Grey Model Prediction Intro

全球的电力消耗尚无可预见的上限。同时，随着技术的发展，电力的生产与消耗也会不断增加。因此，我们采用GM（灰色模型）对其进行预测。

The **Gray Box Model** is a prediction method that establishes a differential prediction model by a set of chaotic information to make a fuzzy long-term description of the development trend.

PS: The mathematical derivation process is very tedious.

To simplify the process, we employ GM(1,1) method. Define 

Then, generate a new sequence through accumulation



And define



Thus, we get the differential equation



where  serves as the developing parameter, and  serves as the controlling parameter.

Their ratio



can be calculated by *GLS (generalized least squares)*, which refers to



where



Substitute it into the former equation, we get

