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1 Hints

Usage of this Package can be found in codeanatomy.usage.pdf and codeanatomy.lstlisting.pdf. This document show only generated reference of commands in this Package.

2 Implementation

2.1 Package Dependencies

\begin{verbatim}{exp13}
\\RequirePackage{exp13}
\\RequirePackage{xparse}
\\RequirePackage{tikz}
\end{verbatim}

Load necessary Ti\textit{k}Z libraries.

\begin{verbatim}{usetikzlibrary{
\end{verbatim}

\footnote{This file describes v0.4-Alpha, last revised 2019/07/12.}

\footnote{E-mail: hong-phuc.bui (at) htwsaar dot de}
2.2 Setup styles

2.2.1 Colors

Define colors which are used in codeanatomy

\definecolor{annotationcolor}{rgb}{0,0.50002,1} % Blue
\colorlet{bgcmdcolor}{gray} % Grey

2.2.2 TikZ styles for code in a Code Anatomy

\tikz[\node[code] [anatomy] at (0,0) {code line 1\code line 2}; ]
yields code line 1
\tikzset{anatomy/.style={%
    anchor=south west,%
    inner sep=0,%
    align=left,%
    font=\ttfamily%
    }}
\tikz[\node[code] [code part] at (0,0) {let a = 12;}; ]
yields \texttt{let a = 12;}
\tikzset{code part/.style={%
    rectangle,%
    draw=annotationcolor,%
    align=left,%
    minimum height=1.175em,%
    inner sep=1.75pt,%
    outer sep=0.1pt,%
    font=\ttfamily%
    }}
\tikz[\node[code] [fit extrem] at (0,0) {}; ]
yields

fit extrem  TikZ style to mark a piece of multiple line code in an anatomy:
\tikz{ \node(c)[fit extrem, fit={((0,0) (0.5,0.975) (1,0))} {};} }

yields

\begin{center}
\begin{tikzpicture}[fit extrem/.style={
rectangle, draw=annotationcolor, align=left, minimum height=1.175em, inner sep=1.75pt, outer sep=0.1pt, font=\ttfamily}\]
\end{tikzpicture}
\end{center}

\textbf{annotation} \hspace{1cm} \textbf{TikZ style of arrows from annotation labels to code parts:}
\begin{verbatim}
\tikz{\draw[] (1,0) circle(3ex); \draw[-,annotation] (0,0) -- (1,0);}
\end{verbatim}

\textbf{yields}

\begin{center}
\begin{tikzpicture}[annotation/.style={
preaction={
  draw=white, line width=3.5pt, arrows={-Triangle Cap[]},\},\]
  draw=annotationcolor, arrows={-Latex[\round, color=annotationcolor, fill=annotationcolor,\]
  shorten >=0.25pt\}]
\end{tikzpicture}
\end{center}

\textbf{code annotation} \hspace{1cm} \textbf{TikZ style for a annotation label \texttt{function name}}
\begin{verbatim}
\tikzset{code annotation/.style={
inner sep=2pt, text=annotationcolor, align=center, font=\sffamily\small}\}
\end{verbatim}

\textbf{code grid debug} \hspace{1cm} \textbf{TikZ style to draw debug grid on the background of anatomy}
\begin{verbatim}
\tikzset{code grid debug/.style={
step=1.0, draw=gray!20, very thin, on background layer\}]
\end{verbatim}
2.3 Command used to set code and code anatomy

\codeBlock{\{code\} }

Complete code listing of a Code Anatomy figure is typeset by this command. Whereas \{\{code\}\} is the formatted code listing. This command can be used if there are no other packages to typeset code listing in use.

\NewDocumentCommand{\codeBlock}{m}{\node(code) [anatomy] at (0,0) \{#1\};}

\cPart{\{node name\} \{piece of code\} }

Assign a piece of typeset code – typical in one line – to a TikZ Node, so that it can be annotated.

- \{\{node name\}\} is a unique TikZ node name in the tikzpicture
- \{\{piece of code\}\} is a single code part to be marked.

\NewDocumentCommand{\cPart}{mm}{\tikzmarknode[code part]{#1}{#2}}

\iPart{\{node name\} \{piece of code\} }

Assign a piece of typeset code – typical in one line – to a TikZ Node, so that it can be annotated. It does not plot border around the pice of code as \cPart does.

- \{\{node name\}\} is a unique TikZ node name in the tikzpicture
- \{\{piece of code\}\} is a single code part to be marked.

\NewDocumentCommand{\iPart}{mm}{\tikzmarknode[code part,draw=none,inner sep=0.75pt]{#1}{#2}}

\mtPoint{\{node name\} }

Marks a point as a most top in a Code Block.

\NewDocumentCommand{\mtPoint}{m}{\tikzmarknode{#1}{\phantom{\rule[1.8ex]{0.1ex}{0.1ex}}} }

\hmtPoint{\{node name\} }

Marks a point as a higher most top point in a Code Block.

