The dnaseq package*

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1 Introduction

This package allows easy setting of simple dna-sequences in userdefined grouping, with numbering of bases (at the begin of each line.

If you need to typeset alignments, have a look at the `texshade`-Package.

The main code has been posted by Andreas Matthias `<amat@kabsi.at>` on `de.comp.text.tex` and is based by itself on old code from Anselm Lingnau.

2 Usage

2.1 DNA

`\DNA` `\DNA` is the main macro of this package. It is used as following:

```
\DNA! actctgctagtcgatgcat!
```

where the delimiting character `!` can be any normal character.

Within the argument you can use `'{<color>}` to change the color of your bases. The color names are normal color.sty names. Look at the full example for more info.

2.2 Configuration

`\DNAblock` The macro `\DNAblock` stores the desired blocking intervall of your sequence. Just do a `\renewcommand{\DNAblock}{<some number>}` to change the default of 10.

`\DNAreserve` The macro defines how much space to reserve for the numbering of bases. To change, do a `\renewcommand{\DNAreserve}{<template>}` The default template is `0000` allowing for for digit numbering.

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3 Example

```
\noindent\begin{minipage}{100pt}

\noindent\rule{\textwidth}{.5pt}
\DNA!  ACGT'{red}A CGT'{white}TGCA'{green}x s df'{white}FJKD SLAF
DSAIOFDSA ACGT'{red}ACGT'{white}TGCA'{green}x sdf '{white}FJKDSLAF
DSAIOFDSA AC GT'{red}ACGT'{white}TG CA'{green}xsdf'{white}FJKD SLAF
DSAIOFDSA ACGT'{red}ACGT'{white}T GCA'{green} xs df'{white}FJKDSLA
FDSAIOFDSA ACGT'{red}AC GT'{white}TGCA'{green}xsdf'{white}FJK DSLA
FDSAIOFDSA !
\end{minipage}

\noindent\begin{minipage}{200pt}
\noindent\rule{\textwidth}{.5pt}
\DNA!  ACGT'{red}A CGT'{white}TGCA'{green}x s df'{white}FJKD SLAF
DSAIOFDSA ACGT'{red}ACGT'{white}TGCA'{green}x sdf '{white}FJKDSLAF
DSAIOFDSA AC GT'{red}ACGT'{white}TG CA'{green}xsdf'{white}FJKD SLAF
DSAIOFDSA ACGT'{red}ACGT'{white}T GCA'{green} xs df'{white}FJKDSLA
FDSAIOFDSA ACGT'{red}AC GT'{white}TGCA'{green}xsdf'{white}FJK DSLA
FDSAIOFDSA !
\end{minipage}

\noindent\begin{minipage}{\textwidth}
\noindent\rule{\textwidth}{.5pt}
\DNA!  ACGT'{red}A CGT'{white}TGCA'{green}x s df'{white}FJKD SLAF
DSAIOFDSA ACGT'{red}ACGT'{white}TGCA'{green}x sdf '{white}FJKDSLAF
DSAIOFDSA AC GT'{red}ACGT'{white}TG CA'{green}xsdf'{white}FJKD SLAF
DSAIOFDSA ACGT'{red}ACGT'{white}T GCA'{green} xs df'{white}FJKDSLA
FDSAIOFDSA ACGT'{red}AC GT'{white}TGCA'{green}xsdf'{white}FJK DSLA
FDSAIOFDSA !
\end{minipage}

\renewcommand{\DNAblock}{5}
\noindent\begin{minipage}{\textwidth}
\noindent\rule{\textwidth}{.5pt}
\DNA!  ACGT'{red}A CGT'{white}TGCA'{green}x s df'{white}FJKD SLAF
DSAIOFDSA ACGT'{red}ACGT'{white}TGCA'{green}x sdf '{white}FJKDSLAF
DSAIOFDSA AC GT'{red}ACGT'{white}TG CA'{green}xsdf'{white}FJKD SLAF
DSAIOFDSA ACGT'{red}ACGT'{white}T GCA'{green} xs df'{white}FJKDSLA
FDSAIOFDSA ACGT'{red}AC GT'{white}TGCA'{green}xsdf'{white}FJK DSLA
FDSAIOFDSA !
\end{minipage}
```

```
  1 ACGTACGTTG
 11 CAxsdfFJKD
 21 SLAFDSAIOF
 31 DSAACGTACG
 41 TTGCAxsdfF
 51 JKDSLAFDSA
 61 IOFDSAACGT
 71 ACGTTGCAxs
 81 dfFJKDSLAF
 91 DSAIOFDSAA
101 CGTACGTTGC
111 AxsdfFJKDS
121 LAFDSAIOFD
131 SAACGTACGT
141 TGCAxsdfFJ
151 KDSLAFDSAI
161 OFDSA
```

```
  1 ACGTACGTTG CAxsdfFJKD SLAFDSAIOF
 31 DSAACGTACG TTGCAxsdfF JKDSLAFDSA
 61 IOFDSAACGT ACGTTGCAxs dfFJKDSLAF
 91 DSAIOFDSAA CGTACGTTGC AxsdfFJKDS
121 LAFDSAIOFD SAACGTACGT TGCAxsdfFJ
151 KDSLAFDSAI OFDSA
```

```
  1 ACGTACGTTG CAxsdfFJKD SLAFDSAIOF DSAACGTACG TTGCAxsdfF
 51 JKDSLAFDSA IOFDSAACGT ACGTTGCAxs dfFJKDSLAF DSAIOFDSAA
101 CGTACGTTGC AxsdfFJKDS LAFDSAIOFD SAACGTACGT TGCAxsdfFJ
151 KDSLAFDSAI OFDSA
```

```
  1 ACGTA CGTTG CAxsd fFJKD SLAFD SAIOF DSAAC GTACG TTGCA xsdfF
 51 JKDSL AFDSA IOFDS AACGT ACGTT GCAxs dfFJK DSLAF DSAIO FDSAA
101 CGTAC GTTGC Axsdf FJKDS LAFDS AIOFD SAACG TACGT TGCAx sdfFJ
151 KDSLA FDSAI OFDSA
```

