



LaTeX Lab 8: Table of Contents, Figures, and Tables

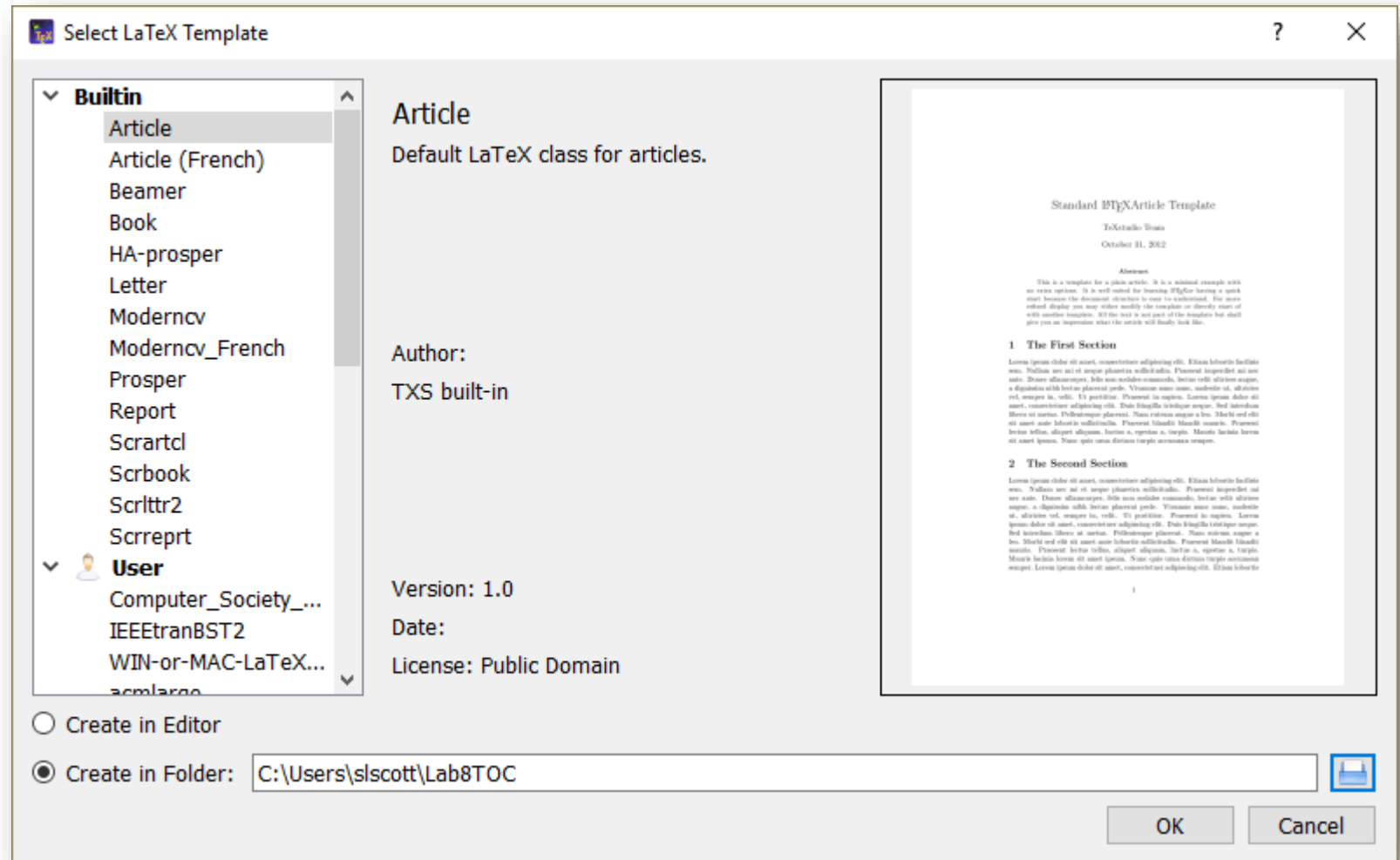
CSI 500

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 "Lab8TOC"
- In TexStudio, File, New From Template
- Select "Article"
- Select "Create in Folder", and navigate to your "Lab8TOC" folder.
- Press OK



