

L^AT_EX



LaTeX Lab 4: Tables

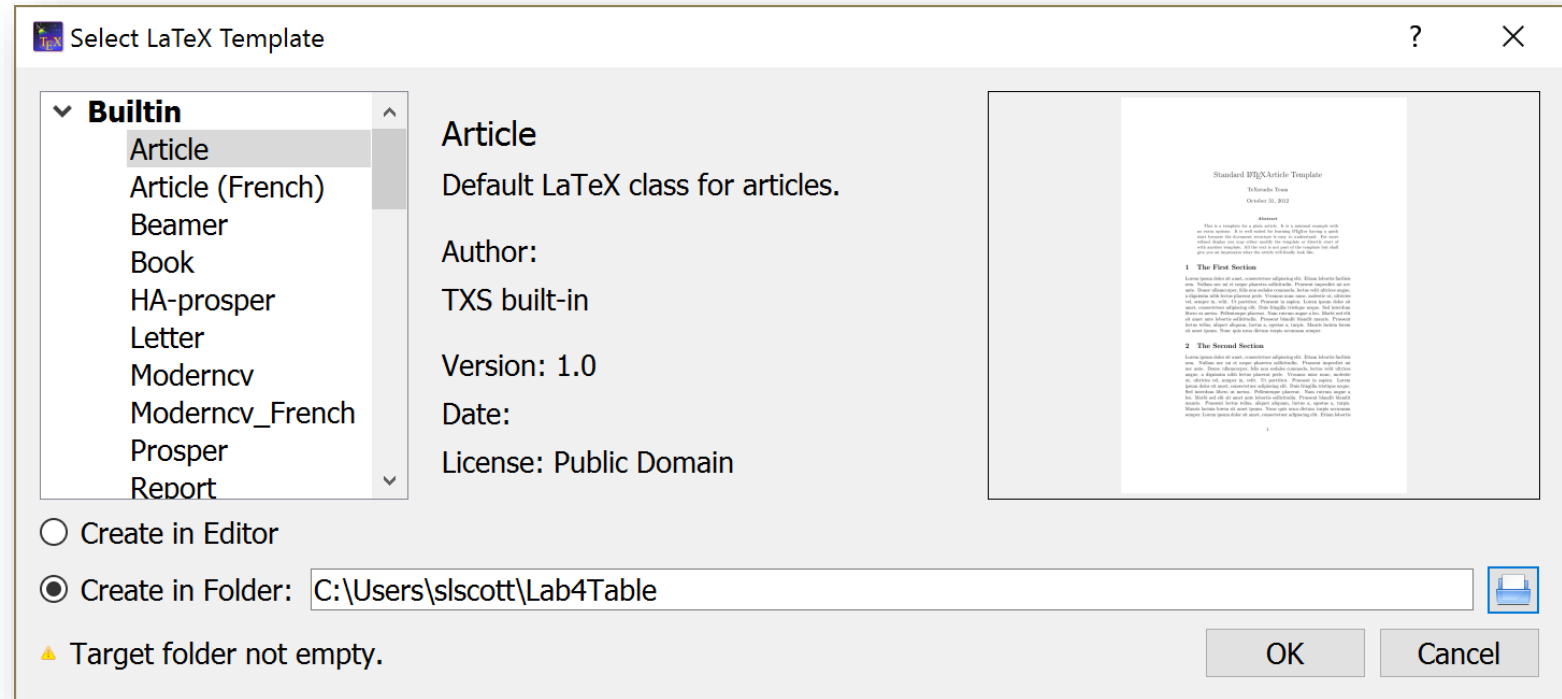
CSI 500

Course material derived from:


Lamport, L. (1994). *L^AT_EX: a document preparation system: user's guide and reference manual*. Addison-Wesley.

