Inversion of Control
Inversion of Control (IoC)

- Usually your code calls the library code

- IoC: Library code calls your code
IoC

- Accumulation of callbacks to be called at specific times
- Popularized in OOP frameworks in the 80s

- Beware of posts on the Internet...
  - Such words! Much confusion! Wow!
  - Most describe dependency injection
IoC enablers

- Higher-order functions
- Objects
Callbacks

```c
main() {
    libraryFunction(myFunction);
}

myFunction(a, b) {
    ...
}
```

```c
libraryFunction(func) {
    ...
    func(1, 2);
    ...
}
```

```c
main() {
    A myObj = new A();
    lib.f(myObj);
}
```

```c
class A {
    m(a, b) { ...}
}
```

```c
class Lib {
    f(A a) {
        ...
        a.m(1, 2);
        ...
    }
}
```
What is a framework?

- More than a library, a generic component or even an application
- Parts of it are customized by user’s code via inversion of control
- Allows developers to build complete components/applications, with small customizations on deployment sites
Publish-Subscribe
Publish Subscribe

Publisher

JMS message

Topic

Subscriber

Copy of JMS message

Subscriber

Copy of JMS message

Publish-Subscribe Middleware

Middleware: JMS or DDS

Decouples Producers and Consumers
Pub Sub

- Producers
  - Publish events

- Consumers
  - Register for events

- Decouples components