

\$SPAD/src/clef edible.c

The Axiom Team

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**Abstract**

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```

/*
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SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
*/

```

## 1 edible Call Graph

This was generated by the GNU cflow program with the argument list. Note that the line:NNNN numbers refer to the line in the code after it has been tangled from this file.

```

cflow --emacs -l -n -b -T --omit-arguments edible.c

;; This file is generated by GNU cflow 1.3. -*- cflow -*-
2 { 0} +-main() <int main () line:122>
3 { 1} +-ptyopen()
4 { 1} +-perror()
5 { 1} +-exit()
6 { 1} +-catch_signals() <void catch_signals () line:482>
7 { 2} | +-sprintf()
8 { 2} | +-getpid()

```

```

 9 { 2} | +-open()
10 { 2} | +-write()
11 { 2} | +-strlen()
12 { 2} | +-close()
13 { 2} | +-bsdSignal()
14 { 2} | +-hangup_handler() <void hangup_handler () line:374>
15 { 3} |   +-open()
16 { 3} |   +-write()
17 { 3} |   +-strlen()
18 { 3} |   +-close()
19 { 3} |   +-kill()
20 { 3} |   +-tcsetattr()
21 { 3} |   +-perror()
22 { 3} |   +-printf()
23 { 3} |   +-unlink()
24 { 3} |   \-exit()
25 { 2} | +-child_handler() <void child_handler () line:430>
26 { 3} |   +-open()
27 { 3} |   +-write()
28 { 3} |   +-strlen()
29 { 3} |   +-close()
30 { 3} |   +-Cursor_shape()
31 { 3} |   +-kill()
32 { 3} |   +-tcsetattr()
33 { 3} |   +-perror()
34 { 3} |   +-printf()
35 { 3} |   +-unlink()
36 { 3} |   \-exit()
37 { 2} | +-terminate_handler() <void terminate_handler () line:396>
38 { 3} |   +-open()
39 { 3} |   +-write()
40 { 3} |   +-strlen()
41 { 3} |   +-close()
42 { 3} |   +-sleep()
43 { 3} |   +-kill()
44 { 3} |   +-tcsetattr()
45 { 3} |   +-perror()
46 { 3} |   +-printf()
47 { 3} |   +-Cursor_shape()
48 { 3} |   +-fprintf()
49 { 3} |   +-unlink()
50 { 3} |   \-exit()
51 { 2} | +-interrupt_handler() <void interrupt_handler () line:418>
52 { 3} |   +-open()
53 { 3} |   +-write()
54 { 3} |   +-strlen()
55 { 3} |   +-close()
56 { 3} |   +-sleep()
57 { 3} |   \-kill()
58 { 2} | +-alarm_handler() <void alarm_handler () line:452>

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```

59 { 3} | | +-getppid()
60 { 3} | | +-open()
61 { 3} | | +-write()
62 { 3} | | +-strlen()
63 { 3} | | +-close()
64 { 3} | | +-alarm()
65 { 3} | | +-tcsetattr()
66 { 3} | | +-perror()
67 { 3} | | +-Cursor_shape()
68 { 3} | | +-fprintf()
69 { 3} | | +-unlink()
70 { 3} | | \-exit()
71 { 2} | \-alarm()
72 { 1} +-strcmp()
73 { 1} +-load_wct_file()
74 { 1} +-fprintf()
75 { 1} +-skim_wct()
76 { 1} +-sprintf()
77 { 1} +-getpid()
78 { 1} +-open()
79 { 1} +-tcgetattr()
80 { 1} +-fork()
81 { 1} +-setsid()
82 { 1} +-dup2()
83 { 1} +-close()
84 { 1} +-tcsetattr()
85 { 1} +-execvp()
86 { 1} +-getenv()
87 { 1} +-strdup()
88 { 1} +-execlp()
89 { 1} +-getppid()
90 { 1} +-init_flag()
91 { 1} +-define_function_keys()
92 { 1} +-init_reader()
93 { 1} +-init_parent() <void init_parent () line:328>
94 { 2} | +-tcgetattr()
95 { 2} | +-perror()
96 { 2} | +-exit()
97 { 2} | +-tcsetattr()
98 { 2} | \-Cursor_shape()
99 { 1} +-FD_ZERO()
100 { 1} +-FD_SET()
101 { 1} +-set_function_chars() <void set_function_chars () line:575>
102 { 1} +-write()
103 { 1} +-strlen()
104 { 1} +-select()
105 { 1} +-check_flip() <void check_flip () line:502>
106 { 2} | +-tcgetattr()
107 { 2} | +-perror()
108 { 2} | +-flip_canonical() <void flip_canonical () line:547>

