

Math Refresher



Course Introduction

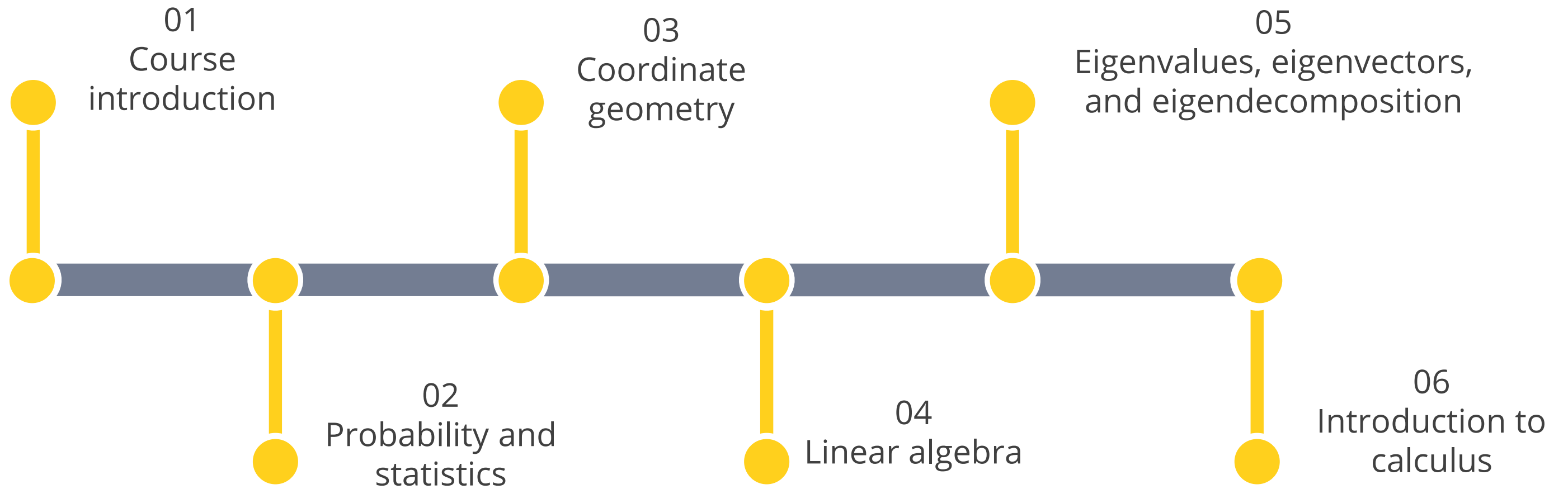




Learning Path

Learning Path for Math Refresher

This course will provide you with the basic mathematical knowledge essential for all data science profiles.



Probability Theory

It is a discipline of mathematics concerned with the study of random processes.



- It estimates the likelihood of future events, often using a numerical scale from 0 to 1, where 0 represents impossibility and 1 denotes certainty.
- It plays a pivotal role in hypothesis testing, Gaussian distribution, and the probability density function.