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

% LaTeX Table of Contents, Figures, and Tables Example

```
\documentclass[11pt]{article}
```

```
\usepackage{fullpage}
```

```
\usepackage{graphicx}
```

```
%opening
```

```
\title{Lab 8 LaTeX Table of Contents, Figures, and Tables}
```

```
\author{Your Name}
```

```
\begin{document}
```

```
\maketitle
```

```
\begin{abstract}
```

In this lab, we use LaTeX features for automatically creating table of contents, figures, and tables.

```
\end{abstract}
```

```
\section{Yosemite National Park}
```

Yosemite National Park is one of America's most popular parks.

```
\newpage
```

```
\section{Park Map}
```

```
\newpage
```

```
\section{Visitor Statistics}
```

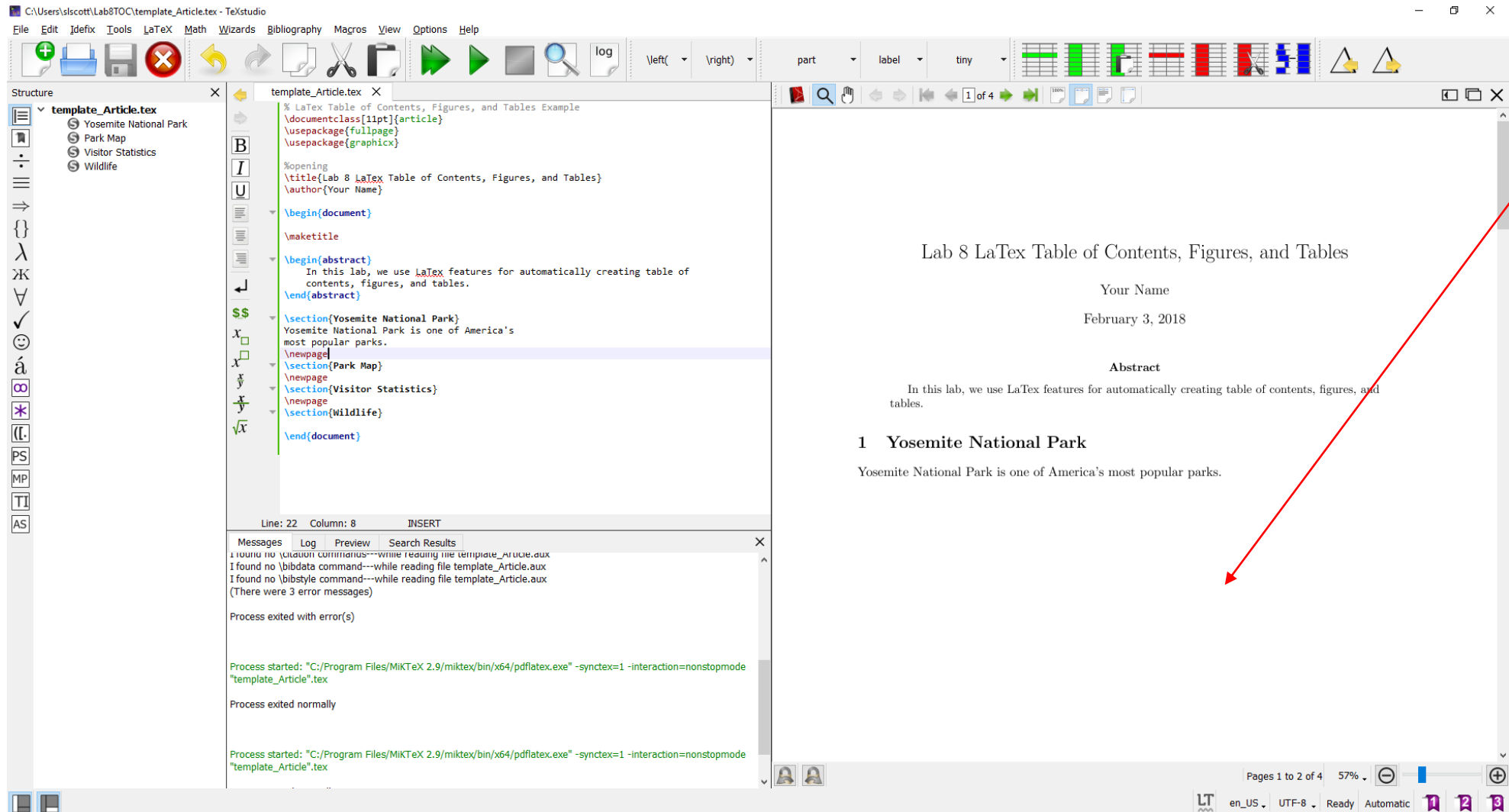
```
\newpage
```

```
\section{Wildlife}
```

```
\end{document}
```

