Assignment-1

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1. What is Bigdata and Why has it become a Significant focus in modern indurstries?

A:- Big data. Very Means Very large amount of data that are too big or complex for traditional tools to handle such as data from Social media, Smartphones, online Shopping and Sensors

→ It has become important because:

- more data is created every data through techniology
- Business can make better decisions using data
- Companies understand customers better
- Work become faster and more efficient
- It helps business stay competitive.
- big data helps organisations use information to work Smarter and make better choices.

2. What are the key factors driving the growth of Big data in today's world?

A:- The key factors driving the growth of big data today are

* Widespread use of the internet and Smartphones— people generate huge amount of data through apps, Social media and online activities
* Social media platforms - photos, Videos, messages, and interaction create massive data every Second
* Internet of Things (IoT) - Devices like Smart Watches, Sensors, and Smart homes constantly collect data.

* online transactions :- E-commerce, digital payments and banking Produce large data records.
* cloud computing - Makes it easy and affordable to store and process large amount of data
* Advance in technology - Better software; faster networks and powerful analytics tools allow data to grow and be used effectively.

3) How is Big data transforming industries Such as healthcare, finance and retail?

A:- Big data is transforming industries by helping them make Smarter and faster, more accurate decisions.

* Healthcare
  → Doctors use data to diagnose diseases earlier.
  → Hospitals predict patient needs and improve treatment
  → Health records help reduce errors and improve Care
* Finance.
  → Banks detect fraud by analyzing transaction Patterns
  → Companies asses risk more accurately
  → Personalized financial Services and better investment decisions
* Retail
  → Stores understand customer Preferences
  → Personalized recommendations and targeted Marketing
  → Better inventory Management and demand forecasting.

4. What technologies and tools have emerged to support the management and analysis of Big Data?

A:- Data storage & Management:
- Hadoop - stores and processes large data sets across many computer
- NOSQL databases (MongoDB, Cassandra) - Handle large, unstructured data
- Cloud platforms (AWS, Google cloud, Azure) - : Provide Scalable storage and computing.

2) Data Processing
- Apache Spark - fast data processing and real-time analytics
- Apache kafka - Handles real time data streaming
- Flink / storm - Process continuous data streams

3) Data Analytics & Visualizations
- Data analytics tools - Python, R
- Visualization tools - Tableau, Power BI

4) AI & Machine learning
- Tools like Tensor flow and PyTorch analyze data and make predictions.

(5) How does Big data differ from traditional data Processing in terms of scope and Scale?

A: Big data and traditional data processing differ mainly in size and complexity

Traditional data processing
→ Handles small to medium amount of data
→ Uses single systems or simple databases
→ Works with mostly structured (tables, rows, colu
→ Processes data slowly or in batches.

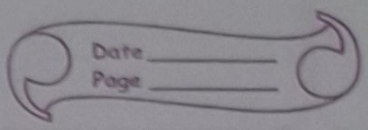
Big data
→ Handles huge volumes of data
→ Uses many computers working together
→ Works with structured and unstructured data
→ Can process data very fast or in real time.

(6) What is structured data and how is it typically stored and processed?

A:- Structured data is data that is organized in a fixed format, usually in rows and columns, making it easy to search and analyze.

How it is stored
→ Stored in databases
→ Uses tables with rows and columns
→ Example: Customer record, bank transaction.

How it is Processed.
→ Processed using database system.



→ Uses SQL to Search, update and analyze data
→ Works well with traditional data processing tools.