Article

- Let's make another LaTeX document
- Make a new folder called "Lab4Table"
- In TexStudio, File, New From Template
- Select "Article"
- Select "Create in Folder", and navigate to your "Lab4Table" folder.
- Press OK



Tables LaTeX code

- Type in the following in the editor window.
 - Your additions are shown in **RED** font color
 - the "%" indicates comments
- Save the document
- Press the green arrowhead titled "Build and View" on the menu bar - it looks like this 
- At the dialog box, press F5 and OK

```
% Table example
\documentclass[11pt]{ article }
\usepackage{ fullpage }

%opening
\title{Lab 4 - LaTeX Tables}
\author{ Your Name }

\begin{ document }

\maketitle

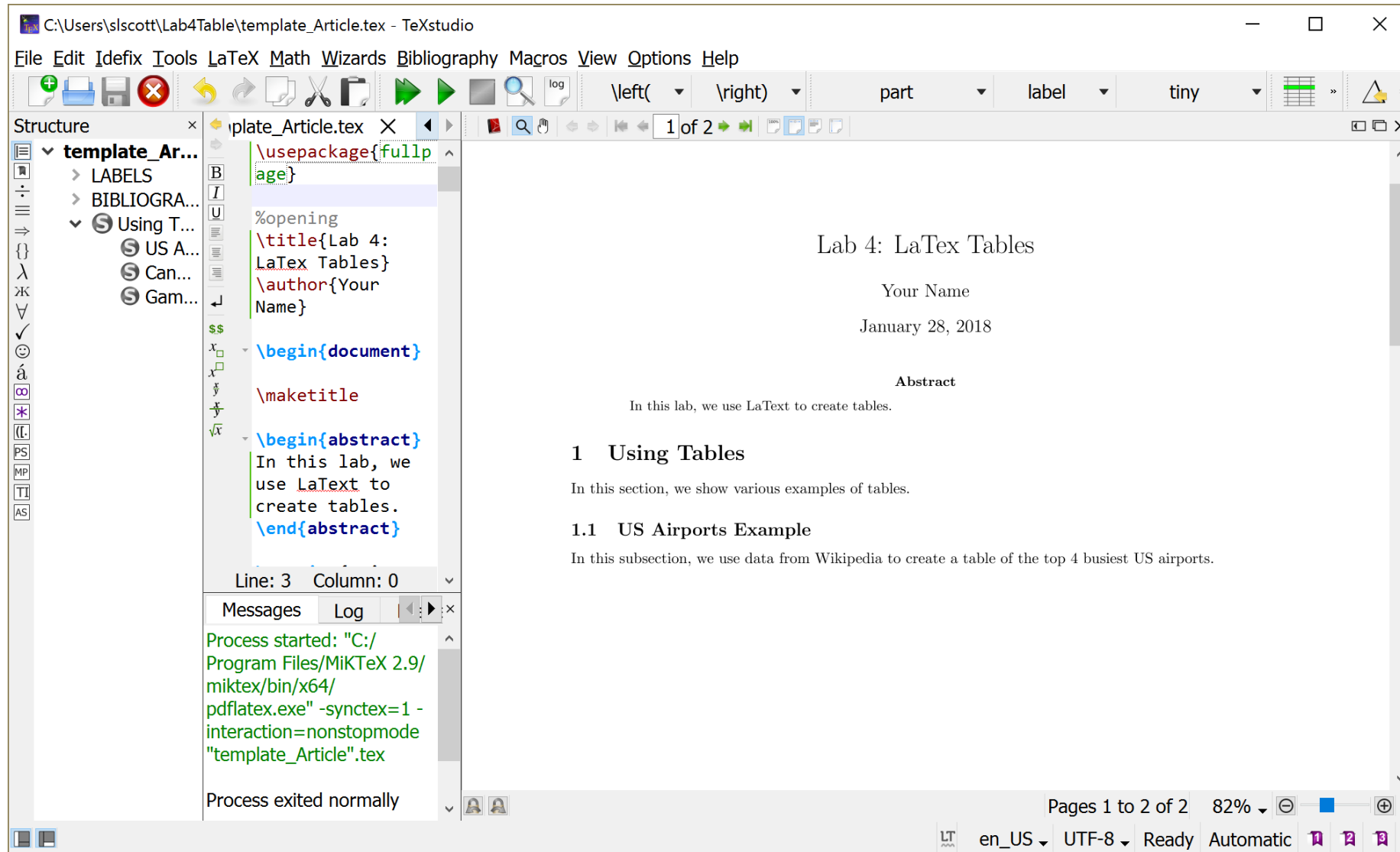
\begin{ abstract }
In this lab, we use LaTeX to create tables.
\end{ abstract }

\section{Using Tables}
In this section, we show various examples of tables.

\subsection{US Airports Example}
In this subsection, we use data from
Wikipedia to create a table of
the top 4 busiest US airports.

\end{ document }
```

