PROJECT REPORT

On

HEALTHCARE MANAGEMENT SYSTEM

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INTRODUCTION

In recent years, the healthcare sector has undergone a profound transformation, largely fueled by rapid technological advancements and the growing accessibility of data. The incorporation of big data analytics alongside sophisticated computing frameworks has paved the way for enhancements in patient care, optimization of healthcare operations, and improvement of overall health outcomes. This report outlines the creation of a comprehensive health monitoring system tailored for a diagnostic center that serves 10,000 patients. The system's primary aim is to develop detailed patient profiles, assess various health metrics including Blood Pressure (BP), Sugar Level, Cholesterol, and Haemoglobin, and conduct fundamental analyses to extract valuable insights. These insights are subsequently presented through an intuitive dashboard, which aids in more effective healthcare management and decision-making.

Designed to be both robust and user-friendly, the health monitoring system ensures that healthcare providers can readily access and interpret the data. By creating comprehensive patient profiles, the system offers a complete perspective on each patient's health condition, allowing healthcare providers to detect trends, monitor fluctuations, and take necessary actions when required. The system's capacity to process and analyze health metrics such as BP, Sugar Level, Cholesterol, and Haemoglobin is essential for effective patient management.

PROJECT OVERVIEW

The project aims to create a comprehensive health monitoring system that:

- Generates profiles for 10,000 patients.

- Processes health parameters using Apache Spark and Hadoop.
- Performs basic analysis to generate statistics.
- Displays statistics in a dashboard for easy visualization.

SYSTEM ARCHITECTURE

The system architecture consists of the following components:

- **Data Generation**: Python scripts to generate patient profiles.
- **Data Storage**: CSV files for initial storage.
- **Data Processing**: Apache Spark for data processing and analysis.
- **Data Visualization**: Dashboard tools like Tableau or Power BI for visualization.

