

Using Boost to generate random numbers

The Boost library is an exhaustive extension for C++ that provides among many other functions (including an interface for binding Boost and Python) also several pseudo random generators. It can be downloaded from www.boost.org, where you can also find a very good Getting Started Guide. On Linux, you only have to download the tarball and to extract it in the directory where you want to put the header files (usually this is `/usr/local/include`). The header-only parts of Boost are enough for our needs, so you do not have to build anything.

The random generator are contained in the Boost Random Library (see www.boost.org/doc/libs/1_38_0/libs/random/index.html). Usually one combines a (uniform) random number generator with a distribution. The following example program generates a normally distributed variable using the Mersenne Twister as underlying generator:

```
#include <iostream>
#include <boost/random.hpp>
#include <time.h>

using namespace std;
using namespace boost;

int main(){

    mt19937 generator; // Mersenne Twister Generator
    generator.seed(time(0)); // different seed at each run
    normal_distribution<> norm_dist; // Distribution
    variate_generator<mt19937&,normal_distribution<> > norm_rnd(generator, norm_dist);
        // Combination of distribution and generator

    double z = norm_rnd();
    cout << z << endl;

    return 0;
}
```

To compile a program that uses Boost, you usually have to specify the location of the Boost header files. This might look like

```
g++ -o TestBoost TestBoost.cpp -I/usr/local/include/boost_1_38_0
```