

Data Engineer Vs Data Analyst Vs Data Scientist Vs ML Engineer | Data Science Job Roles

Data Analyst

DATA ENGINEER

DATA SCIENTIST

ML ENGINEER

Here is the **BEST and clearest comparison** of **Data Engineer vs Data Analyst vs Data Scientist vs ML Engineer** — perfect for **exam + interview + notes**.

Data Science Job Roles — Table Comparison

Role	What They Do	Skills Required	Main Tools	Output
Data Engineer	Builds data pipelines, databases, ETL systems. Ensures data is collected, stored, and accessible.	SQL, Python, Big Data, ETL, Cloud	Hadoop, Spark, Airflow, Kafka, AWS, SQL	Clean & organized data for analysts & scientists
Data Analyst	Analyzes data to produce reports, dashboards & insights for business decisions.	SQL, Excel, BI Tools, Statistics	PowerBI, Tableau, Excel, SQL	Charts, reports, insights
Data Scientist	Builds predictive models, uses stats & ML to solve business problems.	Python, ML, Stats, Visualization	Pandas, NumPy, Sklearn, Jupyter, ML Models	Predictions & data-driven solutions
ML Engineer	Deploys ML models into production, optimizes and maintains them.	Python, ML, MLOps, APIs, Cloud	TensorFlow, PyTorch, Docker, FastAPI, AWS	Production-ready ML systems

Roman Urdu Explanation (Simple)

1) Data Engineer

Ye banda **data collect karta hai, pipelines banata hai, databases maintain karta hai.**
Yani *data kahaan se aa raha hai, kaisay store ho raha hai* — sab iska kaam.

➡ In short: Data ka raasta banata hai.

2) Data Analyst

Ye **data ko visualize, analyze aur interpret** karta hai.
Reports, dashboards, charts banata hai.

➡ In short: Data ko samajh kar business ko insights deta hai.

3) Data Scientist

“A datascientist is someone who’s better at statistics than any software engineer and better at software engineering than any statisticians”

Ye **ML models banata hai, predictive analysis karta hai**, stats aur algorithms use karta hai.

➡ In short: Future predict karta hai.

4) ML Engineer

Data scientist ka banaya hua model **production app ya system mein deploy** karta hai.
Scaling, optimization, APIs — sab sambhalta hai.

➡ In short: ML model ko real world mein chalata hai.

English Summary (Short & Powerful)

- Data Engineer → Builds data pipelines & storage systems
 - Data Analyst → Extracts insights from data
 - Data Scientist → Builds ML models to predict outcomes
 - ML Engineer → Deploys & maintains ML models in production
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★ Perfect One-Liner Differences (Exam-Ready)

- **Data Engineer:** “Prepares and manages large-scale data systems.”
 - **Data Analyst:** “Turns data into business insights using reports.”
 - **Data Scientist:** “Builds predictive models using ML and statistics.”
 - **ML Engineer:** “Deploys ML models and builds production ML systems.”
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If you want, I can also make a **flow diagram** showing how these roles work together.