\NewDocumentCommand{\hmtPoint}{m}{\tikzmarknode{#1}{\phantom{\rule[2.5ex]{0.1ex}{0.1ex}}} }

\mbPoint{\{node name\} }

Marks a point as a deeper most bottom point in a Code Block.

\NewDocumentCommand{\mbPoint}{m}{\tikzmarknode{#1}{\phantom{\rule[-0.55ex]{0.1ex}{0.1ex}}} }

\dmbPoint{\{node name\} }

Marks a point as a deeper most bottom point in a Code Block.

\NewDocumentCommand{\dmbPoint}{m}{\tikzmarknode{#1}{\phantom{\rule[-2ex]{0.1ex}{0.1ex}}} }

\extremPoint{\{node name\} [\{yshift\}] [\{xshift\}] [\{style\}]

Create a TikZ Node as reference point for later use in \fitExtrem.

- \{\{node name\}\} is the TikZ node name which is used in \fitExtrem to reference to this point.
• \((yshift)\) a length, default 0ex which places this markpoint on the base line, shift this mark point vertical, for positive value over base line, negative value under base line.

• \((xshift)\) same as \((yshift)\) but for horizontal direction.

• \((style)\) is a Ti\(\text{kZ}\) style (may be defined by user).

For example:
```
\begin{tikzpicture}[remember picture]
\node (code) [anatomy] at (0,0) {
  \extremPoint{tl}[2ex]Line with some text\extremPoint{br}[-1ex]\`
  \extremPoint{tl2}other Line with some text\`
  some more line\extremPoint{br2}\`
};
\fitExtrem{box1}{(tl) (br)}
\fitExtrem{box2}{(tl2) (br2)}
\end{tikzpicture}
```
yields

```
\begin{tikzpicture}[remember picture]
\node (code) [anatomy] at (0,0) {
  \mtPoint{left}Line 1\`
  Long Line 2\extremPoint{right}\`
  Line 3\mbPoint{bottom}\`
};
\fitExtrem{box} { (left) (bottom) (right) }
\end{tikzpicture}
```
yields

```
Line 1
Long Line 2
Line 3
```
Typeset a piece of code in color \textcolor{bgcmdcolor}. For example
\begin{tikzpicture}[remember picture]
codeBlock{let a := 12}\bgcode{;}}
yields let a := 12;
\end{tikzpicture}

Produce a horizontal space of 4 small characters \texttt{\textbackslash phspace} for example:
\begin{tikzpicture}[remember picture]
codeBlock{a\textbackslash phspace{}b}
yields a b
\end{tikzpicture}

Typeset Annotation labels for a code part.
\begin{itemize}
\item \texttt{(node name)} is a unique Ti\textit{kZ} node name in the \texttt{\textbackslash tikzpicture},
\item \texttt{(coordinate)} is the coordinate of the annotation label, surrounded by a \texttt{()},
\item \texttt{(label text)} is the text content to be typeset.
\end{itemize}

For example:
\begin{tikzpicture}[remember picture]
codeBlock{a \textbackslash cPart{a}{:=} 12 \texttt{\textbackslash plus} 13}
\codeAnnotation{codeLabel} (1,-0.5) {assignment}
\draw[->, annotation] (codeLabel) -- (a);
\end{tikzpicture}

\texttt{\textbackslash codeAnnotation}{\langle node name\rangle}{\langle coordinate\rangle}{\langle label text\rangle}

3 Known Bugs

\underline{Arrows color} Arrows appear in some cases with mysterious color. I don’t know why!

For example:
\begin{tikzpicture}[remember picture]
nodeName\texttt{\textbackslash anatomy} at (0,0) {
\hmtPoint{a}Short line\texttt{\textbackslash extremPoint{b}[-0.5ex]}
};
\fitExtrem{1}{(a) (b)}
\codeAnnotation{n} (-2,0){here is a\textbackslash extremPoint{point}[0.75ex][0.5ex]
long line}
\draw[->, annotation] (point) -- (1);
\end{tikzpicture}

\texttt{\textbackslash NewDocumentCommand}{\texttt{\textbackslash codeAnnotation}}{\langle m\rangle}{\langle r\rangle}{\langle m\rangle} %
{ \langle node\#1\rangle\texttt{[code annotation] at \#2\{\#3\};} }

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The italic numbers denote the pages where the corresponding entry is described, numbers underlined point to the definition, all others indicate the places where it is used.

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Change History

v0.2-Alpha
General: This package does not load \xcolor anymore. It relies on \tikz, that \tikz loads \xcolor in a way that \codeanatomy can define RGB color \textit{1}

v0.4-Alpha
General: Set fill to \annotationcolor explicit for arrow style \textit{3}