

# 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**.

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## Data Science Job Roles — Table Comparison

Role	What They Do	Skills Required	Main Tools	Output
<b>Data Engineer</b>	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
<b>Data Analyst</b>	Analyzes data to produce reports, dashboards & insights for business decisions.	SQL, Excel, BI Tools, Statistics	PowerBI, Tableau, Excel, SQL	Charts, reports, insights
<b>Data Scientist</b>	Builds predictive models, uses stats & ML to solve business problems.	Python, ML, Stats, Visualization	Pandas, NumPy, Sklearn, Jupyter, ML Models	Predictions & data-driven solutions
<b>ML Engineer</b>	Deploys ML models into production, optimizes and maintains them.	Python, ML, MLOps, APIs, Cloud	TensorFlow, PyTorch, Docker, FastAPI, AWS	Production-ready ML systems

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## 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.**

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## 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.**

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## 3) Data Scientist

**“A data scientist is someone who’s better at statistics than any software engineer and better at software engineering than any statistician”**

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

→ In short: **Future predict karta hai.**

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## 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.**

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## ■ 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.