

MADC Learning Resource Library

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Table of contents

Resource Library	4
1 Citation Management	5
1.1 Learn Zotero	5
2 Command-line Interface (CLI)	6
2.1 Learn the Command-line	6
2.2 Command-line Tools	6
3 Generative artificial intelligence (GenAI)	8
3.1 Access UM-Supported AI Services	8
3.2 An Introduction to Generative AI	8
4 Git and GitLab	9
4.1 Learn Git	9
4.2 Learn GitLab	10
4.3 Learn Version Control and Source Code Management	11
5 Microsoft 365	12
5.1 Apps Overview	12
5.2 Automation	12
5.3 Data Management	12
5.4 Gantt	12
5.5 Project Management	13
6 Python	14
6.1 Learn Python	14
6.2 Python for Data Science	15
6.3 Python for Data Visualization	16
6.4 Python for Data Wrangling	16
7 R and RStudio	17
7.1 Introduction to R	17
7.2 R and Data Science	19
7.3 R Markdown	20
7.4 R Packages	20

7.5	Write Your Own R Package	21
7.6	Visualization in R	23
7.7	Data Wrangling in R	23
7.8	Programming in R	25
8	Regular Expressions	26
8.1	Learn Regex	26
9	Structured Query Language (SQL)	28
9.1	Learn SQL	28
9.2	Helpful Tools	29
10	Statistics	30
10.1	Statistical Techniques	30
11	Tableau	32
11.1	Learn Tableau	32
11.2	Visualization in Tableau	33
12	Technical Documentation	34
12.1	Best Practices	34
12.2	Markdown & Quarto	34
12.3	Table Formatting	36

Resource Library

Compiled by members of the [Michigan Alzheimer's Disease Center's \(MADC\) Data Core](#), this site contains a growing list of resources for current and newly on-boarded staff to build technical skills supporting the MADDC's day-to-day work.

Feedback and Suggestions

If you would like to make suggestions of resources to include or provide other feedback related to this library, [please submit this form](#). The team will review your suggestions and update the library regularly.

Accessing O'Reilly Ebooks

For any resources linked from the [O'Reilly Safari Learning Platform](#), staff have unlimited access to a free account via the University of Michigan library. When viewing the screen labeled "Welcome! Get instant access through your library":

1. Choose "**Select your institution**" to open the menu and select the first option "**Not listed? Click here.**"
2. In the **Academic email box**, enter your **U-M email address** (in the format: `unique-name@umich.edu`).

Via O'Reilly's Safari Learning Platform, you have access to 40,000+ technical books, videos, interactive tutorials, case studies, learning paths, and audio books across a [myriad of topics](#).

1 Citation Management

Skill Level: Beginner — Intermediate — Advanced

1.1 Learn Zotero

1.1.0.1 [Zotero Quick-Start Guide - Documentation](#)

An overview of Zotero's features and capabilities from the Zotero team

1.1.0.2 [Zotero Research Guide - Reference](#)

A research guide developed by the University of Michigan Library with guidance on saving, organizing, and automating citation management

1.1.0.3 [How To Use Zotero \(A Complete Beginner's Guide\) - Video](#)

A (12 min) tutorial on how to use Zotero for beginners

1.1.0.4 [Upcoming Sessions from the Teaching and Technology Collaborative - Workshops](#)

A listing of upcoming in-person workshops on citation management and research tools from the University of Michigan Library

2 Command-line Interface (CLI)

Skill Level: Beginner — Intermediate — Advanced

2.1 Learn the Command-line

2.1.0.1 [Command Line for Beginners – How to Use the Terminal Like a Pro](#) - Article

An article from [freeCodeCamp](#) that explains the various parts of the command line interface and the basics of how it works

2.1.0.2 [The Linux Command Line](#) - Book

A book, written with the new command line user in mind, which includes the basics of command line use and shell scripting. Check out the corresponding website: [linuxcommand.org](#)

