Student's Cognitive Overload Score (Mental Load Index)

1. Target Users and Domain Situation

This program is directed to university students, who are often exposed to intense academic pressure, information overload, and life-style imbalances. These pressures lead to mental overload and burnout, which can occur without the student's awareness until performance deteriorates or wellbeing is compromised.

To solve this, the project suggests a Mental Load Index a composite visual score based on stress, sleep, study time, and screen time. The objective is to allow students to recognize early warning signs of overload and adjust their habits accordingly.

2. Datasets and Preprocessing

The project works on two datasets: [exams.csv](academic grades and demographic data) and [Student Mental Stress and Coping Mechanisms](lifestyle and mental health data).csv (lifestyle and mental health data). Since the datasets don't share a common key, they were joined by index to create an integrated sample. After handling missing values through elimination and normalizing numerical fields (like study hours, sleeping time, use of social media, level of stress), groundwork was initiated to develop a Mental Load Index (MLI). The planned MLI will synthesize such variables, whereby additional study hours, use of social media, and stress would lead to higher score, while extra sleep would make it lower. The goal is to normalize the index within the range 0 to 100 in order to represent varying levels of cognitive load.

3. Task Abstraction

The prototype will help with a number of important tasks that help users know their mental load and academic well-being. Users will have the ability to compare their Mental Load Index with academic achievement in an attempt to identify possible correlations between mental stress and academic performance. The project will help identify students who are probable burnouts by indicating high MLI scores. Moreover, users will be able to compare Mental Load Index between groups based on coping strategies or gender, thereby gaining a better understanding of the effects of different variables on mental load. Ultimately, users can see how certain habits; such as

amount of sleep, study time, or social media usage; affect results. Collectively, these activities will engage self-reflection and promote healthier lifestyle modifications through interactive and informative visualizations.

4. Reflection

One of the main problems that I faced was the absence of a common identifier between the two datasets, so a direct merge was not possible. To achieve this, an index-wise merge was done while considering the resulting data as synthetic alignment suitable for exploratory visualization. It allowed me to proceed with the analysis and task design in a meaningful way.The second problem was having to simplify and normalize several variables so that they were usable and visually consistent in the prototype. I cleaned the datasets by eliminating missing values and normalized categorical variables for uniformity.

During the group session, my peers informed me that I might look at other tools in addition to Tableau.. They advised me that we should look at more flexible tools that would offer us more control and adjustment when prototyping.