Principles of

Data Science

applicable.) An excerpt of the ISM, consisting of the solutions/sample answers for the odd-numbered questions only, will also be available as a Student Solution Manual (SSM), downloadable from the public OpenStax Student Resources web page. (Answers to the Group Projects are not provided, as they are integrative, exploratory, open-ended assignments.)

About the Authors

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Additional Resources

Student and Instructor Resources

We've compiled additional resources for both students and instructors, including Getting Started Guides. Instructor resources require a verified instructor account, which you can apply for when you log in or create your account on OpenStax.org. Take advantage of these resources to supplement your OpenStax book.

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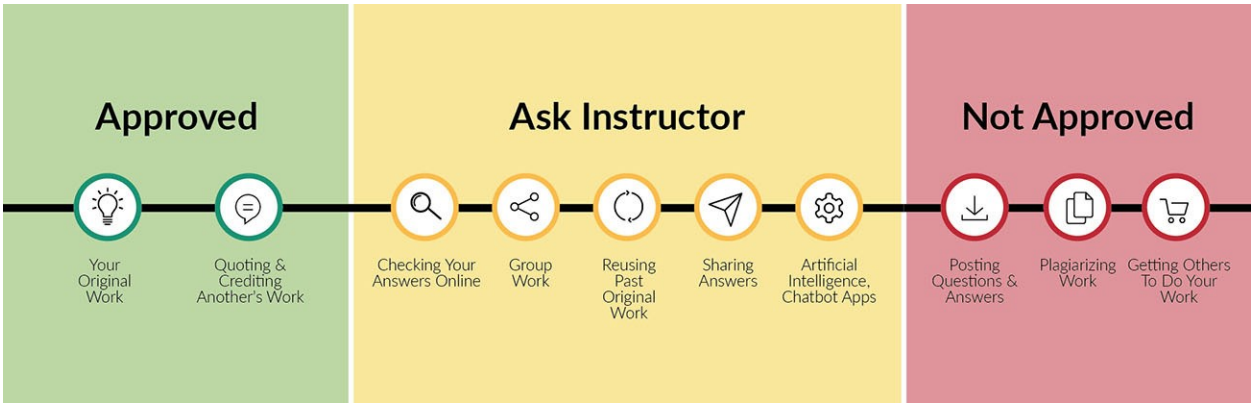
We realize that students benefit when academic integrity ground rules are established early in the course. To that end, OpenStax has created an interactive to aid with academic integrity discussions in your course.



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What Are Data and Data Science?

Figure 1.1 Petroglyphs are one of the earliest types of data generated by humanity, providing vital information about the daily life of the people who created them. (credit: modification of work “Indian petroglyphs (~100 B.C. to ~1540 A.D.) (Newspaper Rock, southeastern Utah, USA) 24” by James St. John/Flickr, CC BY 2.0)

Chapter Outline

Introduction

Many of us use the terms “data” and “data science,” but not necessarily with a lot of precision. This chapter will define data science terminology and apply the terms in multiple fields. The chapter will also briefly introduce the types of technology (such as statistical software, spreadsheets, and programming languages) that data scientists use to perform their work and will then take a deeper dive into the use of Python for data analysis. The chapter should help you build a technical foundation so that you can practice the more advanced data science concepts covered in future chapters.

1.1 What Is Data Science?

Learning Outcomes

By the end of this section, you should be able to:

- 1.1.1 Describe the goals of data science.
- 1.1.2 Explain the data science cycle and goals of each step in the cycle.
- 1.1.3 Explain the role of data management in the data science process.

Data science is a field of study that investigates how to collect, manage, and analyze data of all types in order to retrieve meaningful information. Although we will describe data in more detail in Data and Datasets, you can consider datato be any pieces of evidence or observations that can be analyzed to provide some insights.