What it should look like

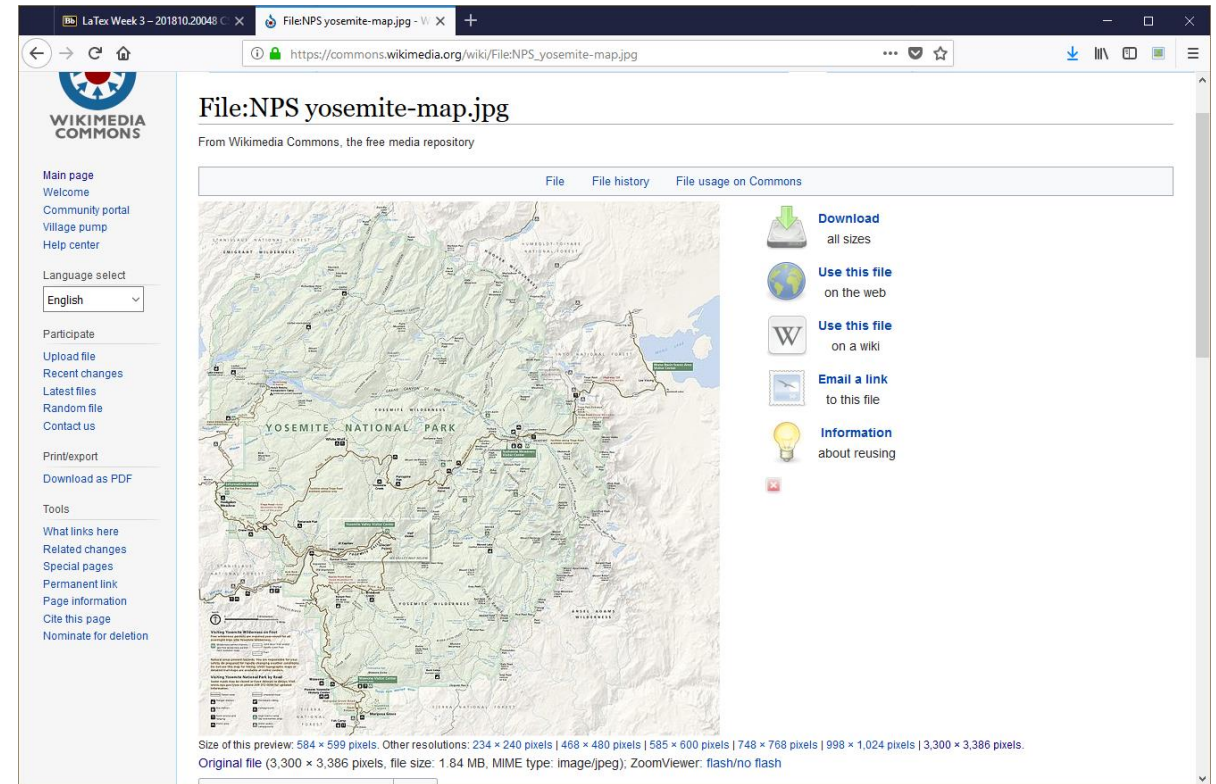
4 Sections



Page 1 of 4

Let's add some geospatial content

- go to Wikimedia commons web site at https://commons.wikimedia.org/wiki/Main_Page
- search for "Yosemite National Park Map"
 - view the images that come back
 - here is a good one that is public domain
 - https://commons.wikimedia.org/wiki/File:NPS_yosemite-map.jpg
 - download the file and save to your working directory



Legal Stuff

This file is made available under the [Creative Commons CC0 1.0 Universal Public Domain Dedication](#). This image or media file contains material based on a work of a [National Park Service](#) employee, created as part of that person's official duties. As a [work](#) of the [U.S. federal government](#), such work is in the [public domain](#) in the United States.

Now let's add a map to our document

- Go to the section titled `\section{Park Map}`
 - enter in the text shown in red
- Now enter in the `\figure` text as shown
- When done, go back to the `\section{Park Map}`
 - add in a reference to the figure using the `\ref` command.

```
\section{Park Map}
```

Here is a map of Yosemite National Park, showing the main visitor attractions for this popular park. (see Figure `\ref{fig:npsyosemite-map}`)

```
\begin{figure}[h!]
```

```
\centering