2.1.0.3 [The Art of Command Line](#) - Guide

A guide that provides an overview of interactive Bash for Linux with two sections that include additional guidance for macOS and Windows users

2.1.0.4 [Command Line Fundamentals](#) - Book

Master shell basics and Unix tools and discover easy commands to perform complex tasks with speed

2.2 Command-line Tools

2.2.0.1 [Tabiew](#) - Tool

Tabiew is a lightweight, terminal-based application to view and query delimiter separated value formatted documents, such as CSV and TSV files

2.2.0.2 **emphatic** - Tool

`{emphatic}` is a tool for exploratory analysis of tabular data. It allows the user to visually colour elements of the data, yet still keep all values visible

3 Generative artificial intelligence (GenAI)

Skill Level: [Beginner](#) — [Intermediate](#) — [Advanced](#)

3.1 Access UM-Supported AI Services

3.1.0.1 [ITS AI Services](#) - Article

ITS is now offering a generative AI platform and these service offerings are equitable, accessible, and support everything from basic consumer usage to advanced research and experimentation

3.2 An Introduction to Generative AI

3.2.0.1 [Generative AI for Beginners \(Version 2\)](#) - A Course - Course

Learn the fundamentals of building Generative AI applications with an 18-lesson comprehensive course by Microsoft Cloud Advocates

4 Git and GitLab

Skill Level: Beginner — Intermediate — Advanced

4.1 Learn Git

4.1.0.1 [Pro Git book](#) - Book

Learn git at your own pace with the Pro Git Book, managed by the git community

4.1.0.2 [Git Cheatsheet by GitLab](#) - Cheatsheet

Quick reference guide for important Git commands, created by GitLab

4.1.0.3 [Git Cheatsheet by Atlassian](#) - Cheatsheet

A handy git cheat sheet guide to enhance your workflow, created by Atlassian.

4.1.0.4 [Git Cheatsheet by GitHub](#) - Cheatsheet

Quick reference guide for important Git commands, created by GitHub

4.1.0.5 [Getting Git: Git version control software with RStudio](#) - Video

A recorded workshop on Git version control software with RStudio from the University of Michigan Biostatistics department

4.1.0.6 [Using Git with RStudio](#) - Tutorial

Quick reference step-by-step tutorial on setting up git with RStudio

4.1.0.7 [Git Learning Videos](#) - Video

Links to some basic tutorial videos created by the git maintainer community

4.1.0.8 [Learn Git on the Command Line](#) - Video

A playlist of YouTube videos prepared by Tower, a git client for macOS and Windows

4.1.0.9 [Version Control with Git](#) - Course

An online beginner course, developed by [Software Carpentry](#), teaching the basics of version control with Git

4.1.0.10 [Interactive Git Cheatsheet](#) - Cheatsheet

An interactive Git Cheatsheet, developed by NDP Software, that visually represents git commands and states

4.1.0.11 [Confusing git terminology](#) - Blog

A blog entry from [Julia Evans](#), a software developer, which walks through various git terms that tend to confuse users

4.2 Learn GitLab

4.2.0.1 [Learn GitLab with Pj: A Walkthrough and Explanation](#) - Video

Overview and walkthrough of GitLab Project basics by a member of the GitLab education team

4.2.0.2 [GitLab Flavored Markdown \(GLFM\)](#) - Documentation

Overview of styling and syntax for GitLab's version of Markdown

4.2.0.3 [Use the left sidebar to navigate GitLab](#) - Tutorial

A walk-through of GitLab's navigation in the left-hand sidebar

4.2.0.4 [Learning GitLab](#) - Video

A (1h 3m) LinkedIn Learning tutorial with an overview of basic GitLab UI and functionality

4.3 Learn Version Control and Source Code Management

4.3.0.1 [What is Version Control? \[Learn Git Video Course\]](#) - Video

A short video reviewing the basics of version control and why to use it

4.3.0.2 [GitLab Branching Strategy | GitLab Flow Tutorial Part 1](#) - Video

A (15 min) tutorial discussing GitLab Flow and a conceptual overview of strategies for working with Git

5 Microsoft 365

Skill Level: [Beginner](#) — [Intermediate](#) — [Advanced](#)

5.1 Apps Overview

5.1.0.1 [Describe productivity solutions of Microsoft 365](#) - Module

Learn about how the productivity solutions through Microsoft 365 help optimize operations, enhance content creation, and empower people to perform tasks in real-time from virtually anywhere

5.2 Automation

5.2.0.1 [Learning Power Automate Desktop for Developers](#) - Video

A (1h 45m) introductory course on getting started with Power Automate Desktop.

5.3 Data Management

5.3.0.1 [Managing Data with Microsoft 365](#) - Video

A (1h 3m) overview course on managing data with Microsoft Forms, Excel, Power Automate, and Power BI

5.4 Gantt

5.4.0.1 [Present your data in a Gantt chart in Excel](#) - Tutorial

Microsoft 365 subscription offers premium Gantt chart templates designed to help you track project tasks with visual reminders and color-coded categories

5.4.0.2 [Get organized with Gantt chart templates](#) - Templates

A listing of Gantt chart templates for Excel

5.4.0.3 [Use a wizard to create a Gantt Chart](#) - Tutorial

Specific to Microsoft Project, which includes a wizard to walk through the creation of a Gantt chart

5.4.0.4 [Building a Gantt Chart using Power BI](#) - Tutorial

A step-by-step guide on loading an excel sheet into Power BI to create a Gantt chart

5.4.0.5 [Set up a basic Gantt chart in Excel](#) - Video

A 10 minute video walking through the process of a setting up a Gantt chart using Excel

5.4.0.6 [Using Excel for Gantt charts: My top 10 tips](#) - Video

A quick 4 minute video with pro tips on using Excel for Gantt charts

5.5 Project Management

5.5.0.1 [Managing Projects with Microsoft 365](#) - Video

A (49m) overview course on managing project using Microsoft Lists, Planner, and Project

5.5.0.2 [Microsoft Planner Essential Training](#) - Video

A (1h 27m) LinkedIn Learning course on the essential features of Microsoft Planner

6 Python

Skill Level: Beginner — Intermediate — Advanced

6.1 Learn Python

6.1.0.1 [PEP 8 – Style Guide for Python Code](#) - Documentation

This document gives coding conventions for the Python code comprising the standard library in the main Python distribution

6.1.0.2 [Python Tutor](#) - Tutorial

The Python Tutor is a unique step-by-step visual debugger and AI tutor to help you understand and debug code

6.1.0.3 [Python for Everybody](#) - Course

This web site is building a set of free [materials](#), [lectures](#), [book](#) and assignments to help students learn how to program in Python

6.1.0.4 [Python Virtual Environments](#) - Tutorial

A quick guide for setting up Python virtual environments on macOS and Windows
10

6.1.0.5 [Fluent Python](#) - Textbook

A hands-on guide walking through how to write effective, modern Python 3 code by leveraging its core language features and libraries

6.1.0.6 [pandas Documentation](#) - Documentation

pandas is an open source, BSD-licensed library providing high-performance, easy-to-use data structures and data analysis tools for the Python programming language

6.1.0.7 [Think Python: How to Think Like a Computer Scientist](#) - Textbook

A textbook that teaches Python through the lens of a computer scientist, utilizing the best features from mathematics, engineering, and natural science

6.1.0.8 [Programming with Python](#) - Course

An online beginner course, developed by [Software Carpentry](#), introducing the basics of Python programming through data analysis

6.2 Python for Data Science

6.2.0.1 [Data Analysis with Pandas and Python](#) - Textbook

A text that introduces you to the popular Pandas library built on top of the Python programming language

