neat figures

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1 Basics of making tables

1.1 Specifying width

• Let's pretend you want to create a table that included tongue twisters from different languages.

(1) a. English
   She sells sea-shells by the sea-shore
  b. Swedish
   Sju sjösjuka sjömän sköttes av sju sköna sjuksköterskor
   'Seven seasick sailors were cared for by seven beautiful nurses'
  c. Mandarin
   sì shì sì, shí shì shí, shísì shì shísì, sìshí shì sìshí
   'Four is four, ten is ten, fourteen is fourteen, forty is forty.'

• Say you wanted to include this in a table with three cells: Language, Example, and English Translation. If we put the above examples in a tabular with the default width comment `\begin{tabular}{lll}...`, we will have the following:

Language	Example	Translation
English	She sells sea-shells by the sea-shore.	
Swedish	Sju sjösjuka sjömän sköttes av sju sköna sjuksköterskor	'Seven seasick sailors were cared for by seven b
Mandarin	sì shì sì, shí shì shí, shísì shì shísì, sìshí shì sìshí	'Four is four, ten is ten, fourteen is fourteen, fo

• This is because the parameters `c,r,l` automatically adjust the width of the cell based on the length of what is inside of them. In order to include line-breaks in a tabular, we have to use another parameter and specify the width (in inches or centimeters). In the default tabular suite in LaTeX, there are three column types that can be specified.

 `p{x}` : top-aligned cells with width of x

 `m{x}` : middle-aligned cells with width of x

 `b{x}` : bottom-aligned cells with width of x

• Let's go go with the following measurements: `Row 1` is 2cm, `Row 2` is 6cm, `Row 3` is 6cm. The skeleton for our table looks like the following:

```
\begin{tabular}{p{2cm} p{6cm} p{6cm}}
\hline Language    & Example & Translation \\\hline
```

```
    &   &  \\\hline
    &   &  \\\hline
    &   &  \\\hline
\end{tabular}
```

- Notably, this doesn't actually require the cells to be filled to stretch out the cells to this width. The code above will produce the following:

Language	Example	Translation

- When we actually include our tongue twisters, it produces the following:

Language	Example	Translation
English	She sells sea-shells by the sea-shore.	
Swedish	Sju sjösjuka sjömän sköttes av sju sköna sjuksköterskor	'Seven seasick sailors were cared for by seven beautiful nurses'
Mandarin	sì shì sì, shí shì shí, shísì shì shísì, sìshí shì sìshí	'Four is four, ten is ten, fourteen is fourteen, forty is forty.'

2 More advanced table stuff

2.1 Combining columns: `\multicolumn{}{}{}`

Person \ Number	SG	PL
1	I	we
2	you	you
3	he, she, it	they

Table 1: English nominative personal pronouns

• We will return to *they* below once we examine how to combine columns. For now, let's focus on the second person pronoun *you*.

[finish description]

```
\begin{tabular}{|r|l|l|}
\hline  \backslashbox{Person}{Number}    & SG & PL \\\hline
1 & I            & we \\\hline
2 & you          & you \\\hline
3 & he, she, it & they\\\hline
\end{tabular}
```

Person \ Number	SG	PL
1	I	we
2	you	
3	he, she, they, it	they

Table 2: English nominative personal pronouns

```
\begin{tabular}{|r|c|c|}
\hline  \backslashbox{Person}{Number}    & SG & PL \\\hline
    1 & I & we \\\hline
    2 & \multicolumn{2}{c|}{you}\\\hline
    3 & he, she, they, it & they\\\hline
\end{tabular}
```

• You may be a bit bothered that the columns in Table 2 do not have the same width. This is because the parameters c, r, l automatically adjust the width of the cell based on the length of what is inside of them. In order to include line-breaks in a tabular, we have to use another parameter and specify the width (in inches or centimeters), as discussed in §[WHERE]

• Let's go with middle-aligned cells with width of 2cm. First, we will change all the cells to 2cm, as in the following:

```
\begin{tabular}{|m{2cm}|m{2cm}|m{2cm}|}
\hline  \backslashbox{Person}{Number}    & SG & PL \\\hline
1 & I            & we \\\hline
2 & you          & you \\\hline
3 & he, she, it & they\\\hline
\end{tabular}
```

- This produces the following:

Person\Number Number SG		PL
1	I	we
2	you	you
3	he, she, it	they

- Oops! In order to avoid this, we could either specify a greater width for row 1 or just leave it as automatically width. We'll go with the latter (i.e. replace the first m{2cm} with r.

```
\begin{tabular}{|r|m{2cm}|m{2cm}|}
\hline  \backslashbox{Person}{Number}    & SG & PL \\\hline
1 & I            & we \\\hline
2 & you          & you \\\hline
3 & he, she, it & they\\\hline
\end{tabular}
```

Number Person	SG	PL
1	I	we
2	you	you
3	he, she, it	they

2.2 Combining columns: `\multirow{}{}{}`

• Let's take an example where it makes sense to combine columns. In Table 3, we see the personal pronouns of Evenki.

