

MGK Workshop – SFB 1412, Berlin

LaTeX for Linguists: Exercises

L 4^L 01: Basics

Exercise 1

- Insert the following lines in your `.tex` file and compile.

```

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% Compile: PDFLaTeX BibTeX PDFLaTeX PDFLaTeX
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

\documentclass{scrartcl}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%% PACKAGES %%%%%%%%%

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%% COMMANDS %%%%%%%%%

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%% META DATA %%%%%%%%%

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%% END PREAMBLE & BEGIN BODY %%%%%%%%%
\begin{document}

  This is my first \LaTeX\ file.

\end{document}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%% END BODY %%%%%%%%%

```

- Write something after the `\end{document}` command and compile again.

Exercise 2

- Specify the following options for your document `.tex` file and compile.

```

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% Compile: PDFLaTeX BibTeX PDFLaTeX PDFLaTeX
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

\documentclass[10pt, paper=a4, abstracton]{scrartcl}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%% PACKAGES %%%%%%%%%

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%% COMMANDS %%%%%%%%%

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%% META DATA %%%%%%%%%

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%% END PREAMBLE & BEGIN BODY %%%%%%%%%
\begin{document}

  This is my first \LaTeX\ file.

\end{document}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%% END BODY %%%%%%%%%

```

Exercise 3

- Specify the meta data in your document with two authors, use the `\maketitle` command, and try different commands for date.

```

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% Compile: PDFLaTeX BibTeX PDFLaTeX PDFLaTeX
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

\documentclass[10pt, paper=a4, abstracton]{scrartcl}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
PACKAGES %%%%%%%%%

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
COMMANDS %%%%%%%%%

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
META DATA %%%%%%%%%
\author{Antonio Machicao y Priemer \and Sebastian Nordhoff}
\title{\LaTeX\ for Linguists}
\subtitle{My first \TeX\ document}
\date{\today}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
END PREAMBLE & BEGIN BODY %%%%%%%%%
\begin{document}

\maketitle

This is my first \LaTeX\ file.

\end{document}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
END BODY %%%%%%%%%

```

Exercise 4

- Load the following packages in your document.

```

\documentclass[10pt, paper=a4, abstracton]{scrartcl}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
PACKAGES %%%%%%%%%
\usepackage[utf8]{inputenc}
\usepackage[ngerman, english]{babel}
\usepackage[T1]{fontenc}
\usepackage{lmodern}
\usepackage{blindtext}
\usepackage{url}
\usepackage{hyperref}

```

- Change the option T1 to T3 for the package `fontenc` and see what happens. Go back to T1.
- After your sentence “This is my first \LaTeX file.”, use the command `\blindtext` and see what happens.
- Delete the package `blindtext`, but keep using the command `\blindtext` and see what happens.
- Load the package `blindtext` again and recompile.

Exercise 5

- Try the following code in your document:

```

\begin{document}

\maketitle

This is my first \LaTeX\ file. \blindtext

{\Huge Hello world!}

The word \textit{italics} is in italics.

\begin{center}
Hello world!
\end{center}

\end{document}

```

Exercise 6

- Put a section and a subsection in your document, add some dummy text.
- Add a table of contents after `\maketitle` and compile.

```

\begin{document}

\maketitle

\tableofcontents

\section[First section]{My First Section}

This is my first \LaTeX\ file. \blindtext

{\Huge Hello world!}

The word \textit{italics} is in italics.

\begin{center}
Hello world!
\end{center}

\subsection[First subsection]{My First Subsection}

\blindtext

\end{document}

```

- Delete the option `english` in the `babel` package. Compile and see what happens.

Exercise 7

- Step by step, add some errors to your document, recompile, check the error messages, fix the error and recompile.



1. Now, put in a chapter, compile, and see what happens. Fix it.
2. Remove one closing brace from a section command, recompile and see what happens. Fix it.
3. Change a `\section{}` to `\Section{}`, recompile and see what happens. Fix it.
4. Choose a section and remove the titles and braces. Recompile and see what happens. Fix it.

Exercise 8

- Add labels to all sections, subsections, and footnotes in your document.
- Write a sentence referring to all labels you have added.
- Use the `\pageref` command.

