Essential tools for CS 181:

- Python
- numpy
- scipy
- sklearn
- ipython notebook
- matplotlib

First of all, these instructions work best for either mac or linux. If you're on windows there are certain packages available that should include everything (http://www.scipy.org/install.html).

First, you'll definitely need Python, which should be built in on mac/linux and can be installed on windows with a bit more effort:
https://www.python.org/downloads/windows/
Note the difference between Python 2.x and Python 3. Python 3 has a slightly different syntax, which is arguably more modern/consistent, but for convenience sake everyone uses Python 2.x (2.7).

Install pip, which is a Python package manager:
https://pip.pypa.io/en/stable/installing/

Next, you'll need numpy, scipy, and sklearn:
http://scikit-learn.org/stable/install.html
These can be most easily installed via pip.

Numpy is a library for fast vector computations in Python, e.g. fast vector and matrix multiplication. This is useful for machine learning, where these operations are performed all the time! Scipy is an extension of numpy that has additional utilities, with higher dimension arrays, linear algebra, signal processing, etc.

Sklearn (scikit.learn) is built on top of both numpy and scipy, and has various implementations of machine learning algorithms. Essentially all popular algorithms are implemented fairly well and efficiently.

For visualization, it may be useful to install matplotlib:
http://matplotlib.org/users/installing.html
This is useful for creating nice plots that can be inserted into psets and reports. Another option is to install Mathematica for creating even nicer looking plots, but this takes a bit more effort.

iPython is an interactive web client for running python, which can be used to run and save your commands (as ipynb files) easily:
http://ipython.org/install.html