---

sum(f,n)   sample – 9

/* **sum(f,n)** This procedure computes and returns

$$\mathbf{sum} = \sum_{i=0}^{n} \mathbf{f}(i)$$

There is no error checking in this example. */

```
double sum(f,n)
double (*f)();      /* function to call */
int n;              /* summation limit */
{
    int i;
    double s = 0;

    for (i=0; i<=n; i++) {
        s += f(i);
    }
    return (s);
}
```

Figure 3: **sum** from the listing of **sample.c**

Other than this the program need not contain any TeX text. Most programs, however, will use plain TeX commands in comments, as well as several new commands provided by c-~~web~~. These are described in Figure 1.

Figure 2 is a sample procedure, **sum**, from a program in c-~~web~~ format. Figure 3 is the listing of the procedure. Not shown in figure 3 is the title page, which includes the title, synopsis (none in this example), and table of contents.

Features of c-~~web~~, some of which are demonstrated in the example, include:

1. Page breaks occur only before comments.
2. The code portion is printed not quite verbatim—indentation is automatically provided. Lines following an opening bracket or parenthesis are indented until the line containing the closing bracket or indentation.
3. The page heading contains the **c** file name, the page number, and the current section name.
4. Alignment rules on the top and left help verify indentation.

Trying it out

A sample program (**pf.c**) demonstrates c-~~web~~ and describes the commands in more detail. Interested persons should obtain a copy of the macro file (**cnoweb.tex**) and the sample program by anony-

mous ftp to **u.washington.edu**. They are in the directory **pub/tex/cnoweb**. Anyone without access to ftp may request the files by mail to me at the address below.

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A TeX Previewer for "Slow" Terminals

Harold T. Stokes

In our department, we have a multi-user computer cluster with one copy of TeX and one laser printer. Our previewer sends document pages to the user's terminal in the Tektronix 4010/4014 graphics format. Most graphics terminals can emulate the Tektronix 4010/4014. This includes PCs using a terminal emulator like MSKermit.

The terminals in our department are connected to the system through a data switch. The rate at which data can be sent to a terminal is limited to 9600 baud (1200 bytes/second). This is rather slow for displaying graphics.

As an example, consider how we might draw the character T on the screen. The individual pixels for this character (from the **cmr10** font) are shown in Fig. 1a. Since Tektronix 4010/4014 graphics is vector-oriented, we might try the obvious raster scan shown in Fig. 1b. However, there are 44 line segments in that raster scan. To draw a single line segment in Tektronix 4010/4014 graphics, at least seven bytes must be sent to the terminal (sometimes eight or nine). At 9600 baud, it would require at least 0.25 seconds to display this single character. An entire document page which may contain 3000 characters would require more than ten minutes to be displayed. This, of course, is unacceptable for a previewer.
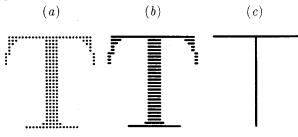

Fig. 1. The character T from **cmr10**: (a) pixels, (b) raster scan, (c) stick figure.

We solved this problem by designing a new set of fonts. We call them "stick-figure" fonts. The T is displayed as two line segments (Fig. 1c). In Fig. 2 we show a sample of some text, including a displayed equation. (The actual clarity will depend on the resolution of the graphics screen used.) Using the stick-figure font, a page containing 3000 characters can usually be displayed on the screen in less than a minute. Some users have even used this previewer from home over a modem.

---

(1) *Subduction condition.* The irrep D of G_0 must subduce into the indentity irrep of G, that is,

$$i(G) = \frac{1}{|G|} \sum_{g \in G} \chi(g) \neq 0, \qquad (1)$$

where $i(G)$ is the subduction frequency, and $\chi(g)$ is the character of D for the element g of G. The summation is taken over all elements g of G.

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Fig. 2. Sample TeX output (a) from our laser printer and (b) how it appears using our previewer with stick-figure fonts.

Our previewer has one major fault. We cannot distinguish between some of the different fonts. But the speed gained more than compensates for this disadvantage.

Our previewer is written in a portable C computer language.

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Philology

Report on Multilingual Activities

Michael J. Ferguson

We now have an Extended TeX Font Encoding which should be officially approved by TUG and available on the archives by the time you read this report. This new standard is the first step in exploiting the enhanced capabilities of TeX 3.0 in a multilingual environment. The use of this standard will enable the direct use of accented characters, hyphenation, and will create, for the first time, a consistent interface to all text fonts in TeX systems. The new standard is intended to be used for all of TeX's text fonts. This means that accessing a particular code in any font will produce similar results. To this end, a tt font will have a ffi sequence of monospaced characters at the same location as the ffi ligature in the bold roman font. It should also serve as the encoding standard for non-Greek variable names in math mode.

The new standard extends the alphabetic content of ISO Latin 1 by including all of the linguistic characters in ISO Latin 2 along with ligatures and punctuation relevant to these languages. This standard includes the national characters, without the necessity of explicit accenting, for Albanian, Czech, Danish, Dutch, English, Faeroese, Finnish, French, German, Hungarian, Icelandic, Irish, Italian, Norwegian, Polish, Portugese, Rumanian, Serbocroatian, Slovak, Slovene, Spanish, Swedish and Turkish. It also includes a block of diacritics, so that these "basic" characters may be extended by use of TeX's accenting mechanism. This capability should allow for the extension to other languages, for example Lappish, at the possible penalty of not allowing hyphenation of words containing these explicitly accented characters.

The standard also includes some important innovative extensions to increase flexibility of use and enhance lexical semantic consistency.

- It includes both a "dash" and an explicit "hyphen char". This capability allows font designers the option of replacing the "-" with an "=" without losing the dash. Since the "-" is no longer the hyphen char, it allows words with explicit dashes, such as INRS-Télécommunications to be hyphenated. It also allows for the Serbocroatian hyphenation rule which says that a word broken at a "-" should