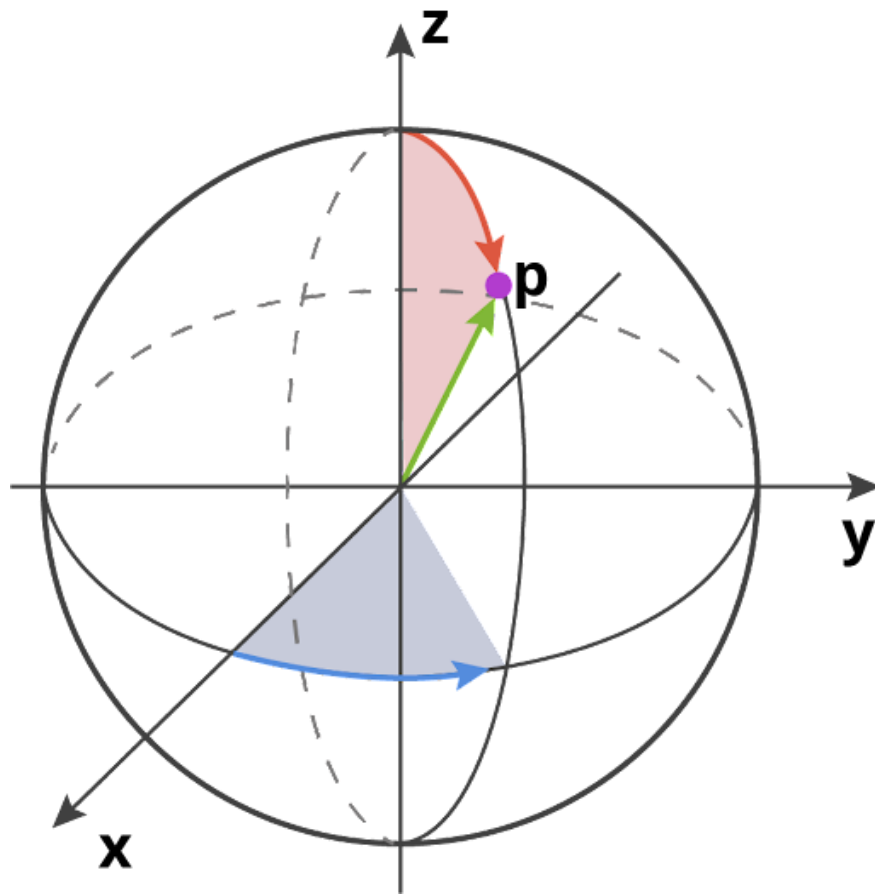
Statistics

It is concerned with the collection and processing of data.



- All machine learning models are built around statistical concepts.
- It is essential to use statistics in machine learning when working with classifications such as logistic regression, discrimination analysis, hypothesis testing, and distributions.

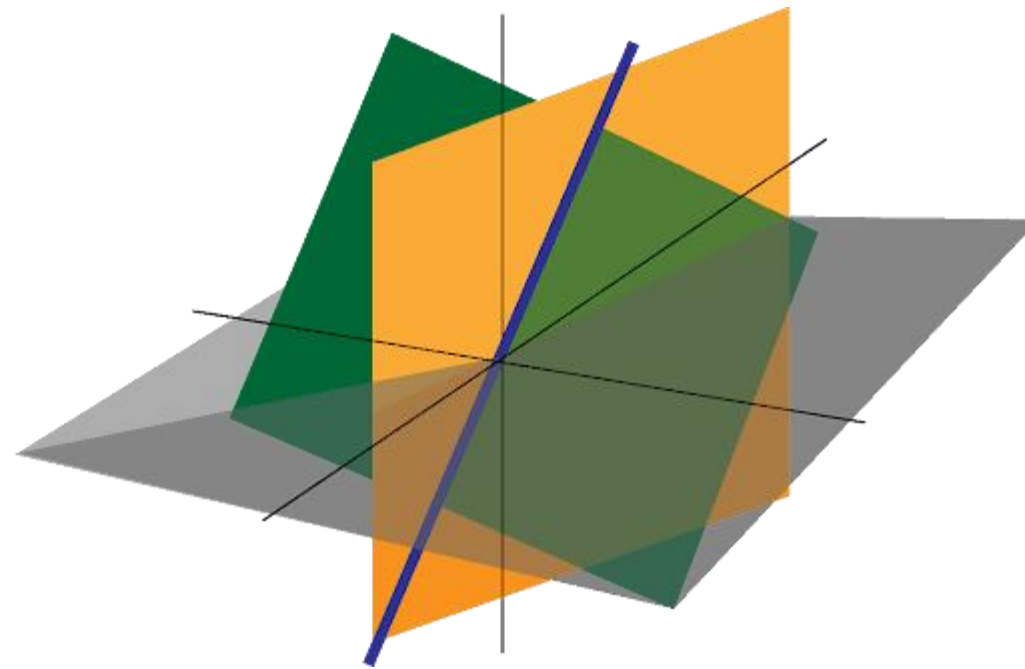
Coordinate Geometry



- It is the combination of algebra and geometry in which algebra analyzes geometrical relationships and geometrical figures are represented by equations.
- It denotes points, lines, and curves using algebraic equations.
- It applies to the data that is analyzed with an ordered pair of coordinates.