What it should look like



Using the TexStudio Tabular Wizard

- TexStudio is an Integrated Development Environment (IDE)
 - it includes a number of built-in tools, including a tabular wizard
- Go under the main menu bar, select "Wizards", select "Quick Tabular"

set Num of Columns to 3

set Num of Rows to 5

enter "Name", "City", and "IACO Code" for row 1 data

Scroll down on the right, and enter the following data

Hatfield-Jackson International	Atlanta	ATL
Los Angeles International	Los Angeles	LAX
O'Hare International	Chicago	ORD
Dallas/Ft Worth Intl	Dallas	DFW

press "OK"

Quick Tabular

	c	c	c
1	Name	City	IACO Code
2			
3			
4			
5			

Num of Columns: 3

Columns

Column : 3

Alignment : Center

Left Border : |

Apply to all columns

Num of Rows: 5

Rows

Row : 1

☒ Top Border

☐ Merge columns : 1 -> 2

Apply to all rows

☒ Bottom Border (last row)

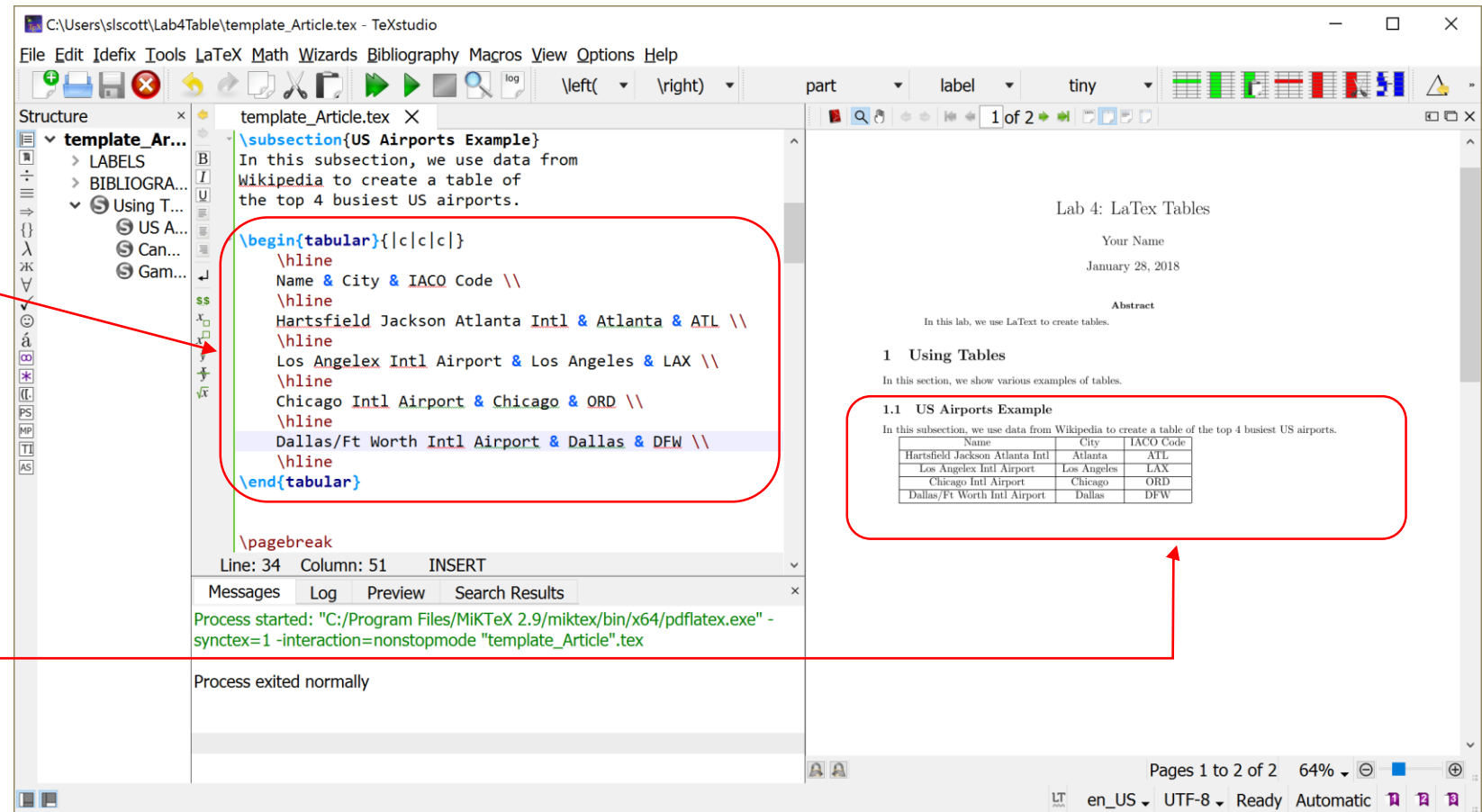
☐ Add vertical margin for each row

Right Border (last column) : |

OK Cancel

TexStudio autogenerated table code

- The tabular wizard will automatically generate the table code and insert into your document
 - note the default settings for centering and lines - you can of course change these if/as needed
- Press the green arrowhead titled "Build and View" on the menu bar, at the dialog box, press F5 and OK





A more complex table

- The previous example showed us how to do a simple table using a Wizard tool
- We can make more complex tables "by hand" using LaTeX formatting commands
 - include captions
 - include cross-references
- Let's make a table listing data from Canada

Province	Capital	Population (2016)
Ontario	Toronto	13,448,495
Quebec	Quebec City	8,164,361
Nova Scotia	Halifax	923,598
New Brunswick	Fredericton	747,101
