TOUCH AND USER CLASSİFİCATİON FROM SMART FABRİC

This dataset is collected from a smart textile sensor array, where users interacted with the fabric using different touch gestures. The fabric has **3200 sensor channels** that capture the pressure and pattern of each touch.

Each row in the dataset represents one touch instance and contains the following:

Feature Name	Description
user_id	ID of the user performing the touch (multi-class classification target)
touch_type	Type/category of the touch (multi-class classification target)
touch, finger, palm, fist	Boolean indicators of gesture style (not used in this task)
1 to 3200	Sensor readings (pressure/intensity values) from the smart fabric grid

- **Total samples:** 2056
- **Sensor features:** 3200
- **Targets:** user_id (e.g., 0-4), touch_type (e.g., 0-3 or more)

Objective

- You are expected to build two separate classification models:
- Predict the user identity (user_id) based on sensor input.
- Predict the touch type (touch_type) using the same sensor data.

Restrictions

- **Do NOT use dimensionality reduction techniques** such as **PCA, UMAP, t-SNE, or Autoencoders**.
- You MUST use **feature selection or ranking** techniques instead, to identify and retain the most informative sensor features.

Hints

- Sensor readings may include noise; apply filtering or z-score outlier removal if necessary.
- Some sensor columns may always be zero or have low variance — remove them early.
- You can use separate pipelines or ColumnTransformer for modular preprocessing.
- Compare feature selection methods in terms of accuracy vs feature count trade-off.