Exceptions e Stack Trace

1 Exceptions

Uma *Exception*¸ou exceção em português, ocorre quando um erro "inesperado" ocorre em uma aplicação. Via de regra a causa real é decorrente de erros de programação, erros de configuração e/ou falhas de software/hardware. Alguns exemplos:

- Usamos variáveis sem instanciá-las (NullPointerException);
- Tentamos acessar recursos indisponíveis;
- Configuramos parâmetros incorretamente;
- Realizamos operações indevidas, como divisão por zero;
- Não há memória RAM disponível;
- A rede se encontra indisponível;
- Um servidor se encontra indisponível.

1.1 Tratamento de exceções

O tratamento de exceções ocorre por meio do conjunto de instruções try/catch. Idealmente, devemos realizar esse tratamento sempre que realizamos a chamada de código externo (de outras classes, bibliotecas, *frameworks*, etc).

O Código 1 apresenta um exemplo de tratamento de exceção. Ao chamar um outro método que pode gerar uma exceção IllegalArgumentException, o método duplicate faz um tratamento, gerando uma nova exceção. Reparem que a exceção original é repassada na nova. O ato de repassar as exceções repetidamente gera uma estrutura de pilha que, quando apresentada, forma o que chamamos de *Stack Trace*.

Código 1 – Tratamento de exceção

```java
public Double duplicate(Double a) {
    try{
        return multiply(a, 2);
    }
    catch(IllegalArgumentException e) {
        throw new RuntimeException("Problema ao duplicar valor", e);
    }
}
```

1.2 Stack Trace

Exceções em Java geram os famosos *Stack Traces*, como o do Código 2. Neste exemplo, chamamos, em App.java (Código 3), o método duplicate de Calculator.java (Código 4). O método duplicate, por sua vez, chama o método multiply, que finalmente chama o método sum.

O início do *Stack Trace* (linhas de 1 a 3) detalham apenas a chamada inicial e não apresentam muitas informações relevantes ao erro. Analisando somente este trecho, saberíamos somente que:

- Linha 1 – Recebemos uma exceção RuntimeException (erro em tempo de execução) com a mensagem "Problema ao duplicar valor";
- Linha 2 – A origem dessa exceção foi a linha 17 da classe Calculator, no método duplicate;
- Linha 3 – A chamada ao método duplicate da classe Calculator foi realizada na linha 10 da classe App, onde tudo começou.

A parte seguinte do *Stack Trace* (linhas de 4 a 7) passa a analisar o erro a partir do método duplicate da classe Calculator. Vemos aqui que a causa também não se encontra nesse método:

- Linha 4 – O método duplicate também recebeu uma exceção, IllegalArgumentException, com a mensagem "Erro em multiplicação";

- Linha 5 – A origem dessa exceção foi a linha 36 da classe Calculator, no método multiply;
- Linha 6 - A chamada ao método multiply foi realizada na linha 14 da classe Calculator, no método duplicate.

A parte final do *Stack Trace* (linhas de 8 a 11) passa a analisar o erro a partir do método multiply da classe Calculator. Aqui finalmente encontramos a causa:

- Linha 8 – O método multiply também recebeu uma exceção, NullPointerException, com a mensagem "Operandos não podem ser nulos". Isso mostra que a causa do erro foi um parâmetro nulo na primeira chamada (podemos ver isso claramente na linha 9 da classe App);
- **Linha 9 – A origem dessa exceção foi a linha 7 da classe Calculator, no método sum. Aqui é lançada uma exceção quando um dos parâmetros apresenta valor nulo, como visto na comparação da linha anterior;**
- Linha 10 - A chamada ao método sum foi realizada na linha 31 da classe Calculator, no método multiply.

Código 2 – *Stack Trace*

```
1   Exception in thread "main" java.lang.RuntimeException: Problema ao duplicar valor
2           at br.gov.sp.fatec.exceptionexample.calculator.Calculator.duplicate(Calculator.java:17)
3           at br.gov.sp.fatec.exceptionexample.App.main(App.java:10)
4   Caused by: java.lang.IllegalArgumentException: Erro em multiplicacao
5           at br.gov.sp.fatec.exceptionexample.calculator.Calculator.multiply(Calculator.java:36)
6           at br.gov.sp.fatec.exceptionexample.calculator.Calculator.duplicate(Calculator.java:14)
7           ... 1 more
8   Caused by: java.lang.NullPointerException: Operandos não podem ser nulos
9           at br.gov.sp.fatec.exceptionexample.calculator.Calculator.sum(Calculator.java:7)
10          at br.gov.sp.fatec.exceptionexample.calculator.Calculator.multiply(Calculator.java:31)
11          ... 2 more
```

Com base nesse exemplo verificamos que a parte mais importante de um *Stack Trace* se encontra no último trecho, onde é apresentada a causa do erro. Para resolver esse problema, geralmente procuramos, em um buscador, a exceção e a mensagem apresentados. Neste exemplo todo o código está acessível, mas a causa raiz geralmente se encontra em classes de uma biblioteca ou *framework*.

Código 3 – App.java

```
1    package br.gov.sp.fatec.exceptionexample;
2
3    import br.gov.sp.fatec.exceptionexample.calculator.Calculator;
4
5    public class App {
6
7        public static void main(String[] args) {
8            Calculator calc = new Calculator();
9            Double a = null;
10           calc.duplicate(a);
11       }
12
13   }
```

Código 4 – Calculator.java

```
1    package br.gov.sp.fatec.exceptionexample.calculator;
2
3    public class Calculator {
4
5        public Double sum(Double a, Double b) {
6            if(a == null || b == null) {
7                throw new NullPointerException("Operandos não podem ser nulos");
8            }
9            return a + b;
10       }
11
12       public Double duplicate(Double a) {
13           try{
14               return multiply(a, 2);
15           }
16           catch(IllegalArgumentException e) {
17               throw new RuntimeException("Problema ao duplicar valor", e);
18           }
19       }
20
21       public Double multiply(Double a, Integer b) {
22           if(b == null || b < 0) {
23               throw new IllegalArgumentException("Multiplicador não pode ser nulo ou negativo");
```

```
24            }
25            try {
26                if(b == 0) {
27                    return 0d;
28                }
29                Double result = a;
30                while(--b > 0) {
31                    result = sum(result, a);
32                }
33                return result;
34            }
35            catch(NullPointerException e) {
36                throw new IllegalArgumentException("Erro em multiplicacao", e);
37            }
38        }
39
40        public String printSum(Double a, Double b) {
41            return a.toString() + " " + b.toString();
42        }
43
44    }
```

Exceções não necessariamente são sempre fruto de validações explícitas no código, como exemplos apresentados até agora. O exemplo apresentado no Código 5 gera uma exceção do tipo NullPointerException, Código 6, porque tentamos acessar um método da variável calc sem instanciá-la antes. Essa exceção é lançada diretamente pela Java Virtual Machine (JVM) ao executar o código. Exceções do tipo NullPointerException são as mais simples de corrigir, pois resultam do uso de variáveis não instanciadas/inicializadas.