	Row A	Row B	Row C
Col 1		SG	PL
Col 2	1.EXCL	bi	bu
Col 3	1.INCL		mit
Col 4	2	si	su
Col 5	3	nungan	nungartyn

Table 3: Evenki Personal Pronouns

• Writing this table is straightforward enough, using the following code:

```
\begin{tabular}{|r|l|l|}
    \hline      &   SG     &        PL  \\ \hline
    1.EXCL      &   bi     &        bu  \\ \hline
    1.INCL      &          &       mit  \\ \hline
    2           &   si     &        su  \\ \hline
    3           & nungan   & nungartyn  \\ \hline
\end{tabular}
```

• There is a problem with Table 3, which is the emptiness `Cell B3`. This looks as if it *could* be filled (in another language), and further, as if Evenki has no way to express 1SG.INCL. But NO language has a way to express this! This is a situation where it makes a lot of sense to combine columns.

• Combining columns in cells requires the `multirow` package, which works similarly to the `multicol` package discussed above.

• The relevant command is `\multirow{I}{II}{III}`, a function which takes three parameters: `I`=number of rows, `II`=width, `III`=text to be included. The reelvant command is:

`\multirow{2}{*}{bi}`

• '2' indicates that we want it to span 2 rows. '*' essentially means "use the default cell width." 'bi' is the contents of the cell.

• We put this in the same place in the code as *bi* above. This will look like this:

```
\begin{tabular}{|r|l|l|}
    \hline      &   SG                       &        PL  \\ \hline
    1.EXCL      &   \multirow{2}{*}{bi}       &        bu  \\ \hline
    1.INCL      &                             &       mit  \\ \hline
    2           &   si                        &        su  \\ \hline
    3           & nungan                      & nungartyn  \\ \hline
\end{tabular}
```

• This code produces Table 5:

	Row A	Row B	Row C
Col 1		SG	PL
Col 2	1.EXCL	bi	bu
Col 3	1.INCL		mit
Col 4	2	si	su
Col 5	3	nungan	nungartyn

Table 4: Evenki Personal Pronouns with 1.SG combined

• But wait! Now the \hline between columns 2 and 3 is going through the cell contents. To avoid this, we need to be more specific in the span of the lines, to make sure it does not span through Row B. This is done by replacing \hline with \cline{x-y}, where x is the row number for the start of the line and y is the row number for the end of the line.

• **NOTE** that for \cline{x-y}, BOTH VALUES ARE REQUIRED. This means for our task, to avoid cutting through cell B3, we have to draw two lines: one spanning Row A and one spanning Row B. Because both values are required, this looks like the following: \cline{1-1} \cline{3-3}. Meaning: "draw one line that spans from Row 1 (=what I have labeled Row A) through Row 1, and draw one line that spans from Row 3 to Row 3."

```
\begin{tabular}{|r|l|l|}
    \hline       &   SG                    &        PL   \\ \hline
    1.EXCL       &   \multirow{2}{*}{bi} &        bu   \\ \cline{1-1} \
       cline{3-3}
    1.INCL       &                         &        mit  \\ \hline
    2            &    si                   &        su   \\ \hline
    3            &  nungan                 &  nungartyn  \\ \hline
\end{tabular}
```

	Row A	Row B	Row C
Col 1		SG	PL
Col 2	1.EXCL	bi	bu
Col 3	1.INCL		mit
Col 4	2	si	su
Col 5	3	nungan	nungartyn

Table 5: Evenki Personal Pronouns with 1.SG combined

2.3 Combining `multirow` and `multicolumn`

• Like \multicolumn{}{}{}, you can produce some really sophisticated figures with \multirow, and even more complex and elegant figures when you use both.

• Let's return to the English personal pronouns we left off in Table 2. If we add in ±animate, and, masculine, and feminine as features for third-person pronouns, we now have *they* appearing in 5 cells:

Pers, Gen \ Number	SG	PL
1	I	we
2	you	
3, +animate, masc.	he	they
3, +animate, fem.	she	they
3, -animate	it	they
3	they	they

Table 6: Revised English third-person pronouns

• How can we reduce L-shaped cyan cells in Table 6? A little magic...

• First we need to pick a cell that we want our single *they* to appear in. There are really good places to put it: either in the plural column (as in Table 7) or centered between singular and plural in the bottow row (as in Table 8). Note that in the following, I have reduced a lot to get the to fit on the same line.

