Big Data Project - Mentored by Industry SDE

Title:- HEALTH MONITORING SYSTEM.(Report)

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# HEALTH MONITORING SYSTEM

Project Report

1. Introduc on The Health Monitoring System is designed to process and analyze the health parameters of 10,000 pa ents in a diagnos c center. This project u lizes Apache Spark, Hadoop, MapReduce, and Ka a for data processing, real- me streaming, and analy cs. The system provides insights into pa ent health and collects feedback for further analysis using NoSQL databases and machine learning techniques.
2. Objec ves
   * Generate synthe c pa ent profiles with health parameters.
   * Process pa ent health data using Spark and Hadoop.
   * Perform sta s cal analysis on pa ent health parameters.
   * Display analy cal results on a dashboard.
   * Implement real- me data streaming using Ka a.
   * Store pa ent feedback in a NoSQL database.
   * Apply sen ment analysis on feedback using machine learning.
   * Use database sharding techniques for efficient storage.
3. Technologies Used
   * Data Processing: Apache Spark, Hadoop, MapReduce
   * Real- me Streaming: Apache Ka a
   * Storage: NoSQL (MongoDB or Cassandra)
   * Visualiza on: Dashboard (Tableau, Power BI, or Web Applica on)
   * Machine Learning: Sen ment Analysis (Python, TensorFlow, or Scikit-Learn)
   * Database Sharding: Distributed database storage techniques
4. System Workflow
   1. Data Genera on:
      * Create 10,000 pa ent profiles with a ributes like Blood Pressure, Sugar Level, Cholesterol, Haemoglobin, etc.
      * Store generated data in Hadoop HDFS.
   2. Data Processing:
      * Use Spark and MapReduce to clean, filter, and analyze pa ent data.
      * Compute basic sta s cs such as average BP, Sugar Level distribu on, and cholesterol trends.
   3. Dashboard Integra on:
      * Display the processed sta s cs and insights on a user-friendly dashboard.
   4. Real- me Streaming with Ka a:
      * Publish processed sta s cs to a Ka a topic.
      * A doctor subscribes to receive real- me updates via Ka a Consumer.
5. Pa ent Feedback Collec on:
   * + Pa ents submit feedback on their test process.
     + Store feedback as (Key: Pa ent ID, Value: Feedback String) in a NoSQL database.
6. Sen ment Analysis & Database Sharding:

o Use ML techniques to classify feedback as posi ve or nega ve. o

Implement database sharding for distributed data storage.

1. Results and Analysis
   * Sta s cal insights into health condi ons of pa ents.
   * Real- me updates to subscribed doctors via Ka a.
   * Pa ent feedback stored and analyzed for service improvements.
   * Efficient data handling using database sharding.
2. Future Enhancements
   * Incorporate deep learning models for advanced health predic ons.
   * Implement anomaly detec on for cri cal health warnings.
   * Enhance dashboard interac vity with AI-driven insights.
3. Conclusion This project successfully integrates big data technologies, real- me streaming, and machine learning to build an efficient health monitoring system. The combina on of Spark, Hadoop, Ka a, and NoSQL databases ensures scalable, real- me processing of pa ent health data, making healthcare monitoring more effec ve and data-driven.
4. References [List relevant books, research papers, online documenta on, and tutorials used in the project.]





