A data analyst collects, cleans, and interprets data sets in order to answer a question or solve a problem. They work in many industries, including business, finance, criminal justice, science, medicine, and government.

What kind of customers should a business target in its next ad campaign? What age group is most vulnerable to a particular disease? What patterns in behavior are connected to financial fraud?

These are the types of questions you might be pressed to answer as a data analyst. Read on to find out more about what a data analyst is, what skills you'll need, and how you can start on a path to become one.

**What is data analysis?**

Data analysis is the process of gleaning insights from data to inform better business decisions. The process of analyzing data typically moves through five iterative phases:

* **Identify** the data you want to analyze
* **Collect** the data
* **Clean** the data in preparation for analysis
* **Analyze** the data
* **Interpret** the results of the analysis

Data analysis can take different forms, depending on the question you’re trying to answer. You can read more about the [types of data analysis](https://www.coursera.org/articles/what-is-data-analysis-with-examples) here. Briefly, descriptive analysis tells us what happened, diagnostic analysis tells us why it happened, predictive analytics forms projections about the future, and prescriptive analysis creates actionable advice on what actions to take.

**Data analyst tasks and responsibilities**

A data analyst is a person whose job is to gather and interpret data in order to solve a specific problem. The role includes plenty of time spent with data but entails communicating findings too.

Here’s what many data analysts do on a day-to-day basis:

* **Gather data:**Analysts often collect data themselves. This could include conducting surveys, tracking visitor characteristics on a company website, or buying datasets from data collection specialists.
* **Clean data:** Raw data might contain duplicates, errors, or outliers. Cleaning the data means maintaining the quality of data in a spreadsheet or through a programming language so that your interpretations won’t be wrong or skewed.
* **Model data:**This entails creating and designing the structures of a database. You might choose what types of data to store and collect, establish how data categories are related to each other, and work through how the data actually appears.
* **Interpret data:** Interpreting data will involve finding patterns or trends in data that could answer the question at hand.
* **Present:**Communicating the results of your findings will be a key part of your job. You do this by putting together visualizations like charts and graphs, writing reports, and presenting information to interested parties.

**What tools do data analysts use?**

During the process of data analysis, analysts often use a wide variety of tools to make their work more accurate and efficient. Some of the most common tools in the data analytics industry include:

* Microsoft Excel
* Google Sheets
* SQL
* Tableau
* R or Python
* SAS
* Microsoft Power BI
* Jupyter Notebooks

**Data analyst salary and job outlook**

The average base [salary for a data analyst](https://www.coursera.org/articles/how-much-do-data-analysts-make-salary-guide) in the US is $69,517 in December 2021, according to Glassdoor. This can vary depending on your seniority, where in the US you’re located, and other factors.

Data analysts are in high demand. The World Economic Forum listed it as number two in growing jobs in the US [[1](https://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf)]. The Bureau of Labor Statistics also reports related occupations as having extremely high growth rates.

From 2020 to 2030, operations research analyst positions are expected to grow by 25 percent, market research analysts by 22 percent, and mathematicians and statisticians by 33 percent. That’s a lot higher than the total employment growth rate of 7.7 percent.

**Data analyst vs. data scientist: What’s the difference?**

Data analysts and data scientists both work with data, but what they do with it differs. Data analysts typically work with existing data to solve defined business problems. Data scientists build new algorithms and models to make predictions about the future. Learn more about the [difference between data scientists and data analysts](https://www.coursera.org/articles/data-analyst-vs-data-scientist-whats-the-difference).

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**Types of data analysts**

As advancing technology has rapidly expanded the types and amount of information we can collect, knowing how to gather, sort, and analyze data has become a crucial part of almost any industry. You’ll find data analysts in the criminal justice, fashion, food, technology, business, environment, and public sectors—among many others.

People who perform data analysis might have other titles such as:

* Medical and health care analyst
* [Market research analyst](https://www.coursera.org/articles/market-research-analyst)
* [Business analyst](https://www.coursera.org/articles/what-does-a-business-analyst-do-and-how-to-become-one)
* [Business intelligence analyst](https://www.coursera.org/articles/business-intelligence-analysts-what-they-are-and-how-to-become-one)
* Operations research analyst
* Intelligence analyst

**How to become a data analyst**

There’s more than one path toward a career as a data analyst. Whether you’re just graduating from school or looking to switch careers, the first step is often assessing what transferable skills you have and building the new skills you’ll need in this new role.