```

```
\includegraphics[width=0.7\linewidth]{NPS_yosemite-map}
```

```
\caption{Map of Yosemite National Park}
```

```
\label{fig:npsyosemite-map}
```

```
\end{figure}
```

(see Figure `\ref{fig:npsyosemite-map}`)

- Press "Build and View"

Here's what it should look like

Structure

- template_Article.tex
 - LABELS
 - Yosemite National Park
 - Park Map
 - Visitor Statistics
 - Wildlife

```
\begin{document}
\maketitle
\begin{abstract}
In this lab, we use LaTeX features for automatically creating table of
contents, figures, and tables.
\end{abstract}
\section{Yosemite National Park}
Yosemite National Park is one of America's
most popular parks.
\newpage
\section{Park Map}
Here is a map of Yosemite National Park, showing the main
visitor attractions for this popular park
(see Figure \ref{fig:npsyosemite-map})
\begin{figure}[h!]
\centering
\includegraphics[width=0.7\linewidth]{NPS_yosemite-map}
\caption{Map of Yosemite National Park}
\label{fig:npsyosemite-map}
\end{figure}
\newpage
\section{Visitor Statistics}
\newpage
\section{Wildlife}
\end{document}
```

Line: 26 Column: 38 INSERT

Messages Log Preview Search Results

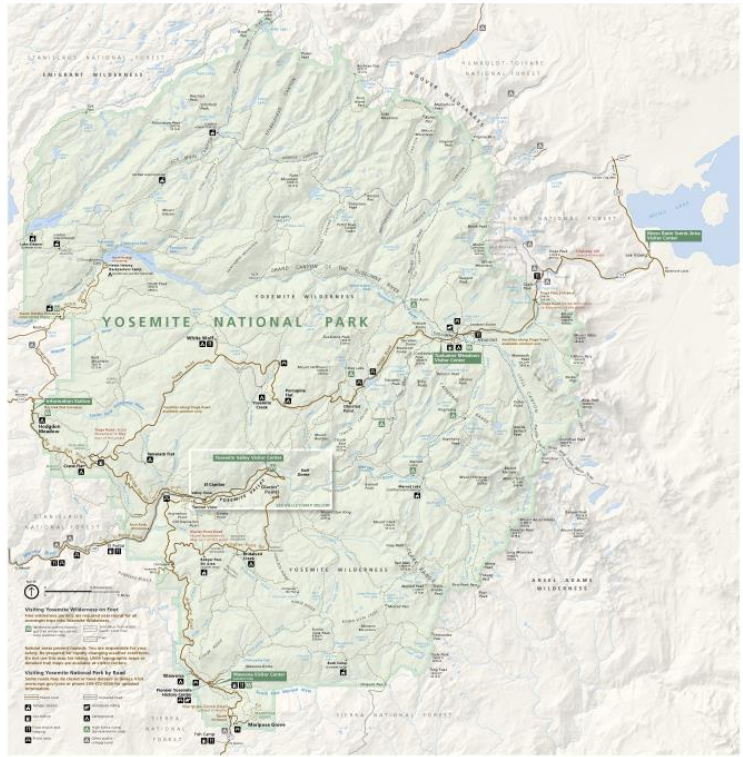
Process started: "C:/Program Files/MiKTeX 2.9/miktex/bin/x64/pdflatex.exe" -synctex=1 -interaction=nonstopmode "template_Article".tex

