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# 1.2 Types of Data Analytics

## Introduction

Data analytics can be divided into four broad categories, each answering a different question about the data. Understanding these types helps analysts choose appropriate techniques.

## Types and definitions

* **Descriptive analytics** – Summarises what has happened by computing metrics such as counts, averages and totals. It provides a historical snapshot.
* **Diagnostic analytics** – Investigates why events occurred by probing relationships and root causes. Techniques include correlation and regression analysis.
* **Predictive analytics** – Uses models to forecast future outcomes based on historical data. Machine learning algorithms often power these models.
* **Prescriptive analytics** – Recommends actions to achieve desired outcomes. It combines predictions with optimisation and decision rules to suggest what should be done.

## Examples

* **Business** – Descriptive analytics summarises last quarter’s sales; diagnostic analytics explains why sales dropped; predictive analytics forecasts next quarter; prescriptive analytics recommends optimal pricing strategies.
* **Healthcare** – Predictive models identify patients at risk for readmission; prescriptive analytics suggests intervention plans to improve outcomes.

## Summary

These four types of analytics represent a continuum from understanding past events (descriptive) and their causes (diagnostic) to forecasting future events (predictive) and determining best actions (prescriptive). Organisations often combine them to support informed decision‑making【205746635100822†L299-L369】.

## Reflection questions

1. Describe how diagnostic analytics differs from predictive analytics.
2. Provide a real‑world example of prescriptive analytics in education.
3. Why are all four types important in a comprehensive analytics strategy?

## References