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109 { 3} | +-tcsetattr()
110 { 3} | +-perror()
111 { 3} | +-exit()
112 { 3} | \-Cursor_shape()
113 { 2} | \-flip_raw() <void flip_raw () line:533>
114 { 3} | +-send_buff_to_child()
115 { 3} | +-tcsetattr()
116 { 3} | +-perror()
117 { 3} | \-exit()
118 { 1} +-FD_ISSET()
119 { 1} +-read()
120 { 1} +-back_up()
121 { 1} +-print_whole_buff()
122 { 1} \-do_reading()

```

— \* —

```

#include <stdlib.h>
#include <unistd.h>
#include <stdio.h>
#include <string.h>
#include <termios.h>
#include <fcntl.h>
#include <sys/stat.h>
#include <sys/time.h>
#include <errno.h>
#include <signal.h>

#if defined (SGIplatform)
#include <bstring.h>
#endif

#include "edible.h"
#include "com.h"
#include "bsdsignal.h"

#include "bsdsignal.h1"
#include "openpty.h1"
#include "prt.h1"
#include "edin.h1"
#include "wct.h1"
#include "edible.h1"
#include "fnct-key.h1"

#ifdef AXIOM_UNLIKELY
#define log 1

```

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#define logterm 1
#define siglog 1
#endif

#define Cursor_shape(x)

#ifdef siglog
int sigfile;
char sigbuff[256];
#endif

/* Here are the term structures I need for setting and resetting the
   terminal characteristics. */

struct termios childbuf; /* the childs normal operating termio */
struct termios oldbuf; /* the initial settings */
struct termios rawbuf; /* the parents raw state, when it is doing nothing */
struct termios canonbuf; /* set it to be canonical */

/* the terminals mapping of the function keys */
unsigned char _INTR, _QUIT, _ERASE, _KILL, _EOF, _EOL, _RES1, _RES2;

int ppid; /* the parents's parent pid */
int child_pid; /* the childs process id */

short INS_MODE ; /* Flag for insert mode */
short ECHOIT = 1; /* Flag for echoing */
short PTY; /* Flag which tells me whether I should echo newlines */

int MODE; /* am I in cbreak, raw, or canonical */

char in_buff[1024]; /* buffer for storing characters read until they are processed */
char buff[MAXLINE]; /* Buffers for collecting input and */
int buff_flag[MAXLINE]; /* flags for whether buff chars
                        are printing
                        or non-printing */

char controllerPath[20]; /* path name for opening the controller side */
char serverPath[20]; /* path name for opening the server side */

int contNum, serverNum; /* file descriptors for pty's */
int num_read; /* Number of chars read */

#ifdef log
int logfd;
char logpath[30];

```

```

#endif

int
main(int argc, char *argv[])
{
    fd_set rfd;          /* the structure for the select call */
    int code;            /* return code from system calls */
    char out_buff[MAXLINE]; /* from child and stdin */
    int out_flag[MAXLINE] ; /* initialize the output flags */
    char *program;        /* a string to hold the child program invocation */
    char **pargs = 0;      /* holds parts of the command line */
    int not_command = 1;   /* a flag while parsing the command line */

    /* try to get a pseudoterminal to play with */
    if (ptyopen(&contNum, &serverNum, controllerPath, serverPath) == -1) {
        perror("ptyopen failed");
        exit(-1);
    }

    /* call the routine that handles signals */
    catch_signals();

    /* parse the command line arguments - as with the aixterm the command
       argument -e should be last on the line. */

    while(++argv && not_command) {
        if(!strcmp(*argv, "-f"))
            load_wct_file(++argv);
        else if(!strcmp(*argv, "-e")) {
            not_command = 0;
            pargs = ++argv;
        }
        else {
            fprintf(stderr, "usage: clef [-f fname] -e command\n");
            exit(-1);
        }
    }
    skim_wct();

#ifdef log
    sprintf(logpath, "/tmp/cleflog%d", getpid());
    logfd = open(logpath, O_CREAT | O_RDWR, 0666);
#endif

    /* get the original termio settings, so the child has them */

    if(tcgetattr(0,&childbuf) == -1) {
        perror("clef trying to get the initial terminal settings");
    }

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```

        exit(-1);
    }

    /* start the child process */

    child_pid = fork();
    switch(child_pid) {
    case -1 :
        perror("clef can't create a new process");
        exit(-1);
    case 0:
        /* CHILD */
        /* Dissasociate from my parents group so all my child processes
           look at my terminal as the controlling terminal for the group */
        setsid();

        serverNum = open(serverPath,O_RDWR);
        if (serverNum == -1) perror("open serverPath failed");

        /* since I am the child, I can close ptc, and dup pts for all it
           standard descriptors */
        if (dup2(serverNum, 0) == -1) perror("dup2 0 failed");
        if (dup2(serverNum, 1) == -1) perror("dup2 1 failed");
        if (dup2(serverNum, 2) == -1) perror("dup2 2 failed");
        if( (dup2(serverNum, 0) == -1) ||
            (dup2(serverNum, 1) == -1) ||
            (dup2(serverNum, 2) == -1) ) {
            perror("clef trying to dup2");
            exit(-1);
        }

        /* since they have been duped, close them */
        close(serverNum);
        close(contNum);

        /* To make sure everything is nice, set off enhedit */
        /*   childbuf.c_line = 0; */

        /* reconfigure the child's terminal get echoing */
        if(tcsetattr(0, TCSAFLUSH, &childbuf) == -1) {
            perror("clef child trying to set child's terminal");
            exit(-1);
        }

        /* fire up the child's process */
        if(pargs){
            execvp( pargs[0], pargs);
            perror("clef trying to execvp its argument");
            fprintf(stderr, "Process --> %s\n", pargs[0]);
        }
    }

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    }
    else{
        program = getenv("SHELL");
        if (!program)
program = strdup("/bin/sh");
        else
program = strdup (program);
        execlp( program,program, 0);
        perror("clef trying to execlp the default child");
        fprintf(stderr, "Process --> %s\n", program);
    }
    exit(-1);
    break;
    /* end switch */
}
/* PARENT */
/* Since I am the parent, I should start to initialize some stuff.
   I have to close the pts side for it to work properly */

close(serverNum);
ppid = getppid();

/* Initialize some stuff for the reading and writing */
init_flag(out_flag, MAXLINE);
define_function_keys();
init_reader();
PTY = 1;
init_parent();

/* Here is the main loop, it simply starts reading characters from
   the std input, and from the child. */

while(1) {          /* loop forever */

    /* use select to see who has stuff waiting for me to handle */
    /* set file descriptors for ptc and stdin */
    FD_ZERO(&rfd);
    FD_SET(contNum,&rfd);
    FD_SET(0,&rfd);
    set_function_chars();
#ifdef log
    {
        char modepath[30];
        sprintf(modepath, "\nMODE = %d\n", MODE);
        write(logfd, modepath, strlen(modepath));
    }
#endif
#ifdef logterm
    {
        struct termio ptermio;

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        char pbuff[1024];
        tcgetattr(contNum, &ptermio);
        sprintf(pbuff, "child's settings: Lflag = %d, Oflag = %d, Iflag = %d\n",
            ptermio.c_lflag, ptermio.c_oflag, ptermio.c_iflag);
        write(logfd, pbuff, strlen(pbuff));
    }
#endif

    code = select(FD_SETSIZE, (void *) &rfd, NULL, NULL, NULL);
    for(;; code < 0 ;) {
        if(errno == EINTR) {
            check_flip();
            code = select(FD_SETSIZE, (void *) &rfd, NULL, NULL, NULL);
        }
        else {
            perror("clef select failure");
            exit(-1);
        }
    }

    /* reading from the child */
    if( FD_ISSET(contNum, &rfd) ) {
        if( (num_read = read(contNum, out_buff, MAXLINE)) == -1 ) {
            num_read = 0;
        }
#ifdef log
        write(logfd, "OUT<<<<<", strlen("OUT<<<<<"));
        write(logfd, out_buff, num_read);
#endif
        if(num_read > 0) {
            /* now do the printing to the screen */
            if(MODE != CLEFRAW) {
                back_up(buff_ptr);
                write(1, out_buff, num_read);
                print_whole_buff(); /* reprint the input buffer */
            }
            else write(1, out_buff, num_read);
        }
    } /* done the child stuff */
    /* I should read from std input */
    else {
        if(FD_ISSET(0, &rfd) ) {
            num_read = read(0, in_buff, MAXLINE);
#ifdef log
            write(logfd, "IN<<<<<", strlen("IN<<<<<"));
            write(logfd, in_buff, num_read);
#endif
            if(MODE == CLEFRAW )
                write(contNum, in_buff, num_read);
        }
    }