Process exited normally

Process started: "C:/Program Files/MiKTeX 2.9/miktex/bin/x64/pdflatex.exe" -synctex=1 -interaction=nonstopmode "template_Article".tex

Process exited normally

Here is a map of Yosemite National Park, showing the main visitor attractions for this park (see Figure 1)

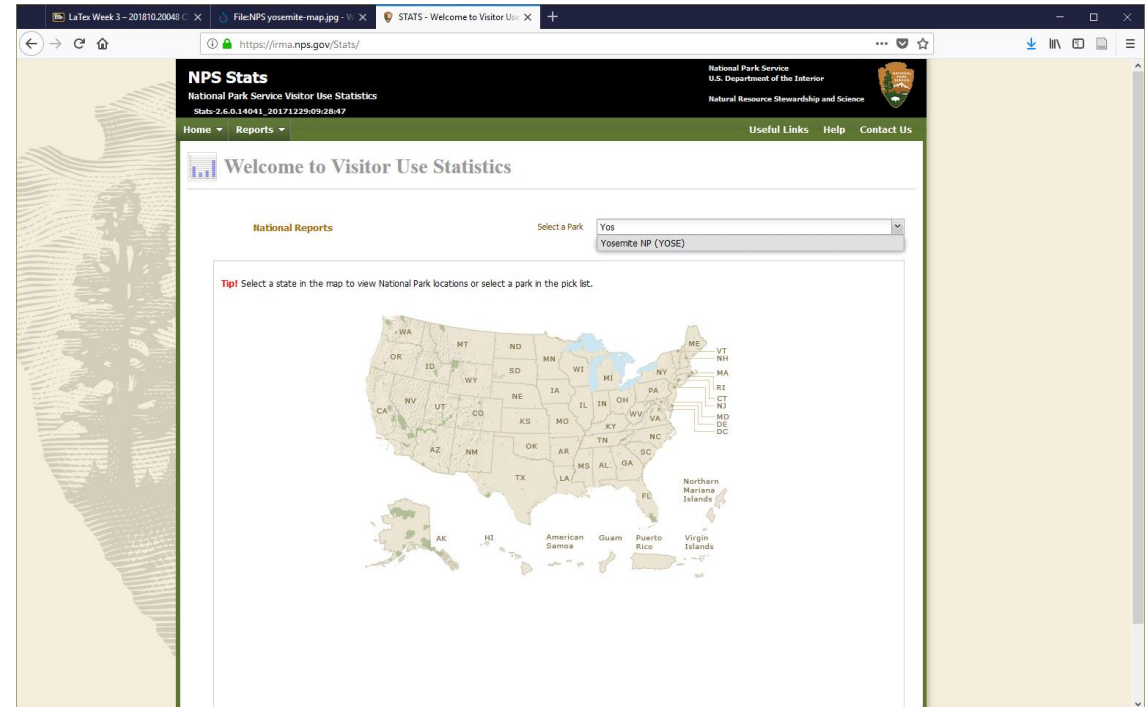


Pages 2 to 3 of 4 75%

LT en_US UTF-8 Ready Automatic 1 2 3

Let's add some numeric content

- go to US National Park Service web site at <https://irma.nps.gov/Stats/>
- search for "Yosemite National Park Map"
- choose the top link "Annual Park Recreation Visitation (1906 - Last Calendar Year)"
- scroll to the bottom for 2010-2016
- save this page - we'll use it for tabular data



