

University of Illinois at Urbana-Champaign
Dept. of Electrical and Computer Engineering

ECE 220: Computer Systems & Programming

Overloading and References

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C++ Allows Functions to Be Overloaded

In **C++**, **functions can be overloaded**,

- meaning that **one function name**
- may have **multiple definitions**.
- (overloading was mentioned briefly when we discussed constructors).

For each call to a function,

- the **compiler selects and generates a call**
- to one of the versions
- **based on** the number and types of **arguments**.
- Selection **must be unambiguous**, but the selection rules are somewhat complicated.

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Compiler Must Be Able to Choose Unambiguously

Here's a simple example:

```
// product of two 32-bit integers
int32_t prod (int32_t a, int32_t b);
// product of two doubles
double prod (double a, double b);
```

Which version should be called for ...

```
prod (42, 1.5) ?
```

Neither. The call is ambiguous.

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Compiler Counts Automatic Conversions

Why?

Among other rules, the **compiler counts automatic conversions and disallows ties**.

Given `prod (42, 1.5)`,

- the compiler can either
- convert the 42 to a **double**,
- or convert the 1.5 to an **int32_t**.
- The **compiler will not choose**.

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