6.2.0.2 [Python for Data Analysis, 3rd Edition](#) - Textbook

A definitive handbook for manipulating, processing, cleaning, and crunching datasets in Python

6.2.0.3 [Pandas for Everyone: Python Data Analysis, 2nd Edition](#) - Textbook

A text providing practical knowledge and insight for solving real problems with [pandas](#), even for those new to Python data analysis

6.2.0.4 [Python Data Science Handbook, 2nd Edition](#) - Textbook

A handbook for scientific computing in Python that highlights the data science stack - IPython, NumPy, pandas, Matplotlib, Scikit-Learn, and other related tools

6.3 Python for Data Visualization

6.3.0.1 [Introduction to Data Visualization in Python - Tutorial](#)

An article with quick tutorials on visualizing data with Python in Matplotlib, Pandas, and Seaborn

6.3.0.2 [A Complete Guide to Data Visualization in Python With Libraries & More - Video](#)

A (1h 54m) video with transcription which reviews the basics of data visualization in Python with Matplotlib and Seaborn

6.3.0.3 [Great Tables: Absolutely Delightful Table-making in Python - Documentation](#)

Documentation for the [Great Tables](#) Python package that makes it easy to generate information-rich, publication-quality tables. The package leverages [pandas](#) and [polars](#) dataframes

6.4 Python for Data Wrangling

6.4.0.1 [polars' Rgonomic Patterns - Blog](#)

A blog post highlighting the advanced data wrangling functionality in python's [polars](#) package to see how it mirrors `dplyr` and `tidyr`'s syntax

7 R and RStudio

Skill Level: Beginner — Intermediate — Advanced

7.1 Introduction to R

7.1.0.1 [Programming with R](#) - Course

An online beginner course, developed by [Software Carpentry](#), introducing the basics of R programming through data analysis

7.1.0.2 [R for Reproducible Scientific Analysis](#) - Course

An online beginner course, developed by [Software Carpentry](#), introducing the basics of R programming through analysis of the gapminder data

7.1.0.3 [Base R Cheat Sheet from Posit](#) - Cheatsheet

A quick reference guide (downloadable pdf) of basic syntax and functionality in R

7.1.0.4 [R for Data Science: Analysis and Visualization](#) - Video

An introductory LinkedIn Learning course (2h 46m) on the basics of getting started with R for data visualization, wrangling, and analysis

7.1.0.5 [Quick-R](#) - Reference

Site containing a broad overview of R resources for learning R created by a statistical consultant and research methodologist

7.1.0.6 Introduction to R and RStudio - Video

A recorded workshop on workflow basics, scripts, and projects from the University of Michigan Biostatistics department

7.1.0.7 R Essential Training: Wrangling and Visualizing Data - Video

An introductory LinkedIn Learning course (4h 18m) on the essential tools for importing visualizing, and wrangling data in R

7.1.0.8 Big Book of R - Reference

A listing of over 300 Reference books on the R programming language

7.1.0.9 Tidy design principles - Book

Still under development, this book identifies challenges and patterns to help you write better R code. There is also a [related Tidy Design Principles blog/newsletter](#) that the author is maintaining during the writing process

7.1.0.10 The tidyverse style guide - Book

A site that describes the style used throughout the tidyverse, written by Hadley Wickham of Posit

7.1.0.11 23 RStudio Tips, Tricks, and Shortcuts - Blog

A blog post covering some of the best features of RStudio with a list of tips, tricks, and shortcuts

7.1.0.12 What They Forgot to Teach You About R - Book

This book focuses on content intrinsically related to the infrastructure surrounding data analysis in R, but does not delve into the data analysis itself

7.1.0.13 [R for the Rest of Us: A Statistics-Free Introduction](#) - Book

A crash course in R, a quick tour of the RStudio programming environment, and a collection of real-world applications that you can put to use right away

7.2 R and Data Science

7.2.0.1 [R for Data Science \(2e\)](#) - Textbook

FREE 2nd edition of “R for Data Science” which provides practical skills for data science, including data importation, data structuring, data transformation, and data visualization

