

\$SPAD/src/lib wct.c

The Axiom Team

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**Abstract**

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— \* —

```
/*
 * Word completion.
 *
 *
 * Word completion is driven from a list of completion tables. Each table
 * contains a list of words.
 *
 */

#include <stdio.h>
#include <stdlib.h>
```

— \* —

The MACOSX platform is broken because no matter what you do it seems to include files from `[[/usr/include/sys]]` ahead of `[[/usr/include]]`. On linux systems these files include themselves which causes an infinite regression of includes that fails. GCC gracefully steps over that problem but the build fails anyway. On MACOSX the `[[/usr/include/sys]]` versions of files are badly broken with respect to the `[[/usr/include]]` versions.

— \* —

```
#if defined(MACOSXplatform)
#include "/usr/include/unistd.h"
#else
#include <unistd.h>
#endif
#include <string.h>
#include <fcntl.h>
#if defined(MACOSXplatform)
#include "/usr/include/time.h"
#else
#include <time.h>
#endif
#include <ctype.h>
#include <sys/types.h>
#include <sys/stat.h>

/* #define PINFO */ /* A flag to suppress printing of the file info */

#define WCT /* A flag needed because ctype.h stole some
            * of my constants */

#include "edible.h"

#define MAX_PREFIX 1024
```

```

#define strneql(a,b,n)  (*(a) == *(b) && !strncmp((a),(b),(n)))
#define Delimiter(c) (! isalnum(c) && c != '%' && c != '!' && c != '?' && c != '_' )

#include "wct.h1"
#include "prt.h1"
#include "edin.h1"

static Wct *pwct = 0;
static Wix *pwix;
static Wix curr_wix;
static char curr_prefix[MAX_PREFIX];
static Wct *pHeadwct;

time_t
ftime(char *path)
{
    int rc;
    struct stat stbuf;

    rc = stat(path, &stbuf);
    if (rc == -1)
        fatal("Cannot determine status of %s.", path);

    return stbuf.st_mtime;
}

off_t
fsize(char *path)
{
    int rc;
    struct stat stbuf;

    rc = stat(path, &stbuf);
    if (rc == -1)
        fatal("Cannot determine status of %s.", path);

    return stbuf.st_size;
}

/*
 * Scan a word completion table for a particular word.
 */

Wix *
scanWct(Wct *pwct, char *prefix)

```

```

{
    long fmod;
    int preflen, i, wc;
    char **wv;

    preflen = strlen(prefix);
    strncpy(curr_prefix, prefix, MAX_PREFIX);

    pHeadwct = pwct;
    curr_wix.pwct = 0;
    curr_wix.word = 0;

    for (; pwct; pwct = pwct->next) {
        curr_wix.pwct = pwct;

        fmod = ftime(pwct->fname);
        if (fmod > pwct->ftime)
            reintern1Wct(pwct);

        wv = pwct->wordv;
        wc = pwct->wordc;
        for (i = 0; i < wc; i++) {
            curr_wix.word = i;
            if (strneql(wv[i], prefix, preflen))
                return &curr_wix;
        }
    }
    return 0;
}

Wix *
rescanWct(void)
{
    Wct *pwct, *start_pwct;
    int preflen, start_word, i, wc;
    char **wv, *prefix;

    start_pwct = curr_wix.pwct;
    start_word = curr_wix.word;

    if (!start_pwct) return(0);
    prefix = curr_prefix;
    preflen = strlen(prefix);

    /*
     * Finish the current structure.
     */

```

```

pwct = start_pwct;

curr_wix.pwct = pwct;
wv = pwct->wordv;
wc = pwct->wordc;
for (i = start_word + 1; i < wc; i++) {
    curr_wix.word = i;
    if (strneql(wv[i], prefix, preflen))
        return &curr_wix;
}

/*
 * Finish to the end of the list, doing whole structures.
 */
for (pwct = pwct->next; pwct; pwct = pwct->next) {
    curr_wix.pwct = pwct;

    wv = pwct->wordv;
    wc = pwct->wordc;
    for (i = 0; i < wc; i++) {
        curr_wix.word = i;
        if (strneql(wv[i], prefix, preflen))
            return &curr_wix;
    }
}

/*
 * Restart at beginning, doing whole structures.
 */
for (pwct = pHeadwct; pwct != start_pwct; pwct = pwct->next) {
    curr_wix.pwct = pwct;

    wv = pwct->wordv;
    wc = pwct->wordc;
    for (i = 0; i < wc; i++) {
        curr_wix.word = i;
        if (strneql(wv[i], prefix, preflen))
            return &curr_wix;
    }
}

/*
 * Do beginning half of the start structure.
 */
curr_wix.pwct = pwct;
wv = pwct->wordv;
wc = pwct->wordc;
for (i = 0; i <= start_word; i++) {
    curr_wix.word = i;
    if (strneql(wv[i], prefix, preflen))