Now let's add a table to our document

- Go to the section titled `\section{Visitor Statistics}`
 - enter in the text shown in red
- Now enter in the `\table` text as shown using NPS data
- When done, go back to the `\section{Visitor Statistics}`
 - add in a reference to the figure using the `\ref` command.
(see Figure `\ref{tab:YosemiteVisitStats}`)
- Press "Build and View"

```
\section{Visitor Statistics}
Located in easy driving distance of major metropolitan
areas, Yosemite National Park has millions of visitors
per year (see Table \ref{tab:YosemiteVisitStats}).
\begin{table}[h!]
\center
\begin{tabular}{|c|r|}
\hline
Year & Visitors \\
\hline
2010 & 3,901,408 \\
\hline
2011 & 3,951,393 \\
\hline
2012 & 3,853,404 \\
\hline
2013 & 3,691,191 \\
\hline
2014 & 3,882,642 \\
\hline
2015 & 4,150,217 \\
\hline
2016 & 5,028,868 \\
\hline
\end{tabular}
\caption{Yosemite Annual Visitors 2010-2016)}
\label{tab:YosemiteVisitStats}
\end{table}
```

Here's what it should look like

The screenshot shows the TeXstudio interface with the following components:

- Structure Panel:** Lists the document structure, including labels for 'Yosemite National Park', 'Park Map', 'Visitor Statistics', and 'Wildlife'.
- Source Editor:** Displays the LaTeX source code for the document. The code includes a section for 'Visitor Statistics' and a table definition for 'Yosemite Annual Visitors 2010-2016'.
- Messages Panel:** Shows the compilation process, indicating that the process started and exited normally.
- Preview Panel:** Displays the rendered output of the document, showing the section title '3 Visitor Statistics' and the table of annual visitors.

The rendered output in the preview panel is as follows:

3 Visitor Statistics

Located in easy driving distance of major metropolitan areas, Yosemite National Park has millions of visitors per year (see table 1).

Year	Visitors
2010	3,901,408
2011	3,951,393
2012	3,853,404
2013	3,691,191
2014	3,882,642
2015	4,150,217
2016	5,028,868

Table 1: Yosemite Annual Visitors 2010-2016)

Let's add some imagery

- You can reuse the image you did for Lab 7, or pick a new image
- Find a copyright-free public domain image for this lab
 - https://commons.wikimedia.org/wiki/Main_Page
- Search for "Yosemite National Park wildlife"
- Download and save to your working directory



A marmot seen on top of
Mount Dana, Yosemite, CA, USA

Legal Stuff

By The Photographer - Own work, CC BY-SA 4.0,

<https://commons.wikimedia.org/w/index.php?curid=54726518>

Licensed under Creative Commons Attribution-Share Alike 3.0 Unported

Attribution: Inklein at the English Language Wikipedia

<https://commons.wikimedia.org/wiki/File:Marmot-edit1.jpg>

Now let's add an image to our document

- Go to the section titled `\section{Wildlife}`
 - enter in the text shown in red
- Now enter in the `\figure` text as shown
- When done, go back to the `\section{Wildlife}`
 - add in a reference to the figure using the `\ref` command.

```
\newpage
\section{Wildlife}
Yosemite is home to wildlife large and small. Here is
a marmot enjoying the view from Mt. Dana (see Figure \ref{fig:marmot})
```

```
\begin{figure}[h!]
  \centering
  \includegraphics[width=0.7\linewidth]{Marmot-edit1}
  \caption{Marmot atop Mt. Dana, Yosemite Natl Park}
  \label{fig:marmot}
\end{figure}
```

(see Figure \ref{fig:marmot})

- Press "Build and View"

Here's what it should look like

TeXstudio interface showing the LaTeX source code and the rendered PDF output.

