Tutorial: Gaussian Process Regression

This tutorial will give you more hands-on experience working with Gaussian process regression and kernel functions. You will explore how setting the hyperparameters determines the behavior of the radial basis function and gain more insight into the expressibility of kernel functions and their construction. It will also serve as an introduction to GPy.

You can download a jupyter notebook called *GP_tutorial1.ipynb* from `https://www.doc.ic.ac.uk/~mpd37/teaching/tutorials/gp/GP_tutorial1.ipynb`. This tutorial was created for the 2015 Gaussian Process Summer School (`http://gpss.cc`) by Nicolas Durrande, James Hensman and Neil Lawrence.

Installing jupyter notebooks

We will be using jupyter/ipython notebooks in this tutorial. For installation, please execute the following command in your terminal:

```
pip install --user ipython
```

Installing GPy

For this tutorial, we will be using the Python package GPy, which implements many features associated with Gaussian processes. Documentation for the package can be found here: `http://sheffieldml.github.io/GPy/`. To install GPy you can run run:

```
pip install --user GPy
```

in your terminal prior to opening the jupyter notebook. To open the Notebook run:

```
ipython notebook GP_tutorial1.ipynb
```

in the directory in which you saved the file, it will then open in your browser.

Potential Problems

If you are experiencing difficulty downloading the data in Part 4, download the file *datasets.py* from `https://www.doc.ic.ac.uk/~mpd37/teaching/tutorials/gp/datasets.py` and replace the file FILEPATH/datasets.py with the new file.

- GPy works only with python 2.7
- Download `datasets.py` from `https://www.doc.ic.ac.uk/~mpd37/teaching/tutorials/gp/datasets.py`
- Replace the corresponding file in `~/.local/lib/python2.7/site-packages/GPy/util/`