Manitoba	Winnipeg	1,278,365
British Columbia	Victoria	4,648,055
Saskatchewan	Charlottetown	142,907
Alberta	Regina	1,098,352
Newfoundland and Labrador	St. Johns	519,716

Data source: Wikipedia

The table code explained...

- we're using a `{table}` environment
- the parameters `!th` mean put the table here, even if it's not aesthetically pretty

```
\subsection{Canadian Provinces Example}
```

This example provides a captioned table listing the provinces of Canada.

```
\begin{table}[!th]
```

```
\begin{tabular}{|l|l|l|r|}
```

```
\hline
```

```
Province & Capital & Population (2016) \\
```

```
\hline
```

```
Ontario & Toronto & 13,448,494 \\
```

```
Quebec & Quebec City & 8,164,361 \\
```

```
% the rest of the provices go here...
```

```
\end{tabular}
```

```
\caption{Canadian Provinces, Capitals, and 2016 Population}
```

```
\label{tbl:CanProv}
```

```
\end{table}
```


The table code explained...

- within the `{table}`, we're using a `{tabular}` environment
- the parameters `[|l|l|r]` mean
 - 3 columns
 - separated by vertical lines (`|`)
 - left, left, and right justification
- `\hline` means horizontal line

```
\subsection{Canadian Provinces Example}
```

This example provides a captioned table listing the provinces of Canada.

```
\begin{table}[!th]
```

```
\begin{tabular}{|l|l|r|}
```

```
\hline
```

```
Province & Capital & Population (2016) \\
```

```
\hline
```

```
Ontario & Toronto & 13,448,494 \\
```

```
Quebec & Quebec City & 8,164,361 \\
```

```
% the rest of the provices go here...
```

```
\end{tabular}
```

```
\caption{Canadian Provinces, Capitals, and 2016 Population}
```

```
\label{tbl:CanProv}
```

```
\end{table}
```

The table code explained...

