

Generic Lambdas

Chapter 2 Conditionally Safe Features

```

        ret = biggest;
        biggest = element;
    }
    else if (ret < element) {
        ret = element;
    }
});

return ret;
}

```

The declarations of `second` and `ret` use the placeholder **auto** (see Section 2.1. “**auto** Variables” on page 195) to deduce the variables’ types from their respective initializers. The return type of `secondBiggest` is also declared **auto** and is deduced from the type of `ret` (see Section 3.2. “**auto** Return” on page 1182). The **generic lambda** being passed to `std::for_each` uses the C++14 init-capture (see Section 2.2. “Lambda Captures” on page 986) to initialize `biggest` to the largest value known so far. Because the lambda is declared **mutable**, it can update `biggest` each time a larger element is encountered. The `ret` variable is also captured — by reference — and is updated with the previous biggest value when a new biggest value is encountered. Note that, at the point where `ret` appears in the **lambda capture**, its type has already been deduced. When `for_each` invokes the **function-call operator**, the type of the **auto** parameter, `element`, is conveniently deduced to be the element type for the input range and is thus the same reference type as `ret` except with an added **const** qualifier.

Constraints on deduced parameters

A **generic lambda** can accept any mix of **auto** and **nonauto** parameters:

```

void g1()
{
    auto y1 = [](auto& a, int b, auto c) { a += b * c; };

    int i = 5;
    double d = 1;

    y1(i, 2, 2); // i is now 9.
    y1(d, 3, 0.5); // d is now 2.5.
}

```

If the **auto** placeholder in a **generic lambda** parameter is part of a type declaration that forms a potentially cv-qualified reference, pointer, pointer-to-member, pointer-to-function, or reference-to-function type, then the allowable arguments will be restricted accordingly:

```

struct C1 { double d_i; };
double f1(int i);

```