# Week 5 – Class Discussion Evidence

## 1. Big Data

Characteristics: Big Data refers to extremely large and complex datasets that traditional tools cannot process efficiently. It is defined by its scale, variety, velocity, and complexity.

Six V’s of Big Data:

• Volume (amount of data)  
• Velocity (speed of data generation and processing)  
• Variety (different formats like text, video, sensor data)  
• Veracity (quality and reliability of data)  
• Value (insight and usefulness)  
• Variability (inconsistencies in data flows)

Who/What generates data: Sources include IoT devices, social media, sensors, mobile apps, financial transactions, health monitors, and cloud-based services.

## 2. Big Data and Cloud Computing

How IoT, Cloud, and Big Data link:  
• IoT devices continuously generate huge data streams.  
• Cloud computing provides storage and processing power to manage this data.  
• Big Data analytics extracts insights and patterns from it. Together, they create scalable solutions (e.g., smart homes, healthcare monitoring).

What is NoSQL?  
• A class of non-relational databases designed for distributed, high-volume, flexible storage. Examples: MongoDB, Cassandra.

Characteristics/Advantages of NoSQL for IoT:  
• Handles unstructured and semi-structured data.  
• Highly scalable and fault-tolerant.  
• Supports fast reads/writes across distributed servers.  
• Ideal for IoT applications where data is massive, diverse, and continuously changing.

## 3. Data Warehousing

What is Data Warehousing?  
• A central repository that integrates data from multiple sources, structured for analysis and decision-making.

Why needed for IoT applications?  
• IoT systems generate fragmented data from many devices.  
• Data warehousing allows integration, cleaning, and historical analysis, enabling better scalability, forecasting, and business intelligence.

## Reflection

This discussion helped me understand how IoT, Big Data, and Cloud computing are interconnected, and why technologies like NoSQL and Data Warehousing are essential for building scalable IoT systems.