4 The code

<*dnaseq>

```
\def\DNAblock{10}
\def\DNAreserve{0000}% für 4-stellige Zahlen
%%
%% registers /counters
%%
\newlength\bl@cklen
\newlength\l@neln
\newlength\t@mpln
\newlength\ch@rwd
\newcount{\blocks}
%%
```

```
%% calculate blocks per line
%%
\def\DNAc@lcline{%
 \settowidth{\ch@rwd}{A}
 \setlength{\bl@cklen}{\DNAblock\ch@rwd}%
 \settowidth{\t@mpln}{\DNAreserve}
 \setlength{\l@neln}{\textwidth}
 \addtolength{\l@neln}{-\t@mpln}
 \loop%
    \setlength{\t@mpln}{\blocks\bl@cklen}
    \addtolength{\t@mpln}{\blocks\ch@rwd}
    \ifdim\l@neln>\t@mpln\advance\blocks by 1
 \repeat
 \advance\blocks by -1
 \ifnum\blocks<1\errmessage{line too short for 1 block^^J}%
 \else\expandafter\message\expandafter{Blocks per line: \the\blocks^^J}\fi%
}

%% main user macro
\def\DNA#1{%
   \def\@DNA@end{#1}\bgroup\ttfamily\DNAc@lcline
   \settoheight\dimen@{I}\advance\dimen@ by 1pt
   \edef\htst{\the\dimen@}%
   \def\struty{\rule[-.5pt]{\z@}{\htst}}%
   %% dnabase per line counter
   \count@=0
   %% block counter
   \@tempcnta=0
   %% total dnabase counter
   \@tempcntb=0
   \fboxrule=0pt \fboxsep=0pt
   \noindent\phantom{\DNAreserve}\llap 1\
   \@DNA
}

\def\@DNA@color{'}
\def\@DNA@thecolor{white}
\def\@DNA@setcolor#1{\def\@DNA@thecolor{#1}\@DNA}
%% do the blocking/line breaking
\def\@DNA#1{%
%% insert a space after \DNAblock bases
   \ifnum\count@=\DNAblock\count@=0\ %
   \advance\@tempcnta by 1\fi
   \def\@DNA@cmp{#1}%
%% check for end of sequence or color shift
   \ifx\@DNA@cmp\@DNA@end
     \let\next\egroup
   \else
     \ifx\@DNA@cmp\@DNA@color
       \let\next\@DNA@setcolor
```

```
    \else
      \advance\count@ by 1
      \advance\@tempcntb by 1
%% line break after calculated number of blocks
      \ifnum\@tempcnta=\blocks \\
        \hskip\z@\phantom{\DNAreserve}\llap {\the\@tempcntb}\ %
        \@tempcnta=0
      \fi
      \colorbox{\@DNA@thecolor}{\struty#1}%
      \penalty0\let\next\@DNA
    \fi
  \fi
  \next
}
```

</dnaseq>