Understanding Data Science Roles: Who Does What?

A close-up of hands on a computer screen

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Today’s world revolves around data—there’s no getting around that fact. Every time we use our smartphones or log into our computers, we leave a trail of data behind us. That data holds key insights into our behavior, our likes and dislikes, and the products we purchase. How do businesses make sense of all that data? By hiring skilled individuals to perform careful analysis and uncover trends, improve business practices, and make more profitable decisions.

With data becoming increasingly important to companies’ bottom lines, data scientists are some of the most valuable individuals in the professional world today. But with more open roles in the field than ever before, the initial excitement from seeing all those job postings can quickly turn to anxiety when you realize just how many options are out there. Not to mention the positions that you don’t even know about yet.

Looking to leverage your [**data boot camp**](https://bootcamp.cvn.columbia.edu/data/) knowledge or jumpstart a career in data science? Below, we’ll take a look at some of the more popular data science jobs, what they do, and the skills they require to be successful—so you can determine which one is right for you.

What is a Data Scientist?

The first thing to keep in mind is that the phrase “data scientist” tends to be used as an umbrella term for just about every job in the field. In fact, if you ask ten different people what they think a data scientist does, you’ll likely get ten different answers.

The reality is, data science is a vast field that employs individuals in a variety of roles and responsibilities. They may hold the title of Data Analyst, Business Analyst, Software Engineer, Marketing Data Scientist, or Machine Learning Engineer—just to name a few. Because data has become so prevalent in our everyday lives, it might surprise you to learn which industries are actively searching for and hiring data science professionals.

Unfortunately, many companies’ job listings don’t always get the distinction right, so it’s crucial to understand your personal and professional goals before starting your search for a [**data boot camp**](https://bootcamp.cvn.columbia.edu/data/) and eventually, a job in the field.

Data Science Roles

Data science teams are constantly faced with complex problems they need to solve using—you guessed it—data. Whether it’s analyzing the sentiment of incoming communications (like Tweets or survey responses), tracking sales leads, or devising a new marketing campaign, there are a variety of data science jobs assigned to perform the myriad processes required of the field. While many of these positions share some of the same tools and responsibilities, the day-to-day experience for each can vary drastically.

Whether you’re preparing to enroll in a boot camp or you’re starting the job hunt for a position in the field, you should have a basic idea of how you want to [**apply your data analytics skills**](https://bootcamp.cvn.columbia.edu/blog/data-analyst-skills/). Take a look at some of the most in-demand data science jobs to get a better understanding of how they fit into their respective teams.

Data Analyst

As a typical entry-level position, a Data Analyst’s primary job is to develop systems that collect and sift through company data, then use it to extract insights that answer business questions with actionable solutions. Individuals in this role should have a keen eye for detail and the ability to brainstorm new approaches to analyzing data. Often times, Data Analysts are tapped to work with a variety of departments and individuals, so collaboration and communication skills are a must, especially when explaining technical ideas to non-technical teams.

* **Responsibilities:**Accessing and cleaning data, performing statistical analysis, visualizing and communicating the results
* **Programming languages required:**Python, R, SQL
* **Tools/skills required:** Data science programming, probability and statistics, collaboration, communication
* **Growth potential:**Many Data Analysts go on to become senior analysts or take on a management role at larger companies with data teams
* **Top industries:** Finance, insurance, gambling, retail banking, consumer products, healthcare, energy
* **Open job positions on Indeed\*:**23,146

Data Scientist

Think of a Data Scientist as taking the Data Analyst role another step further down the data science funnel. Data Scientists take on many of the same responsibilities as analysts, but they’re also responsible for building machine learning models and working with algorithms to make accurate predictions based on collected data—ultimately making Data Analysts’ jobs a little easier. Of course, it’s always good to know how analysis fits into the larger picture, and successful Data Scientists have a solid understanding of handling raw data, analyzing it, and sharing insights in a compelling way. Since the role tends to be more independent, motivation and curiosity go a long way for these professionals.

