## Strengths

Model 1 is developed as all ten factors contribute to the eventual projection in different weights. This highly resembles the often situation in reality, where multiple factors decide the final result in minor proportions, instead of a few major ones determining every aspect.

In order to keep the models’ flexibility factors changes, Model 2 embodied the original trends in determining factors when predicting by simplifying trends in selected factors directly form a compound algorithm. While it provides more flexible insights by simplifying the attribution of weight between factors, the form of exponential function also decides that the changing rate of factors and the independent factor $c$ beer a linear relationship, which is a more realistic way for variables to change.

By designing feedback functions, Model 3 clearly shows the influence of efforts to reduce carbon emissions taken into account. By focusing on the amount of CO2 emission – the derivative of CO2 concentration with respect to time, instead of CO2 concentration itself, Model 3 is intuitively more reliable that other 2 models.

In model 4, we applied Lowess smoothing to rule out the noises and reflect the real trend of data. we artificially extract the vibrating pattern of land-ocean temperature, which is more accurate than that directly generated by linear regression models. In model 5, we adapted an innovative partial estimating strategy to predict future relation between temperature and CO2 concentration.

## Weaknesses

We used all ten variables for the prediction, resulting in a problem that the more factors are, the bigger the possibility that intense changes occur after sudden disruptions. Thus, it becomes harder to avoid unreasonable bothers and to maintain the result within a reasonable interval, making the algorithm more fragile to sudden changes or long-term projections. In this case, it goes the opposite way from the other two projections and failed to foresee the positive changes in basic factors supporting the projection.

In model 3, we designed the feedback function artificially and there’s nothing to support our design. Thereby, the effectiveness of the model relies heavily on our design. Also, the model predicts that CO2 concentration will maintain as high as 460 ppm, which seems not reasonable.

In model 4, we assume that solar activities affect the periodical pattern of temperature. Although the temperature curve fitted the data well, this assumption is not supported by the conclusion made by Grey Analysis in model 5.