

Team 15: Analysis of Desktop Computers and Hardware Components in Turkish E-Commerce

1 Introduction

The **15.csv Turkish E-Commerce Desktop Computer** dataset provides comprehensive information on desktop computers and hardware components available on a popular e-commerce platform in Turkey. This dataset serves as a valuable resource for **researchers, data scientists, and analysts** interested in hardware specifications, pricing trends, and e-commerce insights. By analyzing this dataset, one can gain a deeper understanding of market dynamics, pricing patterns, and consumer preferences in the desktop computer segment.

2 Dataset Description

The dataset consists of **28 attributes** capturing key technical specifications and pricing information. The primary attributes include:

2.1 General Information

- **Brand (Marka)** – Manufacturer of the computer (e.g., XASER, HP, Dell).
- **Price (Fiyat)** – Selling price of the desktop (in Turkish Lira - TL).
- **Country of Manufacture (Menşei)** – Country where the product was manufactured.

2.2 Processor and Memory Specifications

- **Processor Type (İşlemci Tipi)** – Brand and model of the CPU (e.g., Intel Core i5, AMD Ryzen 7).
- **Base Clock Speed (Temel İşlemci Hızı)** – Processor's base speed in GHz.
- **Processor Frequency (İşlemci Frekansı)** – Maximum speed of the processor (above 3.00 GHz, etc.).
- **RAM (Sistem Belleği)** – Installed system memory (e.g., 8 GB, 16 GB).
- **Expandable Maximum Memory (Arttırılabilir Azami Bellek)** – Maximum RAM capacity.
- **SSD Capacity (SSD Kapasitesi)** – Storage capacity of the SSD (e.g., 256 GB, 512 GB).

2.3 Graphics and Display Features

- **Graphics Card (Ekran Kartı)** – Model of the GPU.
- **Graphics Card Memory (Ekran Kartı Kapasitesi)** – VRAM capacity (e.g., 4 GB, 8 GB).
- **Graphics Memory Type (Ekran Kartı Bellek Tipi)** – Type of GPU memory (e.g., DDR3, GDDR5).
- **Graphics Card Type (Ekran Kartı Tipi)** – Dedicated or integrated GPU.
- **Monitor Size (Ekran Boyutu)** – Screen size in inches (e.g., 24", 27").
- **Screen Refresh Rate (Ekran Yenileme Hızı)** – Display refresh rate (e.g., 75 Hz, 165 Hz).
- **Panel Type (Panel Tipi)** – Monitor panel technology (VA, IPS, TN).

2.4 Connectivity and Physical Attributes

- **Connections (Bağlantılar)** – Available ports such as HDMI, DisplayPort.
- **Weight (Cihaz Ağırlığı)** – Total weight of the desktop computer.

3 Tasks and Requirements

To analyze and extract meaningful insights from the dataset, the following tasks need to be performed:

3.1 Data Exploration and Preprocessing

- Load and clean the dataset, handling missing values and inconsistent formatting.
- Normalize numerical attributes such as price, processor speed, and RAM.
- Convert categorical variables (e.g., brand, processor type) into structured formats for analysis.
- Identify outliers in pricing and technical specifications.

3.2 Market and Pricing Analysis

- Analyze pricing trends across different brands and hardware configurations.
- Examine the relationship between technical specifications (e.g., RAM, SSD size, processor type) and pricing.
- Identify popular brands and models based on price distribution.
- Predict pricing trends using **linear regression** or **time-series forecasting** models.

3.3 Hardware Component Trends

- Investigate the most common processor and graphics card configurations.
- Compare performance attributes of different brands and price segments.
- Detect emerging trends in RAM and SSD capacity over time.

3.4 Visualization and Reporting

- Generate distribution plots to visualize price variation among brands.
- Create heatmaps to analyze correlations between system specifications and pricing.
- Develop bar charts showcasing popular configurations and feature trends.

4 Submission Requirements

- A well-structured report detailing the methodology, results, and analysis in a given report format.
- Python code is used for implementation.
- A presentation summarizing key findings and recommendations in a given presentation format.