```

```

        else
            do_reading();
    }
}
}

void
init_parent(void)
{

    /* get the original termio settings, so I never have to check again */
    if(tcgetattr(0, &oldbuf) == -1) {
        perror("clef trying to get terminal initial settings");
        exit(-1);
    }

    /* get the settings for my different modes */
    if ((tcgetattr(0, &canonbuf) == -1) ||
        (tcgetattr(0, &rawbuf) == -1) ) {
        perror("clef trying to get terminal settings");
        exit(-1);
    }

    canonbuf.c_lflag &= ~(ICANON | ECHO | ISIG);
    /* read before an eoln is typed */

    canonbuf.c_lflag |= ISIG;

    /* canonbuf.c_line = 0;          turn off enhanced edit */

    canonbuf.c_cc[VMIN] = 1;          /* we want every character */
    canonbuf.c_cc[VTIME] = 1;        /* these may require tweaking */

    /* also set up the parents raw setting for when needed */
    rawbuf.c_oflag = rawbuf.c_iflag = rawbuf.c_lflag /* = rawbuf.c_line */ = 0;
    rawbuf.c_cc[VMIN] = 1;
    rawbuf.c_cc[VTIME] = 1;

    if(tcsetattr(0, TCSAFLUSH, &canonbuf) == -1) {
        perror("clef setting parent terminal to canonical processing");
        exit(0);
    }

    /* initialize some flags I will be using */
    MODE = CLEFCANONICAL;
    INS_MODE = 1;

```

```

    Cursor_shape(2);
}

void
hangup_handler(int sig)
{
#ifdef siglog
    sigfile = open(sigbuff, O_RDWR | O_APPEND);
    write(sigfile, "Hangup Handler\n", strlen("Hangup Handler\n"));
    close(sigfile);
#endif
    /* try to kill my child if it is around */
    if(kill(child_pid, 0)) kill(child_pid, SIGTERM);
    if(kill(ppid, 0) >= 0) {
        /* fix the terminal and exit */
        if(tcsetattr(0, TCSAFLUSH, &oldbuf) == -1) {
            perror("clef restoring terminal in hangup handler");
        }
        printf("\n");
    }
    /* remove the temporary editor filename */
    unlink(editorfilename);
    exit(-1);
}

void
terminate_handler(int sig)
{
#ifdef siglog
    sigfile = open(sigbuff, O_RDWR | O_APPEND);
    write(sigfile, "Terminate Handler\n", strlen("Terminate Handler\n") + 1);
    close(sigfile);
    sleep(1);
#endif
    kill(child_pid, SIGTERM);
    /* fix the terminal, and exit */
    if(tcsetattr(0, TCSAFLUSH, &oldbuf) == -1) {
        perror("clef restoring terminal in terminate handler");
    }
    printf("\n");
    Cursor_shape(2);
    fprintf(stderr, "\n");
    /* remove the temporary editor filename */
    unlink(editorfilename);
    exit(0);
}

void
interrupt_handler(int sig)