- table data is next
- column headers first, then data rows
- the "&" character is a column data separator
- spaces are ignored, but & are aligned
- the \\ indicates new line

```
\subsection{Canadian Provinces Example}
```

This example provides a captioned table listing the provinces of Canada.

```
\begin{table}[!th]
```

```
\begin{tabular}{|l|l|l|r|}
```

```
\hline
```

```
Province & Capital & Population (2016) \\
```

```
\hline
```

```
Ontario & Toronto & 13,448,494 \\
```

```
Quebec & Quebec City & 8,164,361 \\
```

```
% the rest of the provinces go here...
```

```
\end{tabular}
```

```
\caption{Canadian Provinces, Capitals, and 2016 Population}
```

```
\label{tbl:CanProv}
```

```
\end{table}
```

The table code explained...

- the `\caption` command provides the table caption
- the `\label` command provides a key used to cross-reference this table
 - use any labeling style you like

```
\subsection{Canadian Provinces Example}
```

This example provides a captioned table listing the provinces of Canada.

```
\begin{table}[!th]
```

```
\begin{tabular}{|l|l|r|}
```

```
\hline
```

```
Province & Capital & Population (2016) \\\
```

```
\hline
```

```
Ontario & Toronto & 13,448,494 \\\
```

```
Quebec & Quebec City & 8,164,361 \\\
```

```
% the rest of the provinces go here...
```

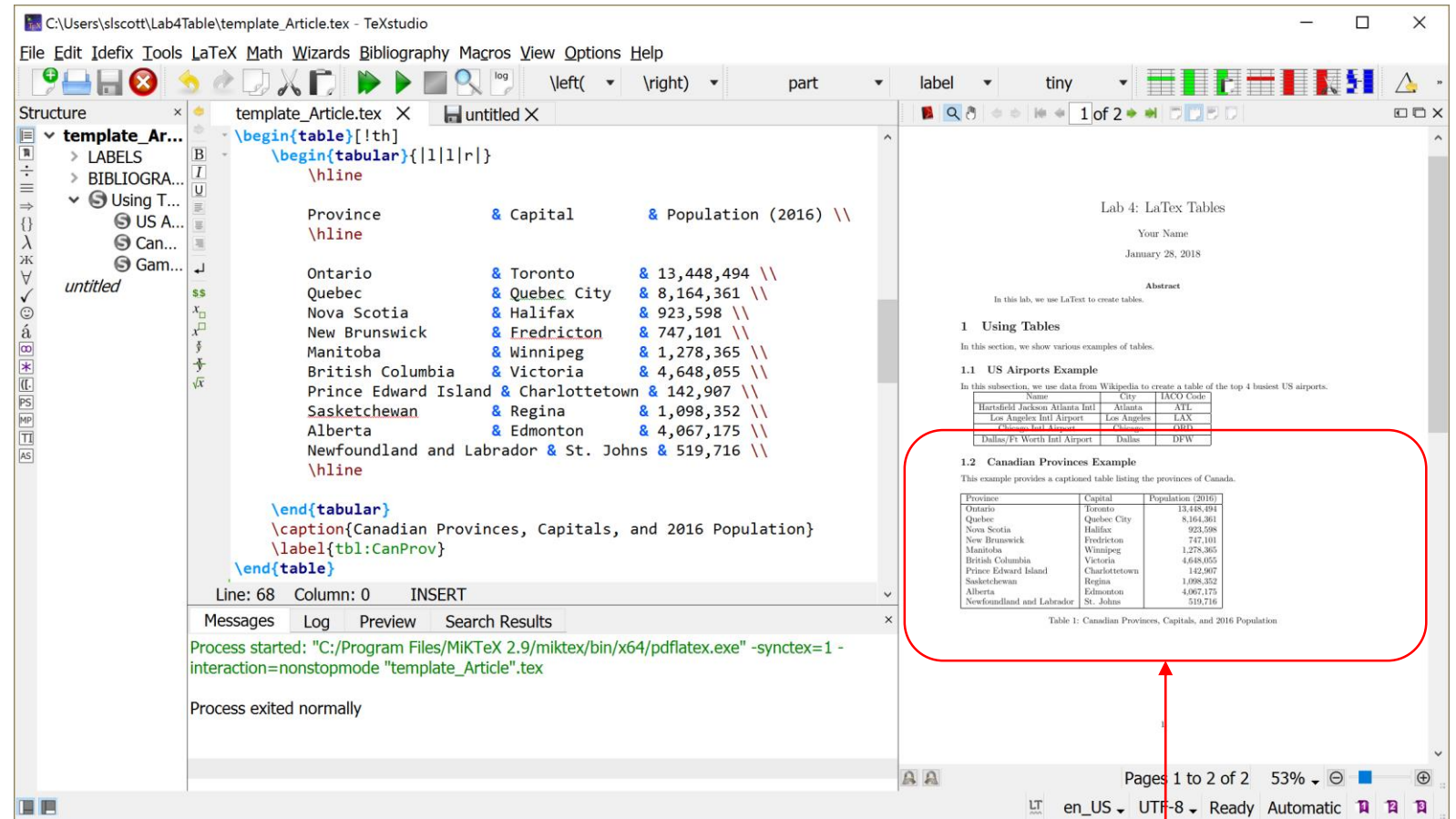
```
\end{tabular}
```

```
[ \caption{Canadian Provinces, Capitals, and 2016 Population}  
  \label{tbl:CanProv}
```

```
\end{table}
```

Now type in the code, and build-view

- You should now have a new table with a caption under your first table.



The screenshot shows the TeXstudio interface with the file `template_Article.tex` open. The code editor displays LaTeX code for a table of Canadian provinces, capitals, and 2016 populations. The preview window shows the rendered document, which includes a title page, an abstract, and two tables. The first table is titled "US Airports Example" and the second is titled "Canadian Provinces Example". A red box highlights the second table in the preview, and a red arrow points from the bottom of the box to the status bar at the bottom right of the window.

```
\begin{table}[!th]
\begin{tabular}{|l|l|r|}
\hline
Province & Capital & Population (2016) \\
\hline
Ontario & Toronto & 13,448,494 \\
Quebec & Quebec City & 8,164,361 \\
Nova Scotia & Halifax & 923,598 \\
New Brunswick & Fredericton & 747,101 \\
Manitoba & Winnipeg & 1,278,365 \\
British Columbia & Victoria & 4,648,055 \\
Prince Edward Island & Charlottetown & 142,907 \\
Saskatchewan & Regina & 1,098,352 \\
Alberta & Edmonton & 4,067,175 \\
Newfoundland and Labrador & St. Johns & 519,716 \\
\hline
\end{tabular}
\caption{Canadian Provinces, Capitals, and 2016 Population}
\label{tbl:CanProv}
\end{table}
```

Lab 4: LaTeX Tables

Your Name

January 28, 2018

Abstract

In this lab, we use LaTeX to create tables.

1 Using Tables

In this section, we show various examples of tables.

1.1 US Airports Example

In this subsection, we use data from Wikipedia to create a table of the top 4 busiest US airports.

Name	City	IATA Code
Hartfield Jackson Atlanta Intl	Atlanta	ATL
Los Angeles Intl Airport	Los Angeles	LAX
Chicago Intl Airport	Chicago	MDW
Dallas/Ft. Worth Intl Airport	Dallas	DFW

1.2 Canadian Provinces Example

This example provides a captioned table listing the provinces of Canada.