Exercise 9

- Play around with some of the following commands:

<code>\textit{}</code>	<code>\small</code>	<code>\itshape</code>
<code>\textbf{}</code>	<code>\large</code>	<code>\upshape</code>
<code>\textsc{}</code>	<code>\normalsize</code>	<code>\scshape</code>
<code>\textup{}</code>	<code>\footnotesize</code>	<code>\bfseries</code>
<code>\texttt{}</code>	<code>\scriptsize</code>	<code>\ttfamily</code>
<code>\emph{}</code>	<code>\tiny</code>	<code>\sffamily</code>
<code>\textsubscript{}</code>		
<code>\textsuperscript{}</code>		

- Try to embed them in other commands, e.g. for bold and italics or for small caps and bold.
- Use `%` to comment out some text.

Exercise 10

- Download the PDF `myTeXguide01.pdf` and replicate its content changing your actual file. We are now building our own \LaTeX guide.

<https://www.linguistik.hu-berlin.de/de/staff/amyp//latex20sfb/mytexguide-01.pdf>

- Do not forget to label all sections (and subsections) as well as all footnotes.
- **EXTRA:**
 - Change your `documentclass` to `scrbook` and recompile. What differences do you see?
 - Add a `\chapter` above the `\sections` and recompile.
 - Change the `documentclass` back to `scrartcl` and recompile.
 - Comment out the line with `\chapter` and recompile.
 - Add some `\subsections` `\subsubsections` and `\paragraphs`.
 - Add `\tableofcontents` at the beginning, add another `\tableofcontents` at the end.

L 4^L 02: Math mode & new commands

Exercise 1

- Load the following packages in the preamble of your document:

```
\usepackage{amsmath}
\usepackage{amsfonts}
\usepackage{amssymb}
\usepackage{amstext}
\usepackage{mathrsfs}
```

- Create a new section in your document with the title: Math mode & new commands.
- Write a sentence (i.e. text) in the inline math mode, use also \ddot{u} , β , \acute{a} and see what happens.
- Use `texttrm` inside the math mode.
- Write the Pythagorean theorem ($a^2 + b^2 = c^2$) in the display mode.
- Use the equation environment to produce the quadratic formula:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad (1)$$

- Label your equation and refer to it with `eqref` in a sentence.

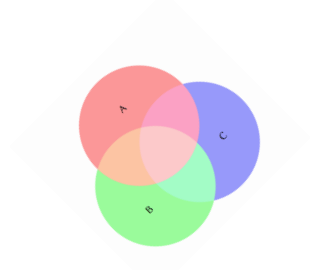
Exercise 2

- Create a command `\XB` which outputs “X-bar theory”.
- Create a command `\wrt` which outputs “w.r.t.”
- Create a command `\obj` with one argument which outputs the argument in italics, e.g. for marking object language.
- Create a command `\gqq` with one argument which outputs double German quotation marks around text (try out: `\glqq{}` and `\grqq{}` for this task). Try a similar command for English quotation marks and for single quotation marks.
- Create a command `\abbsec` with one argument which outputs the abbreviation “Sec.” and the cross reference to a Section (code for protected blank `\,`).
- Create a command `\sspace` with two arguments which outputs a number (1st argument) and a scale unit (2nd argument) separated by a protected short blank (code for protected short blank `~`).
- Create a command `\mix` (with 3 arguments) using your predefined commands: `wrt`, `obj` and `\sspace` (output: w.r.t. *door knob* 5.10 \$).
- Put the definition of `mix` before the definition of `wrt`.

L 4^L 03: Figures, tables & floats

Exercise 1

- Create a new section in your document with the title: Figures, tables & floats.
- Load the package `graphicx`.
- Include the graphic `vennDiagram` with `includegraphics` three times.
- For the first graphic, set `width` to `textwidth`
- For the second graphic, set `height` to 30 % of the `textheight`.
- For the third graphic, scale the size of the graphic to 20 % of the original size and rotate the graphic 45 degrees (try out the option `angle=`).



Exercise 2

- Create the following table 3 times:

German case paradigm:	M	F	N
NOM	Tisch	Lampe	Licht
ACC	Tisch	Lampe	Licht
DAT	Tisch(e)	Lampe	Licht(e)
GEN	Tisch(e)s	Lampe	Licht(e)s

- For each table, play around with the parameters t, c, b, and l, c, r, and p.