```

```

        return &curr_wix;
    }

    /* Not found? */
    return 0;
}

/*
 * Summarize a table.
 */
void
skimWct(Wct *pwct)
{
    while (pwct) {
#ifdef PINFO
        skim1Wct(pwct);
#endif
        pwct = pwct->next;
    }
}

void
skim1Wct(Wct *pwct)
{
#define NHEAD    13
#define NTAIL    7

    int cc;

    printf("%-10s", pwct->fname);
    printTime((long *)&(pwct->ftime));
    cc = skimString(pwct->fimage, pwct->fsize, NHEAD, NTAIL);
    printf("%s", " " + (cc - (NHEAD + NTAIL)));
    printf(" [%d w, %ld c]", pwct->wordc, (long)(pwct->fsize));
    printf("\n");

#ifdef SHOW_WORDS
    {
        int i;
        char **wv;

        for (i = 1, wv = pwct->wordv; *wv; i++, wv++) {
            printf("%5d: %s\n", i, *wv);
        }
    }
#endif
}

void
printTime(long *clock)

```

```

{
    struct tm *tm;

    tm = localtime((time_t *)clock);
    printf("%.2d/%.2d/%.2d %.2d:%.2d:%.2d ",
           tm->tm_year, tm->tm_mon + 1, tm->tm_mday,
           tm->tm_hour, tm->tm_min, tm->tm_sec);
}

int
skimString(char *s, int slen, int nhead, int ntail)
{
    int spos, tlen, i, cc;

    cc = printf("\n");
    for (spos = 0; spos < slen && cc <= nhead; spos++)
        cc += prChar(s[spos]);

    /* Assume same tail has the same multi-character format ratio. */
    tlen = ntail * ((1.0 * spos) / nhead);

    if (spos + tlen >= slen)
        for (; spos < slen; spos++)
            cc += prChar(s[spos]);
    else {
        cc += printf("\n...\n");
        for (i = slen - tlen; i < slen; i++)
            cc += prChar(s[i]);
    }
    cc += printf("\n");
    return cc;
}

int
prChar(int c)
{
    if (c == '\n')
        return printf("\n");
    if (c == '\t')
        return printf("\t");
    if (c == '\b')
        return printf("\b");
    if (c == '"')
        return printf("\\");
    if (iscntrl(c))
        return printf("^%c", (c + 0100) % 0200);
    if (isascii(c))
        return printf("%c", c);

    return printf("%d", c);
}

```



```

}

Wct *
reread1Wct(Wct *pwct)
{
    int fd, rc;

    /* Check information about the file. */
    pwct->fsize = fsize(pwct->fname);
    pwct->ftime = ftime(pwct->fname);

    /* Allocate space for file image */
    if (pwct->fimage)
        free(pwct->fimage);
    pwct->fimage = (char *) malloc(pwct->fsize + 1);
    if (pwct->fimage == 0)
        sfatal("Cannot allocate new table.");
    pwct->fimage[pwct->fsize] = 0;

    /* Read file into buffer. */
    fd = open(pwct->fname, O_RDONLY);
    if (fd == -1)
        fatal("Cannot read file %s.", pwct->fname);
    rc = read(fd, pwct->fimage, pwct->fsize);
    if (rc != pwct->fsize)
        fatal("Did not read all of file %s.", pwct->fname);

    return pwct;
}

Wct *
read1Wct(char *fname)
{
    Wct *pwct;

    /* Allocate a new link for this file. */
    pwct = (Wct *) malloc(sizeof(Wct));
    if (pwct == 0)
        sfatal("Cannot allocate new table.");

    pwct->fname = fname;
    pwct->wordc = 0;
    pwct->wordv = 0;
    pwct->fimage = 0;
    pwct->next = 0;

    return reread1Wct(pwct);
}

Wct *

