Topic 2: XAI – Switching Behaviour in Health Insurance

Goal: *Explainable AI for Understanding Switching Behaviour in Statutory Health Insurance*

Project Description:

Insured individuals in Germany can generally switch their statutory health insurance provider after a minimum coverage period of 12 months, with exceptions in the case of additional contribution increases. Existing hypotheses suggest that **younger individuals** and **dissatisfied members**, especially those perceiving service issues are more likely to switch. With access to rich, high-dimensional survey and profile data, the aim is to develop interpretable machine learning models to identify **which customer characteristics most strongly influence switching decisions**. Using advanced XAI techniques, the project provides transparency and actionable insights into the personas and motivations of switchers.

Research Questions:

- Which customer characteristics are most predictive of switching behaviour?
- What are the **explainable factors** (not just statistical correlations) that drive individuals to change insurers?
- Can we build **interpretable switching personas** to inform strategic decisions by insurers?

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Tasks:
- Preprocess and integrate insurer-level data with Customer Monitor survey responses and profile dimensions.
- Perform exploratory analysis to identify dominant switching patterns across demographic and behavioral segments.
- Train interpretable models and black-box models for comparison.
- Apply XAI methods (e.g., SHAP, LIME, counterfactual explanations, etc.) to analyze feature contributions.
- Cluster individuals into personas based on key switching drivers and probabilities.
- Build a dashboard prototype to visualize personas, feature influences, and switching likelihood across segments.

Expected Outcome:
- An **explainable AI model** identifying and interpreting the top features influencing switching decisions.
- A set of **personas with switching probabilities**, differentiated by insurer or group if needed.
- A **web interface dashboard** displaying switching personas, explainability outputs, and policy insights.

Data:
- Number of insured individuals per statutory health insurance provider as of January 1st each year (quarterly breakdown available upon request).
- Customer monitor 2022-2024 (representative survey with % of individuals indicating switching intent across all providers)
- 70 dimensions available for profiling switchers:
  - 24 personal characteristics: e.g. gender, age group, regions, quality vs. price
  - 8 switching reasons: e.g. overall satisfaction, satisfaction price-performance
  - 22 contact channels: e.g. satisfaction personal contact person, contact app
  - 10 brand values: e.g. sustainability, reliability, digital orientation
  - 6 price-performance: e.g. satisfaction performance claim, additional contribution