Individual task - Module 2

Data Essentials, Types, Big Data, processing, and Ethics

1)Understanding Big Data Around Me(Example:Youtube Recommendations/Google maps).

What is Big Data?

- Big Data refers to extremely large and complex datasets that cannot be handled using traditional data processing tools.
- These datasets are generated from multiple sources such as videos, GPS signals, user clicks, searches, and social media interactions.
- Big Data requires advanced technologies like cloud computing, data analytics, and artificial intelligence to process and extract useful information.
- Example: Every time a user watches a video on YouTube or searches for a route on Google Maps, data is generated and stored.

Characteristics of Big Data (3 V's)

1. Volume

- Volume refers to the huge amount of data generated every day.
- Example: Millions of users upload and watch videos daily. Each video produces data such as views, likes, comments, and watch time.
- Example (Google Maps): Millions of vehicles share location data every second, creating massive datasets.

2. Velocity

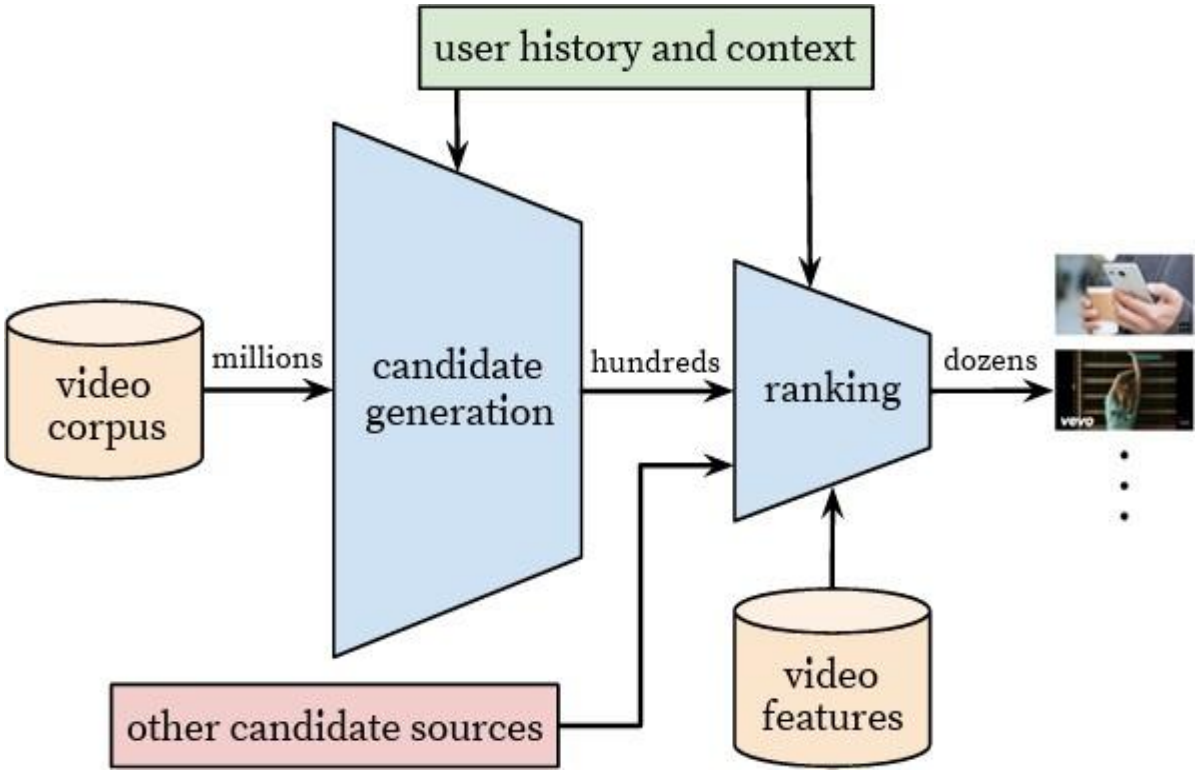
- Velocity refers to the speed at which data is generated and processed.
- Example (YouTube): YouTube instantly updates recommendations when you watch or skip a video.
- Example (Google Maps): Traffic conditions update in real time based on live user movement.

3. Variety

- Variety refers to different types of data such as text, images, audio, and location data.
- Example (YouTube):
    - Video content
    - User comments
    - Likes and dislikes
    - Search history
- Example (Google Maps):
    - GPS coordinates
    - Traffic signals
    - Road images
    - User reviews

How Big Data Works in YouTube Recommendations

- YouTube uses Big Data to analyze user behavior and provide personalized video suggestions.
- The system collects data such as watch history, search keywords, time spent on videos, and user interactions.
- this data is processed using machine learning algorithms to predict what a user may like next.
- Example: if a user watches cooking videos frequently, youtube will recommend more cooking-related content.



How Big Data works in Google maps

- Google maps collects data from satellites, mobile devices, traffic sensors, and users.
- It analyzes real-time data to provide accurate navigation, traffic updates, and estimated arrival times.
- Example:If many users slow down on a particular road, Google maps detects traffic congestion and suggests an alternative route.

Benefits of Big data in Daily Life

- Personalized user experience
- Accurate traffic prediction
- Time-saving recommendations
- Improved decision-making.
- Example: Google maps helps users avoid traffic and reach destinations faster.

Challenges and Ethical Issues in Big Data

- Despite its advantages, Big Data raises concerns about data privacy and security.
- User data must be collected and used responsibly.