Exercise 3

- Use the figures and tables you created and put them in floating environments.
- Use the `caption` and `label` command for each table and figure.
- Use the commands `\centering`, `\raggedleft`, and `\raggedright` inside the environments.
- Play around with the parameters h, t, b, and p of the floating environments.
- Write a sentence and refer to your figures/tables (with `\ref{}`), use also the command `\pageref{}`
- Use the package `subfigure` and try `\subfigure[My caption]{\includegraphics{myfile.jpg}}` inside the `figure` environment.
- Try the following command: `\documentclass[draft]{scrartcl}`
- Rearrange your pages with `\clearpage` and `\newpage`

L 4^L 04: BibT_EX

Exercise 1

- In your overleaf project, create a `.bib` file and write the following BibT_EX entries there:

```
@article{Bach86a,
  Author = {Bach, Emmon},
  Title = {The Algebra of Events},
  Journal = {Linguistics and Philosophy},
  Volume = {1},
  Number = {9},
  Pages = {5--16},
  Year = {1986} }

@book{Chomsky81b,
  Author = {Chomsky, Noam},
  Title = {Lectures on (G)overnment and (B)inding},
  Publisher = {Foris Publications},
  Address = {Dordrecht},
  Year = {1981} }

@incollection{Kratzer98a,
  Author = {Kratzer, Angelika},
  Title = {Scope or Pseudoscope? Are There Wide-Scope Indefinites?},
  BookTitle = {Events and Grammar},
  Editor = {Rothstein, Susan},
  Publisher = {Kluwer},
  Address = {Dordrecht},
  Pages = {163--196},
  Year = {1998} }
```

Exercise 2

- Add the `bibliographystyle` command with the style `abbrv` and the `bibliography` command with your bibliography to your document.
- Put some citations in your document, try the different versions of the `cite` command.
- Remove a comma from the final line of a bib entry. Recompile and see what happens. Fix it.
- Remove a `}` from a line in your `bib` file, recompile and see what happens. Fix it.
- Remove the final `}` from a bib entry, recompile and see what happens. Fix it.

Exercise 3

- Load the package `natbib` with the option `authoryear`.
- Change the style setting, such that a colon separates year and page.
- Change your style to `chicago` and recompile.
- Create the following outputs (check the bibliography of these slides for the information needed in your `bib` file):
 1. Chomsky (1957)
 2. (Chomsky, 1957)
 3. Chomsky (1957: 15)
 4. (Chomsky, 1957: 15)
 5. (cf. Chomsky, 1957: 15)
 6. (cf. Chomsky, 1957)
 7. cf. Chomsky (1957)
 8. (cf. Chomsky, 1957; Jackendoff, 1977)
 9. (Chomsky, 1957, 1965)
 10. Chomsky showed in 1957 ...
- Add the reference Hauser et al. (2002) to your Bib_T_E_X file (separate the author's names with `and`), this reference should also have a `URL` and a `URLdate` (i.e. an access date). You can also try to add the `DOI`.
- Upload the styles: `unified`, `deChicagoMyP`, and `enChicagoMyP` to your project, try them out and see the differences in your list of references.
- Try also the style `apalike` out.
- Make sure capitalisation is correct in the output.
- Create an entry with the title “Under_scores in practices” and cite that entry in your document. Recompile and see what happens.
- Create an entry with “ θ -roles in practice” and cite that entry in your document. Recompile and see what happens.

- In Bib_T_E_X, it is also possible to write the author's names as:

```
author = {Noam Chomsky and Morris Halle},
```

But create in this way an entry with the authors: Juan Pablo Ruiz de Mendoza, Klaus von Heusinger, and Frank Van Eynde. Cite that entry. Fix the errors.

