Hyperion Development

Task: Machine Learning V

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Introduction

Welcome to The Fifth Machine Learning Task!

In the previous tasks, we assumed that the real relationship between the explanatory variables and the response variable is linear. This assumption is not always true, as you will see in the polynomial-regression.py file. Thus, in this task we will introduce polynomial regression; a special case of multiple linear regression that adds terms with degrees greater than one to the model.

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A NOTE FROM THE HYPERION TEAM

Over time, there have been several myths surrounding Machine Learning such as "Machine Learning is just summarizing data" or "Learning algorithms just discover correlations between events", but probably one of the most prominent is that "Machine Learning can't predict unseen events". Well, let's debunk this.

If something has never happened before, its predicted probability must be zero, right? What else could it be? On the contrary, machine learning is the art of predicting rare events with high accuracy. If A is one of the causes of B and B is one of the causes of C, A can lead to C, even if we've never seen it happen before. Every day, spam filters correctly flag freshly concocted spam emails.

Polynomial Regression

In statistics, polynomial regression is a form of linear regression in which the relationship between the independent variable x and the dependent variable y is modeled as an nth degree polynomial in x. Polynomial regression fits a nonlinear relationship between the value of x and the corresponding conditional mean of y, denoted E(y|x), and has been used to describe nonlinear phenomena such as the growth rate of tissues, the distribution of carbon isotopes in lake sediments, and the progression of disease epidemics. Although polynomial regression fits a nonlinear model to the data, as a statistical estimation problem it is linear, in the sense that the regression function E(y|x) is linear in the unknown parameters that are estimated from the data. For this reason, polynomial regression is considered to be a special case of multiple linear regression.

A NOTE FROM CEO
RIAZ MOOLA

Sorry to interrupt, but did you know that cutting-edge startups, as well as established tech companies and Universities, are increasingly finding new, novel, and exciting ways to apply powerful machine learning tools such as neural networks to existing problems in many different industries.

Cornell University, for example, is working on an algorithm to identify whales in the ocean based on audio recordings so that ships can avoid hitting them. Also, Oregon State University is working on software that will determine which bird species is/are on a given audio recording collected in field conditions.

Compulsory Task

Follow these steps:

- Read the example file.
- Try to think of a relationship you can model and create a new Python file in this folder called poly.py.
- Inside poly.py, identify a relationship, and use Polynomial regression to train, predict, and plot your results.

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