#Basic of data analytics

1.Define the role of a Data Analyst in your own words. What value do they bring to an organization?

 # Data analytic is the process of examining raw data to discover patterns and uncleard data to clear data.become a data analytic learn excel,phython,sql,power bi etc.

2.List three tools commonly used by Data Analysts and explain what each is mainly used for?

#Excel -it is spread sheet a collect data in raws and colums basis program.

#Power BI -There is dashboard it present data very clearly to other person.

#SQL -Structive query language which deal large data.

#Write the end-to-end analytics workflow in the correct order and briefly explain each step.

1. Define the Problem / Objective

Goal: *Clearly understand what question or business problem you are trying to solve.*
Explanation: *Identify the purpose of the analysis — e.g., "Why are sales dropping?" or "Which customers are most likely to churn?" This ensures your analysis stays focused and relevant.*

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2. Data Collection

Goal: *Gather all relevant data from internal and external sources.*
Explanation: *Collect raw data from databases, APIs, surveys, sensors, or third-party providers. Data can be structured (like tables) or unstructured (like text, images).*

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3. Data Cleaning (Data Preparation)

Goal: *Make the data accurate, consistent, and usable.*
Explanation: *Handle missing values, remove duplicates, fix errors, standardize formats, and transform data types. Clean data ensures reliable insights.*

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4. Data Exploration and Analysis (EDA)

Goal: *Understand data patterns and relationships.*
Explanation: *Use statistical summaries, visualizations, and correlation checks to identify trends, outliers, and relationships that inform deeper analysis.*

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5. Feature Engineering / Data Transformation

Goal: *Prepare data for modeling or deeper analysis.*
Explanation: *Create new variables, scale numerical features, encode categorical variables, or reduce dimensionality to improve model performance or insight clarity.*

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6. Modeling / Analysis

Goal: *Build analytical or predictive models to extract insights.*
Explanation: *Apply statistical methods, machine learning algorithms, or business intelligence models to analyze and predict outcomes based on the data.*

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7. Model Evaluation and Validation

Goal: *Assess how well the model performs.*
Explanation: *Test model accuracy, precision, recall, or other metrics using validation datasets. This step ensures your model or analysis is reliable and generalizable.*

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8. Data Visualization and Reporting

Goal: *Communicate results clearly and effectively.*
Explanation: *Create dashboards, charts, and reports to present findings to stakeholders in a visually meaningful and actionable way.*

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9. Decision Making and Action

Goal: *Use insights to drive strategy or operational improvements.*
Explanation: *Apply analytical findings to inform business decisions, optimize processes, or guide future actions.*

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10. Monitoring and Maintenance

Goal: *Ensure long-term effectiveness of the analytical solution.*
Explanation: *Continuously track model performance, update data, and refine analyses as new information or business conditions arise.*

#What is Prompt Engineering, and explain any two types of prompts used in Generative AI?

Prompt Engineering is the process of designing and refining the input (prompt) given to a Generative AI model like chatGPT.

1. Zero-Shot Prompting

- ***Definition:*** *The model is asked to perform a task* ***without any examples*** *— only using the task instruction.*

- ***Example:***
  Prompt: *“Translate the following sentence into French: I love reading books.”*

2. Few-Shot Prompting

- ***Definition:*** *The model is given* ***a few examples*** *before being asked to perform the task on new data.*

Example:
Prompt:

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Translate the following sentences into French:

1. I like apples. → J’aime les pommes.

2. She is my friend. → Elle est mon amie.
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- `Now translate: They are playing football.`

#What are the key differences between a Business Analyst and a Data Analyst in terms of roles, responsibilities, and focus?

	Business Analyst (BA)	***Data Analyst (DA)***	
Main Focus	***Data Handling***	*Uses data conceptually (what data is needed and why)*	*Extracts, cleans, and analyzes actual datasets*

Decision Support	*Provides business recommendations*	*Provides quantitative evidence to support decisions*
Documentation	*Prepares business requirement documents (BRDs), use cases, and reports*	*Creates dashboards, visualizations, and analytical reports*

Common Tools	*MS Excel, MS Visio, Jira, Confluence, PowerPoint*	*SQL, Python/R, Power BI, Tableau, Excel*
Core Skills	*Communication, problem-solving, project management, stakeholder management*	*Statistics, data visualization, programming, data wrangling*

#Explain any three AI-powered ETL (Extract, Transform, Load) tools and how they are used in analytics.

Here are three AI-powered ETL tools and their uses in analytics:

Informatica Intelligent Data Management Cloud (IDMC):
Uses AI to automate data mapping, cleansing, and transformation, ensuring high-quality, integrated data for analytics dashboards and reports.

Talend Data Fabric:
Employs machine learning for data quality improvement and anomaly detection during transformation, helping analysts trust and act on accurate insights.

Azure Data Factory (with Synapse integration):
Uses AI to optimize data pipelines and recommend transformations, enabling seamless data movement and preparation for real-time analytics in cloud environments.

#Give three applications of Data Analytics across different industries and explain how it creates value.

Healthcare:

Predicts disease outbreaks and improves patient diagnosis using predictive analytics — leading to better treatment outcomes and reduced costs.

Retail:

Analyzes customer behavior to personalize marketing and manage inventory — increasing sales and customer satisfaction.

Finance:

Detects fraud and assesses credit risk using real-time analytics — protecting assets and improving decision-making.

#Explain the evolution of analytics, highlighting the different stages from Descriptive to Generative AI.

Descriptive Analytics – Looks at historical data to answer *"What happened?"* (e.g., dashboards, reports).

Diagnostic Analytics – Investigates data to find *"Why did it happen?"* (e.g., root cause analysis).

Predictive Analytics – Uses statistical models and ML to forecast *"What is likely to happen?"* (e.g., demand forecasting).

Prescriptive Analytics – Recommends actions to answer *"What should we do?"* (e.g., optimization for decision-making).

Generative AI Analytics – Creates new data, insights, and automated decisions using advanced AI models to answer *"What can we create or automate?"* (e.g., auto-generated strategies, reports, simulations).