

## Variable Templates

## Chapter 1 Safe Features

```
#include <type_traits> // std::is_floating_point
#include <cassert>     // standard C assert macro

template <typename T>
const bool sane_for_pi = std::is_floating_point<T>::value; // same type

template <typename T> const T pi(3.1415926535897932385); // distinct types

void testPi()
{
    assert(!sane_for_pi<bool>);
    assert(!sane_for_pi<int>);

    assert( sane_for_pi<float>);
    assert( sane_for_pi<double>);
    assert( sane_for_pi<long double>);

    const float    pi_as_float    = 3.1415927;
    const double   pi_as_double   = 3.141592653589793;
    const long double pi_as_long_double = 3.1415926535897932385;

    assert(pi<float>      == pi_as_float);
    assert(pi<double>    == pi_as_double);
    assert(pi<long double> == pi_as_long_double);
}

```

Variable templates may be **declared** at namespace-scope or as **static members** of a **class**, **struct**, or **union** but are not permitted as non**static** members nor at all in **function scope**:

```
template <typename T> T vt1;           // OK, external linkage
template <typename T> static T vt2;   // OK, internal linkage

namespace N
{
    template <typename T> T vt3;       // OK, external linkage
    template <typename T> static T vt4; // OK, internal linkage
}

struct S
{
    template <typename T> T vt5;       // Error, not static
    template <typename T> static T vt6; // OK, external linkage
};

```