Province	Capital	Population (2016)
Ontario	Toronto	13,448,494
Quebec	Quebec City	8,164,361
Nova Scotia	Halifax	923,598
New Brunswick	Fredericton	747,101
Manitoba	Winnipeg	1,278,365
British Columbia	Victoria	4,648,055
Prince Edward Island	Charlottetown	142,907
Saskatchewan	Regina	1,098,352
Alberta	Edmonton	4,067,175
Newfoundland and Labrador	St. Johns	519,716

Table 1: Canadian Provinces, Capitals, and 2016 Population

Pages 1 to 2 of 2 53% en_US UTF-8 Ready Automatic

Adding cross references

- when we used the `\label` command, we identified our table object with a "tag"
 - this "tag" can be used to refer to the table object elsewhere in the paper
- to do so, use the `\ref{tag}` command syntax, where `\ref` is the cross-reference command, and tag is the name we assigned to our object
 - LaTeX does not require a labeling format, but it's best to use a consistent easy to remember style
- TexStudio automatically prompts you for label tags

```
\subsection{Canadian Provinces Example}
```

This example provides a captioned table listing the provinces of Canada.

See table `\ref{`

```
\begin{table}[!th]
```

```
\begin{tabular}{|l|l|l|r|}
```

```
\hline
```

```
Province & Capital & Population (2016) \\
```

```
\hline
```

```
Ontario & Toronto & 13,448,494 \\
```

```
Quebec & Quebec City & 8,164,361 \\
```

```
% the rest of the provices go here...
```

```
\end{tabular}
```

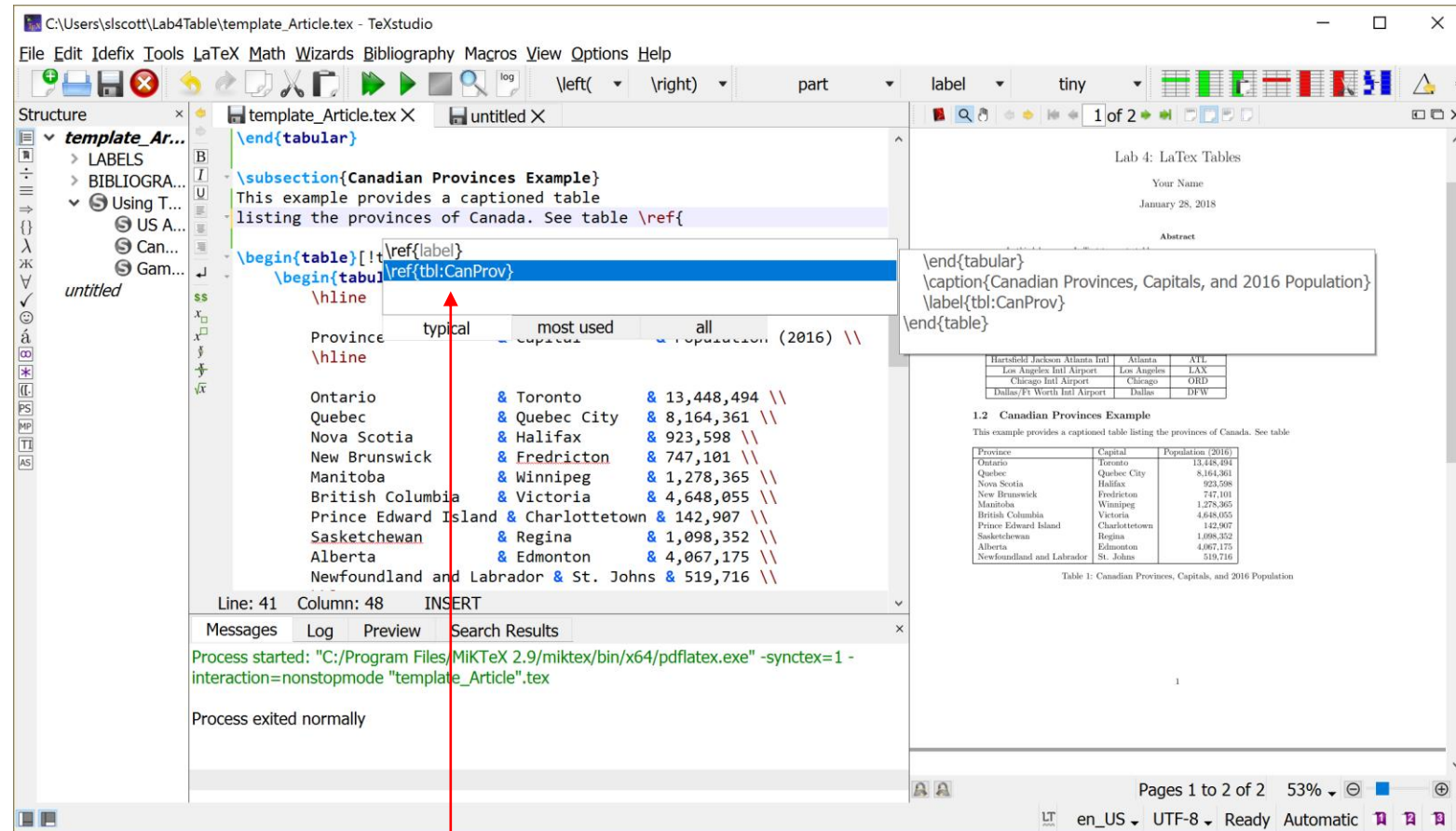
```
\caption{Canadian Provinces, Capitals, and 2016 Population}
```

```
\label{tbl:CanProv}
```

```
\end{table}
```