Linear Algebra

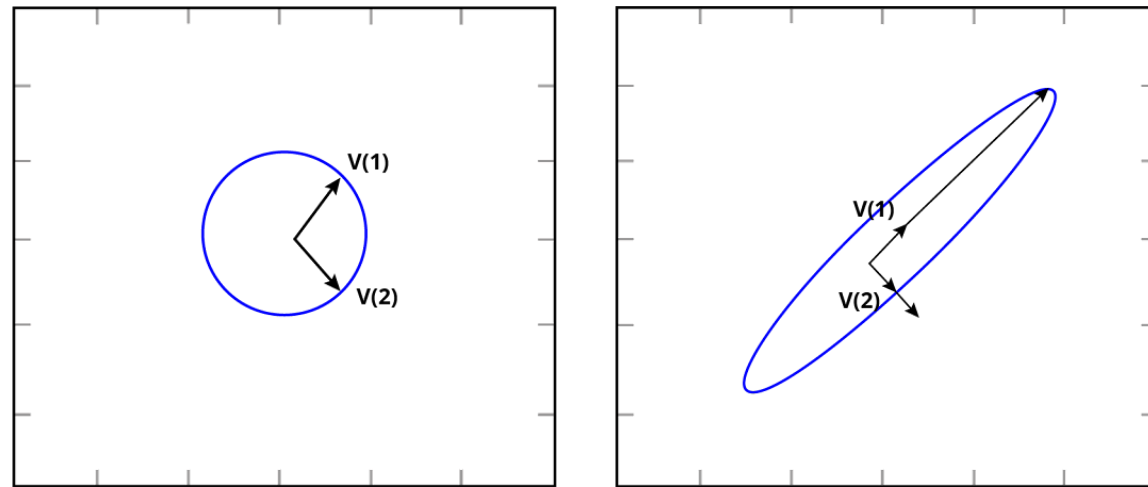
The construction of linear equations is vital in developing machine learning algorithms for analyzing and monitoring datasets.



Linear algebra plays a significant role in machine learning, influencing loss functions, regularization, covariance matrices, and supporting vector machine classification.

Eigenvalues, Eigenvectors, and Eigendecomposition

Following are some fundamental concepts in linear algebra and play a crucial role in various mathematical and scientific applications.



- It is used in a wide range of fields, such as physics, engineering, and computer science.
- For example, eigendecomposition is used in techniques such as PCA, feature extraction, and image compression.

Calculus

It is used in to train and optimize mathematical models.

The diagram illustrates the components of the definite integral notation $\int_a^b f(x) dx$. It features a light blue rounded rectangle containing the expression. Colored arrows point from descriptive text labels to specific parts of the notation: a red arrow points to the integral symbol \int , an orange arrow points to the upper limit b , a pink arrow points to the lower limit a , a blue arrow points to the function $f(x)$, and a green arrow points to the differential dx .

Integral symbol \int

Upper limit of integration b

Lower limit of integration a

Function is the integrand $f(x)$

x is the variable of integration dx

- Multivariate calculus is used in training algorithms and gradient descent.
- It is a combination of derivatives, curvature, divergence, and quadratic approximations.



Applications of Math in Data Industry

Applications of Math in Data Industry

Some major applications of math in data-centered domains are as follows:

Computer vision

Natural language
processing (NLP)

Marketing and sales

Applications of Math in Data Industry

Computer vision

It uses linear algebra for image representation, image processing, increasing agricultural yields, illness classification, and diagnosis.

It is applied in image recognition, the agricultural industry, and the healthcare industry.

Applications of Math in Data Industry

Natural language processing (NLP)

It uses unsupervised learning approaches, such as topic modeling and predictive analytics, as well as linear algebra for word embeddings.

It is applied in chatbots, language translation, speech recognition, and sentiment analysis.

Applications of Math in Data Industry

Marketing and sales

Marketing campaigns are evaluated using statistical approaches, such as hypothesis testing. It is also used to examine customer spending habits.

It is applied in customer analysis for providing personalization recommendations through predictive modeling or clustering.



Program Components

Course Features



Theoretical concepts



Examples

Course Components



E-books



Assessments



Let's get started!