```

```

{
#ifdef siglog
    sigfile = open(sigbuff, O_RDWR | O_APPEND);
    write(sigfile, "Interrupt Handler\n", strlen("Interrupt Handler\n") + 1);
    close(sigfile);
    sleep(1);
#endif
    kill(child_pid, SIGINT);
}

void
child_handler(int sig)
{
#ifdef siglog
    sigfile = open(sigbuff, O_RDWR | O_APPEND );
    write(sigfile, "Child Handler\n", strlen("Child Handler\n") + 1);
    close(sigfile);
#endif
    Cursor_shape(2);
    close(contNum);
    if(kill(ppid, 0) >= 0) {
        /* fix the terminal, and exit */
        if(tcsetattr(0, TCSAFLUSH, &oldbuf) == -1) {
            perror("clef restoring terminal in child handler");
        }
        printf("\n");
    }
    /* remove the temporary editor filename */
    unlink(editorfilename);
    exit(0);
}

void
alarm_handler(int sig)
{
    int newppid = getppid();
#ifdef siglog
    sigfile = open(sigbuff, O_RDWR | O_APPEND);
    write(sigfile, "Alarm Handler\n", strlen("Alarm Handler\n")+ 1 );
    close(sigfile);
#endif
    /* simply gets the parent process id, if different, it terminates ,
       otherwise it resets the alarm */

    if(ppid == newppid) {
        alarm(60);
        return;
    }
    else {
        /* once that is done fix the terminal, and exit */

```

```

        if(tcsetattr(0, TCSAFLUSH, &oldbuf) == -1) {
            perror("clef restoring terminal in alarm handler");
        }
        Cursor_shape(2);
        fprintf(stderr, "\n");
        /* remove the temporary editor filename */
        unlink(editorfilename);
        exit(0);
    }
}

/* a procedure which tells my parent how to catch signals from its children */
void
catch_signals(void)
{
#ifdef siglog
    sprintf(sigbuff, "/tmp/csig%d", getpid());
    sigfile = open(sigbuff, O_RDWR | O_TRUNC | O_CREAT);
    write(sigfile, "Started \n", strlen("Started \n"));
    close(sigfile);
#endif
    bsdSignal(SIGHUP, hangup_handler, RestartSystemCalls);
    bsdSignal(SIGCHLD, child_handler, RestartSystemCalls);
    bsdSignal(SIGTERM, terminate_handler, RestartSystemCalls);
    bsdSignal(SIGINT, interrupt_handler, RestartSystemCalls);
    bsdSignal(SIGALRM, alarm_handler, RestartSystemCalls);
    alarm(60);
}

/* Here is where I check the child's termio settings, and try to copy them.
   I simply trace through the main modes (CLEFRAW, CLEFCANONICAL) and
   try to simulate them */
void
check_flip(void)
{
    return;

#ifdef 0
    /*simply checks the termio structure of the child */

    if(tcgetattr(contNum, &childbuf) == -1) {
        perror("clef parent getting child's terminal in check_termio");
    }
    if(childbuf.c_lflag & ICANON) {
        if(MODE != CLEFCANONICAL) {
            flip_canonical(contNum);
            MODE = CLEFCANONICAL;
        }
    }
    else {

```

```

        if(MODE != CLEFRAW) {
            flip_raw(contNum);
            MODE = CLEFRAW;
        }
    }
    /* While I am here, lets set the echo */
    if(childbuf.c_lflag & ECHO) ECHOIT = 1;
    else ECHOIT = 0;
#endif
}

void
flip_raw(int chann)
{

    if(MODE == CLEFCANONICAL)
        send_buff_to_child(chann);

    if(tcsetattr(0, TCSAFLUSH, &rawbuf) == -1) {
        perror("clef resetting parent to raw ");
        exit(-1);
    }
}

void
flip_canonical(int chann)
{
    if(tcsetattr(0, TCSAFLUSH, &canonbuf) == -1) {
        perror("clef resetting parent to canonical ");
        exit(-1);
    }
    if(INS_MODE)
        Cursor_shape(5);
    else
        Cursor_shape(2);
}

void
etc_get_next_line(char * line,int * nr,int  fd)
{
    *nr = read(fd, line, 1024);
    if(*nr == -1) {
        perror("Reading /etc/master");
    }
    if(*nr == 0) {
        fprintf(stderr, "Not found \n");
    }
}

```



```

}

#define etc_whitespace(c) ((c == ' ' || c == '\t')?(1):(0))

void
set_function_chars(void)
{
    /* get the special characters */
    _INTR = childbuf.c_cc[VINTR];
    _QUIT = childbuf.c_cc[VQUIT];
    _ERASE = childbuf.c_cc[VERASE];
    _KILL = childbuf.c_cc[VKILL];
    _EOF = childbuf.c_cc[VEOF];
    _EOL = childbuf.c_cc[VEOL];
    return;
}

```

---

## References

- [1] nothing