**Data analyst technical skills**

* **Database tools:** Microsoft Excel and [SQL](https://www.coursera.org/articles/sql-certifications-for-your-data-career) should be mainstays in any data analyst’s toolbox. While Excel is ubiquitous across industries, SQL can handle larger sets of data and is widely regarded as a necessity for data analysis.
* **Programming languages:** Learning a statistical programming language like [Python or R](https://www.coursera.org/articles/python-or-r-for-data-analysis) will let you handle large sets of data and perform complex equations. Though Python and R are among the most common, it’s a good idea to look at several job descriptions of a position you’re interested in to determine which language will be most useful to your industry.
* **Data visualization:**Presenting your findings in a clear and compelling way is crucial to being a successful data analyst. Knowing how best to present information through charts and graphs will make sure colleagues, employers, and stakeholders will understand your work. Tableau, Jupyter Notebook, and Excel are among the many tools used to create visuals.
* **Statistics and math:** Knowing the concepts behind what data tools are actually doing will help you tremendously in your work. Having a solid grasp of statistics and math will help you determine which tools are best to use to solve a particular problem, help you catch errors in your data, and have a better understanding of the results.

If that seems like a lot, don’t worry—there are plenty of courses that will walk you through the basics of the hard skills you need as a data analyst. This [IBM Data Analyst Professional Certificate course](https://www.coursera.org/professional-certificates/ibm-data-analyst) on Coursera can be a good place to start.

**Data analyst workplace skills**

* **Problem solving:**A data analyst needs to have a good understanding of the question being asked and the problem that needs to be solved. They also should be able to find patterns or trends that might reveal a story. Having the critical thinking skills will allow you to focus on the right types of data, recognize the most revealing methods of analysis, and catch gaps in your work.
* **Communication:**Being able to get your ideas across to other people will be crucial to your work as a data analyst. Strong written and speaking skills to communicate with colleagues and other stakeholders are good assets in data analysts.
* **Industry knowledge:**Knowing about the industry you work in—health care, business, finance, or otherwise—will give you an advantage in your work and in job applications. If you’re trying to break into a specific industry, take some time to pay attention to the news in your industry, or read a book on the subject. This can familiarize you with the industry’s main issues and trends.

**Learn more:** [7 In-Demand Data Analyst Skills to Get Hired](https://www.coursera.org/articles/in-demand-data-analyst-skills-to-get-hired)

**Paths to becoming a data analyst**

Acquiring these skills is the first step to becoming a data analyst. Here are a few routes you can take to get them that are flexible enough to fit in around your life.

* **Professional certificate:**Entry-level professional certificate programs usually require no previous experience in the field. They can teach you basic skills like SQL or statistics while giving you the chance to create projects for your portfolio and provide real-time feedback on your work. Several [professional certificate programs on Coursera](https://www.coursera.org/professional-certificates) do just that.
* **Bachelor's degree:**The Bureau of Labor Statistics recommends a [bachelor’s degree](https://www.coursera.org/degrees/unt-online-bachelor-completion) for jobs that involve data analysis. If you’re considering getting a degree to become a data analyst, focusing your coursework in statistics, math, or [computer science](https://www.coursera.org/degrees/bachelor-of-science-computer-science-london) can give you a head start with potential employers. Many online bachelor’s degrees have flexible scheduling so you can fit a degree in around your priorities.
* **Self-study:** If you want a path that doesn’t include formal training, it’s possible to learn the skills necessary for data analysis on your own. Get started with this [data analytics reading list for beginners](https://www.coursera.org/articles/data-analytics-books-for-beginners). Once you’re ready to start [building a portfolio](https://www.coursera.org/articles/how-to-build-a-data-analyst-portfolio), here are some [ideas for data analytics projects](https://www.coursera.org/articles/data-analytics-projects-for-beginners).

For more on how to become a data analyst (with or without a degree), check out our [step-by-step guide](https://www.coursera.org/articles/how-to-become-a-data-analyst).

**Data analyst career advancement**

Being a data analyst can also open doors to other careers. Many who start as data analysts go on to [work as data scientists](https://www.coursera.org/articles/what-is-a-data-scientist). Like analysts, data scientists use statistics, math, and computer science to analyze data. A scientist, however, might use advanced techniques to build models and other tools to provide insights into future trends.