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| **Date:** | **10-07-2020** | **Name:** | **Dhanya Shetty** |
| **Course:** | **Mathematics for Machine Learning: Linear Algebra** | **USN:** | **4AL17EC026** |
| **Topic:** | **Week 1** | **Semester & Section:** | **6th A** |
| **Github Repository:** | **Dhanya Shetty\_026** |  |  |

**DAILY ASSESSMENT FORMAT**

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| **FORENOON SESSION DETAILS(9.00am to 1.00pm)** |
| C:\Users\Hp\Desktop\report\10julymat1111.PNG  C:\Users\Hp\Desktop\report\10julymat2222.PNG  **C:\Users\Hp\Desktop\report\10julymat3333.PNG**  **C:\Users\Hp\Desktop\report\10julymat4444.PNG**  **C:\Users\Hp\Desktop\report\10julymat55555.PNG**  **Linear algebra** is a sub-field of **mathematics** concerned with vectors, matrices, and **linear** transforms. It is a key foundation to the field of **machine learning**, from notations used to describe the operation of algorithms to the implementation of algorithms in code  Although linear algebra is integral to the field of machine learning, the tight relationship is often left unexplained or explained using abstract concepts such as vector spaces or specific matrix operations.  In this post, you will discover 10 common examples of machine learning that you may be familiar with that use, require and are really best understood using linear algebra.  After reading this post, you will know:   * The use of linear algebra structures when working with data, such as tabular datasets and images. * Linear algebra concepts when working with data preparation, such as one hot encoding and dimensionality reduction. * The ingrained use of linear algebra notation and methods in sub-fields such as deep learning, natural language processing, and recommender systems.   The math includes at least **calculus**, statistics, probability theory. and **linear algebra**. Numerical analysis and something like topology will help if you want to create your own algorithms or tackle deep learning.  **Linear algebra** is absolutely key to understanding the calculus and statistics you **need** in **machine learning**. ... Deeper Intuition: If you can understand **machine learning** methods at the level of vectors and matrices you will improve your intuition for how and when they work  Definition of **linear algebra**. : a branch of mathematics that is concerned with mathematical structures closed under the operations of addition and scalar multiplication and that includes the theory of systems of **linear** equations, matrices, determinants, vector spaces, and **linear** transformations.  **Linear algebra** plays a major role in **Artificial Intelligence** and machine Learning. In various machine learning algorithms like supervised learning and unsupervised learning, to calculate inputs and to train the machines with the characteristics and expected outputs.   |  |  |  |  | | --- | --- | --- | --- | | **Date:** | **10-07-2020** | **Name:** | **Dhanya Shetty** | | **Course:** | **Basic Statistics** | **USN:** | **4AL17EC026** | | **Topic:** | **Week 1** | **Semester & Section:** | **6th A** | | **Github Repository:** | **Dhanya Shetty\_026** |  |  |   **C:\Users\Hp\Desktop\report\10julysta1111.PNG**  **C:\Users\Hp\Desktop\report\10julysta2222.PNG**  **C:\Users\Hp\Desktop\report\10julysta333.PNG**  There are few well know **statistics** are the average (or “mean”) value, and the “standard deviation” etc. Standard deviation is the variability within a data set around the mean value. The “variance” is the square of the standard deviation. The linear trend is another example of a data “**statistic**”.   Types of statistics   * Mathematical statistics. * Data collection. * Types of data. * Descriptive statistics. * Inferential statistics. * Exploratory data analysis. * Misinterpretation: correlation. * Applied statistics, theoretical statistics and mathematical statistics.   **Statistical** methods involved in carrying out a study include planning, designing, collecting **data**, analysing, drawing meaningful interpretation and reporting of the research findings. The **statistical analysis** gives meaning to the meaningless numbers, thereby breathing life into a lifeless **data**.  **Statistics** is the discipline that concerns the collection, organization, analysis, interpretation and presentation of data. In applying statistics to a scientific, industrial, or social problem, it is conventional to begin with a [statistical population](https://en.wikipedia.org/wiki/Statistical_population) or a [statistical model](https://en.wikipedia.org/wiki/Statistical_model) to be studied. Populations can be diverse groups of people or objects such as "all people living in a country" or "every atom composing a crystal". Statistics deals with every aspect of data, including the planning of data collection in terms of the design of [surveys](https://en.wikipedia.org/wiki/Statistical_survey) and [experiments](https://en.wikipedia.org/wiki/Experimental_design). See [glossary of probability and statistics](https://en.wikipedia.org/wiki/Glossary_of_probability_and_statistics).  When [census](https://en.wikipedia.org/wiki/Census) data cannot be collected, [statisticians](https://en.wikipedia.org/wiki/Statistician) collect data by developing specific experiment designs and survey [samples](https://en.wikipedia.org/wiki/Sample_(statistics)). Representative sampling assures that inferences and conclusions can reasonably extend from the sample to the population as a whole. An [experimental study](https://en.wikipedia.org/wiki/Experimental_study) involves taking measurements of the system under study, manipulating the system, and then taking additional measurements using the same procedure to determine if the manipulation has modified the values of the measurements. In contrast, an [observational study](https://en.wikipedia.org/wiki/Observational_study) does not involve experimental manipulation.  Two main statistical methods are used in [data analysis](https://en.wikipedia.org/wiki/Data_analysis): [descriptive statistics](https://en.wikipedia.org/wiki/Descriptive_statistics), which summarize data from a sample using [indexes](https://en.wikipedia.org/wiki/Index_(statistics)) such as the [mean](https://en.wikipedia.org/wiki/Mean) or [standard deviation](https://en.wikipedia.org/wiki/Standard_deviation), and [inferential statistics](https://en.wikipedia.org/wiki/Statistical_inference), which draw conclusions from data that are subject to random variation (e.g., observational errors, sampling variation). Descriptive statistics are most often concerned with two sets of properties of a *distribution* (sample or population): [*central tendency*](https://en.wikipedia.org/wiki/Central_tendency) (or *location*) seeks to characterize the distribution's central or typical value, while [*dispersion*](https://en.wikipedia.org/wiki/Statistical_dispersion) (or *variability*) characterizes the extent to which members of the distribution depart from its center and each other. Inferences on [mathematical statistics](https://en.wikipedia.org/wiki/Mathematical_statistics) are made under the framework of [probability theory](https://en.wikipedia.org/wiki/Probability_theory), which deals with the analysis of random phenomena.  A standard statistical procedure involves the collection of data leading to [test of the relationship](https://en.wikipedia.org/wiki/Statistical_hypothesis_testing) between two statistical data sets, or a data set and synthetic data drawn from an idealized model. A hypothesis is proposed for the statistical relationship between the two data sets, and this is compared as an [alternative](https://en.wikipedia.org/wiki/Alternative_hypothesis) to an idealized [null hypothesis](https://en.wikipedia.org/wiki/Null_hypothesis) of no relationship between two data sets. Rejecting or disproving the null hypothesis is done using statistical tests that quantify the sense in which the null can be proven false, given the data that are used in the test. Working from a null hypothesis, two basic forms of error are recognized: [Type I errors](https://en.wikipedia.org/wiki/Type_I_error) (null hypothesis is falsely rejected giving a "false positive") and [Type II errors](https://en.wikipedia.org/wiki/Type_II_error) (null hypothesis fails to be rejected and an actual relationship between populations is missed giving a "false negative").[[6]](https://en.wikipedia.org/wiki/Statistics#cite_note-6) Multiple problems have come to be associated with this framework: ranging from obtaining a sufficient sample size to specifying an adequate null hypothesis.[[*citation needed*](https://en.wikipedia.org/wiki/Wikipedia:Citation_needed)]  Measurement processes that generate statistical data are also subject to error. Many of these errors are classified as random (noise) or systematic ([bias](https://en.wikipedia.org/wiki/Bias_(statistics))), but other types of errors (e.g., blunder, such as when an analyst reports incorrect units) can also occur. The presence of [missing data](https://en.wikipedia.org/wiki/Missing_data) or [censoring](https://en.wikipedia.org/wiki/Censoring_(statistics)) may result in biased estimates and specific techniques have been developed to address these problems. |

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