Código 5 – App.java

```
1    package br.gov.sp.fatec.exceptionexample;
2
3    import br.gov.sp.fatec.exceptionexample.calculator.Calculator;
4
5    public class App {
6
7        public static void main(String[] args) {
8            Calculator calc = null;
9            Double a = null;
10            calc.duplicate(a);
11        }
12
13    }
```

Código 6 – *Stack Trace*

```
1    Exception in thread "main" java.lang.NullPointerException
2            at br.gov.sp.fatec.exceptionexample.App.main(App.java:10)
```

Que *Stack Traces* seriam gerados pelos Códigos 7, 8 e 9?

Código 7 – App.java

```
1    package br.gov.sp.fatec.exceptionexample;
2
3    import br.gov.sp.fatec.exceptionexample.calculator.Calculator;
4
5    public class App {
6
7        public static void main(String[] args) {
8            Calculator calc = new Calculator();
9            Double a = 2d;
10            Integer b = -1;
11            calc.multiply(a, b);
12        }
13
14    }
```

Código 8 – App.java

```
1    package br.gov.sp.fatec.exceptionexample;
2
3    import br.gov.sp.fatec.exceptionexample.calculator.Calculator;
4
5    public class App {
6
7        public static void main(String[] args) {
8            Calculator calc = new Calculator();
9            Double a = 2d, b = null;
10            System.out.println(calc.printSum(a, b));
11        }
12
13    }
```

Código 9 – App.java

```
1    package br.gov.sp.fatec.exceptionexample;
2
3    import br.gov.sp.fatec.exceptionexample.calculator.Calculator;
4
5    public class App {
6
7        public static void main(String[] args) {
8            Calculator calc = new Calculator();
9            Double a = null, b = 2d;
10           calc.sum(a, b);
11       }
12
13   }
```

1.3   Outros exemplos

Os Códigos 10, 11, 12 e 13 apresentam exemplos de *Stack Traces* relacionados a Banco de Dados. Apesar do tamanho gigantesco, a causa raiz do erro apresentado no Código 10 indica que não foi possível se conectar ao SGBD. Isso pode ocorrer quando a URL de conexão foi inserida incorretamente, o SGBD não se encontra em execução ou há um problema de rede.

Código 10 – Erro de conexão

```
org.springframework.jdbc.support.MetaDataAccessException: Could not get Connection for extracting meta-data; nested
exception is org.springframework.jdbc.CannotGetJdbcConnectionException: Failed to obtain JDBC Connection; nested
exception is com.mysql.jdbc.exceptions.jdbc4.CommunicationsException: Communications link failure

The last packet sent successfully to the server was 0 milliseconds ago. The driver has not received any packets from
the server.
        at   org.springframework.jdbc.support.JdbcUtils.extractDatabaseMetaData(JdbcUtils.java:328)   ~[spring-jdbc-
5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at   org.springframework.jdbc.support.JdbcUtils.extractDatabaseMetaData(JdbcUtils.java:356)   ~[spring-jdbc-
5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at        org.springframework.boot.autoconfigure.orm.jpa.DatabaseLookup.getDatabase(DatabaseLookup.java:72)
~[spring-boot-autoconfigure-2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at    org.springframework.boot.autoconfigure.orm.jpa.JpaProperties.determineDatabase(JpaProperties.java:166)
[spring-boot-autoconfigure-2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at
org.springframework.boot.autoconfigure.orm.jpa.JpaBaseConfiguration.jpaVendorAdapter(JpaBaseConfiguration.java:111)
[spring-boot-autoconfigure-2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at
org.springframework.boot.autoconfigure.orm.jpa.HibernateJpaConfiguration$$EnhancerBySpringCGLIB$$3ed8554a.CGLIB$jpaVen
dorAdapter$10(<generated>) [spring-boot-autoconfigure-2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at
org.springframework.boot.autoconfigure.orm.jpa.HibernateJpaConfiguration$$EnhancerBySpringCGLIB$$3ed8554a$$FastClassBy
SpringCGLIB$$bce30e62.invoke(<generated>) [spring-boot-autoconfigure-2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at        org.springframework.cglib.proxy.MethodProxy.invokeSuper(MethodProxy.java:228)        [spring-core-
5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.context.annotation.ConfigurationClassEnhancer$BeanMethodInterceptor.intercept(ConfigurationClassEn
hancer.java:361) [spring-context-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.boot.autoconfigure.orm.jpa.HibernateJpaConfiguration$$EnhancerBySpringCGLIB$$3ed8554a.jpaVendorAda
pter(<generated>) [spring-boot-autoconfigure-2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method) ~[na:1.8.0_74]
        at sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:62) ~[na:1.8.0_74]
        at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43) ~[na:1.8.0_74]
        at java.lang.reflect.Method.invoke(Method.java:498) ~[na:1.8.0_74]
        at
org.springframework.beans.factory.support.SimpleInstantiationStrategy.instantiate(SimpleInstantiationStrategy.java:154
) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.ConstructorResolver.instantiateUsingFactoryMethod(ConstructorResolver.java:5
82) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.instantiateUsingFactoryMethod(AbstractAut
owireCapableBeanFactory.java:1247) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.createBeanInstance(AbstractAutowireCapabl
eBeanFactory.java:1096) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.doCreateBean(AbstractAutowireCapableBeanF
actory.java:535) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.createBean(AbstractAutowireCapableBeanFac
tory.java:495) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractBeanFactory.lambda$doGetBean$0(AbstractBeanFactory.java:317)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.DefaultSingletonBeanRegistry.getSingleton(DefaultSingletonBeanRegistry.java:
222) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at       org.springframework.beans.factory.support.AbstractBeanFactory.doGetBean(AbstractBeanFactory.java:315)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at         org.springframework.beans.factory.support.AbstractBeanFactory.getBean(AbstractBeanFactory.java:199)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.config.DependencyDescriptor.resolveCandidate(DependencyDescriptor.java:251)
~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
```

```
org.springframework.beans.factory.support.DefaultListableBeanFactory.doResolveDependency(DefaultListableBeanFactory.ja
va:1135) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.DefaultListableBeanFactory.resolveDependency(DefaultListableBeanFactory.java
:1062) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.ConstructorResolver.resolveAutowiredArgument(ConstructorResolver.java:818)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.ConstructorResolver.createArgumentArray(ConstructorResolver.java:724)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.ConstructorResolver.instantiateUsingFactoryMethod(ConstructorResolver.java:4
74) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.instantiateUsingFactoryMethod(AbstractAut
owireCapableBeanFactory.java:1247) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.createBeanInstance(AbstractAutowireCapabl
eBeanFactory.java:1096) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.doCreateBean(AbstractAutowireCapableBeanF
actory.java:535) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.createBean(AbstractAutowireCapableBeanFac
tory.java:495) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractBeanFactory.lambda$doGetBean$0(AbstractBeanFactory.java:317)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.DefaultSingletonBeanRegistry.getSingleton(DefaultSingletonBeanRegistry.java:
222) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at    org.springframework.beans.factory.support.AbstractBeanFactory.doGetBean(AbstractBeanFactory.java:315)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at      org.springframework.beans.factory.support.AbstractBeanFactory.getBean(AbstractBeanFactory.java:199)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.config.DependencyDescriptor.resolveCandidate(DependencyDescriptor.java:251)
~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.DefaultListableBeanFactory.doResolveDependency(DefaultListableBeanFactory.ja
va:1135) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.DefaultListableBeanFactory.resolveDependency(DefaultListableBeanFactory.java
:1062) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.ConstructorResolver.resolveAutowiredArgument(ConstructorResolver.java:818)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.ConstructorResolver.createArgumentArray(ConstructorResolver.java:724)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.ConstructorResolver.instantiateUsingFactoryMethod(ConstructorResolver.java:4
74) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.instantiateUsingFactoryMethod(AbstractAut
owireCapableBeanFactory.java:1247) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.createBeanInstance(AbstractAutowireCapabl
eBeanFactory.java:1096) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.doCreateBean(AbstractAutowireCapableBeanF
actory.java:535) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.createBean(AbstractAutowireCapableBeanFac
tory.java:495) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractBeanFactory.lambda$doGetBean$0(AbstractBeanFactory.java:317)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.DefaultSingletonBeanRegistry.getSingleton(DefaultSingletonBeanRegistry.java:
222) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at     org.springframework.beans.factory.support.AbstractBeanFactory.doGetBean(AbstractBeanFactory.java:315)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at      org.springframework.beans.factory.support.AbstractBeanFactory.getBean(AbstractBeanFactory.java:199)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.context.support.AbstractApplicationContext.getBean(AbstractApplicationContext.java:1089) ~[spring-
context-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.context.support.AbstractApplicationContext.finishBeanFactoryInitialization(AbstractApplicationCont
ext.java:859) ~[spring-context-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.context.support.AbstractApplicationContext.refresh(AbstractApplicationContext.java:550)  ~[spring-
context-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at      org.springframework.boot.SpringApplication.refresh(SpringApplication.java:762)        ~[spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at    org.springframework.boot.SpringApplication.refreshContext(SpringApplication.java:398)    ~[spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at        org.springframework.boot.SpringApplication.run(SpringApplication.java:330)        ~[spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at      org.springframework.boot.SpringApplication.run(SpringApplication.java:1258)        ~[spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at        org.springframework.boot.SpringApplication.run(SpringApplication.java:1246)        ~[spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at br.gov.sp.fatec.SpringDataJpaApplication.main(SpringDataJpaApplication.java:17) ~[classes/:na]
Caused by:  org.springframework.jdbc.CannotGetJdbcConnectionException:  Failed  to  obtain  JDBC  Connection;  nested
exception is com.mysql.jdbc.exceptions.jdbc4.CommunicationsException: Communications link failure

The last packet sent successfully to the server was 0 milliseconds ago. The driver has not received any packets from
the server.
        at org.springframework.jdbc.datasource.DataSourceUtils.getConnection(DataSourceUtils.java:81) ~[spring-jdbc-
```

```
5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at   org.springframework.jdbc.support.JdbcUtils.extractDatabaseMetaData(JdbcUtils.java:319)   ~[spring-jdbc-
5.0.8.RELEASE.jar:5.0.8.RELEASE]
        ... 60 common frames omitted
Caused by: com.mysql.jdbc.exceptions.jdbc4.CommunicationsException: Communications link failure

The last packet sent successfully to the server was 0 milliseconds ago. The driver has not received any packets from
the server.
        at sun.reflect.NativeConstructorAccessorImpl.newInstance0(Native Method) ~[na:1.8.0_74]
        at       sun.reflect.NativeConstructorAccessorImpl.newInstance(NativeConstructorAccessorImpl.java:62)
~[na:1.8.0_74]
        at     sun.reflect.DelegatingConstructorAccessorImpl.newInstance(DelegatingConstructorAccessorImpl.java:45)
~[na:1.8.0_74]
        at java.lang.reflect.Constructor.newInstance(Constructor.java:423) ~[na:1.8.0_74]
        at com.mysql.jdbc.Util.handleNewInstance(Util.java:425) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at     com.mysql.jdbc.SQLError.createCommunicationsException(SQLError.java:990)      ~[mysql-connector-java-
5.1.46.jar:5.1.46]
        at com.mysql.jdbc.MysqlIO.<init>(MysqlIO.java:342) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at       com.mysql.jdbc.ConnectionImpl.coreConnect(ConnectionImpl.java:2188)        ~[mysql-connector-java-
5.1.46.jar:5.1.46]
        at      com.mysql.jdbc.ConnectionImpl.connectOneTryOnly(ConnectionImpl.java:2221)       ~[mysql-connector-java-
5.1.46.jar:5.1.46]
        at       com.mysql.jdbc.ConnectionImpl.createNewIO(ConnectionImpl.java:2016)        ~[mysql-connector-java-
5.1.46.jar:5.1.46]
        at com.mysql.jdbc.ConnectionImpl.<init>(ConnectionImpl.java:776) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at com.mysql.jdbc.JDBC4Connection.<init>(JDBC4Connection.java:47) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at sun.reflect.NativeConstructorAccessorImpl.newInstance0(Native Method) ~[na:1.8.0_74]
        at       sun.reflect.NativeConstructorAccessorImpl.newInstance(NativeConstructorAccessorImpl.java:62)
~[na:1.8.0_74]
        at     sun.reflect.DelegatingConstructorAccessorImpl.newInstance(DelegatingConstructorAccessorImpl.java:45)
~[na:1.8.0_74]
        at java.lang.reflect.Constructor.newInstance(Constructor.java:423) ~[na:1.8.0_74]
        at com.mysql.jdbc.Util.handleNewInstance(Util.java:425) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at       com.mysql.jdbc.ConnectionImpl.getInstance(ConnectionImpl.java:386)         ~[mysql-connector-java-
5.1.46.jar:5.1.46]
        at    com.mysql.jdbc.NonRegisteringDriver.connect(NonRegisteringDriver.java:330)      ~[mysql-connector-java-
5.1.46.jar:5.1.46]
        at com.zaxxer.hikari.util.DriverDataSource.getConnection(DriverDataSource.java:117) ~[HikariCP-2.7.9.jar:na]
        at com.zaxxer.hikari.util.DriverDataSource.getConnection(DriverDataSource.java:123) ~[HikariCP-2.7.9.jar:na]
        at com.zaxxer.hikari.pool.PoolBase.newConnection(PoolBase.java:365) ~[HikariCP-2.7.9.jar:na]
        at com.zaxxer.hikari.pool.PoolBase.newPoolEntry(PoolBase.java:194) ~[HikariCP-2.7.9.jar:na]
        at com.zaxxer.hikari.pool.HikariPool.createPoolEntry(HikariPool.java:460) ~[HikariCP-2.7.9.jar:na]
        at com.zaxxer.hikari.pool.HikariPool.checkFailFast(HikariPool.java:534) ~[HikariCP-2.7.9.jar:na]
        at com.zaxxer.hikari.pool.HikariPool.<init>(HikariPool.java:115) ~[HikariCP-2.7.9.jar:na]
        at com.zaxxer.hikari.HikariDataSource.getConnection(HikariDataSource.java:112) ~[HikariCP-2.7.9.jar:na]
        at   org.springframework.jdbc.datasource.DataSourceUtils.fetchConnection(DataSourceUtils.java:151)   ~[spring-
jdbc-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at   org.springframework.jdbc.datasource.DataSourceUtils.doGetConnection(DataSourceUtils.java:115)   ~[spring-
jdbc-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at org.springframework.jdbc.datasource.DataSourceUtils.getConnection(DataSourceUtils.java:78) ~[spring-jdbc-
5.0.8.RELEASE.jar:5.0.8.RELEASE]
        ... 61 common frames omitted
Caused by: java.net.ConnectException: Connection refused: connect
        at java.net.DualStackPlainSocketImpl.waitForConnect(Native Method) ~[na:1.8.0_74]
        at java.net.DualStackPlainSocketImpl.socketConnect(DualStackPlainSocketImpl.java:85) ~[na:1.8.0_74]
        at java.net.AbstractPlainSocketImpl.doConnect(AbstractPlainSocketImpl.java:350) ~[na:1.8.0_74]
        at java.net.AbstractPlainSocketImpl.connectToAddress(AbstractPlainSocketImpl.java:206) ~[na:1.8.0_74]
        at java.net.AbstractPlainSocketImpl.connect(AbstractPlainSocketImpl.java:188) ~[na:1.8.0_74]
        at java.net.PlainSocketImpl.connect(PlainSocketImpl.java:172) ~[na:1.8.0_74]
        at java.net.SocksSocketImpl.connect(SocksSocketImpl.java:392) ~[na:1.8.0_74]
        at java.net.Socket.connect(Socket.java:589) ~[na:1.8.0_74]
        at    com.mysql.jdbc.StandardSocketFactory.connect(StandardSocketFactory.java:211)      ~[mysql-connector-java-
5.1.46.jar:5.1.46]
        at com.mysql.jdbc.MysqlIO.<init>(MysqlIO.java:301) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        ... 84 common frames omitted
```

O Código 11 também apresenta um *Stack Trace* bastante extenso, mas a causa raiz, apresentada ao final, indica que o usuário utilizado não possui autorização para acessar o Banco de Dados. Isso pode ocorrer quando faltou dar permissão de acesso ao usuário configurado na aplicação ou quando a senha foi digitada incorretamente. Nesse caso em específico o erro é de senha, pois o usuário root sempre tem acesso a todos os Bancos de Dados.

Código 11 – Credenciais inválidas

```
org.springframework.jdbc.support.MetaDataAccessException: Could not get Connection for extracting meta-data; nested
exception is org.springframework.jdbc.CannotGetJdbcConnectionException: Failed to obtain JDBC Connection; nested
exception is java.sql.SQLException: Access denied for user 'root'@'localhost' (using password: YES)
        at  org.springframework.jdbc.support.JdbcUtils.extractDatabaseMetaData(JdbcUtils.java:328)   ~[spring-jdbc-
5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at  org.springframework.jdbc.support.JdbcUtils.extractDatabaseMetaData(JdbcUtils.java:356)   ~[spring-jdbc-
5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at         org.springframework.boot.autoconfigure.orm.jpa.DatabaseLookup.getDatabase(DatabaseLookup.java:72)
~[spring-boot-autoconfigure-2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at     org.springframework.boot.autoconfigure.orm.jpa.JpaProperties.determineDatabase(JpaProperties.java:166)
[spring-boot-autoconfigure-2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at
org.springframework.boot.autoconfigure.orm.jpa.JpaBaseConfiguration.jpaVendorAdapter(JpaBaseConfiguration.java:111)
[spring-boot-autoconfigure-2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at
org.springframework.boot.autoconfigure.orm.jpa.HibernateJpaConfiguration$$EnhancerBySpringCGLIB$$b2a9c8ff.CGLIB$jpaVen
dorAdapter$6(<generated>) [spring-boot-autoconfigure-2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at
org.springframework.boot.autoconfigure.orm.jpa.HibernateJpaConfiguration$$EnhancerBySpringCGLIB$$b2a9c8ff$$FastClassBy
SpringCGLIB$$4061056c.invoke(<generated>) [spring-boot-autoconfigure-2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at         org.springframework.cglib.proxy.MethodProxy.invokeSuper(MethodProxy.java:228)          [spring-core-
```

```
5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.context.annotation.ConfigurationClassEnhancer$BeanMethodInterceptor.intercept(ConfigurationClassEn
hancer.java:361) [spring-context-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.boot.autoconfigure.orm.jpa.HibernateJpaConfiguration$$EnhancerBySpringCGLIB$$b2a9c8ff.jpaVendorAda
pter(<generated>) [spring-boot-autoconfigure-2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method) ~[na:1.8.0_74]
        at sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:62) ~[na:1.8.0_74]
        at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43) ~[na:1.8.0_74]
        at java.lang.reflect.Method.invoke(Method.java:498) ~[na:1.8.0_74]
        at
org.springframework.beans.factory.support.SimpleInstantiationStrategy.instantiate(SimpleInstantiationStrategy.java:154
) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.ConstructorResolver.instantiateUsingFactoryMethod(ConstructorResolver.java:5
82) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.instantiateUsingFactoryMethod(AbstractAut
owireCapableBeanFactory.java:1247) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.createBeanInstance(AbstractAutowireCapabl
eBeanFactory.java:1096) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.doCreateBean(AbstractAutowireCapableBeanF
actory.java:535) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.createBean(AbstractAutowireCapableBeanFac
tory.java:495) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractBeanFactory.lambda$doGetBean$0(AbstractBeanFactory.java:317)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.DefaultSingletonBeanRegistry.getSingleton(DefaultSingletonBeanRegistry.java:
222) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at      org.springframework.beans.factory.support.AbstractBeanFactory.doGetBean(AbstractBeanFactory.java:315)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at        org.springframework.beans.factory.support.AbstractBeanFactory.getBean(AbstractBeanFactory.java:199)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.config.DependencyDescriptor.resolveCandidate(DependencyDescriptor.java:251)
~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.DefaultListableBeanFactory.doResolveDependency(DefaultListableBeanFactory.ja
va:1135) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.DefaultListableBeanFactory.resolveDependency(DefaultListableBeanFactory.java
:1062) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.ConstructorResolver.resolveAutowiredArgument(ConstructorResolver.java:818)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.ConstructorResolver.createArgumentArray(ConstructorResolver.java:724)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.ConstructorResolver.instantiateUsingFactoryMethod(ConstructorResolver.java:4
74) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.instantiateUsingFactoryMethod(AbstractAut
owireCapableBeanFactory.java:1247) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.createBeanInstance(AbstractAutowireCapabl
eBeanFactory.java:1096) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.doCreateBean(AbstractAutowireCapableBeanF
actory.java:535) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.createBean(AbstractAutowireCapableBeanFac
tory.java:495) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractBeanFactory.lambda$doGetBean$0(AbstractBeanFactory.java:317)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.DefaultSingletonBeanRegistry.getSingleton(DefaultSingletonBeanRegistry.java:
222) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at      org.springframework.beans.factory.support.AbstractBeanFactory.doGetBean(AbstractBeanFactory.java:315)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at        org.springframework.beans.factory.support.AbstractBeanFactory.getBean(AbstractBeanFactory.java:199)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.config.DependencyDescriptor.resolveCandidate(DependencyDescriptor.java:251)
~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.DefaultListableBeanFactory.doResolveDependency(DefaultListableBeanFactory.ja
va:1135) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.DefaultListableBeanFactory.resolveDependency(DefaultListableBeanFactory.java
:1062) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.ConstructorResolver.resolveAutowiredArgument(ConstructorResolver.java:818)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.ConstructorResolver.createArgumentArray(ConstructorResolver.java:724)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.ConstructorResolver.instantiateUsingFactoryMethod(ConstructorResolver.java:4
74) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.instantiateUsingFactoryMethod(AbstractAut
owireCapableBeanFactory.java:1247) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.createBeanInstance(AbstractAutowireCapabl
```

```
eBeanFactory.java:1096) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.doCreateBean(AbstractAutowireCapableBeanF
actory.java:535) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.createBean(AbstractAutowireCapableBeanFac
tory.java:495) [spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractBeanFactory.lambda$doGetBean$0(AbstractBeanFactory.java:317)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.DefaultSingletonBeanRegistry.getSingleton(DefaultSingletonBeanRegistry.java:
222) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at     org.springframework.beans.factory.support.AbstractBeanFactory.doGetBean(AbstractBeanFactory.java:315)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at       org.springframework.beans.factory.support.AbstractBeanFactory.getBean(AbstractBeanFactory.java:199)
[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.context.support.AbstractApplicationContext.getBean(AbstractApplicationContext.java:1089) ~[spring-
context-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.context.support.AbstractApplicationContext.finishBeanFactoryInitialization(AbstractApplicationCont
ext.java:859) ~[spring-context-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.context.support.AbstractApplicationContext.refresh(AbstractApplicationContext.java:550)  ~[spring-
context-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at      org.springframework.boot.SpringApplication.refresh(SpringApplication.java:762)        ~[spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at    org.springframework.boot.SpringApplication.refreshContext(SpringApplication.java:398)   ~[spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at      org.springframework.boot.SpringApplication.run(SpringApplication.java:330)           ~[spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at       org.springframework.boot.SpringApplication.run(SpringApplication.java:1258)          ~[spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at       org.springframework.boot.SpringApplication.run(SpringApplication.java:1246)          ~[spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at br.gov.sp.fatec.SpringDataJpaApplication.main(SpringDataJpaApplication.java:17) ~[classes/:na]
Caused   by:  org.springframework.jdbc.CannotGetJdbcConnectionException:  Failed  to  obtain  JDBC  Connection;  nested
exception is java.sql.SQLException: Access denied for user 'root'@'localhost' (using password: YES)
        at org.springframework.jdbc.datasource.DataSourceUtils.getConnection(DataSourceUtils.java:81) ~[spring-jdbc-
5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at    org.springframework.jdbc.support.JdbcUtils.extractDatabaseMetaData(JdbcUtils.java:319)    ~[spring-jdbc-
5.0.8.RELEASE.jar:5.0.8.RELEASE]
        ... 60 common frames omitted
Caused by: java.sql.SQLException: Access denied for user 'root'@'localhost' (using password: YES)
        at com.mysql.jdbc.SQLError.createSQLException(SQLError.java:965) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at com.mysql.jdbc.MysqlIO.checkErrorPacket(MysqlIO.java:3976) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at com.mysql.jdbc.MysqlIO.checkErrorPacket(MysqlIO.java:3912) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at com.mysql.jdbc.MysqlIO.checkErrorPacket(MysqlIO.java:871) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at  com.mysql.jdbc.MysqlIO.proceedHandshakeWithPluggableAuthentication(MysqlIO.java:1714)  ~[mysql-connector-
java-5.1.46.jar:5.1.46]
        at com.mysql.jdbc.MysqlIO.doHandshake(MysqlIO.java:1224) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at        com.mysql.jdbc.ConnectionImpl.coreConnect(ConnectionImpl.java:2190)        ~[mysql-connector-java-
5.1.46.jar:5.1.46]
        at        com.mysql.jdbc.ConnectionImpl.connectOneTryOnly(ConnectionImpl.java:2221)       ~[mysql-connector-java-
5.1.46.jar:5.1.46]
        at        com.mysql.jdbc.ConnectionImpl.createNewIO(ConnectionImpl.java:2016)          ~[mysql-connector-java-
5.1.46.jar:5.1.46]
        at com.mysql.jdbc.ConnectionImpl.<init>(ConnectionImpl.java:776) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at com.mysql.jdbc.JDBC4Connection.<init>(JDBC4Connection.java:47) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at sun.reflect.NativeConstructorAccessorImpl.newInstance0(Native Method) ~[na:1.8.0_74]
        at          sun.reflect.NativeConstructorAccessorImpl.newInstance(NativeConstructorAccessorImpl.java:62)
~[na:1.8.0_74]
        at       sun.reflect.DelegatingConstructorAccessorImpl.newInstance(DelegatingConstructorAccessorImpl.java:45)
~[na:1.8.0_74]
        at java.lang.reflect.Constructor.newInstance(Constructor.java:423) ~[na:1.8.0_74]
        at com.mysql.jdbc.Util.handleNewInstance(Util.java:425) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at        com.mysql.jdbc.ConnectionImpl.getInstance(ConnectionImpl.java:386)          ~[mysql-connector-java-
5.1.46.jar:5.1.46]
        at      com.mysql.jdbc.NonRegisteringDriver.connect(NonRegisteringDriver.java:330)      ~[mysql-connector-java-
5.1.46.jar:5.1.46]
        at com.zaxxer.hikari.util.DriverDataSource.getConnection(DriverDataSource.java:117) ~[HikariCP-2.7.9.jar:na]
        at com.zaxxer.hikari.util.DriverDataSource.getConnection(DriverDataSource.java:123) ~[HikariCP-2.7.9.jar:na]
        at com.zaxxer.hikari.pool.PoolBase.newConnection(PoolBase.java:365) ~[HikariCP-2.7.9.jar:na]
        at com.zaxxer.hikari.pool.PoolBase.newPoolEntry(PoolBase.java:194) ~[HikariCP-2.7.9.jar:na]
        at com.zaxxer.hikari.pool.HikariPool.createPoolEntry(HikariPool.java:460) ~[HikariCP-2.7.9.jar:na]
        at com.zaxxer.hikari.pool.HikariPool.checkFailFast(HikariPool.java:534) ~[HikariCP-2.7.9.jar:na]
        at com.zaxxer.hikari.pool.HikariPool.<init>(HikariPool.java:115) ~[HikariCP-2.7.9.jar:na]
        at com.zaxxer.hikari.HikariDataSource.getConnection(HikariDataSource.java:112) ~[HikariCP-2.7.9.jar:na]
        at  org.springframework.jdbc.datasource.DataSourceUtils.fetchConnection(DataSourceUtils.java:151)   ~[spring-
jdbc-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at  org.springframework.jdbc.datasource.DataSourceUtils.doGetConnection(DataSourceUtils.java:115)   ~[spring-
jdbc-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at org.springframework.jdbc.datasource.DataSourceUtils.getConnection(DataSourceUtils.java:78) ~[spring-jdbc-
5.0.8.RELEASE.jar:5.0.8.RELEASE]
        ... 61 common frames omitted
```

O erro apresentado no Código 12 se refere a um problema de restrição (*constraint*). Ele indica que o valor
"Teste JPA" está duplicado e informa o nome da restrição envolvida, uni_usuario_nome. Para erros assim
se faz necessário verificar a DDL do Banco de Dados. Neste caso específico, a restrição é uma chave
única aplicada à coluna de nome de usuário. Em resumo, a aplicação tentou inserir um novo usuário com
um nome já cadastrado. Erros similares podem ocorrer para outros tipos de restrição.

Código 12 – Restrição de integridade

```
java.lang.IllegalStateException: Failed to execute CommandLineRunner
        at        org.springframework.boot.SpringApplication.callRunner(SpringApplication.java:803)        [spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at        org.springframework.boot.SpringApplication.callRunners(SpringApplication.java:784)        [spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at          org.springframework.boot.SpringApplication.run(SpringApplication.java:338)        [spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at          org.springframework.boot.SpringApplication.run(SpringApplication.java:1258)        [spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at          org.springframework.boot.SpringApplication.run(SpringApplication.java:1246)        [spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at br.gov.sp.fatec.SpringDataJpaApplication.main(SpringDataJpaApplication.java:17) [classes/:na]
Caused by: org.springframework.dao.DataIntegrityViolationException: could not execute statement; SQL [n/a]; constraint
[null]; nested exception is org.hibernate.exception.ConstraintViolationException: could not execute statement
        at
org.springframework.orm.jpa.vendor.HibernateJpaDialect.convertHibernateAccessException(HibernateJpaDialect.java:259)
~[spring-orm-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.orm.jpa.vendor.HibernateJpaDialect.translateExceptionIfPossible(HibernateJpaDialect.java:225)
~[spring-orm-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.orm.jpa.AbstractEntityManagerFactoryBean.translateExceptionIfPossible(AbstractEntityManagerFactory
Bean.java:527) ~[spring-orm-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.dao.support.ChainedPersistenceExceptionTranslator.translateExceptionIfPossible(ChainedPersistenceE
xceptionTranslator.java:61) ~[spring-tx-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at  org.springframework.dao.support.DataAccessUtils.translateIfNecessary(DataAccessUtils.java:242)  ~[spring-
tx-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.dao.support.PersistenceExceptionTranslationInterceptor.invoke(PersistenceExceptionTranslationInter
ceptor.java:153) ~[spring-tx-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:185)
~[spring-aop-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.data.jpa.repository.support.CrudMethodMetadataPostProcessor$CrudMethodMetadataPopulatingMethodInte
rceptor.invoke(CrudMethodMetadataPostProcessor.java:135) ~[spring-data-jpa-2.0.9.RELEASE.jar:2.0.9.RELEASE]
        at org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:185)
~[spring-aop-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.aop.interceptor.ExposeInvocationInterceptor.invoke(ExposeInvocationInterceptor.java:92)  ~[spring-
aop-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:185)
~[spring-aop-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.data.repository.core.support.SurroundingTransactionDetectorMethodInterceptor.invoke(SurroundingTra
nsactionDetectorMethodInterceptor.java:61) ~[spring-data-commons-2.0.9.RELEASE.jar:2.0.9.RELEASE]
        at org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:185)
~[spring-aop-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at   org.springframework.aop.framework.JdkDynamicAopProxy.invoke(JdkDynamicAopProxy.java:212)   ~[spring-aop-
5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at com.sun.proxy.$Proxy72.save(Unknown Source) ~[na:na]
        at br.gov.sp.fatec.service.UsuarioServiceImpl.incluirUsuario(UsuarioServiceImpl.java:54) ~[classes/:na]
        at          br.gov.sp.fatec.service.UsuarioServiceImpl$$FastClassBySpringCGLIB$$43bb9aa.invoke(<generated>)
~[classes/:na]
        at          org.springframework.cglib.proxy.MethodProxy.invoke(MethodProxy.java:204)          ~[spring-core-
5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.aop.framework.CglibAopProxy$CglibMethodInvocation.invokeJoinpoint(CglibAopProxy.java:746)
~[spring-aop-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:163)
~[spring-aop-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.transaction.interceptor.TransactionAspectSupport.invokeWithinTransaction(TransactionAspectSupport.
java:294) ~[spring-tx-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at org.springframework.transaction.interceptor.TransactionInterceptor.invoke(TransactionInterceptor.java:98)
~[spring-tx-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:185)
~[spring-aop-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.aop.framework.CglibAopProxy$DynamicAdvisedInterceptor.intercept(CglibAopProxy.java:688)  ~[spring-
aop-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at  br.gov.sp.fatec.service.UsuarioServiceImpl$$EnhancerBySpringCGLIB$$1e5e47e6.incluirUsuario(<generated>)
~[classes/:na]
        at br.gov.sp.fatec.SpringDataJpaApplication.run(SpringDataJpaApplication.java:27) [classes/:na]
        at        org.springframework.boot.SpringApplication.callRunner(SpringApplication.java:800)        [spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        ... 5 common frames omitted
Caused by: org.hibernate.exception.ConstraintViolationException: could not execute statement
        at        org.hibernate.exception.internal.SQLExceptionTypeDelegate.convert(SQLExceptionTypeDelegate.java:59)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at
org.hibernate.exception.internal.StandardSQLExceptionConverter.convert(StandardSQLExceptionConverter.java:42)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at  org.hibernate.engine.jdbc.spi.SqlExceptionHelper.convert(SqlExceptionHelper.java:111)   ~[hibernate-core-
5.2.17.Final.jar:5.2.17.Final]
        at  org.hibernate.engine.jdbc.spi.SqlExceptionHelper.convert(SqlExceptionHelper.java:97)   ~[hibernate-core-
5.2.17.Final.jar:5.2.17.Final]
        at        org.hibernate.engine.jdbc.internal.ResultSetReturnImpl.executeUpdate(ResultSetReturnImpl.java:178)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at
org.hibernate.dialect.identity.GetGeneratedKeysDelegate.executeAndExtract(GetGeneratedKeysDelegate.java:57)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at        org.hibernate.id.insert.AbstractReturningDelegate.performInsert(AbstractReturningDelegate.java:42)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at         org.hibernate.persister.entity.AbstractEntityPersister.insert(AbstractEntityPersister.java:2933)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at         org.hibernate.persister.entity.AbstractEntityPersister.insert(AbstractEntityPersister.java:3524)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at        org.hibernate.action.internal.EntityIdentityInsertAction.execute(EntityIdentityInsertAction.java:81)