7.2.0.2 [Statistical Inference via Data Science: A ModernDive into R and the Tidyverse](#) - Textbook

The companion website to Chester Ismay and Albert Y. Kim’s introductory statistics textbook, which walks students through the entire data analysis pipeline using R and tidyverse

7.2.0.3 [R Screencasts](#) - Video

Live data analysis screencasts from a top Data Scientist, David Robinson

7.2.0.4 [Tools for Analyzing R Code the Tidy Way](#) - Article

An article on two packages, [matahari](#) and [tidycode](#), written to analyze R code in a tidy manner

7.2.0.5 [Tidy Modeling with R](#) - Textbook

A guide to using a collection of software in the R programming language for model building called tidymodels

7.3 R Markdown

7.3.0.1 [R Markdown Cookbook](#) - Textbook

This book is broken down into small “recipes” that aim to demonstrate a single R Markdown concept at a time.

7.3.0.2 [R Markdown: The Definitive Guide](#) - Reference

This book is a definitive reference guide to the R Markdown language

7.3.0.3 [R Markdown Tips, Tricks, and Shortcuts](#) - Blog

A blog post with some helpful tips and tricks for working with R Markdown in RStudio

7.4 R Packages

7.4.0.1 [Quick list of useful R packages](#) - Reference

A categorized list of recommended free libraries of code written by the active user community

7.4.0.2 [CRAN Task Views](#) - Reference

Comprehensive R Archive Network (CRAN)’s listing of packages by topic area or “task”, i.e. Bayesian, ClinicalTrials, MachineLearning, MissingData, etc

7.4.0.3 [ggplot2 Cheatsheet by Posit](#) - Cheatsheet

A quick reference guide for basic syntax and functionality of the data visualization ggplot2 package, including a downloadable pdf

7.4.0.4 [rmarkdown Cheatsheet by Posit](#) - Cheatsheet

A quick reference guide for basic syntax and functionality of the authoring framework rmarkdown, including a downloadable pdf

7.4.0.5 [tidyverse Cheatsheet by Posit](#) - Cheatsheet

A quick reference guide for basic syntax and functionality of the data science packages that comprise the tidyverse, including a downloadable pdf

7.4.0.6 [dplyr Cheatsheet by Posit](#) - Cheatsheet

A quick reference guide for basic syntax and functionality of the data manipulation dplyr package, including a downloadable pdf

7.4.0.7 [tidyr Cheatsheet by Posit](#) - Cheatsheet

A quick reference guide for basic syntax and functionality of the data cleaning tidyr package, including a downloadable pdf

7.4.0.8 [Using Python with RStudio and reticulate](#) - Video

This tutorial walks through the steps to enable data scientists to use RStudio and the reticulate package to call their Python code from Shiny apps, R Markdown notebooks, and Plumber REST APIs

7.4.0.9 [htmlwidget](#)- Documentation

A package for creating JavaScript data visualizations in R

7.4.0.10 [reprex](#) - Documentation

An R package for preparing reproducible examples of R code

7.5 Write Your Own R Package

7.5.0.1 [Reproducible research with R, RStudio and GitLab](#) - Documentation

A manual describing easy reproducibility and collaboration with R and Git

7.5.0.2 [Instructions for Creating Your Own R Package](#) - Article

An article with a step-by-step guide to creating your own R package

7.5.0.3 [Writing R Packages in RStudio](#) - Tutorial

A tutorial walking through the set up of a basic R package that can be installed from GitHub

7.5.0.4 [Making Your First R Package](#) - Blog

A blog entry that walks through the steps of organizing code in a package with consistent documentation

7.5.0.5 [The Package: learning how to build an R package](#) - Blog

A blog entry from R-Bloggers that walks through the process of setting up an R package

7.5.0.6 [Writing an R package from scratch](#) - Blog

A blog entry from Hilary Parker of Etsy on setting up your first R package from scratch

