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**Problem Statement**

Cardiovascular diseases (CVDs) are a leading cause of death worldwide, often due to factors like arterial blockages and organ damage. The task is to design a digital health program that uses real-time vital signs data to predict the likelihood of fatal cardiovascular events. By analyzing patients’ data, the goal is to create a tool that helps healthcare providers monitor vital signs and intervene early, reducing the risk of death from CVDs. The solution will support clinicians in making timely, data-driven decisions to prevent fatal outcomes.

**Structure of the Program**

**Loading Module :**This module will handle loading the dataset from a CSV file and retrieves it for further processing into a nested dictionary, which should be returned by the functions. **Query Module**: This module contains the functions for querying the dataset for various statistics and insights.

**User Interface Module**: This module provides an interactive interface for users to query the system and display results.

**Relationship between the Modules**

The loading module supplies the data set into a dictionary to be worked upon by the query module to perform computations and analyses. The user interface takes the user’s input and displays information in a user friendly format that was processed by the query module.

**Instructions on how to execute the program**

Ensure you have a Python interpreter installed on your computer .

The dataset file should be available in the same directory as the application files.

The program consists of three main modules: loading module, query module and user interface modules .

**Run the Program.**

**Interact with the System.**

**Insights from Data Analysis**

Older patients are more likely to experience fatal heart failure, as the average age of those who died (65.21) was higher than the dataset’s general average age (60.83).

The patients that had longer follow up periods didn’t die and this suggests effective medical care. It’s most likely that the patients that died early in their follow up period didn’t show up at the hospital early so patients should be encouraged to show up at the hospital for proper monitoring.

The age that is mostly affected by diabetes is 60 years old and this suggests that as patients approach that age they should be take care of their sugar level by reducing sugary foods and increasing exercises.

The relationship between smoking ,diabetes and high blood pressure is not significant meaning that other lifestyle changes apart from smoking should be focused on in the prevention of diabetes.

Death due to heart failure is not only caused by high blood pressure because there are many patients without high blood pressure that died .

**Reflections**

* I gained proficiency in the analysis of data, particularly in the querying and analysing of data.
* I implemented functions to query my data set which deepened my understanding of programming concepts like loop, iterations, conditionals and data structures.
* I worked with data structures like lists and dictionaries to analyse the data set. It enhanced my coding skills in areas like logic development, data handling and errors.

**Conclusion**

This project involved developing a system to analyze cardiovascular disease data, aimed at helping healthcare providers monitor patients' vital signs. It included three key modules: the **Loading Module** for importing data, the **Query Module** for statistical analysis, and the **User Interface Module** for user interaction. The system enables healthcare providers to query and analyze critical patient data, such as age, blood pressure, and diabetes, to identify patterns and trends that can inform clinical decisions and improve patient care, ultimately contributing to better management of cardiovascular diseases.