

**Project:** Gym & Fitness Lifestyle Analysis Dashboard (20k Records) **Course:** CEN445 - Introduction to Data Visualization

**1. Dataset Context & Objectives:** We utilized the **Gym Members Exercise Dataset** (20,000 records), significantly exceeding the course requirement. The dashboard aims to visualize complex relationships between workout habits, nutritional intake, and physiological responses using Python/Streamlit. Our goal was to uncover how specific diets influence workout intensity and identify demographic health patterns across a large-scale population.

**2. Team Contributions & Visualization Techniques:** The dashboard features **9 visualizations** (including 4 **Advanced** types), with responsibilities divided as follows:

- **Ibrahim Emre Yıldız (Lead & Architecture):** Designed the data pipeline and sidebar logic. Created a **Sankey Diagram (Advanced)** to map the flow from *Diet Types* to *Workout Types*, revealing nutritional impacts on exercise choice. Also implemented a **Treemap (Advanced)** for *Muscle Group* hierarchy and **Bar Charts** for gender distribution.
- **Kamal Asadov (Trend Analysis):** Focused on multidimensional drill-downs. Developed a **Sunburst Chart (Advanced)** to visualize the nested relationship of *Diet* → *Workout* → *Difficulty*. Additionally, built **Scatter Plots** (Max vs. Avg BPM) and **Line Charts** to analyze heart rate trends across age groups.
- **Muhlis Çolak (Statistical Distributions):** Handled density and outlier analysis. Used **Density Contour Plots (Advanced)** to visualize Age/Gender clusters without overplotting. Implemented **Box Plots** to detect outliers in session durations and **Histograms** for heart rate frequency distributions.

### 3. Key Insights

- **Dietary Impact:** The Sankey analysis confirms that high-protein diets (e.g., Paleo) strongly correlate with high-intensity workouts (HIIT, Strength), while Vegan diets show a balanced distribution across lower-impact activities.
- **Demographics:** Density plots highlight that the most active demographic is males aged 25-35, whereas female participation is evenly distributed across the 20-40 age range.
- **Physiological Efficiency:** Scatter analysis shows that experienced users maintain lower Average BPMs during intense sessions, indicating better cardiovascular conditioning.

### 4. Resources GitHub Repo:

[[https://github.com/IbrahimEmreYildiz/data\\_visulation\\_dashboard](https://github.com/IbrahimEmreYildiz/data_visulation_dashboard)] | **Dataset Source:** <https://www.kaggle.com/datasets/valakhorasani/gym-members-exercise-dataset>