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Identify business questions	Notes Business questions should be identified by **understanding** the **project's objectives** and the **business context**. It involves recognizing the business problem or opportunity that the analytics project aims to address. For example, questions related to healthcare usage patterns for different demographics (e.g., age groups, income levels, education levels) can be formulated.
Explain how to answer descriptive questions	Descriptive analytics involves **summarizing and presenting historical data to provide insights into what has happened**. To answer a descriptive analytics question, data analysts can use techniques such as aggregations, visualizations (e.g., bar charts, line charts, scatter plots), and summary statistics to describe and understand patterns, trends, and characteristics within the data.
Explain how to answer diagnostic questions	Diagnostic analytics focuses on understanding **why certain events occurred**. To answer a diagnostic analytics question, data analysts can use techniques like correlation analysis to identify relationships between variables and investigate the factors that contribute to specific outcomes or patterns observed in the data.
Explain how to answer predictive questions	Predictive analytics aims to **forecast future trends or outcomes based on historical data**. To answer a predictive analytics question, machine learning techniques, such as regression analysis or time series analysis, can be applied. These methods use historical data to build models that can make predictions about future events or trends.

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	Notes
Explain how to answer prescriptive questions	Prescriptive analytics involves **providing recommendations for actions to optimize outcomes**. To answer a prescriptive analytics question, optimization techniques, decision trees, or other advanced analytics methods can be employed. These methods recommend actions to achieve the desired goals based on the analysis of historical data.
Identify methods of collecting data	Data can be **collected** from **various sources**, including **internal databases, websites, and surveys**. The choice of method depends on research objectives, available resources, and accuracy requirements. Internal databases provide data generated by an organization's operations, websites offer insights into user behavior, and surveys allow the collection of information from diverse people.
Identify the sources of data	Sources of data include **internal databases** (e.g., corporate information systems, other data warehouses) and **external data** (e.g., competitors' analysis, market research reports, social media data). For example, a retail company may use sales data from its point-of-service system to analyze product sales, but it must also consider external data quality and relevance, such as social media sentiment, to gain a comprehensive view.

Summary

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	Notes
Identify data quality requirements	Data quality requirements involve **ensuring accuracy, completeness, timeliness, and relevance of data** for research objectives. For instance, accurate customer demographics, purchase history, and other relevant information are crucial for a customer segmentation analysis. Establishing data quality checks and metrics is necessary to monitor and maintain data integrity throughout the project.
Probe data sources and quality questions	Questions about data sources and quality involve **investigating the reliability and relevance of data**. For instance, a marketing agency using social media data should inquire about the data source's reputation and whether it represents the target audience. Questions about completeness, accuracy, and relevance help ensure data quality.
Data Analytics techniques	Data analytics techniques are methods and tools used to analyze and process data to achieve business objectives. They include **regression analysis, decision trees, clustering, association rules, machine learning, time series analysis, market basket analysis, process mining, t-test, correlation analysis, text mining, and neural networks**.
Impacts of different techniques	Data analytics techniques impact organizations by **providing insights for informed decision-making, optimizing operations, improving customer satisfaction, identifying opportunities for growth and innovation, reducing costs, and gaining a competitive advantage**.

Summary

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	Notes
Use specific analysis or reporting	Choosing the appropriate analysis method depends on the type of data, research questions, and level of measurement. For example, correlation analysis or regression analysis is suitable for examining relationships between continuous variables, while a t-test is used to compare means of two independent samples.
Appropriate visualizations	Choosing the right data visualization technique **depends** on the **audience**, **message**, and **insights**. Bar charts, line charts, scatter plots, and heat maps can be used to effectively communicate different aspects of data based on the nature of the information.
Differentiate techniques	Data analytics techniques vary in their applications and strengths. For example, regression analysis - identifies relationships between variables, clustering - groups similar data points, and association rules - identify patterns in large datasets. Understanding these differences helps in selecting the most suitable technique for specific research questions.
Data requirements for techniques	Different data analytics techniques have distinct data requirements. For instance, regression analysis requires numerical data, while text mining requires unstructured text data. Ensuring that the data used is accurate, complete, and relevant to the specific technique is crucial for meaningful results.
Correct metrics	Metrics, such as conversion rate, click-through rate, customer lifetime value, churn rate, customer acquisition cost, return on investment, bounce rate, time on site, engagement rate, and revenue growth, are selected based on the specific questions or goals of a data analytics problem. **Metrics quantify, measure, and track different aspects of data to evaluate success or effectiveness**.

Summary