L 4^L 05: IPA & verbatim

Exercise 1

- Load the package `fontenc` with the options `T3` and `T1` (in that order).
- Load `tipa` with the options `noenc` and `safe`.
- Take a look at the IPA tables in Linke & Linke (2005) and transcribe ⟨ätzenderer⟩ and ⟨strenght⟩ as follows:

- (2) a. [ʔɛts̄əndərə̃]
 b. [st̄ɛŋkθ]

Exercise 2

- Load the package `xcolor` (for coloured elements).
- Load the package `listings`.
- Specify the setting of the package `listings` as provided in the slides.
- Write the following code in your document using the `listings` environment:

```
\usepackage{listings}

\lstset{
  language=TeX,
  backgroundcolor=\color{lightgray},
  basicstyle={\footnotesize\ttfamily\color{blue}},
  showstringspaces=false,
  columns=flexible
}
```

- Use the `verb` command to write the following code:

(3) `\textipa{[Pan.SK\t{aI}.\@n]}`

- Use the `lstinline` command to write the following code:

(4) `\textipa{[Pan.SK\t{aI}.\@n]}`

- In your setting for `listings`, change the size of the output.

L 4^L 06: Examples & glossing

Exercise 1

- Load the package `gb4e` and
- Replicate the following examples:
 - (5) Colorless green ideas sleep furiously.
 - (6) Furiously sleep ideas green colorless.
 - (7) a. Have you a book on modern music?
b. The book seems interesting.
 - (8) a. Read you a book on modern music?
b. The child seems sleeping.
 - (9) This is a sentence.
 - a. This is a sentence with a modifier.
 - b. This is a sentence that has a relative clause.
 - i. This is a sentence that has a relative clause that has a relative clause.
 - ii. a phrase with a relative clause with a relative clause
 - c. This is a modified sentence.
 - (10) This is a sentence with a sentence.

We refer to the following examples: (5), (7), (8b), (9), (9b-ii), and (9c).

Exercise 2

- Put acceptability judgements to your sentences from before.
 - Please check the alignment of your sentences.
 - Are the labels still working? The syntax for labelled examples with acceptability judgements is:


```
\ex[*]{example}\label{ex:ID}
```
 - (11) # Colorless green ideas sleep furiously.
 - (12) * Furiously sleep ideas green colorless.
 - (13) a. Have you a book on modern music?
b. The book seems interesting.
 - (14) a. * Read you a book on modern music?
b. * The child seems sleeping.
 - (15) This is a sentence.
 - a. This is a sentence with a modifier.
 - b. This is a sentence that has a relative clause.
 - i. This is a sentence that has a relative clause that has a relative clause.
 - ii. a phrase with a relative clause with a relative clause
 - c. This is a modified sentence.
 - (16) ? This is a sentence with a sentence.
- Put the first two examples (11) and (12) at the end. Recompile and enjoy the consistency!

Exercise 3

- Gloss example (17) with the acceptability judgement.
- Do not forget to label it and refer to it in a sentence afterwards.

(17) # Farblose grüne Ideen schlafen wütend.

You can find example (17) in Chomsky (1957: 15).

- Reproduce example (18) with glossing and translation. You actually do not need to worry that the example is too long. \LaTeX takes care of it!

(18) Jones buttered the toast slowly, deliberately, in the bathroom, with a
 Jones bestrich mit Butter den Toast langsam absichtlich in dem Bad mit einem
 knife, at midnight.
 Messer um Mitternacht
 ‘Jones bestrich den Toast mit Butter absichtlich um Mitternacht langsam mit einem Messer
 im Bad.’ (Davidson, 1967: 82)

Exercise 4

- Upload the packages `lsp-gb4eMyP`, `lsp-cgloss`, and `jambox` to your project.
- Comment out the package `gb4e`.
- Load instead `lsp-gb4eMyP` (`lsp-cgloss`, and `jambox` are loaded in this package, you don’t need to load them).
- Compile.
- Write examples (5)–(8b) with the new syntax (`\ea`, `\ex`, `\z`).
- Change your glossed example (17) to the new syntax.
- Make a copy of your examples (9)–(10) and use the commands `\exr{}` and `\exp{}` (You will need the environment syntax!).
- With the `\exi{}` command, you can build dialogues. Replicate (19).

(19) A: Who didn’t show?
 B: Mary didn’t show.

- Copy examples (5) and (18), add the source of the example with `jambox` (compare it with `\hf11`).
- Use `jambox` to give language information:

(20) a. Ik ga het huis uit (Dutch)
 b. Ich gehe aus dem Haus (German)
 c. I leave the house (English)

- Create the following example with the right glossing:

- La reina de Inglaterra se llama Isabel
La regina d’Inghilterra si chiama Elisabetta
La reine d’Angleterre s’appelle Élisabeth
The queen of England REFL call Elizabeth ‘The queen of England is called Elizabeth’
- Put this definition `\def\exfont{\it}` after the command loading `lsp-gb4eMyP`. See what happens with your examples.
- Make the font of the glosses smaller.
- Remove one `\\` at the end of the `\gll` line and see what happens. Fix it.
- Remove a `\z` at the end of an example and see what happens. Fix it.

L 4^L 07: Math mode 2 & trees

Exercise 1

- Write the following expressions:
 - (21) a. $\emptyset \subseteq \{\text{tea, foil, computer}\}$
b. $\#\{\emptyset, 20, \text{kitchen cabinet, e}\} = 4$
c. $\emptyset \notin \{\text{tea, foil, computer}\}$
 - (22) De Morgan: $\overline{[A \cup B]} = [\overline{A} \cap \overline{B}]$
 - (23) $\llbracket \text{red or round} \rrbracket = \llbracket \text{red} \rrbracket \cup \llbracket \text{round} \rrbracket$
- Write the following expressions:
 - (24) $(A \wedge B) \wedge C \Leftrightarrow A \wedge (B \vee C)$
 - (25) $\neg(A \Leftrightarrow B) \Leftrightarrow (A \Leftrightarrow \neg B)$
 - (26) $\llbracket \text{All students read a book} \rrbracket := \forall x \exists y [\text{STUDENT}(x) \rightarrow \text{READ}(x)(y)]$
 - (27) $\llbracket \llbracket \text{Lola runs} \rrbracket \rrbracket (s_3)$
 $= \llbracket \text{runs} \rrbracket (s_3) (\llbracket \text{Lola} \rrbracket (s_3))$
 $= \lambda s \lambda x [x \text{ runs in } s] (s_3) (\lambda s [\text{Lola}] (s_3))$
 $= \lambda x [x \text{ runs in } s_3] (\text{Lola})$
 $= \llbracket \text{Lola runs in } s_3 \rrbracket$
 $= 1$

Exercise 2

- Load the package `forest` with the option `linguistics`.
- Replicate the following:

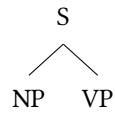
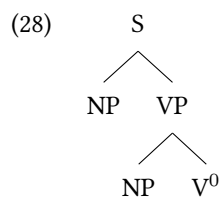


Figure 1: Simple tree

Figure 1 shows a simple tree created with the package `forest`.

Exercise 3

- Copy your tree from Figure 1 and expand it as in (28).
- Replicate the following:



The tree in 28 shows a tree embedded in an example environment.

Exercise 4

- Copy your tree (28) in an example environment.
- Put some words in the NPs separated by commas and a verb and use `roof` to abbreviate the nodes.

Exercise 5

- Replicate the following:

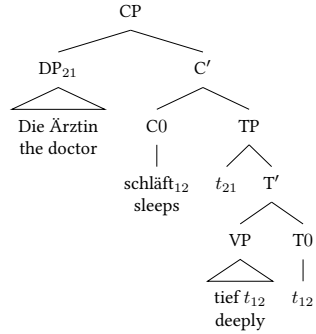


Figure 2: Complex tree

Exercise 6

- Copy your tree in Figure 2 and make some changes to replicate the following:

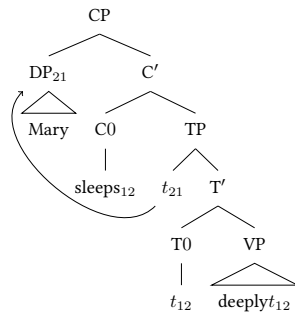


Figure 3: Complex tree with arrow

- Create the following tree:

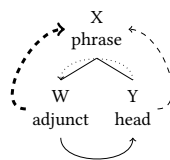


Figure 4: Head-adjunct relation

You will need the following specifications for the arrows: **dotted**, **dashed**, **ultra thick**.

