HOMEWORK 1

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BASIC TASKS：

What is Data?

Data is a collection of facts, figures, or observations that can be in various forms such as numbers, text, images, or sounds. It is raw and unprocessed, without any specific meaning on its own. For example, a list of numbers like 23, 56, 78, and 90 is data.

What is Information?

Information is data that has been processed, organized, and given context. It provides meaning and answers questions. For instance, if we know that the numbers 23, 56, 78, and 90 represent the scores of four students in a test, then this is information.

Difference between Data and Information

Data is raw and unorganized, while information is processed and meaningful.

Data is a set of individual elements, whereas information is a combination of data that tells a story or provides an answer.

Data can be ambiguous and difficult to understand on its own, while information is clear and useful.

What is Metadata?

Metadata is data about data. It provides additional information about a particular set of data. For example, metadata for an image might include the date it was taken, the camera settings used, the file size, and the author.

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 ensures that data is protected from unauthorized access, use, or disclosure.

Key elements for maintaining data privacy compliance

Practices: Implementing strong access controls, such as passwords, two-factor authentication, and role-based access. Regularly training employees on data privacy best practices.

Rules and guidelines: Adhering to relevant data protection laws and regulations. Developing internal policies and procedures for handling data.

Tools: Using encryption to protect data in transit and at rest. Employing firewalls and intrusion detection systems to prevent unauthorized access.

Justification for importance of data privacy to individuals and businesses

For individuals, data privacy is crucial as it protects their personal information, such as financial details, medical records, and social security numbers. It helps prevent identity theft, fraud, and unwanted marketing. For businesses, maintaining data privacy compliance builds trust with customers and protects their reputation. It also helps avoid legal penalties and financial losses due to data breaches.

Differences in data privacy concerns between individuals and businesses

Individuals are mainly concerned with protecting their personal information from being misused or disclosed. They worry about identity theft, privacy of their communications, and targeted advertising.

Businesses are concerned with protecting customer data, trade secrets, and intellectual property. They also need to ensure compliance with legal requirements and avoid reputational damage.

ADVANCED TASKS：

Database security is essential to protect databases from malicious cyber-attacks, software vulnerabilities, intrusion, misuse, or carelessness and damage. It encompasses tools, processes, and methodologies to ensure the safety of both the data stored in the database and the data management system itself.

Some measures to ensure database security include:

Implementing strong access controls: Limiting access to the database to authorized users only. This can be done through user authentication and authorization mechanisms.

Encrypting data: Encrypting the data stored in the database helps protect it from unauthorized access even if the database is compromised.

Regularly patching and updating software: Keeping the database software up to date with the latest security patches helps prevent vulnerabilities from being exploited.

Monitoring and auditing: Regularly monitoring database activity and auditing access logs can help detect and respond to security incidents quickly.

Backing up data: Regularly backing up the database ensures that data can be recovered in case of a disaster or data loss.