Evolution of Program Abstraction
Mechanisms: Generic Programming

Douglas C. Schmidt
d.schmidt@vanderbilt.edu
www.dre.vanderbilt.edu/~schmidt

Professor of Computer Science
Institute for Software Integrated Systems
Vanderbilt University
Nashville, Tennessee, USA
C++ Generic Programming
Stack Implementation
Template Implementation in C++

- A parameterized type Stack class interface using C++

```cpp
int main() { 
  try {
    // Multiple stacks that are created automatically.
    stack<int> s1(size: 10), s2(size: 100);
    int item = 0;

    while (!s1.full())
      s1.push(item++);

    while (!s1.empty()) {
      cout << "top item = " << s1.top() << endl;
      s1.pop();
    }

    s1 = s2; // No aliasing problem with copy assignment
    // s1.top_ = 10; // Access problem caught at compile-time!
    // Termination is handled automatically.

  } catch (std::out_of_range &ex) {
    cout << "caught out of range exception" << endl;
  }
}
```

See [CPlusPlus/tree/master/overview/4-C++-templates](https://CPlusPlus/tree/master/overview/4-C++-templates)