```

```

nconcWct(Wct *pwct, Wct * qwct)
{
    Wct *p0 = pwct;

    if (!p0)
        return qwct;

    while (pwct->next)
        pwct = pwct->next;
    pwct->next = qwct;

    return p0;
}

void
sortWct(Wct *pwct)
{
    while (pwct) {
        sort1Wct(pwct);
        pwct = pwct->next;
    }
}

void
sort1Wct(Wct *pwct)
{
    qsort((char *) pwct->wordv, pwct->wordc,
          sizeof(*(pwct->wordv)), mystrcmp);
}

int
mystrcmp(const void *s1, const void * s2)
{
    return strcmp(*(char **)s1, *(char **)s2);
}

/*
 * Break wct struct into words.
 */

void
burstWct(Wct *pwct)
{
    while (pwct) {
        burst1Wct(pwct);
        pwct = pwct->next;
    }
}

void

```

```

burst1Wct(Wct *pwct)
{
    char *s, **wv;
    int i, j, inword = 0;

    for (s = pwct->fimage, i = 0; i < pwct->fsize; s++, i++) {
        if (isspace(*s) || iscntrl(*s)) {
            *s = 0;
            inword = 0;
        }
        else if (!inword) {
            inword = 1;
            pwct->wordc++;
        }
    }

    if (pwct->wordv)
        free(pwct->wordv);
    pwct->wordv = (char **) calloc(pwct->wordc + 1, sizeof(char *));
    if (!pwct->wordv)
        fatal("Could not make word list for %s.", pwct->fname);

    s = pwct->fimage;
    i = 0;
    for (wv = pwct->wordv, j = 0; j < pwct->wordc; wv++, j++) {
        while (i < pwct->fsize && !s[i])
            i++;
        *wv = s + i;
        while (i < pwct->fsize && s[i])
            i++;
    }
    *wv = 0;
}

Wct *
intern1Wct(char *fname)
{
    Wct *pwct;

    pwct = read1Wct(fname);
    burst1Wct(pwct);
    return pwct;
}

void
reintern1Wct(Wct *pwct)
{
    reread1Wct(pwct);
    burst1Wct(pwct);
}

```

```

}

void
sfatal(char *s)
{
    fatal("%s", s);
}

void
fatal(char *fmt, char * s)
{
    static char fbuf[256];

    sprintf(fbuf, fmt, s);

    perror(fbuf);
    exit(1);
}

/* load up the wct database */
void
load_wct_file(char *fname)
{
    pwct = nconcWct(intern1Wct(fname), pwct);
}

void
skim_wct(void)
{
    skimWct(pwct);
}

/*
 * This routine is called when a tab is hit. It simply takes the current
 * buffer and tries to find a completion of the last word on the line in the
 * data base.
 */

void
rescan_wct(void)
{
    int b = curr_pntr - 1;
    int old_len;
    int new_len;
    int diff;
    int i;
    int ncs = 0;

```

```

/*
 * first thing I should do is find my way back to the beginning of the
 * word
 */
while (b && !Delimiter(buff[b]))
    b--;
if (Delimiter(buff[b]))
    b++;

old_len = curr_pntr - b;

pwix = rescanWct();

if (!pwix) {
    putchar(_BELL);
    fflush(stdout);
}
else {
    Wct *pwct = pwix->pwct; /* start replacing it */

    new_len = strlen(pwct->wordv[pwix->word]);
    if (new_len > old_len) {

        /*
         * I have to just slide the characters forward a bit, stuff in
         * the new characters, and then adjust curr_pntr
         */
        diff = new_len - old_len;
        if (curr_pntr != buff_pntr) {
            forwardcopy(&buff[curr_pntr + diff],
                        &buff[curr_pntr],
                        buff_pntr - curr_pntr);
            forwardflag_cpy(&buff_flag[curr_pntr + diff],
                            &buff_flag[curr_pntr],
                            buff_pntr - curr_pntr);
        }
        buff_pntr += diff;
        ncs = curr_pntr + diff;

        /* Now insert the new word */
        for (i = 0; i < new_len; i++)
            buff[b + i] = (pwct->wordv[pwix->word])[i];

        /* move cursor to the beginning of the word */
        for (; curr_pntr != b; curr_pntr--)
            putchar(_BKSPC);

        /** now print the characters on the rest of the line */
        printbuff(curr_pntr, buff_pntr - curr_pntr);
    }
}

