Write at least 300 words describing three real life usages of TSA.

Time Series Analysis is concerned with the study and interpretation of time series data to extract meaningful statistics and other characteristics of the data. The main difference with the traditional approaches of statistical modeling and inferences is that the assumption that the adjacent observations are independent and identically distributed is no longer valid, because of the correlations that is introduced by past points in time. This means that time series data, by construction, have a natural temporal ordering, like for example: unemployment rate, monthly energy consumption, and blood pressure.

The first example, unemployment rate, tries to understand the trends, patterns, and possible cycles of the percentage of people that are unemployed. Its study and analysis are important because it can give clues on how seasons affect employment, the impacts of financial crises, and the possible effects of labor policies. Also, by understanding its behavior and considering its trend, seasonality, and cycle policy makers can monitor how well the economy is doing, since low rates of unemployment can be correlated with a growing number of companies that are in need of a working force.

The second example, monthly energy consumption, is related with the average consumption of electricity of a household, a factory, a shop or even a public building. Its analysis and understanding are of great importance because it can help a company identify irregular peaks or decreases that can be cause by faulty meters or people tampering with meters to avoid paying more. Even more, this type of time series analysis can help users understand their consumption patterns and possibly identify ways to be more efficient with the consumption.

Finally, the last example, blood pressure, is a type of time series that is related with medicine where a physician measures a patience blood pressure over time with the purpose to evaluate how effective has been the usage of determine hypertension treatment. By applying time series analysis, the physician has the capability to extract useful information that can lead him to state several hypotheses about why the blood pressure is increasing or decreasing. With this information, the doctor can formulate the proper course of actions to achieve the proper blood pressure.