Exercise 7

- Create the following tree:

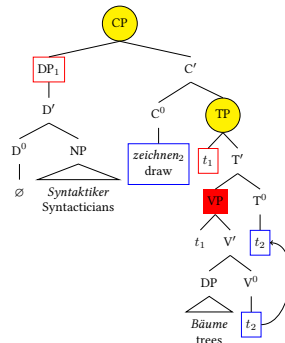


Figure 5: Complex trees

- Rescale your tree to 50% of the original size.

Exercise 8

- Create the following tree with the forest package:

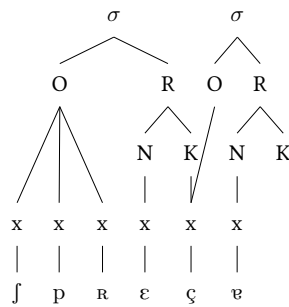


Figure 6: Syllabic structure with forest

- Create the following tree with the forest package and the GP1 option:

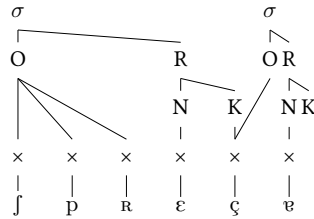


Figure 7: Syllabic structure with forest and GP1

Exercise 9

- Load the package `tikz-qtrees` with the library `\usetikzlibrary{positioning}`
- Create the following tree with the TikZ-qtrees package.
- Do not forget to put the TikZ-setting:

```
\tikzset{edge from parent/.style={draw,edge from parent path={(\tikzparentnode.south)-- +(0,-8pt)-| (\tikzchildnode)}}}
```

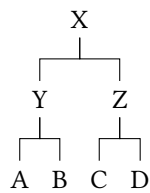


Figure 8: Tree with TikZ-qtrees

- Comment out the TikZ setting, compile and see what happens.

L 4^L 08: Venn diagram, Vowel diagram, sonority profile & table 2

Exercise 1

- Copy the following code into your document.

```

\begin{tikzpicture}

\begin{scope}[blend group=soft light]
\fill[red!40!white]
(90:1.2) circle (2);
\fill[green!40!white]
(210:1.2) circle (2);
\fill[blue!40!white]
(330:1.2) circle (2);
\end{scope}

\node at (90:2) {A};
\node at (210:2) {B};
\node at (330:2) {C};

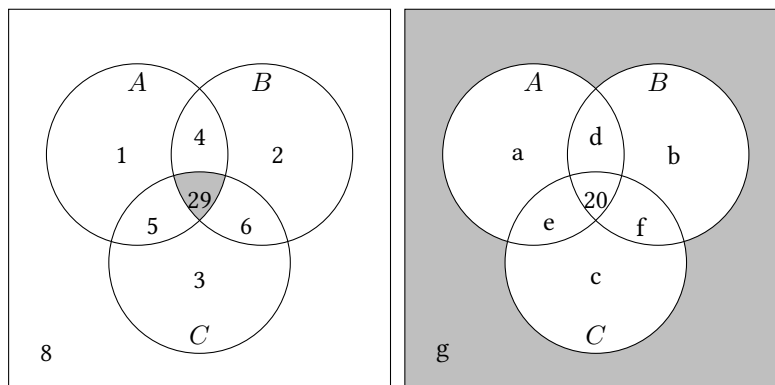
\end{tikzpicture}

```

- Change the names A, B, and C in the sets.
- Add (a node) D to the green set, E to the pink set and F to the violet set.
- Try to change a bit the colour of the sets.

Exercise 2

- Load the package `venndiagram`.
- Replicate the following figure.

Figure 9: Two venn diagrams in *figure* environment

Exercise 3

- Load the package vowel.
- Replicate the following figure.

