

Problem 1: Thread analysis .

Signals cannot be used to count events in other processes because signals are not queued. Solving this problem requires inter-process communication (IPC) mechanisms (not discussed in the text), or threads.

Problem 2: Signals and nonlocal jumps .

```
#include "csapp.h"
static sigjmp_buf env;
static void handler(int sig)
{
    Alarm(0);
    siglongjmp(env, 1);
}
char *tfgets(char *s, int size, FILE *stream)
{
    Signal(SIGALRM, handler);
    Alarm(5);
    if (sigsetjmp(env, 1) == 0)
        return(Fgets(s, size, stream)); /* return user input */
    else
        return NULL; /* return NULL if fgets times out */
}
int main()
{
    char buf[MAXLINE];
    while (1) {
        bzero(buf, MAXLINE);
        if (tfgets(buf, sizeof(buf), stdin) != NULL)
            printf("read: %s", buf);
        else
            printf("timed out\n");
    }
    exit(0);
}
```

Problem 3: UNIX I/O .

“fd2 =4”.