PROJECT SUMMARY
SeniorShield :
Preventing Elderly Falls with Data Analysis

Objective: The project aims to identify the circumstances associated with falls in the elderly through medical narratives and unsupervised machine learning techniques. The focus is on correlating falls with clinical factors and finding ways to prevent them.

METHODOLOGY

Exploratory Data Analysis: explore data from the primary_data.csv file, identifying relevant columns, handling missing values, and visualizing the distribution of ages, genders, and diagnoses.

Text Processing: preprocessing of medical narratives, including tokenization and conversion into numerical representations.

Topic Modeling: apply topic modeling techniques like LDA and NMF to identify relevant topics in the narratives.

Association Analysis: analyze relationships between variables such as age, gender, and diagnoses in relation to the identified topics.
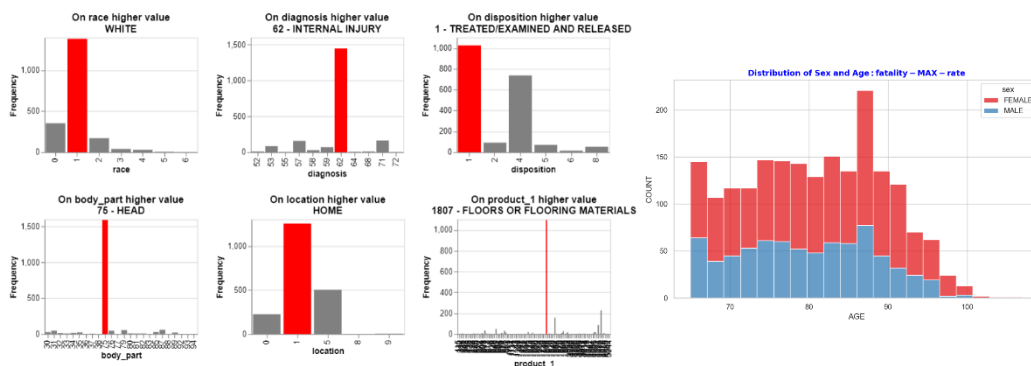
Evaluation and Interpretation: evaluate the quality of identified topics and generated insights to reduce falls in the elderly.

Key Milestones:

✓ Key words related to narratives and worst-case scenario for an elderly fall.
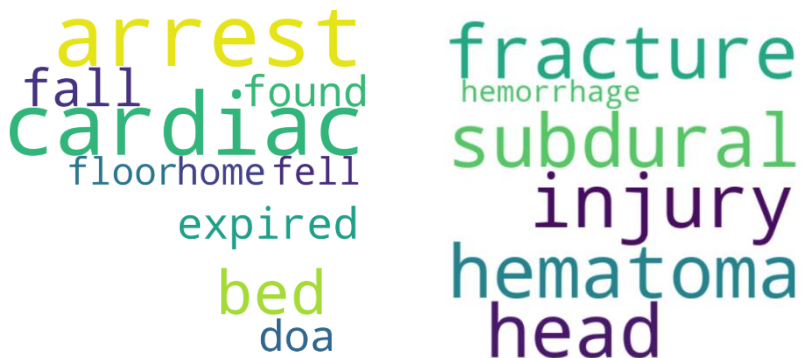
✓ Identified profile with higher KPI Fatality rate.

Unsupervised main tools used.

This study combines LDA topic analysis and K-means clustering for data classification. It begins by creating a TF-IDF corpus to represent word frequencies in narrative attributes. Next, an LDA model is trained to uncover underlying topics within the narratives and extract keywords for each topic. These topics are then used to categorize narratives into the DOA group (Death on Arrival), enabling the calculation of a fatality rate KPI. This approach helps identify the group at a higher risk of fatal falls.

SUMMARY: In this project, we successfully developed a fatality indicator for elderly falls through topic analysis and keyword extraction from narratives related to diagnoses, including internal organ damage and more. This indicator, when thoroughly explored, can reveal the profile of elderly individuals most susceptible to severe situations involving falls, providing valuable insights into fall-related fatalities.