7.5.0.7 [CRAN documentation on Creating R packages](#) - Reference

Original documentation on how to create an R package from the Comprehensive R Archive Network (CRAN)

7.5.0.8 [How to write your own R package and publish it on CRAN](#) - Tutorial

A blog tutorial on writing and publishing R packages

7.5.0.9 [R Packages \(2e\)](#) - Textbook

Learn how to create a package, the fundamental unit of shareable, reusable, and reproducible R code from Hadley Wickham and Jennifer Bryan of Posit

7.6 Visualization in R

7.6.0.1 [The R Graph Gallery](#) - Reference

A collection of R's available chart types listed by purpose, and including guidance on required packages and syntax

7.6.0.2 [Data Visualization in R With ggplot2](#) - Video

A video course on how to create great looking, insightful data visualizations using the R package, ggplot2

7.6.0.3 [Color in Data Vis](#) - Blog

A feed of blog entries on the selection of beautiful, legible colors in data visualization, charts, and maps

7.6.0.4 [Exciting Data Visualizations with ggplot2 Extensions](#) - Video

A (1h 28m) presentation, by [Cédric Scherer](#), diving into the world of data visualization and the art of creating engaging and effective data graphics with ggplot2

7.6.0.5 [Psychology of Data Visualization](#) - Course

An online self-paced course that examines a variety of issues related to data visualization from a largely psychological perspective, including an overview of ggplot2

7.6.0.6 [Modern Data Visualization with R](#) - Book

A helpful and user-friendly book that walks through creating the most popular visualizations - from quick and dirty plots to publication-ready graphs

7.7 Data Wrangling in R

7.7.0.1 [tidyexplain](#) - Tutorial

Animations of tidyverse verbs using R, the tidyverse, and gganimate

7.7.0.2 [Data Wrangling with R](#) - **Textbook**

A text for all levels of R programmers, covering the various data wrangling packages: dplyr, tidyr, httr, stringr, lubridate, readr, rvest, magrittr, xlsx, readxl, and others

7.7.0.3 [Data Wrangling in R](#) - **Video**

A (2h 51m) LinkedIn Learning course that provides an overview of data wrangling techniques for cleaning and transforming data

7.7.0.4 [Introduction to the Tidyverse](#) - **Video**

A recorded workshop on the tidyverse and visualizing data in ggplot2 from the University of Michigan Biostatistics department

7.7.0.5 [Learning the R Tidyverse](#) - **Video**

A (3h 50m) LinkedIn Learning course walking through the tidyverse approach to data science

7.7.0.6 [The Quartz Guide to Bad Data](#) - **Reference**

This guide presents thorough descriptions and suggested solutions to many of the kinds of problems that you will encounter when working with data

7.7.0.7 [Visualizing {dplyr}'s mutate\(\), summarize\(\), group_by\(\), and ungroup\(\) with animations](#) - **Article**

Visually explore how {dplyr}'s more complex core functions work together to wrangle data

7.7.0.8 [Introduction to R with Tidyverse](#) - **Course**

This course is a gentle introduction to the RStudio interface and provides the basics of the R coding language and syntax. This course is ideal for beginners with little or no prior coding experience

7.8 Programming in R

7.8.0.1 [Introduction to Programming in R](#) - Video

A recorded workshop on functions, vectors, and iteration in R from the University of Michigan Biostatistics department

7.8.0.2 [Efficient R Programming](#) - Textbook

A textbook for all skill levels on making R code faster, more efficient, and scalable

7.8.0.3 [Hands-On Programming with R](#) - Textbook

This book will teach you how to program in R, with hands-on examples.

7.8.0.4 [Advanced R](#) - Textbook

An advanced textbook on metaprogramming or the idea that code is data that can be inspected and modified programmatically

7.8.0.5 [R Programming for Data Science](#) - Textbook

This book is about the fundamentals of R programming. With the fundamentals provided in this book, you will have a solid foundation on which to build your data science toolbox.