Pers, Gen \ Number	SG	PL
1	I	we
2	you	
3, +anim, msc.	he	they
3, +anim, f.	she	
3, -anim	it	
3		

Table 7: Route 1

Pers, Gen \ Number	SG	PL
1	I	we
2	you	
3, +anim, msc.	he	
3, +anim, f.	she	
3, -anim	it	
3	they	

Table 8: Route 2

• Let's focus on only the third-person cells. Here's how to do it...

• Here is the code for Route 1 (tab. 7):

```
\begin{tabular}{|l|m{1.5cm}|m{1.5cm}|}
3, +anim, msc.  & he                   & \multirow{4}{*}{they} \\\cline{1-2}
3, +anim, f.    & she                  &        \\ \cline{1-2}
3, -anim        & it                   &        \\ \cline{1-2}
3               & \multicolumn{1}{l}{} &        \\ \hline
\end{tabular}
```

• There are three main changes: first, put a `\multirow...` for the bottom four columns in the Plural column. Next, we change the `\hline` to `\cline1-2` in those rows affected by `\multirow`. Finally, add `\multicolumn{1}{l}{}` to the bottom 3SG cell. This is done in order to get ride of the middle line break.
• Route 2 (Table 8) is similar, with the difference being that we put *they* in a `\multicolumn` rather than in a `\multirow`:

```
\begin{tabular}{|l|m{1.5cm}|m{1.5cm}|}
3, +anim, msc.  & he             &              \\ \cline{1-2}
3, +anim, f.    & she            &              \\ \cline{1-2}
3, -anim        & it             &              \\ \cline{1-2}
3               & \multicolumn{2}{c|}{they}                    \\\hline
\end{tabular}
```

2.3.1 Ukrainian Noun declensions

Declension class	First declension				Second declension			
Number	SG		PL		SG		PL	
Case↓, animacy→	−	+	−	+	−	+	−	+
Nominative	-a		-y		∅		-y	
Accusative	-u							
Genitive	-y		∅		-a		-jiv	
Dative	-i		-am		-ovi		-am	
Locative			-ax				-ax	
Instrumental	-oju		-amy		-om		-amy	

Table 9: Some noun declension classes from Ukrainian

2.4 Assorted tables

Role	Sah *da(qany)*	Hun *is/sem*	BCS *i/ni*	Heb *kol*	Jpn *-mo*
everyone, ∀	✗	✗	✗	✓ (**kul**-am)	✓ (daré-**mo**)
anyone, FCI	✗	✓ (akár-ki **is**)	✗	✓ (**kol**-exad)	✓ (dare-de-**mo**)
anyone, NPI	✓ (kim **da(qany)**)	✓ (vala-ki **is**/ akár-ki **is**)	✓ (**i**-(t)ko)	✓ (**kol**-exad)	✓ (dare-**mo**)
both X and Y	✓ (X **da(qany)** Y **da(qany)**)	✓ (X **is** Y **is**)	✓ (**i** X **i** Y)	✗	✓ (Y-**mo** Y-**mo**)
neither X nor Y	✓ (X **da(qany)** Y **da(qany)**)	✓ (**sem** X **sem** Y/ X **sem** Y **sem**)	✓ (**ni** X **ni** Y)	✗	✓ (X-**mo** Y-**mo**)
X too	✗	✓ (X **is**)	✓ (**i** X)	✗	✓ (X-**mo**)
even X	✓ ((onnooqor) X **da(qany)**)	✓ (még X **is**)	✓ (čak **i** X)	✗	✓ (X-**mo**)

Table 10: A cool table

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Category	Role		Sakha		Jpn	Hun	BCS	Hindi
			da(ɣani)	*em(i)e/ emit*	*-mo*	*is/sem*	*i/ni*	*bhii*
QNPs	∀-GQ, 'everybody'		✗	✗	✓	✗	✗	✗
	NPI, 'anybody'		✓ *kim **da**, biir **da** kihi*	✗	✓	✓	✓	✓
	(Environment)	Direct Neg	✓		✓	✓ (*sem*)	✓ (*ni*)	✓
		Indirect Neg	maybe?		✗	✓ (*is*)	✓ (*i*)	
		Comparative	✓		✗	✗	✓	
		Conditional	✗	✓	✗	✓	✓	✓
		Polar Question	✗	✓	✗	✓	✓	✓
		Restrictor of ∀	✗					✓
	FCI, 'anybody'		✗	✓	✓	✓	✗	✓
Focus	Additive, 'X too/also/either'		✗	✓ X ***emie***, ***emie*** X	✓	✓	✓	✓
	Scalar, 'even X'		✓ *Onnooɣor* X ***da***	✗ ✗	✓	✓	✓	✓
Coord.	'Both X and Y'		✓ X ***da*** Y ***da*** Y	✓ ***emie da*** X ***emie da*** Y	✓	✓	✓	✓
	'Neither X nor Y'		✓ X ***da*** Y ***da*** (w/ NEG)		✓	✓	✓	

Table 11: Another cool table