Machine Learning - Regression Model

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1 Basic part

For City A, the regression equation is

$$\begin{aligned} y = & 0.007982119326698012x^4 - 0.7125281058251858x^3 \\ & + 22.512685418128967x^2 - 289.6496422290802x \\ & + 1229.2750129699707 \end{aligned} \tag{1}$$

For City B, the regression equation is

$$\begin{aligned} y = & - 0.11077442114037694x^3 + 7.458440331276506x^2 \\ & - 166.8636347129941x + 1262.573723912239 \end{aligned} \tag{2}$$

For City C, the regression equation is

$$\begin{aligned} y = & 0.22522304691960926x^2 - 14.877287703982574x \\ & + 274.34064501895045 \end{aligned} \tag{3}$$

2 Advanced part

Compared to the basic part (only one input variable: temperature), two input variables temperature and precipitation are included in the data set in advanced part. And, I also implemented the multivariate linear regression model through the scikit-learn package to make more accurate predictions than basic part.

3 Summary

There are three difficulties I encountered in this assignment. First, data splitting and processing really take me a large amount of time to finish since my poor python coding skill. I spent some time on watching python tutorials. Next, the concept of OLS and gradient descent is somehow complicated. It also takes me a lot of time to figure out the computing details, not to mention the implementation. Lastly, I was extremely exhausted while coding in front of the computer since I got COVID the day before yesterday :(