What is the difference between statistics and analytics?

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Statistics and analytics are two closely related fields that are often used interchangeably, but they have distinct differences. Statistics is the practice of collecting, analyzing, and interpreting data to make informed decisions or draw conclusions about a population. It involves the use of mathematical methods and techniques to summarize and describe data, as well as test hypotheses and make predictions. On the other hand, analytics is the process of using statistical methods and tools to gain insights and make informed decisions based on data. It involves the use of various techniques such as data mining, machine learning, and predictive modeling to uncover patterns, trends, and relationships in data. While both statistics and analytics involve working with data, statistics focuses on understanding and describing data, while analytics focuses on using data to drive actions and decisions. In summary, the main difference between statistics and analytics lies in their purpose and approach, with statistics being more descriptive and analytics being more prescriptive.

Statistics vs. Analytics: What's the Difference?

The field of statistics is concerned with collecting, analyzing, interpreting, and presenting data.

The field of analytics is concerned with applying statistical methods to practical business problems.

There is much overlap between these two fields, but here is the main difference:

A statistician is more likely to work in a clinical setting or research setting where study design, , , and are more commonly used.

An analyst is more likely to work in a business setting where descriptive statistics, data visualizations, and

regression models are more commonly used.

Both statisticians and analysts work with data in their daily roles, but statisticians tend to be more focused on testing statistical hypotheses while analysts tend to be more focused on understanding data and patterns underlying business operations.

Keep reading to see how statistics and analytics are used in real-world scenarios.

The Use of Statistics in the Real World

Here are a few examples of how statistics is used in real-world scenarios.

Example 1: Hypothesis Testing

Statisticians working in clinical settings often use hypothesis tests to determine if a new drug causes improved outcomes in patients.

For example, a biostatistician may administer a blood pressure drug to 30 patients for one month and then administer a second blood pressure drug to the same 30 patients for another month.

Then, they may perform a to determine if there is a statistically significant difference in blood pressure reduction between the two drugs.

Example 2: ANOVA Models

Statisticians working in agricultural settings often use ANOVA models to determine if there is a statistically significant difference in crop yield between three or more types of fertilizers.

For example, a statistician may apply three different fertilizers to different fields for one month and then collect data to measure the mean crop yield.

They could then perform a to determine if there is a between the mean yield.

Example 3: Confidence Intervals

Statisticians working in medical settings often use confidence intervals to quantify the mean value of different biometrics.

For example, a statistician may collect data on the blood pressure of 50 patients who all use the same blood pressure medication to come up with a range of

values that is likely to contain the true mean reduction in blood pressure for patients in the overall population who use this particular medication.

The Use of Analytics in the Real World

Here are a few examples of how analytics is used in real-world scenarios.

Example 1: Descriptive Statistics

Business analysts often use descriptive statistics to summarize data related to the finances of companies.

For example, a business analyst who works for a retail company may calculate the following descriptive statistics during one business quarter:

Mean number of daily salesMedian number of daily salesStandard deviation of daily salesTotal revenueTotal expensesPercentage change in new customersPercentage of products returned by customers

Using these metrics, the analyst can gain an understanding of the financial state of the company and also compare these metrics to previous quarters to

understand how the metrics are trending over time.

They can then use these metrics to inform the organization on areas that could use improvement to help the company increases revenue or reduce expenses.

Example 2: Data Visualizations

Analysts who work for retail companies often created data visualizations such as line charts, bar charts, heat maps, box plots, scatter plots, and other charts to visualize the total sales, revenue, expenses, refunds, etc. during different business quarters.

In the real world, many analysts often create interactive dashboards using software like so that business leaders can interactively dig into different metrics and explore data trends and patterns to better understand how the business is performing.

Example 3: Regression Models

Financial analysts often use regression models to quantify the relationship between one or more predictor variables and a .

For example, an analyst may have access to data on total money spent on TV advertising, online advertising, and total revenue generated.

They might then build the following multiple linear regression model:

Revenue = 76.4 + 4.6(online advertising) + 0.8(TV advertising)

Here's how to interpret the in this model:

For each additional dollar spent on online advertising, revenue increases by an average of $4.60 (assuming dollars spent on TV advertising is held constant).For each additional dollar spent on TV advertising, revenue increases by an average of $0.80 (assuming dollars spent on online advertising is held constant).

Using this model, a financial analyst can quickly understand that money spent on online advertising results in much higher average revenue compared to money spent on TV advertising.

Conclusion

Statistics and analytics are two fields that share much overlap.

However, statisticians tend to be more focused on testing statistical hypotheses while analysts tend to be more focused on understanding data and patterns underlying business operations.

In the real world, statisticians and analysts often work side by side and it's not uncommon for the two professions to collaborate to solve real-world problems.

Additional Resources

The following articles explain the importance of statistics in various fields: