CS544 EA
Spring

Dependency Injection: XML Setter & Constructor

XML and DI

- With XML you have the following options:
  - **Setter Injection** (use a setter method)
  - **Constructor Injection** (use a constructor)
  - **Autowiring** (have spring figure it out)
    - By type
    - By name
    - By constructor (types)

Setter Injection

```xml
<bean id="customerService" class="cs544.spring04.di.xml.CustomerService">
    <property name="customerDao" ref="customerDao" />
</bean>
<bean id="customerDao" class="cs544.spring04.di.xml.CustomerDao"/>
```

XML **property** tag indicates that Spring should use Setter

```java
package cs544.spring04.di.xml;

public class CustomerService {
    private ICustomerDao customerDao;

    public void setCustomerDao(ICustomerDao customerDao) {
        this.customerDao = customerDao;
    }
}
```

JavaBean standard specifies that if there is a property called **customerDao** there has to be a **setCustomerDao()** method

Constructor Injection

```xml
<bean id="customerService" class="cs544.spring05.di.xml.CustomerService">
    <constructor-arg ref="customerDao" />
</bean>
<bean id="customerDao" class="cs544.spring05.di.xml.CustomerDao"/>
```

XML **constructor-arg** tag indicates that Spring should inject into constructor

```java
package cs544.spring05.di.xml;

public class CustomerService {
    private ICustomerDao customerDao;

    public CustomerService(ICustomerDao customerDao) {
        this.customerDao = customerDao;
    }
}
```

To accomplish this customerDao has to be created before CustomerService

Constructor has to accept the specified bean type

Multi Param Constructor

```java
package cs544.spring09.di.xml;

public class PaymentService {
    private VisaVerifier visaVerifier;
    private MastercardVerifier mastercardVerifier;

    public PaymentService(VisaVerifier visaVerifier, MastercardVerifier mastercardVerifier) {
        this.visaVerifier = visaVerifier;
        this.mastercardVerifier = mastercardVerifier;
    }
}
```

```xml
<bean id="paymentService" class="cs544.spring06.di.xml.PaymentService">
    <constructor-arg ref="visaVerifier" />
    <constructor-arg ref="mastercardVerifier" />
</bean>
<bean id="visaVerifier" class="cs544.spring06.di.xml.VisaVerifier"/>
<bean id="mastercardVerifier" class="cs544.spring06.di.xml.MastercardVerifier"/>
```

Can switch order
Spring will check types

Multiple Params of Same Type

```java
package cs544.spring10.di.xml;

public class PaymentService {
    private CreditCardVerifier visaVerifier;
    private CreditCardVerifier mastercardVerifier;

    public PaymentService(CreditCardVerifier visaVerifier, CreditCardVerifier mastercardVerifier) {
        this.visaVerifier = visaVerifier;
        this.mastercardVerifier = mastercardVerifier;
    }
}
```

```xml
<bean id="paymentService" class="cs544.spring07.di.xml.PaymentService">
    <constructor-arg ref="visaVerifier" />
    <constructor-arg ref="mastercardVerifier" />
</bean>
<bean id="visaVerifier" class="cs544.spring07.di.xml.CreditCardVerifier"/>
<bean id="mastercardVerifier" class="cs544.spring07.di.xml.CreditCardVerifier"/>
```

Spring will inject based on order in XML

Index Attribute

```java
package cs544.spring11.di.xml;

public class PaymentService {
    private CreditCardVerifier visaVerifier;
    private CreditCardVerifier mastercardVerifier;

    public PaymentService(CreditCardVerifier visaVerifier, CreditCardVerifier mastercardVerifier) {
        this.visaVerifier = visaVerifier;
        this.mastercardVerifier = mastercardVerifier;
    }
}
```

```xml
<bean id="paymentService" class="cs544.spring08.di.xml.PaymentService">
    <constructor-arg index="0" ref="visaVerifier" />
    <constructor-arg index="1" ref="mastercardVerifier" />
</bean>
<bean id="visaVerifier" class="cs544.spring08.di.xml.CreditCardVerifier"/>
<bean id="mastercardVerifier" class="cs544.spring08.di.xml.CreditCardVerifier"/>
```

Index hardcodes order allowing tags to be switched in XML