Modeling Seasonal Time Series.

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A time series **X** is a vector subspace (of the Hilbert space of time series) of which vectors have the same mean as **X**. The **best model** (from a class of models) is a time serie such that the mean of square of error is minimum. The used method will be the Regression.

In the following, we represent in fonction of the Variance and Covariance, the coefficeints of the Best Model for the three most common models:

- the models that contains only a seasonal componenet,
- the models that contains only a trend (for which we obtain the classical regression coefficients),
- the models that contains a seasonal component and a trend.

We prove that is always better in order to have a model for a seasonal time series, to consider a model that has a seasonal component and a trend, even the series seams to have only a seasonal component.

The paper is organised as follows: in the first section we introduce the notions, in the second we state the problem in the general case and, in the section 3, we obtain the best model for each the three classes of models . In the section 4 we compare and find the condition to obtain the same mean of square of error for:

- the model that has only a seasonal componenet and the model that has a seasonal component and a trend,
- the model that has a seasonal component and a trend and the model obtained by the Census method.