

Curve fitter in Python

Project for the Python in the Enterprise by T.Szumlak

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Abstract

This is the report explaining basic concepts and features of the curve fitter program - an assesment project for the Python in the Enterprise, implemented under python in version 2.7. It contains description of all components of the program, user tutorial and short discussion of the results of analysis of the relation between noise strength and quality of the fit.

1 Project objectives

General requirements which implemented curve fitter should fulfil were provided by the teacher in the following PDF file: http://home.agh.edu.pl/~szumlak/lects/pite_2016_1/sproject_2.pdf. The main objective of the project was to implement a software that allows fitting some model to the data and checking the fit quality.

Sub-objectives set for the project:

1. Implement all program components according to teacher's guidelines
2. Check impact of the noise on the quality of the fits for a few data models

2 Implementation

Created software consists of the following files:

1. FitBox.py - main program file
2. DataGenerator.py - class representing an experiment, which means source of data distributed according to some predefined function
3. NoiseGenerator.py - class representing resolution of the measurement (gaussian smearing)
4. Fitter.py - module responsible for fitting signal model to the data
5. StatAnalyser.py - module which evaluates quality of the fit done by Fitter
6. Plotter.py - class containing methods drawing data and fit results

3 Program usage

1. Download curve fitter package from GitHub repository:
https://github.com/rafalsikora/PITE_FitBox
2. Start "FitBox.py" with a standard command
`~$ python FitBox.py.`
3. After a few seconds output file (in PDF format) will appear in program directory.

One can easily change parameters of the program e.g. signal shape, noise levels etc. in file FitBox.py.

4 Conclusions

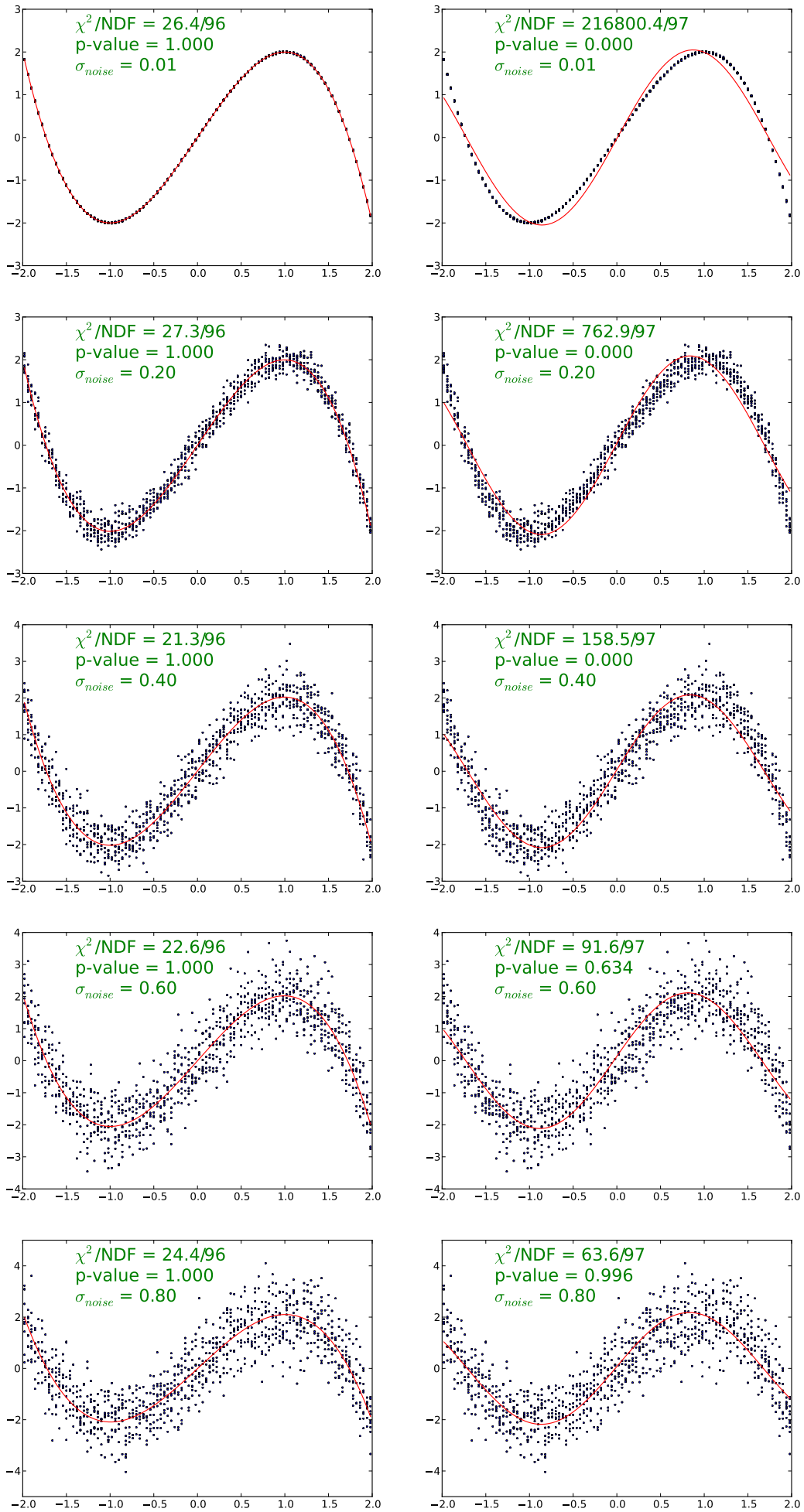


Figure 1: Output of the program.