Lecture note macros

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Notes for CS 594 – Fall 2004

Basic problem

- Disabling piece of input (under construction)
- Selectively inluding parts of input (teacher/student versions)
- Multiple processing of input (input and output)

Structure of the solution

- Use environment
- Read input, line by line, verbatim
- Output to file
- Maybe process file.

API

- Define comment by

  `\excludecomment{comment}`

  or

  `\includecomment{comment}`

- Then write

```
\begin{comment}
maybe in, maybe out
\end{comment}
```

- (file `comment.sty`)

Tools

File handling in TEX

- Define stream `\newwrite\CommentStream`
- Open stream `\openout\CommentStream=<file>`
- Write to stream `\write\CommentStream{#1}`
- Close stream `\closeout\CommentStream`
- (TEXnical bit: use `\immediate` for open/close/write)

Verbatim handling

```
*\show\dospecials
> \dospecials=macro:
->\do \ \do \\\do \{\do \}\do \$\do \&\do \#\do \^\do \_\do

\def\makeinnocent#1{\catcode`#1=12 }

<inside the verbatim macro:>
    \let\do\makeinnocent \dospecials
    \makeinnocent\^^L% and whatever other special cases
    \endlinechar`\^^M \catcode`\^^M=12
```

LaTeX environments

Environment

```
\begin{foo}
...
\end{foo}
```

is really nothing but

```
\begingroup
  \foo
  ...
  \endfoo % if it exists
\endgroup
```

Putting the algorithm together

Comment environment definition

Call `\excludecomment{foo}` defines `\foo` as start of processing; end command is more tricky.

Full implementation

```
\def\excludecomment
 #1{\csarg\def{#1}{\endgroup
        \begingroup
           \def\ProcessCutFile{}%
           \def\ThisComment####1{}\ProcessComment{#1}}%
    \csarg\def{After#1Comment}{\CloseAndInputCutFile \endgr
    \CommentEndDef{#1}}
```

Recursive processing (simplified)

```
\def\ProcessComment#1% start it all of
   {\begingroup
    <all that makeinnocent stuff goes here>
    \xComment}
{\escapechar=-1\relax
 \global\edef\endcommenttest{\string\\end\string\{comment\}
}
{\catcode`\^^M=12 \endlinechar=-1 %
 \gdef\xComment#1^^M{\ProcessCommentLine}
 \gdef\ProcessCommentLine#1^^M{\def\test{#1}
      \ifx\endcommenttest\test
          \edef\next{\endgroup\noexpand\EndOfComment}%
      \else \immediate\write\CommentStream{#1}
          \let\next\ProcessCommentLine
      \fi \next}
```

The utility stuff

```
\def\CommentCutFile{comment.cut}
\def\SetUpCutFile
   {\immediate\openout\CommentStream=\CommentCutFile
    \let\ThisComment\WriteCommentLine}
\def\WriteCommentLine#1{\immediate\write\CommentStream{#1}}
\def\CloseAndInputCutFile
   {\immediate\closeout\CommentStream
    \ProcessCutFile
    }%
\def\ProcessCutFile
   {\input{\CommentCutFile}\relax}
```

Nifty extension

More general macro

```
\long\def\generalcomment
 #1#2#3{\message{General comment '#1'}%
    \csarg\def{#1}{\endgroup % counter the environment oper
          #2\relax \SetUpCutFile \ProcessComment{#1}}%
    \csarg\def{After#1Comment}{\CloseAndInputCutFile#3}%
    \CommentEndDef{#1}}
% Use \#1
\generalcomment{inputwithcode}
  {\begingroup\def\ProcessCutFile{}}
  {\verbatiminput{\CommentCutFile}
   \endgroup
   \input{\CommentCutFile}
  }
```

more examples

```
\generalcomment{mathexamplewithcode}
  {\begingroup\def\ProcessCutFile{}}
  {\verbatiminput{\CommentCutFile}
   Output:
   \begin{equation} \input{\CommentCutFile} \end{equation}
   \endgroup
  }
\generalcomment{examplewithcode}
  {\begingroup
     \def\ProcessCutFile{}\def\CommentCutFile{example.tex}}
  {\verbatiminput{\CommentCutFile}
   Output:
   \begin{quote}
     \begin{minipage}[t]{3in}
        \everypar{} \input{\CommentCutFile}
     \end{minipage}
   \end{quote}
   \endgroup
  }
```

Exercise and answer macros

Use:

```
\begin{594exercise}
Show that ...
\end{594exercise}
\begin{answer}
Given ....
\end{answer}
```

in the input file of the chapter.

Implementation

```
\generalcomment{594exercise}
  {\refstepcounter{excounter}%
   \begingroup\def\ProcessCutFile{}\par
   \edef\tmp{\def\noexpand\CommentCutFile
                  {\chaptername-ex\arabic{excounter}.tex}}\tmp
   }
  {\begin{quote}
   \textbf{Exercise \arabic{excounter}.}\hspace{1em}\ignorespaces
   \input{\CommentCutFile}
   \end{quote}
   \endgroup}
\generalcomment{answer}
  {\begingroup
   \edef\tmp{\def\noexpand\CommentCutFile
                  {\chaptername-an\noexpand\arabic{excounter}.tex}}\tmp
   \def\ProcessCutFile{}}
  {\endgroup}
```

exercise sheet

Chapter file has:

```
\input{\chaptername}
\newwrite\nx
\openout\nx=\chaptername-nx.tex
\write\nx{\arabic{excounter}}
\closeout\nx
```

Exercise file has

```
\newread\nx
\openin\nx=\chaptername-nx.tex
\read\nx to \nex
\closein\nx

\begin{enumerate}
\repeat \for{nx} \to{\nex}
  \do{\item \edef\tmp{\noexpand\input \chaptername-ex\number\nx.tex}\tm
\end{enumerate}
```