

Then

```
\countcommas{#1}
makes the value of \count1 be the
number of commas in #1.
```

The `\endd` trick is used to handle "hidden" commas, but the `*` trick isn't needed, since we don't care what `\cm` does to `#1`.

(d) If we do `\countcommas{#1}`, then `\ifpos1` will tell us whether `#1` contains at least one comma. But it is preferable to use the following scheme, which doesn't involve any counters, and which stops as soon as the first comma is found:

```
\def\cm#1,#2{\ismarker{#2}
  \if T\ans{\gdef\nextcm{}}
  \else{\gdef\Hascomma{T}
    \gdef\nextcm#1\marker{}}
  \nextcm}
\def\hascomma#1{\gdef\Hascomma{F}
  \cm#1,\marker}
```

(e) Suppose we want to perform the operation in part (b) on some input of the form

```
(string1)\\(string2)\\...\\(stringn)
```

where the separator is the control sequence `\\` (which is never used in isolation, and is initially defined by `\def\\{}`). We could use exactly the same scheme, replacing `\def\op#1,#2\endd` by `\def\op#1\\#2\endd`. But we can also take advantage of the fact that the separator is a control sequence to obtain a definition that is both more elegant and more efficient:

```
\def\op#1\\{A\kill#1Z\\}
\def\operate#1{\def\\{\op*}
  \op*#1\def\op{\kill}\\}
```

⊗ The `\def\op{}` needs to be replaced by `\gdef\op{}` if `\op` puts things inside braces; in this case, the original definition of `\op` should be made part of the definition of `\operate`.

◇ There might appear to be possible confusion if some `(stringi)` contains `\\` within a group `{...\\...}`. In *AMS-TeX* this occurs only in constructions like

```
{\align...\\...}\endalign}
```

where `\\` is temporarily re-defined anyway.

## V. Searching For Strings

*TeX*'s method of determining where an argument in a definition ends has the following peculiar feature. Suppose we define

```
\def\cs#1ab#2{...}
```

Then the first argument is the smallest (possibly empty) token or group that is followed by a, *not* the smallest group that is followed by `ab`. So the input

```
\cs xayabc
```

gives the error message

```
! Use of \cs does not match its definition.
```

So if we want to know whether `ab` occurs in some string we can't simply replace the comma by `ab` in the method of part IV(d), because an `a` might occur alone. Instead we have to do something like the following:

```
\def\isb#1{\compare*b{#1}}
\def\finda#1a#2#3\endd{\ismarker{#2}
  \if T\ans{\gdef\nextfinda{}}
  \else{\isb{#2}
    \if T\ans{\gdef\Hasab{T}
      \gdef\nextfinda{}}
    \else{\gdef\nextfinda
      {\finda#2#3\endd}}
  \nextfinda}
\def\hasab#1{\gdef\Hasab{F}
  \finda#1a\marker\endd}
```

```
* * * * *
```

## Problems

```
* * * * *
```

The first formatting problems posed in this column come from the videotaped *TeXarcana Class* taught by Don Knuth last March. Solutions will be presented in the next issue. Readers with working *TeX* systems are encouraged to attempt solutions to these problems, in order to better appreciate the problems and their solutions.

Lynne A. Price

### Problem no. 1:

Type:

```
\vskip 12pt
\noindent\hide{--}Allan Temko
```

```
\vskip 2pt
\noindent Architecture Critic
```

To get:

```
-Allan Temko
Architecture Critic
```

**Problem no. 2:***Type:*

\fancy Senator and Mrs.\Stanford had reserved to themselves control of the University's affairs during their lifetimes, including the parceling out of ``all the money that could be wisely used.'' Mrs.\Stanford had remained in her husband's shadow---on opening day she could not bring herself to deliver the short speech she had written out. But following the death of the Senator she, at age 65, took on full responsibility for the University with unsuspected strength.

*To get:*

Senator and Mrs. Stanford had reserved to themselves control of the University's affairs during their lifetimes, including the parceling out of "all the money that could be wisely used." Mrs. Stanford had remained in her husband's shadow—on opening day she could not bring herself to deliver the short speech she had written out. But following the death of the Senator she, at age 65, took on full responsibility for the University with unsuspected strength.

**Problem no. 3:***Type:*

\hspace 25em

\noindent This is a case where the name and address fit in nicely with the review.\signed{A. Reviewer}{Ann Arbor, Mich.}

\vskip 8pt

\noindent But sometimes an extra line must be added.\signed{N. Bourbaki}{Paris}

*To get:*

This is a case where the name and address fit in nicely with the review.           A. Reviewer (Ann Arbor, Mich.)

But sometimes an extra line must be added.

N. Bourbaki (Paris)

**Problem no. 4:**

Type:

```
\point 0 0
\point 1 2
\point 2 1
\point .5 5
\point -1 -1
```

To get:

•(.5,5)

•(1,2)

•(2,1)

•(0,0)

•(-1,-1)

**Problem no. 5:**

Type:

```
\hsize 20em
End of a paragraph.\par
\rightjustifthefollowing
This is the first line
{\it This is the second line.}
{\sl The third.}
{\bf The last.}
\endrightjustify
Beginning of another paragraph.
```

To get:

End of a paragraph.

This is the first line.  
*This is the second line.*  
*The third.*  
**The last.**

Beginning of another paragraph.

**Problem no. 6:**

Type:

```
How do you do this?
$$\lineskip 2pt
\baselineskip 1.3ex
\center{\halign{\hfil#\hfil\cr
\linedown{Look at this {strange} pile.}}\quad
\center{\halign{\hfil#\hfil\cr
\lineup{And at this {stranger} one.}}}\$
```

To get:

How do you do this?

L o o k  a t  t h i s  s t r a n g e  p i l e  .	stranger  s i h t  t a  d n A
--	---