grammar v1

Abstract

This is the grammar for controlling the order of appearance for 3 main objects: text, image, and table. It works off of Latex syntax with added sequence number header.

Alphabet

The alphabet is the same as Python alphabet.

Production rules

// every line starts with sequence number followed by the object to control

S → “<” <seqNum> “>” <objectIdentifier> <newline>

<objectIdentifier> → <imgIdentifier> | <tabIdentifier> | <textIdentifier>

// images and svg are treated as a single item

<imgIdentifier> → <imgID>

<imgID> → <stringIdentifier>

// can control table as a whole, just an array or cell, or the table ruler

<tabIdentifier> → <tabID> | <arrID> | <ruleID>

<tabID> → <stringIdentifier>

<arrID> → <tabID> <indexChain>

<ruleID> → <topruleID> | <bottomruleID>

<topruleID> → “\toprule{” < arrList> “}”

<bottomruleID> → “\bottomrule{” <arrList> “}”

<arrList> → <arrID> λ | “,” λ | <arrList>

<indexChain> → “[” <index> “]” <indexChainTail>

<indexChainTail> → λ | <indexChain> // should we limit to 2D array only?

// text could be a string literal, or an item in a (enumerated) list

<textIdentifier> → <textboxID> | <stringLiteral> | <enumeration> | <itemization>

<textboxID> → <stringIdentifier>

<enumeration> → “\begin{enumerate}” <newline> <enumItemList> “\end{enumerate}” <newline>

<itemization> → “\begin{itemize}” <newline> <itemList> “\end{itemize}” <newline>

<enumItemList> → <orderedEnumItem>$^{+}$

<itemList> → <orderedItem>$^{+}$

<orderedEnumItem> → “<” <seqNum> “>” “\item[” <index> “]” <item> <newline>

<orderedItem> → “<” <seqNum> “>” “\item” <item> <newline>

<item> → <stringLiteral> | <imgID> | <textboxID> // limiting <item> to <stringLiteral> only?

// terminal symbols

<stringIdentifier> → <char> <stringIdentifierTail>

<stringIdentifierTail> → λ | <char> | <number> <stringItendifierTail>

<stringLiteral> → <char>*

<char> → “a” |…| “z” | “A” |…| “Z” | “_”

<index> → <number>+

<seqNum> → <number>+

<number> → “0” |…| “9”

<newline> → “\n”

Sample code

Images

```
// this declare variable is a bit Python-ish
tensor_img = get_img("https://anURL.io/")
highlighted_vector = get_img("$HOME/Downloads/photos/")
random_graph = get_img(uploads=True)

// while this part is a bit Latex-ish
<1> tensor_img
<2> highlighted_tensor
<3> random_graph
```

Table

```
// the whole table
<3> tab1

// one row of the table
<4> tab1[2]

//to select 1 column of the table, we must use list comprehension
col1 = [row[1] for row in tab1]
// or we must select column via numpy or pandas
import numpy as np
tab1np = np.array(tab1)
col1 = tab1np[:, 1]
// then:
<5> col1

// a single cell in the table
<1> tab1[1][2]
<2> tab1[0][0]

// the rule of selected cells
<3> \toprule{tab1[2][2], tab1[2][3]}

// the rule of the entire row
<4> \bottomrule{tab1[2]}
```

Text and textbox

```
// stirng literal
<1> the quick brown fox jumps over the lazy dog

// using with lists in LaTeX
\begin{itemize}
    <2> \item tomato
    <3> \item milk
    <4> \item mimimimi
\end{itemize}

\begin{enumerate}
    <1> \item[1] tomato
    <2> \item[2] mimimimi
\end{enumerate}
```