

# Databases-Week01

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## **BASIC TASKS**

- **What is Data?**

Data is raw, unprocessed facts or figures collected through various means such as observations, measurements, or research. It consists of discrete pieces of information that do not necessarily convey meaning on their own. Examples of data include numbers, words, measurements, or images.

- **What is Information?**

Information is data that has been processed, organized, and structured in a way that gives it context and relevance. It provides meaning and utility to the recipient. Information is what we derive from data after it has been analyzed and interpreted. For example, if you collect data on the daily temperatures over a month, the average temperature for that period would be considered information.

- **What is the difference between Data and Information?**

1. Context and Meaning: Data lacks context and direct meaning, whereas information is meaningful and contextualized.

2. Purpose: Data is collected for potential use, while information is used for decision-making, understanding, or communication.

3. Value: Raw data may have little value until it is transformed into information, which can then provide significant value by informing decisions or actions.

## ● What is Metadata?

Metadata is data that provides information about other data. It describes, explains, or makes it easier to access and manage the primary data. In essence, metadata acts as a set of descriptive details or characteristics about a piece of data or an object. This can include details such as when the data was created, who created it, how it is formatted, and where it is stored.

Example: Metadata of the photo, including the size of the image, when it was taken or aperture and shutter information, and GPS data.

## ● Why we need Metadata?

1. Organization: Metadata helps organize large amounts of data, making it easier to categorize and sort.

2. Searchability: By providing descriptive tags or labels, metadata improves the searchability of data within databases or file systems.

3. Understanding: Metadata clarifies the context and purpose of the data, which aids users in understanding and interpreting the data correctly.

4. Management: Metadata facilitates the management of data by providing information on its quality, lifecycle, and usage policies.

5. Integration: When integrating different data sources, metadata ensures compatibility and consistency, enabling seamless data exchange and interoperability.

## **MEDIUM TASKS**

### **● What is Data Privacy?**

Data privacy refers to the right of individuals and organizations to control the collection, use, and disclosure of their personal and sensitive information. It involves protecting data from unauthorized access, use, disclosure, or destruction. Data privacy ensures that personal information is kept confidential and used only for legitimate purposes.

### **● Key elements that organizations use to maintain data privacy compliance:**

**Practices:** Implementing strict access controls, encrypting data at rest and in transit, regularly backing up data, and conducting privacy impact assessments.

**Rules and guidelines:** Adhering to data protection laws and regulations such as the General Data Protection Regulation (GDPR) and other relevant legislation. Developing internal privacy policies and procedures that outline how data is collected, used, and protected.

**Tools:** Using data encryption software, firewalls, intrusion detection systems, and access management tools to safeguard data.

- **Justification for the importance of data privacy to both individuals and businesses:**

**For individuals:**

1. Protects personal identity and financial information from identity theft and fraud.
2. Ensures the confidentiality of sensitive personal information such as medical records, social security numbers, and credit card details.
3. Gives individuals control over their personal information and how it is used.

**For businesses:**

1. Builds trust with customers by demonstrating a commitment to protecting their data.
2. Helps avoid costly data breaches and legal penalties.
3. Enhances the reputation of the business and its brand.

- **Differences in data privacy concerns between individuals and businesses:**

**For individuals:**

- Concerns often revolve around protecting personal information from being misused or shared without consent. Worries about targeted advertising, identity theft, and invasion of privacy.

- May be more concerned about the privacy of their social media activity, online shopping habits, and personal communications.

**For businesses:**

- Focus on protecting customer data to comply with legal requirements and maintain customer trust. Concerns about data breaches that could lead to financial losses and damage to reputation.
- Need to manage and secure large amounts of data from multiple sources, including employee data, customer data, and business-sensitive information.

## **ADVANCED TASKS**

### **● How to keep databases safe and secure?**

To ensure database security, a combination of tools, processes, and methodologies is essential.

**Tools:** Implement firewalls to block unauthorized access. Use encryption software to protect data both in transit and at rest. Employ intrusion detection and prevention systems to detect and stop malicious activities.

**Processes:** Regularly update and patch the database software to address vulnerabilities. Conduct periodic security audits to identify potential risks. Have a backup and recovery process in place to safeguard data in case of disasters.

**Methodologies:** Adopt a risk-based approach to prioritize security efforts. Follow industry best practices for database

security. Train employees on security awareness and proper database usage to minimize human errors.