prof, struct timeval window);		
DESCRIPTION office_hours() examines the schedules for the professors in the professor set prof to see which have office hours scheduled within the given window from the current time. office_hours() replaces the professor set with the subset of professors who have office hours in the given window.		
RETURN VALUE office_hours() returns the number of professors from the ps_set who have office hours in the window, or -1 if an error occurs. If office_hours() returns with an error, the descriptor sets will be unmodified and the global variable errno will be set to indicate the error.		

Suppose that (like file descriptors), professors are represented by small integers and there are professors defined as follows:

```
#define MICHELLE 1
#define ANDREW 2
#define JEN 3
#define ALAN 4
... (there are more)
```

You are only interested in office hours held by Jen or Michelle in the next 5 hours. Finish the program on the other side of this page, so that it calls `office_hours` and then prints either the message "Jen has office hours" or the message "Michelle has office hours" or both messages as appropriate.

Demonstrate that you know how to properly check for errors on a system call by writing the code to give the conventional behaviour if `office_hours` fails.

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```
int main() {

    struct timeval window;
    window.interval = 5 * 60;

    // set up first argument to office_hours
    ps_set profs;
    PS_ZERO(&profs);
    PS_SET(MICHELLE, &profs);
    PS_SET(JEN, &profs);

    // call office_hours
    if (office_hours(&profs, window) == -1) {
        perror("office_hours");
        exit(1);
    }

    // print the appropriate message
    if (PS_ISSET(JEN, &profs)) {
        printf("Jen has office hours\n");
    }
    if (PS_ISSET(MICHELLE, &profs)) {
        printf("Michelle has office hours\n");
    }
    return 0;
}
```