Time Series Analysis Course

Final Project

Tomer Hait

316350651

Tal Peer

208851253

**Technion - Israel Institute of Technology**

Part 1 – Introduction, Data Selection and Visualization

Our project will focus on the analysis of <u>Global Radiation measurements between 2017-2023</u>.

Global radiation refers to the total solar radiation received on a horizontal surface, encompassing both direct and diffuse solar radiation. This radiation is a key component of Earth's energy balance and plays a crucial role in various natural processes.

We selected a dataset spanning hourly measurements of global radiation recorded at the Haifa Technion station, covering the years from 2017 to 2023.

Originally, the dataset provided measurements for each hour from 8:00 to 20:00. However, we opted to aggregate the data to compute daily averages, along with additional temporal information.
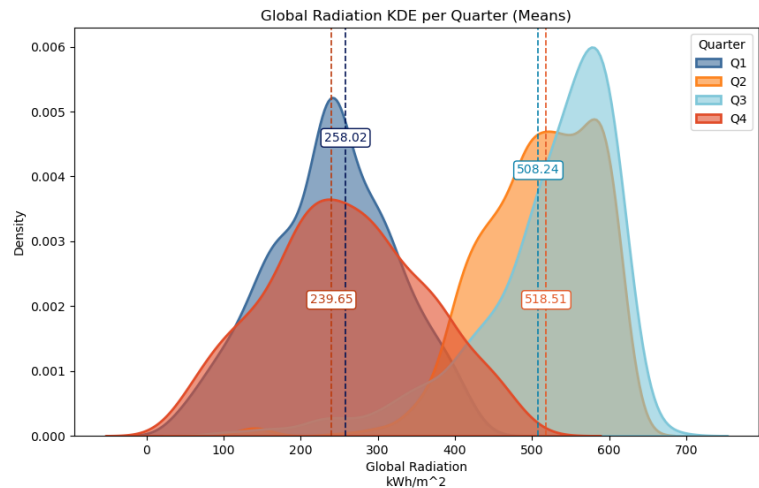
The dataset was sourced from the Israeli Meteorological Service website, under the governance of the Ministry of Transport and Road Safety. It comprises 2546 records and the following attributes:

date	date of the recorded data and serves as the table index (each row corresponds to a specific date)
avg_daily_global_radiation	average daily global radiation measured on each date.
year	year of the recorded data.
month	month of the recorded data
day	day of the recorded data
quarter	categorizes the data into four quarters: Q1, Q2, Q3, and Q4. (manual mapping)

Decomposing the dataset, we can observe that seasonality manifests as fluctuations in global radiation levels throughout the year, with higher levels during certain seasons (e.g., Q3) and lower levels during others (e.g., Q1 and Q4).
We can observe an overall trend by increasing
radiation levels over the mentioned years.
Also, we can observe from the boxplot and residuals plot a discernible regularities or structures by short-term fluctuations outliers in Q2.