Adding cross references

- when we used the `\label` command, we identified our table object with a "tag"
 - this "tag" can be used to refer to the table object elsewhere in the paper
- to do so, use the `\ref{tag}` command syntax, where `\ref` is the cross-reference command, and tag is the name we assigned to our object
 - LaTeX does not require a labeling format, but it's best to use a consistent easy to remember style
- TexStudio automatically prompts you for label tags



select "CanProv" as the tag

Build and view to see table cross reference

- Build and View, F5 to regenerate the document
- LaTeX has automatically connected the table tag "CanProv" with our numbered reference "Table 1".

The screenshot displays the TeXstudio interface with the file `template_Article.tex` open. The source code defines a subsection titled "Canadian Provinces Example" and includes a table listing Canadian provinces, their capitals, and populations in 2016. The table is created using the `\begin{table}` and `\begin{tabular}` environments. A cross-reference is established by using `\ref{tbl:CanProv}` in the text and `\caption{Table 1: Canadian Provinces, Capitals, and 2016 Population}` below the table.

The compiled PDF document is shown on the right. It includes a title page, an abstract, and a section titled "1.2 Canadian Provinces Example". The table is rendered correctly, and the caption is "Table 1: Canadian Provinces, Capitals, and 2016 Population". A red circle highlights the caption, and a red arrow points from the text "see table 1." in the preceding paragraph to the caption, demonstrating the successful cross-reference.

Province	Capital	Population (2016)
Ontario	Toronto	13,448,494
Quebec	Quebec City	8,164,361
Nova Scotia	Halifax	923,598
New Brunswick	Fredricton	747,101
Manitoba	Winnipeg	1,278,365
British Columbia	Victoria	4,648,055
Prince Edward Island	Charlottetown	142,907
Saskatchewan	Regina	1,098,352
Alberta	Edmonton	4,067,175
Newfoundland and Labrador	St. John's	519,716

Tables: summary

- LaTeX provides features to represent tabular data
- The TexStudio tabular wizard can handle a lot of the mechanics of setting up simple tables
- You can also create tables by hand using `\tabular{}` and `\table{}` environments
- LaTeX provides table captioning and labeling using the `\caption{}` and `\label{tag}` commands, respectively
- LaTeX provides table cross referencing so you can refer to table objects in text using the `\ref{ tag }` command