8 Regular Expressions

Skill Level: Beginner — Intermediate — Advanced

8.1 Learn Regex

8.1.0.1 [Regex101](#) - Tool

Helpful online tool for learning, building, and matching regular expressions to a test string

8.1.0.2 [RegExr](#) - Tool

Helpful online tool for learning, building, and matching regular expressions to a test string

8.1.0.3 [RegexOne](#) - Tutorial

An interactive tutorial with simple exercises for learning regular expressions

8.1.0.4 [RegexLearn](#) - Tutorial

A step-by-step tutorial for practicing regular expressions

8.1.0.5 [RegexLearn Cheatsheet](#) - Cheatsheet

Quick reference guide for regex syntax

8.1.0.6 [Learning Regular Expressions](#) - Video

A (3h 18m) LinkedIn Learning course with a broad overview of regular expressions

8.1.0.7 **Pythex** - Tool

Helpful interactive tool for testing Python regular expressions

9 Structured Query Language (SQL)

Skill Level: Beginner — Intermediate — Advanced

9.1 Learn SQL

9.1.0.1 [SQL Tutorial](#) - Tutorial

A self-paced tutorial, by [w3schools](#), that walks through basic SQL commands

9.1.0.2 [SQL Keywords Reference](#) - Reference

A quick reference list of the reserved words in SQL

9.1.0.3 [SQLZoo Tutorial](#) - Tutorial

A step by step tutorial reviewing the basics of SQL queries

9.1.0.4 [Practical SQL, 2nd Edition](#) - Book

An approachable and fast-paced guide to SQL (Structured Query Language), the standard programming language for defining, organizing, and exploring data in relational databases

9.1.0.5 [Learn SQL](#) - Course

A free self-paced course, developed by [codecademy](#), which demonstrates how to manage large datasets and analyze real data using standard data management language

9.1.0.6 [SQLBolt: Introduction to SQL](#) - Course

A series of interactive lessons and exercises designed to help you quickly learn SQL in your browser

9.1.0.7 [SQL join flavors](#) - Article

An article that explores various types of SQL joins, including helpful visualizations for each

9.1.0.8 [SQL for the Weary](#) - Tutorial

A tutorial with notes and working examples for various SQL and database functions

9.1.0.9 [SQL Style Guide](#) - Reference

A SQL syntax guide designed to be compatible with Joe Celko's [SQL Programming Style](#) book

9.2 Helpful Tools

9.2.0.1 [SQL Polyglot](#) - Tool

A browser-based tool for checking if a particular SQL feature is supported in various database systems

10 Statistics

Skill Level: Beginner — Intermediate — Advanced

10.1 Statistical Techniques

10.1.0.1 [Institute for Social Research \(ISR\) Population Dynamics and Health Program Workshops - Video](#)

A listing of past virtual workshops on various statistical techniques

10.1.0.2 [Consulting for Statistics, Computing, & Analytics Research \(CSCAR\) Workshops - Events](#)

A listing of upcoming in-person workshops on various statistical techniques

10.1.0.3 [Statistical Inference via Data Science: A ModernDive into R and the Tidyverse - Textbook](#)

The companion website to Chester Ismay and Albert Y. Kim's introductory statistics textbook, which walks students through the entire data analysis pipeline using R and tidyverse

10.1.0.4 [Statistics Course for Data Science - Video](#)

The Statistics for Data Science Course covers statistical concepts taught in many intro and intermediate statistics courses in universities and colleges

10.1.0.5 [Think Stats: Exploratory Data Analysis in Python - Textbook](#)

This text is an introduction to the practical tools of exploratory data analysis

10.1.0.6 Probably Overthinking It: Data Science and Bayesian Statistics - Blog

A blog series by Allen Downey, a curriculum designer at Brilliant, professor emeritus at Olin College, and author of Think Python, Think Bayes, and other books

