

Data Analyst vs Data Engineer vs Data Scientist: Skills and Responsibilities

Data Analyst vs Data Engineer vs Data Scientist

Data has always been vital to any kind of decision making. Today's world runs completely on data and none of today's organizations would survive without data-driven decision making and strategic plans. There are several roles in the industry today that deal with data because of its invaluable insights and trust. In this article, we will discuss the key differences and similarities between a data analyst, data engineer and data scientist.

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Who is a Data Analyst, Data Engineer and Data Scientist?

Data Analyst vs Data Engineer vs Data Scientist

Data Analyst	Data Engineer	Data Scientist
Data Analyst analyzes numeric data and uses it to help companies make better decisions.	Data Engineer involves in preparing data. They develop, constructs, tests & maintain complete architecture.	A data scientist analyzes and interpret complex data. They are data wranglers who organize (big) data.

- **Data Analyst**

Most entry-level professionals interested in getting into a data-related job start off as **Data analysts**. Qualifying for this role is as simple as it gets. All you need is a bachelor's degree and good statistical knowledge. Strong technical skills would be a plus and can give you an edge over most other applicants. Other than this, companies expect you to understand data handling, modeling and reporting techniques along with a strong understanding of the business.

- **Data Engineer**

Data Engineer either acquires a master's degree in a data-related field or gather a good amount of experience as a Data Analyst. A **Data Engineer** needs to have a strong technical background with the ability to create and integrate APIs. They also need to understand data pipelining and performance optimization.

- **Data Scientist**

Data Scientist is the one who analyses and interpret complex digital data. While there are several ways to get into a data scientist's role, the most seamless one is by acquiring enough experience and learning the [various data scientist skills](#). These skills include advanced statistical analyses, a complete understanding of machine learning, data conditioning etc.



For a better understanding of these professionals, let's dive deeper and understand their required skill-sets.

Skill-Sets

The below table illustrates the different skill sets required for Data Analyst, Data Engineer and Data Scientist:

Data Analyst vs Data Engineer vs Data Scientist Skill Sets		
Data Analyst	Data Engineer	Data Scientist
Data Warehousing	Data Warehousing & ETL	Statistical & Analytical skills
Adobe & Google Analytics	Advanced programming knowledge	Data Mining
Programming knowledge	Hadoop-based Analytics	Machine Learning & Deep learning principles
Scripting & Statistical skills	In-depth knowledge of SQL/ database	In-depth programming knowledge (SAS/R/ Python coding)
Reporting & data visualization	Data architecture & pipelining	Hadoop-based analytics
SQL/ database knowledge	Machine learning concept knowledge	Data optimization
Spread-Sheet knowledge	Scripting, reporting & data visualization	Decision making and soft skills

As mentioned above, a data analyst's primary skill set revolves around data acquisition, handling, and processing. A data engineer, on the other hand, requires an intermediate level understanding of programming to build thorough algorithms along with a mastery of statistics and math! And finally, a data scientist needs to be a master of both worlds. Data, stats, and math along with in-depth programming knowledge for [Machine Learning](#) and [Deep Learning](#).

Now that we have a complete understanding of what skill sets you need to become a data analyst, data engineer or data scientist, let's look at what the typical roles and responsibilities of these professionals.

Next, let us compare the different roles and responsibilities of a data analyst, data engineer and data scientist in their day to day life.

Roles And Responsibilities

The roles and responsibilities of a [data analyst](#), data engineer and data scientist are quite similar as you can see from their skill-sets. Refer the below table for more understanding:

Data Analyst vs Data Engineer vs Data Scientist Roles		
Data Analyst	Data Engineer	Data Scientist
Pre-processing and data gathering	Develop, test & maintain architectures	Responsible for developing Operational Models
Emphasis on representing data via reporting and visualization	Understand programming and its complexity	Carry out data analytics and optimization using machine learning & deep learning
Responsible for statistical analysis & data interpretation	Deploy ML & statistical models	Involved in strategic planning for data analytics
Ensures data acquisition & maintenance	Building pipelines for various ETL operations	Integrate data & perform ad-hoc analysis
Optimize Statistical Efficiency & Quality	Ensures data accuracy and flexibility	Fill in the gap between the stakeholders and customer

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