* **Responsibilities:** Analyzing data, building and training machine learning models to make reliable future predictions
* **Programming languages required:** Python, R
* **Tools/skills required:**Everything required from a data analyst, plus strong foundations in math, analytics, and computer science, knowledge of machine learning methods, statistical models, advanced data science programming and familiarity with Apache Spark
* **Growth potential:** Data Scientists may move on to become a senior data scientist, while some decide to take the path to become a machine learning engineer or a chief data officer
* **Top industries:**Healthcare, telecommunications, energy, automotive
* **Open job positions on Indeed\*:** 12,088

Business Analyst

In order for Data Analysts’ insights to be communicated throughout a company, it’s up to the Business Analyst to use storytelling techniques to turn them into actionable business insights. The main goal for individuals in this role is to facilitate potential solutions to organizational problems, but they should also be prepared to take on additional responsibilities like quality assurance and management. Needless to say, time management and prioritization are common traits shared among successful Business Analysts—and you’re not likely to get hired as one without them. While it’s not a heavily tech-focused role, understanding how to apply a variety of business processes using high-level strategic thinking is a crucial skill for these data science specialists.

* **Responsibilities:** Use data-driven insights to clearly communicate initiatives throughout entire organizations, often acting as the intermediary between a company’s business and tech teams
* **Programming languages required:**SQL, Tableau
* **Tools/skills required:**Understanding of business processes, data visualization tools, listening and storytelling, data modeling
* **Growth potential:**With experience, many Business Analysts take on a leadership title or move on to more senior roles in product management
* **Top industries:**Telecom, utilities, real estate, healthcare, government, pharmaceuticals
* **Open job positions on Indeed\*:**20,244

Software Engineer

Nowadays, most software companies want to leverage their users’ data to optimize their offerings, while data-driven businesses have turned to creating custom software built around their specific needs or goals. That’s where Software Engineers come in. Depending on the type of company, a Software Engineer might be tasked with optimizing certain product features based on user data, or they might be responsible for building a new program that will ultimately increase a company’s bottom line. Needless to say, individuals holding these roles should be well-versed in programming *and* data analytics to truly be successful.

* **Responsibilities:**Collaborate with data scientists and business analysts to ensure alignment between the business objectives and the analytics back-end of the software they are working to produce or modify, as well as ensure the scalability and security of the final product
* **Programming languages required:**Java, Python, C, C++
* **Tools/skills required:**Experience with machine learning and deep learning frameworks, understanding of mathematics including linear algebra and statistics, strong programming and debugging skills, data processing, writing and communication, and attention to detail
* **Growth potential:**Given the fact that this is a relatively new role within the industry, the opportunities for individuals holding this role are virtually endless
* **Top industries:**Retail, healthcare, research and development, government and defense, IT services
* **Open job positions on Indeed\*:**110,188

Marketing Data Scientist

When a company builds a new campaign, it’s up to the Marketing Data Scientist to analyze company data and user research to inform the marketing strategy around the launch and measure its outcomes. On a granular level, this could involve anything from email marketing and search engine optimization (SEO) to web analytics and growth hacking—and everything in between! To be a successful Marketing Data Scientist, candidates need to have the ability to leverage data to enhance key marketing components and achieve desired company outcomes. Because market data tends to change rapidly, Marketing Data Scientists should be able to adapt to the pace at which campaigns progress.

* **Responsibilities:**Gather and analyze data to objectively strategize the launch and evolution of a business’s promotions and marketing campaigns while communicating between stakeholders
* **Programming languages required:**SQL, Python, R, Tableau
* **Tools/skills required:**Solid understanding of data analytics, objective thinking, strong communication, and adaptability
* **Growth potential:**With so many specialties to choose from, the sky’s the limit for individuals holding a Marketing Data Scientist role, some of whom go on to hold senior-level positions or even start their own companies
* **Top industries:**Banking and finance, advertising, retail, technology, travel
* **Open job positions on Indeed\*:**3,336

Machine Learning Engineer

While Data Scientists build a company’s machine learning models and Data Analysts determine which data is worthy of exploring, it’s the Machine Learning Engineer who wrangles and applies the algorithms to the datasets. Usually, the ultimate goal for individuals in this role is to eventually create artificial intelligence. There’s plenty of trial-and-error involved in the job, so persistence and resilience are key contributors to success. In addition, having a solid understanding of how long it takes to apply various approaches will also prove advantageous in this field.

* **Responsibilities:**Processing data provided by a company’s Data Analyst using machine learning algorithms developed by the Data Scientist to glean insights that will ultimately drive business decisions
* **Programming languages required:**R, Java, Python, C++
* **Tools/skills required:**Strong communication paired with an understanding of data structures, vectors, matrices, derivatives and integrals, as well as statistical concepts and probability theory
* **Growth potential:** Many Machine Learning Engineers progress to become more specialized in deep learning methods, while others transition to machine learning researchers or leads on data engineering teams
* **Top industries:**Healthcare, financial services, retail, government, transportation
* **Open job positions on Indeed\*:** 19,159