10.1.0.7 50 years of Data Science - Article

An article based on a presentation from the 2015 Tukey Centennial workshop reviewing the last 50 years of Data Science and its emergence from the fields of statistics and machine learning

10.1.0.8 Lessons in Statistical Thinking - Book

Lessons in Statistical Thinking presents the statistical ideas and methods behind decision-making to guide action

11 Tableau

Skill Level: Beginner — Intermediate — Advanced

11.1 Learn Tableau

11.1.0.1 [Tableau for Data Scientists](#) - Video

A (5h 55m) LinkedIn Learning course on how to visualize data in Tableau through a Data Science lens

11.1.0.2 [Creating Interactive Tableau Dashboards](#) - Video

A (3h 28m) LinkedIn Learning course on how to create interactive dashboards in Tableau

11.1.0.3 [Tableau and R for Analytics Projects](#) - Video

A (2h 27m) LinkedIn Learning course on visualizing data with Tableau and R

11.1.0.4 [IT4U91: 50 Tableau Tips](#) - Video

A (40m) video on techniques and tips for building Tableau visualizations from the University of Michigan's ITS department

11.1.0.5 [IT4U79: Tiled Dashboards Design in Tableau](#) - Video

A (43m) video on building a dashboard layout in Tableau by the University of Michigan's ITS department

11.2 Visualization in Tableau

11.2.0.1 [Data Visualization Tips and Tricks](#) - Video

A (2h 14m) LinkedIn Learning course giving guidance on basic data visualization

12 Technical Documentation

Skill Level: Beginner — Intermediate — Advanced

12.1 Best Practices

12.1.0.1 [How to name files by Jennifer Bryan of Posit](#) - Video

Low-tech common sense about filenames. The holy trinity is: machine readable, human readable, sorted in a useful way

12.1.0.2 [The Documentation System](#) - Reference

A simple, comprehensive and nearly universally-applicable scheme for writing software documentation

12.1.0.3 [Diátaxis technical documentation system](#) - Reference

This reference describes an information architecture that emerges from a systematic approach to understanding the needs of documentation users

12.1.0.4 [How To Write a Useful README for Your Next Project](#) - Article

An article outlining the “must-haves” for any project’s README file

12.2 Markdown & Quarto

12.2.0.1 [Getting Started: An overview of Markdown...](#) - Reference

The Markdown Guide is a comprehensive Markdown reference designed for both novices and experts

12.2.0.2 [John Gruber's Markdown documentation](#) - Documentation

The original Markdown documentation, written by the creator of Markdown

12.2.0.3 [Markdown Tutorial](#) - Tutorial

A web-based walk-through of Markdown basics

12.2.0.4 [Awesome Markdown](#) - Reference

A listing of Markdown libraries, services, editors, tools, cheatsheets, etc.

12.2.0.5 [Awesome Quarto](#) - Reference

The most up to date curated list of Quarto docs, talks, tools, examples & articles the internet has to offer

12.2.0.6 [R Markdown Tips, Tricks, and Shortcuts](#) - Blog

A blog post with some helpful tips and tricks for working with R Markdown in RStudio

12.2.0.7 [Trello Markdown Support](#) - Reference

A reference chart that indicates which Markdown features are supported in Trello, along with a link to their syntax

12.2.0.8 [How to format your text in Trello](#) - Tutorial

A quick guide to the keyboard shortcuts and Markdown features available in Trello

12.2.0.9 [Quarto Example Gallery](#) - Tutorial

Quarto can produce a wide variety of output formats. This resource contains examples of the following categories: [Articles & Reports](#), [Presentations](#), [Dashboards](#), [Websites](#), [Books](#), [Interactive Docs](#)

12.3 Table Formatting

12.3.0.1 [The Design Philosophy of Great Tables](#) - Article

Tables have come a long way and we've learned a lot from our continued research in tabular design. This article walks through the philosophy behind the [Great Tables package](#)