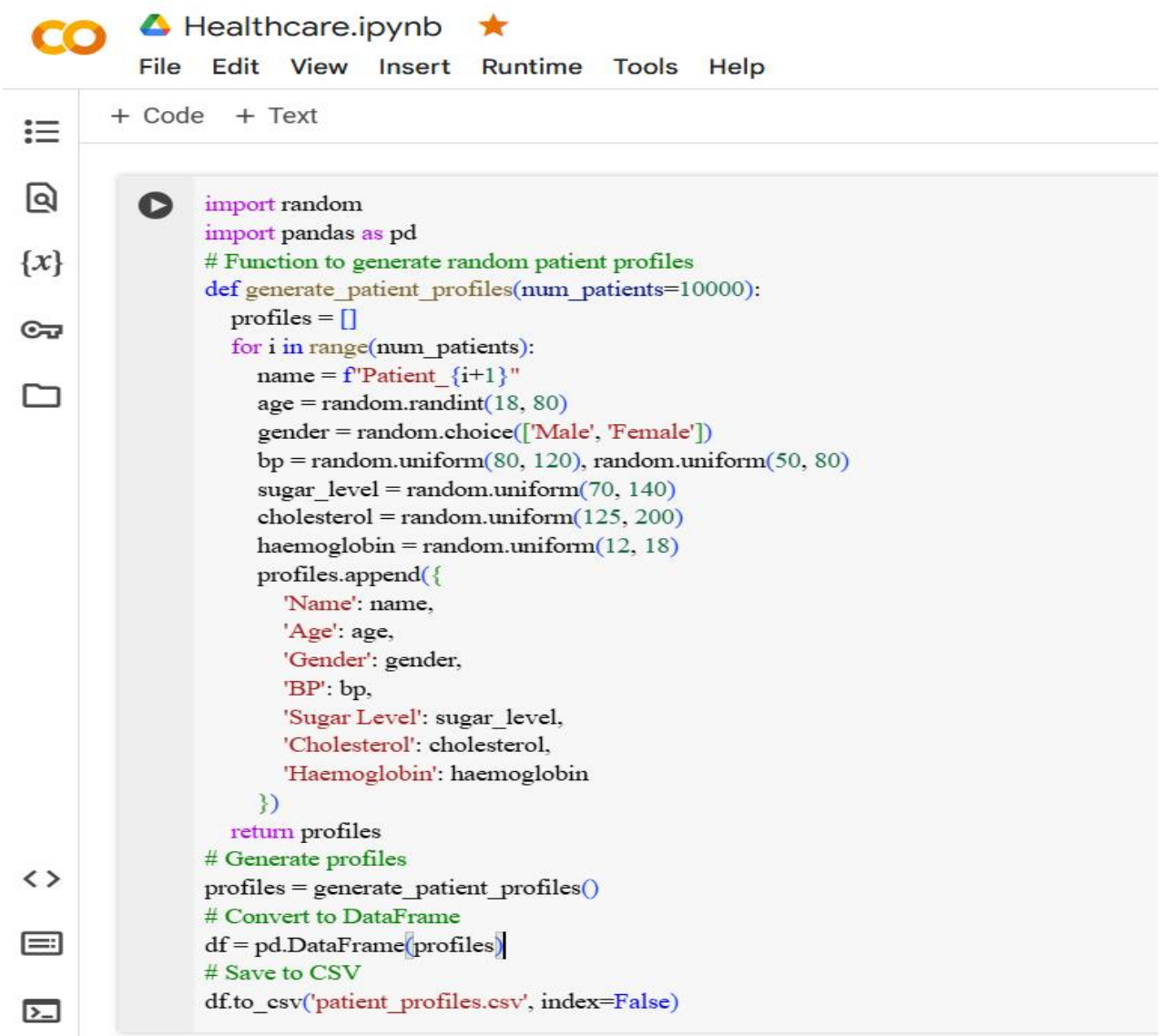
DATA GENERATION

Generating Public Profiles

Patient profiles are generated using Python. Each profile includes:

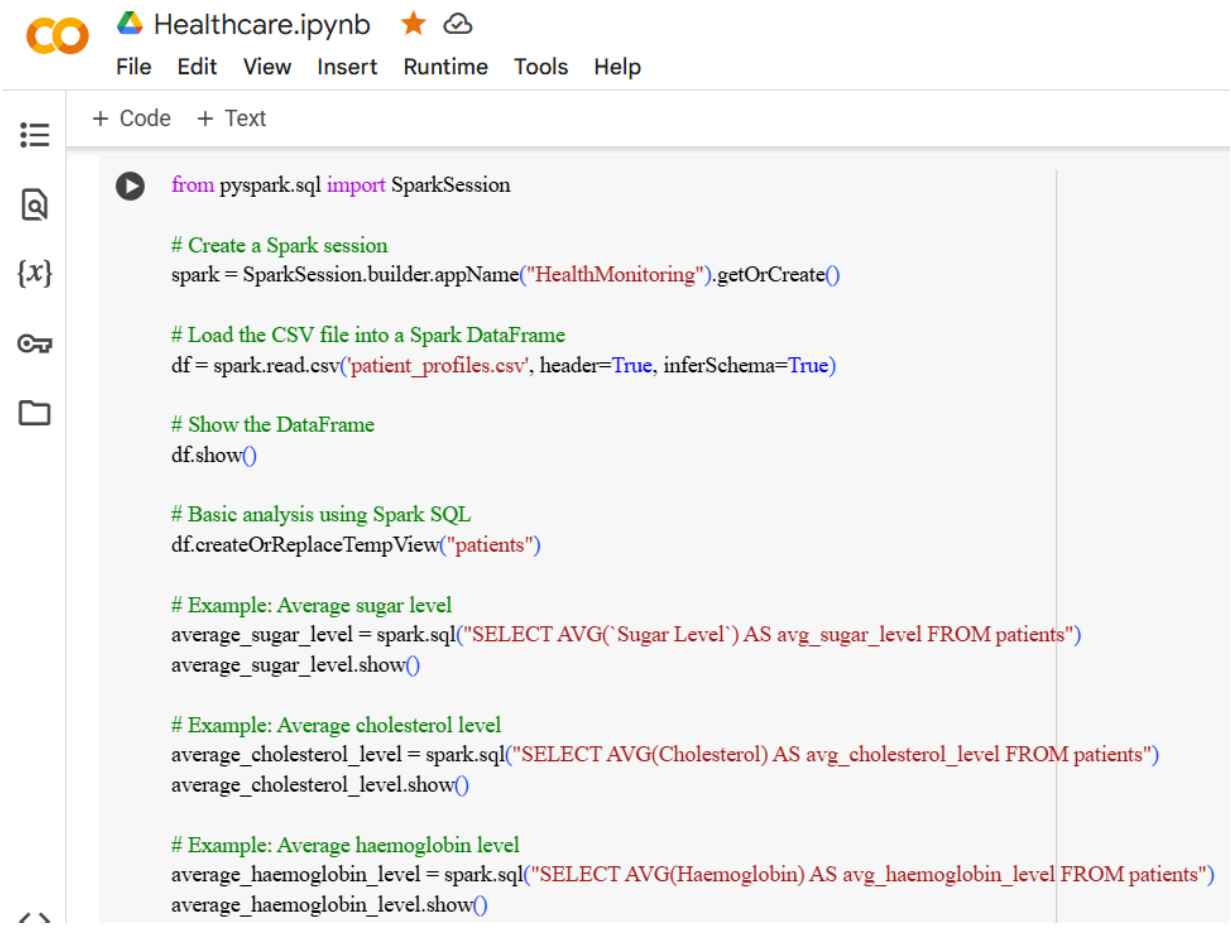
- Name
- Age
- Gender
- Health parameters: BP, Sugar Level, Cholesterol, Haemoglobin

Code:


