Data science

1. What is data science?

Data science is the domain of study that deals with vast volumes of data using modern tools and techniques, including essential data science skills to find unseen patterns, derive meaningful information, and make business decisions.

1. Prerequisites:

* Here are some of the technical concepts you should know about before starting to learn data science.
* Machine learning: machine learning is the backbone of data science.
* Modeling: mathematical models enable you to make quick calculation and predictions based on what you already know about the data.
* Statistic: statistics are at the core of data science. A sturdy handle on statistics can help you extract more intelligence and obtain more meaningful results.
* Programming: some level of programming is required to execute a successful data science project. you can use python and r language for programming.
* Database: A capable data scientist needs to understand how to data base work, how to manage them, and how to extract data from them.

1. What is data scientist:

Data scientists are among the most recent analytical data professionals who have the technical ability to handle complicated issues as well as the desire to investigate what questions need to be answered. they are a mix of mathematicians, computer scientists, and trend forecasters.

1. What they do:

* Discover patterns and trends in database to get insights.
* Create forecasting algorithms and data models
* Improve the quality of data or product offerings by utilizing machine earning techniques
* Distribute suggestions to other terms and top management
* In data analysis, use data tools such R, SAS, python or SQL
* Top the field OF data science innovations

1. Use of data science:

* Data science may detect patterns in seemingly unstructured or unconnected data, allowing conclusions and predictions to be made.
* Teach businesses that acquire user data can utilize strategies to transform that into valuable or profitable information.
* Data science applications provide a better level of therapeutic customization through genetics and genomics research.

1. Where do you fit in data science:

Now that you know the users of data science and what is data science in general, let’s see all the opportunity that this field offers to focus on and specialize in one aspect of the field. Here is a sample of different ways you can fit into exciting, fast-gorwing field,

6.1 Data scientist:

* Job role: determine what the problem is, what questions need answers, and where to find the data. Also they mine, clean and present the relevant data.
* Skills needed: Programming skills (SAS, R, Python), storytelling and data visualization, statistical and mathematical skills, knowledge of Hadoop, SQL, and Machine Learning.

6.2. Data analyst:

* Job role: Analysts bridge the gap between the data scientists and the business analysts, organizing and analyzing data to answer the questions the organization poses. They take the technical analyses and turn them into qualitative action items.
* Skills needed: Statistical and mathematical skills, programming skills (SAS, R, Python), plus experience in data wrangling and data visualization.

1. Data science tools:

The data science profession is challenging but fortunately, there are plenty of tools available to help the data scientist succeed at their job. And now that we know what is data science, it’s lifecycle and more about the role in general, let us dig into it’s tools.

* 1. Data analysis: SAS, jupyter, R studio, exel
  2. Data warehousing: informatica/ talend, aws redshift
  3. Data visualization: jupyter, RAW, cognos
  4. Machine learning: spark MLib, Mahout,Azure ML studio

1. Application of data science:
   1. Healthcare:

Healthcare companies are using data science to build sophisticated medical instruments to detect and cure diseases.

* 1. Gaming:

Video and computer games are now being created with the help of data science and that has taken the gaming experience to the next level.

* 1. Image recognition:

Identifying patterns is one of the most commonly known applications of data science. in images and detecting objects in an image is one of the most popular data science applications.

* 1. Recommendation system:

Next up in the data science and its applications list comes Recommendation Systems. Netflix and Amazon give movie and product recommendations based on what you like to watch, purchase, or browse on their platforms.

* 1. Logistics:

Data Science is used by logistics companies to optimize routes to ensure faster delivery of products and increase operational efficiency.

* 1. Freud detection:

Fraud detection comes the next in the list of applications of data science. Banking and financial institutions use data science and related algorithms to detect fraudulent transactions.

1. Examples of data science:
   1. [Law Enforcement:](https://www.ibm.com/case-studies/police-charleroi)

In this scenario, data science is used to help police in Belgium to better understand where and when to deploy personnel to prevent crime. With only limited resources and a large area to cover data science used dashboards and reports to increase the officers’ situational awareness, allowing a police force that’s spread thin to maintain order and anticipate criminal activity.

* 1. [Pandemic Fighting:](https://www.ibm.com/case-studies/state-of-rhode-island/)

The state of Rhode Island wanted to reopen schools, but was naturally cautious, considering the ongoing COVID-19 pandemic. The state used data science to expedite case investigations and contact tracing, enabling a small staff to handle an overwhelming number of concerned calls from citizens. This information helped the state set up a call center and coordinate preventative measures.

* 1. [Driverless Vehicles:](https://www.ibm.com/case-studies/lunewave-inc-watson-ai-building-sensors-for-autonomous-vehicles)

Lunewave, a sensor manufacturing company, was looking for a way to make sensor technology more cost-effective and accurate. They turned to data science and machine learning to train their sensors to be safer and more reliable, as well as using data to improve their 3D-printed sensor manufacturing process.