```

```

        /* now move back the number of characters I want to */
        for (i = buff_ptr; i != ncs; i--)
            putchar(_BKSPC);

        fflush(stdout);

        curr_ptr = ncs;
    }
    else if (new_len < old_len) {
        /* this time I simply copy backwards and do the substituting */
        diff = old_len - new_len;
        strncpy(&buff[curr_ptr - diff],
                &buff[curr_ptr],
                buff_ptr - curr_ptr);
        flagncpy(&buff_flag[curr_ptr - diff],
                &buff_flag[curr_ptr],
                buff_ptr - curr_ptr);
        buff_ptr -= diff;
        ncs = curr_ptr - diff;

        /* Now insert the new word */
        for (i = 0; i < new_len; i++)
            buff[b + i] = (pwct->wordv[pwix->word])[i];

        /* move cursor to the beginning of the word */
        for (; curr_ptr != b; curr_ptr--)
            putchar(_BKSPC);

        /** now print the characters on the rest of the line */
        printf(b, buff_ptr - b);

        /* now blank out the characters out on the end of this line */
        for (i = 0; i < diff; i++)
            myputchar(' ');

        /* now move back the number of characters I want to */
        for (i = buff_ptr + diff; i != ncs; i--)
            putchar(_BKSPC);

        fflush(stdout);

        curr_ptr = ncs;
    }
    else {
        diff = 0;
        ncs = curr_ptr;
        /* Now insert the new word */
        for (i = 0; i < new_len; i++)
            buff[b + i] = (pwct->wordv[pwix->word])[i];
    }

```

```

        /* move cursor to the beginning of the word */
        for (; curr_pntr != b; curr_pntr--)
            putchar(_BKSPC);

        /** now print the characters on the rest of the line **/
        printf(curr_pntr, buff_pntr - curr_pntr);

        /* now move back the number of characters I want to */
        for (i = buff_pntr; i != ncs; i--)
            putchar(_BKSPC);

        fflush(stdout);

        curr_pntr = ncs;
    }
}

void
find_wct(void)
{
    char search_buff[100];
    char *filler = search_buff;
    int b = curr_pntr - 1;
    int e = curr_pntr;
    int ne = 0;
    int st;
    Wix *pwix;
    int curr_len;
    int new_len;
    int diff;
    int i;

    /*
     * First thing I do is try and construct the string to be searched for.
     * Basically I just start from the curr_pntr and search backward until I
     * find a blank. Once I find a blank I copy forward until I get back to
     * curr_pntr;
     */
    if (!curr_pntr) {
        putchar(_BELL);
        return;
    }
    /* then get back to the first blank or back to the beginning */
    while (b && !Delimiter(buff[b]))
        b--;
    if (Delimiter(buff[b]))
        b++;

```

```

/* At the same time, let me find the end of the word */
while (e < buff_pntr && !Delimiter(buff[e])) {
    e++;
    ne++;
}

st = b;
curr_len = e - b;

/* now simply copy the text forward */
while (b < curr_pntr)
    *filler++ = buff[b++];

*filler = '\0';

pwix = scanWct(pwct, search_buff);

/*
 * else pwix = rescanWct();
 */

if (!pwix) {
    putchar(_BELL);
    fflush(stdout);
}
else {
    Wct *pwct = pwix->pwct;

    /*
     * printf("Found %s in file %s\n", pwct->wordv[pwix->word],
     * pwct->fname);
     */
    /* copy them buffer into where it should be */
    new_len = strlen(pwct->wordv[pwix->word]);
    diff = new_len - curr_len;
    if (curr_pntr != buff_pntr) {
        forwardcopy(&buff[curr_pntr + diff],
                    &buff[curr_pntr],
                    buff_pntr - curr_pntr);
        forwardflag_cpy(&buff_flag[curr_pntr + diff],
                        &buff_flag[curr_pntr],
                        buff_pntr - curr_pntr);
    }
    buff_pntr += diff;

    /* Now insert the new characters */
    for (i = new_len - diff; i < new_len; i++)
        buff[st + i] = (pwct->wordv[pwix->word])[i];
}

```



```

        /* Now move the cursor forward to the end of the word */
        for (i = 0; i < diff; i++)
            putchar(buff[curr_pntr++]);

        /** now print the characters on the rest of the line **/
        printbuff(curr_pntr, buff_pntr - curr_pntr);

        /* now move back the number of characters I want to */
        for (i = buff_pntr; i != e + diff; i--)
            putchar(_BKSPC);

        fflush(stdout);

        curr_pntr = diff + e;
    }

}

```

---

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```

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```

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## References

- [1] nothing