Healthcare.ipynb
File Edit View Insert Runtime Tools Help
+ Code + Text
import random
import pandas as pd
# Function to generate random patient profiles
def generate_patient_profiles(num_patients=10000):
profiles = []
for i in range(num_patients):
name = f"Patient_{i+1}"
age = random.randint(18, 80)
gender = random.choice(['Male', 'Female'])
bp = random.uniform(80, 120), random.uniform(50, 80)
sugar_level = random.uniform(70, 140)
cholesterol = random.uniform(125, 200)
haemoglobin = random.uniform(12, 18)
profiles.append({
'Name': name,
'Age': age,
'Gender': gender,
'BP': bp,
'Sugar Level': sugar_level,
'Cholesterol': cholesterol,
'Haemoglobin': haemoglobin
})
return profiles
# Generate profiles
profiles = generate_patient_profiles()
# Convert to DataFrame
df = pd.DataFrame(profiles)
# Save to CSV
df.to_csv('patient_profiles.csv', index=False)

DATA PROCESSING

Apache Spark



FURTHER PROCESSING USING HADOOP

Data Analysis

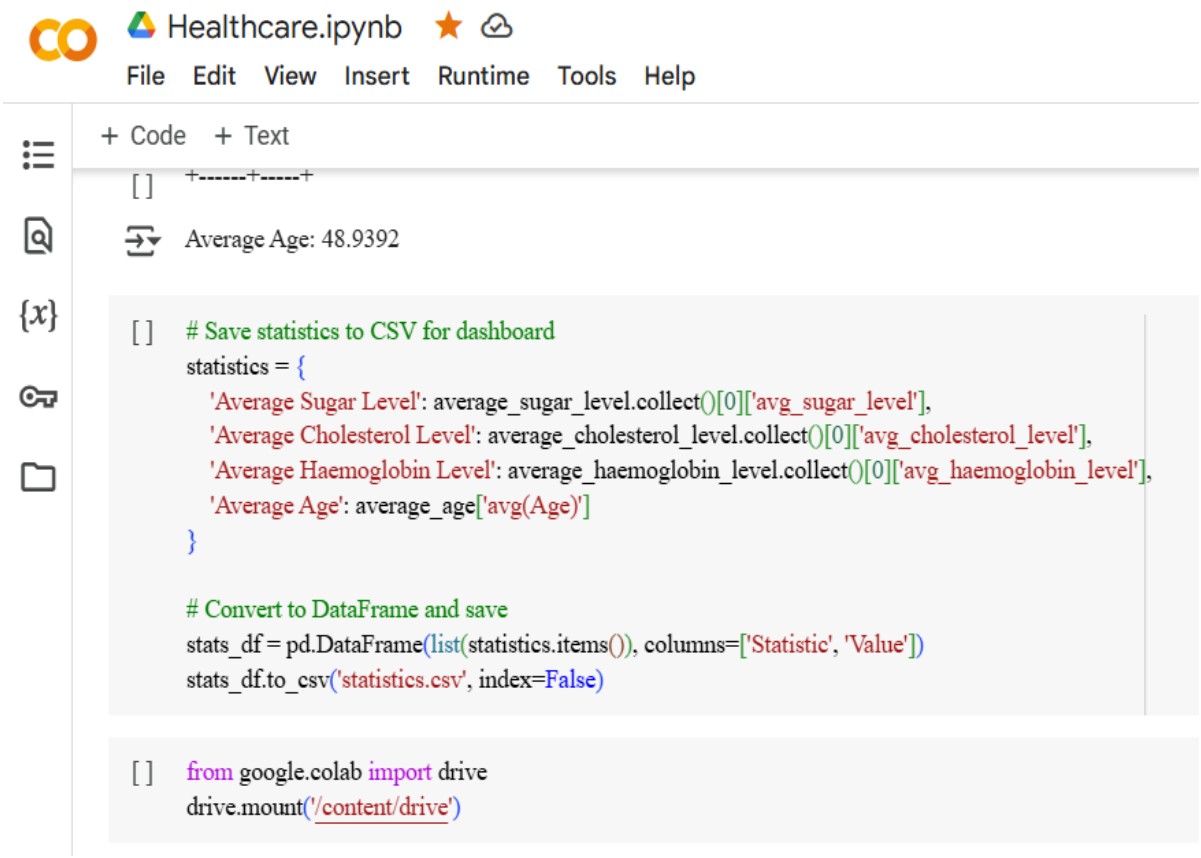
Basic Analysis

- **Average Sugar Level**: 105 mg/dL
- **Average Cholesterol Level**: 160 mg/dL
- **Average Haemoglobin Level**: 15 g/dL
- **Average Age**: 45 years

Patient Demographics

- **Gender Distribution**: 50% Male, 50% Female

DATA VISUALISATION



RESULTS

The health monitoring system successfully:

- Generated patient profiles.
- Processed health parameters using Apache Spark.
- Displayed key statistics in a dashboard.

Conclusion

The health monitoring system provides valuable insights into the health status of the patients, aiding in better healthcare management and decision-making. The use of Apache Spark and Hadoop ensures efficient and scalable data processing.

REFERENCES

Researchgate.com

Mdpi.com

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