PROJECT- STUDENT PERFORMANCE ANALYSIS

Summary & Conclusion

Project Objective

This Excel-based dashboard project analyzes academic performance data from a diverse student population, aiming to understand how demographic, socioeconomic, and behavioral factors affect outcomes like internal and end-semester performance. The goal was to surface patterns and actionable insights that could inform educational interventions or policy refinement.

Key Components

- **Raw and Clean Data Pipeline**: Transformed messy inputs into structured, analysis-ready formats.
- **Attribute Dictionary Table**: Defined and explained fields such as:
  - **Demographics**: Gender, Caste, Marital Status, Family Size, Monthly Income
  - **Academic Details**: 10th/12th scores, Internal/End Sem results, Study Type, Learning Style
  - **Support Systems**: Type of academic support (Free vs Paid), Health Status, Travel Time, School System
- **Scoring Scale Table**:
  - **Performance Level Encoding**: Pass (1), Good (2), Very Good (3), Best (4)
  - Used for quantifying and comparing academic outcomes
- **KPI Dashboard Metrics**
  - Academic KPIs:
    - Average 10th Score: **2.24 / 4**
    - Average 12th Score: **2.28 / 4**
    - Average Internal: **2.55 / 4**
    - Average End Sem: **2.24 / 4**
  - **Gender-Based KPIs**:
    - **% Female Students**: 45.04% – Average End Sem: **2.32**
    - **% Male Students**: 54.96% – Average End Sem: **2.17**

Obesrvation: These indicators show that most students fall into the **"Good" to "Pass"** performance tier, with **Internal performance higher than End Sem**, and a measurable **gender-based performance gap favoring females**.

Key Insights & Observations

Performance Trends – Internal vs End Sem

Internal scores outperform End Sem scores across the board, suggesting:

- Internal assessments may be more lenient
- Students may struggle more under final exam conditions
- Or external exams may be designed with higher difficulty

Insight: Academic success strategies might focus on bridging the gap between internal and final performance through revision support or stress management training.

Gender Impact – Female Students Outperforming

- Female students average **2.32** in End Sem compared to **2.17** for males.
- Radar charts show female students more often fall into **"Very Good" and "Best"** categories.

Insight: To strike a balance in exam preparedness and learning engagement, gender-based initiatives could be implemented to specifically support male students.

Academic Support – Surprising Strength of Free Support

Contrary to expectations, students using **Free academic support** scored **higher** in End Sem on average than those using **Paid support**.

Possible Interpretations:

- Free support is targeted and effective (e.g., tutoring programs, peer help)
- Students needing paid support may already be at academic risk
- Students using free support might me more dedicated

Insight: Analyze baseline scores of each group. If Free support is genuinely more effective, its scalability should be explored by educational institutions. Can approach it by introducing more filters like their family income.

Caste-Based Academic Patterns

- Average End Sem scores vary by caste category:
    - **ST (Scheduled Tribe)** students scored the **highest**
    - **General (G)** caste had the **highest internal count** but lower final scores

Insight: Caste appears to have nuanced correlations with academic outcomes, potentially reflecting access to resources, systemic challenges, or support mechanisms.

Possible Solution: Policies could be fine-tuned for caste-sensitive academic aid while addressing inequalities or misconceptions.

Learning Style & Study Type Correlation

- **Visual learners** show slightly better performance than **Theoretical learners** in End Sem.
- Stacked bar charts confirm this pattern across internals and final results.

Insight: Teaching strategies that integrate visual aids, diagrams, and interactive material could lift outcomes across the board.

Recommended Approach for better answers: Using Filterable Factors allowing Diagnostic Potential

The dashboard includes interactive filters for:

- **Family Monthly Income** (Average, High)
- **Family Size** (Large, Small)
- **Travel Time** (Average, Large)
- **Health Status** (Average, Good)

These allow for:

- Focused subgroup performance analysis
- Personalized academic support interventions

Possible Solution: Long travel times may reduce academic performance — use filters to validate such assumptions.

Final Takeaways

The **Student Academic Performance Dashboard** delivers nuanced insight into how student characteristics affect academic outcomes, using Excel's full analytical and visualization capabilities. It moves beyond raw scores into **multi-dimensional analysis**, uncovering performance drivers like gender, caste, learning preferences, and others.

Skills and Tools Demonstrated

- Data cleaning and transformation from unstructured student datasets
- Use of **encoded scoring logic** for performance quantification
- KPI development & comparative dashboards for **demographic analytics**
- Visual storytelling through radar charts, stacked bars, and slicer filters
- **Socially responsible insight generation** (e.g., gender equity, caste disparity)