Source Code (template_Article.tex):

```
2012 & 3,853,404 \\
\hline
2013 & 3,691,191 \\
\hline
2014 & 3,882,642 \\
\hline
2015 & 4,150,217 \\
\hline
2016 & 5,028,868 \\
\hline
\end{tabular}
\caption{Yosemite Annual Visitors 2010-2016}
\label{tab:YosemiteVisitStats}
\end{table}

\newpage
\section{Wildlife}
Yosemite is home to wildlife large and small. Here is
a marmot enjoying the view from Mt. Dana (see Figure \ref{fig:marmot})

\begin{figure}[h!]
\centering
\includegraphics[width=0.7\linewidth]{Marmot-edit1}
\caption{Marmot atop Mt. Dana, Yosemite Natl Park}
\label{fig:marmot}
\end{figure}
\end{document}
```

Rendered PDF Output:

4 Wildlife

Yosemite is home to wildlife large and small. Here is a marmot enjoying the view from Mt. Dana (see Figure 2)




Figure 2: Marmot atop Mt. Dana, Yosemite Natl Park

The interface also shows a Structure pane on the left with a tree view of the document, a Messages pane at the bottom with log output, and a status bar at the very bottom indicating the current page (3 of 4) and zoom level (53%).

Adding tables of contents, figures, and tables

- LaTeX supports automatically generating tables of contents, figures, and tables
 - The `\tableofcontents` command generates a table of contents
 - The `\listoffigures` command generates a table of figures
 - The `\listoftables` command generates a table of tables
 - All these commands immediately insert the results at the point where the command occurs in the document
- Add the code at the right to your document, press "Build and View"

```
\begin{document}
```

```
\maketitle
```

```
\begin{abstract}
```

In this lab, we use LaTeX features for automatically creating table of contents, figures, and tables.

```
\end{abstract}
```

```
\tableofcontents
```

```
\listoffigures
```

```
\listoftables
```

```
\newpage
```

```
\section{Yosemite National Park}
```

Yosemite National Park is one of America's most popular parks.

What is should look like

The screenshot shows the TeXstudio interface with a LaTeX document titled "Lab 8 LaTeX Table of Contents, Figures, and Tables". The document is structured as follows:

Title Page:

Lab 8 LaTeX Table of Contents, Figures, and Tables

Your Name

February 3, 2018

Abstract:

In this lab, we use LaTeX features for automatically creating table of contents, figures, and tables.

Contents:

1	Yosemite National Park	2
2	Park Map	3
3	Visitor Statistics	4
4	Wildlife	5

List of Figures:

1	Map of Yosemite National Park	3
2	Marmot atop Mt. Dana, Yosemite Natl Park	5

List of Tables:

1	Yosemite Annual Visitors 2010-2016)	4
---	-------------------------------------	---

The interface also shows the LaTeX source code on the left, including commands like `\title`, `\author`, `\begin{document}`, `\maketitle`, `\begin{abstract}`, `\end{abstract}`, `\tableofcontents`, `\listoffigures`, `\listoftables`, `\newpage`, `\section{Yosemite National Park}`, `\section{Park Map}`, and `\section{Wildlife}`. The status bar at the bottom indicates "Pages 1 to 2 of 5" and "53%".

Tables of Contents, figures, and tables summary

- LaTeX supports automatically generating a table of contents
 - the `\tableofcontents` command creates the TOC
 - lists the Sections and their page numbers
- LaTeX supports figures including graphics and images using the major image file formats (JPEG, PNG, TIF, others)
 - the `\listoffigures` command generates the list of figures and page numbers
- LaTeX supports tabular data such as tables
 - the `\listoftables` command generates the list of tables and page numbers