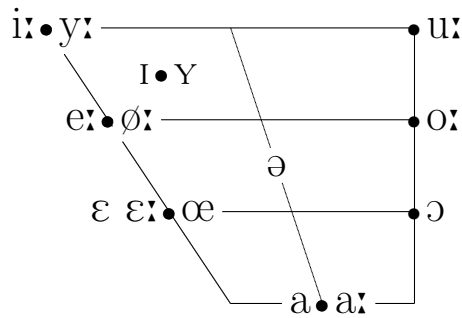


Figure 10: Vowel diagram in *figure* environment

Exercise 4

- Copy the following code for a sonority profile and change it.

```
\begin{tikzpicture}[scale=.5]
  \draw[black] (-1,0)--(6.5,0); % x axis
  \draw[black] (-1,0)--(-1,6.5); % y axis

  \node at (-2.5,6) {vowel};
  \node at (-2.5,5) {\textipa{/ \textscr/}};
  \node at (-2.5,4) {\textipa{/l/}};
  \node at (-2.5,3) {nasal};
  \node at (-2.5,2) {fricative};
  \node at (-2.5,1) {plosive};

  \draw[black] (0,2)--(1,1)--(2,5)--(3,6)--(4,2);
  \node at (0,-1) {\strut \textipa{S}};
  \node at (1,-1) {\strut \textipa{p}};
  \node at (2,-1) {\strut \textipa{\textscr}};
  \node at (3,-1) {\strut \textipa{I}};
  \node at (4,-1) {\strut \textipa{\c{c}}};

  \fill (0,2) circle [radius=3pt];
  \fill (1,1) circle [radius=3pt];
  \fill (2,5) circle [radius=3pt];
  \fill (3,6) circle [radius=3pt];
  \fill (4,2) circle [radius=3pt];
\end{tikzpicture}
```

- Copy the code for the `shrug` command (put it where you have your own commands) and use it in your document.

```
\newcommand{\shrug}[1] [] {%
\begin{tikzpicture}[baseline,x=0.8\ht\strutbox,y=0.8\ht\strutbox,line width=0.125ex,#1]
\def\arm{(-2.5,0.95) to (-2,0.95) (-1.9,1) to (-1.5,0) (-1.35,0) to (-0.8,0)};
\draw \arm;
\draw[xscale=-1] \arm;
\def\headpart{(0.6,0) arc[start angle=-40, end angle=40,x radius=0.6,y radius=0.8]};
\draw \headpart;
\draw[xscale=-1] \headpart;
\def\eye{(-0.075,0.15) .. controls (0.02,0) .. (0.075,-0.15)};
\draw[shift={(-0.3,0.8)}] \eye;
\draw[shift={(0,0.85)}] \eye;
% draw mouth
\draw (-0.1,0.2) to [out=15,in=-100] (0.4,0.95);
\end{tikzpicture}}
```

Exercise 5

- Create a centered 4x4 tabular (1,2,3,4),(5,6,7,8),(9,10,11,12),(13,14,15,16)
- Change the column definition to `l` and `r`.
- Change one column definition to `p{.75cm}`
- Add some empty lines.
- Adjust vertical spacing between lines with `\[2.5mm]`

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

- Put your tabular in a `table` environment.
- Add a `caption` and a `label`.
- Add an additional tabular within the same table environment
- Use `-` to adjust the spacing between the two tabulars.
- Try `\centering` after the begin of the environment.

1	2	3	4	1	2	3	4
5	6	7	8	5	6	7	8
9	10	11	12	9	10	11	12
13	14	15	16	13	14	15	16

Table 1: Exercise table

- Load the package `tabularx`.
- Add a new table `\begin{tabularx}{\textwidth}{l1111}` with the same content as above.
- Vary the column definitions between `l`, `r`, `c`, and `X`.
- Vary the width of the tabular, e.g. `0.66\textwidth`
- Remove one `l` from one of your tabular column definitions. Recompile. Fix it.
- Add additional `ls` to one of your tabular definitions. Recompile. Fix it.
- Enclose the content of the first cell of the last row in `[]`. Fix it.

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

Table 2: Exercise table

- Load the package `booktabs`.
- Add `\toprule`, `\midrule`, `\bottomrule` to your tabulars.
Note: typographers suggest that lines in tables should be limited to a minimum.
- Replace some `\midrules` by `\hlines` and inspect the difference.
- Use `\multicol{2}{c}{content for merged cell}` in one of your tables.
- Use `\multicol{2}{l}{content for merged cell}` in one of your tables.
- Use `\multicol{2}{r}{content for merged cell}` in one of your tables.
- Load the package `multirow`.
- Use `\multirow{2}{*}{content for merged cell}` in one of your tables.

1	2	3	4
5	6	7	8
multirow	10	11	12
	14	15	16

Table 3: Exercise table

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