```

```
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at         org.hibernate.engine.spi.ActionQueue.execute(ActionQueue.java:637)         ~[hibernate-core-
5.2.17.Final.jar:5.2.17.Final]
        at    org.hibernate.engine.spi.ActionQueue.addResolvedEntityInsertAction(ActionQueue.java:282)    ~[hibernate-
core-5.2.17.Final.jar:5.2.17.Final]
        at        org.hibernate.engine.spi.ActionQueue.addInsertAction(ActionQueue.java:263)        ~[hibernate-core-
5.2.17.Final.jar:5.2.17.Final]
        at           org.hibernate.engine.spi.ActionQueue.addAction(ActionQueue.java:317)         ~[hibernate-core-
5.2.17.Final.jar:5.2.17.Final]
        at
org.hibernate.event.internal.AbstractSaveEventListener.addInsertAction(AbstractSaveEventListener.java:318)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at
org.hibernate.event.internal.AbstractSaveEventListener.performSaveOrReplicate(AbstractSaveEventListener.java:275)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at    org.hibernate.event.internal.AbstractSaveEventListener.performSave(AbstractSaveEventListener.java:182)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at
org.hibernate.event.internal.AbstractSaveEventListener.saveWithGeneratedId(AbstractSaveEventListener.java:113)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at
org.hibernate.jpa.event.internal.core.JpaPersistEventListener.saveWithGeneratedId(JpaPersistEventListener.java:67)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at
org.hibernate.event.internal.DefaultPersistEventListener.entityIsTransient(DefaultPersistEventListener.java:189)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at  org.hibernate.event.internal.DefaultPersistEventListener.onPersist(DefaultPersistEventListener.java:132)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at    org.hibernate.event.internal.DefaultPersistEventListener.onPersist(DefaultPersistEventListener.java:58)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at         org.hibernate.internal.SessionImpl.firePersist(SessionImpl.java:783)         ~[hibernate-core-
5.2.17.Final.jar:5.2.17.Final]
        at            org.hibernate.internal.SessionImpl.persist(SessionImpl.java:768)          ~[hibernate-core-
5.2.17.Final.jar:5.2.17.Final]
        at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method) ~[na:1.8.0_74]
        at sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:62) ~[na:1.8.0_74]
        at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43) ~[na:1.8.0_74]
        at java.lang.reflect.Method.invoke(Method.java:498) ~[na:1.8.0_74]
        at
org.springframework.orm.jpa.SharedEntityManagerCreator$SharedEntityManagerInvocationHandler.invoke(SharedEntityManager
Creator.java:305) ~[spring-orm-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at com.sun.proxy.$Proxy69.persist(Unknown Source) ~[na:na]
        at    org.springframework.data.jpa.repository.support.SimpleJpaRepository.save(SimpleJpaRepository.java:490)
~[spring-data-jpa-2.0.9.RELEASE.jar:2.0.9.RELEASE]
        at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method) ~[na:1.8.0_74]
        at sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:62) ~[na:1.8.0_74]
        at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43) ~[na:1.8.0_74]
        at java.lang.reflect.Method.invoke(Method.java:498) ~[na:1.8.0_74]
        at
org.springframework.data.repository.core.support.RepositoryComposition$RepositoryFragments.invoke(RepositoryCompositio
n.java:377) ~[spring-data-commons-2.0.9.RELEASE.jar:2.0.9.RELEASE]
        at
org.springframework.data.repository.core.support.RepositoryComposition.invoke(RepositoryComposition.java:200)
~[spring-data-commons-2.0.9.RELEASE.jar:2.0.9.RELEASE]
        at
org.springframework.data.repository.core.support.RepositoryFactorySupport$ImplementationMethodExecutionInterceptor.inv
oke(RepositoryFactorySupport.java:629) ~[spring-data-commons-2.0.9.RELEASE.jar:2.0.9.RELEASE]
        at org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:185)
~[spring-aop-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.data.repository.core.support.RepositoryFactorySupport$QueryExecutorMethodInterceptor.doInvoke(Repo
sitoryFactorySupport.java:593) ~[spring-data-commons-2.0.9.RELEASE.jar:2.0.9.RELEASE]
        at
org.springframework.data.repository.core.support.RepositoryFactorySupport$QueryExecutorMethodInterceptor.invoke(Reposi
toryFactorySupport.java:578) ~[spring-data-commons-2.0.9.RELEASE.jar:2.0.9.RELEASE]
        at org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:185)
~[spring-aop-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.data.projection.DefaultMethodInvokingMethodInterceptor.invoke(DefaultMethodInvokingMethodIntercept
or.java:59) ~[spring-data-commons-2.0.9.RELEASE.jar:2.0.9.RELEASE]
        at org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:185)
~[spring-aop-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.transaction.interceptor.TransactionAspectSupport.invokeWithinTransaction(TransactionAspectSupport.
java:294) ~[spring-tx-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at org.springframework.transaction.interceptor.TransactionInterceptor.invoke(TransactionInterceptor.java:98)
~[spring-tx-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:185)
~[spring-aop-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.dao.support.PersistenceExceptionTranslationInterceptor.invoke(PersistenceExceptionTranslationInter
ceptor.java:139) ~[spring-tx-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        ... 26 common frames omitted
Caused by: com.mysql.jdbc.exceptions.jdbc4.MySQLIntegrityConstraintViolationException: Duplicate entry 'Teste JPA' for
key 'uni_usuario_nome'
        at sun.reflect.NativeConstructorAccessorImpl.newInstance0(Native Method) ~[na:1.8.0_74]
        at            sun.reflect.NativeConstructorAccessorImpl.newInstance(NativeConstructorAccessorImpl.java:62)
~[na:1.8.0_74]
        at        sun.reflect.DelegatingConstructorAccessorImpl.newInstance(DelegatingConstructorAccessorImpl.java:45)
~[na:1.8.0_74]
        at java.lang.reflect.Constructor.newInstance(Constructor.java:423) ~[na:1.8.0_74]
        at com.mysql.jdbc.Util.handleNewInstance(Util.java:425) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at com.mysql.jdbc.Util.getInstance(Util.java:408) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at com.mysql.jdbc.SQLError.createSQLException(SQLError.java:936) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at com.mysql.jdbc.MysqlIO.checkErrorPacket(MysqlIO.java:3976) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at com.mysql.jdbc.MysqlIO.checkErrorPacket(MysqlIO.java:3912) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at com.mysql.jdbc.MysqlIO.sendCommand(MysqlIO.java:2530) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at com.mysql.jdbc.MysqlIO.sqlQueryDirect(MysqlIO.java:2683) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at com.mysql.jdbc.ConnectionImpl.execSQL(ConnectionImpl.java:2486) ~[mysql-connector-java-5.1.46.jar:5.1.46]
        at   com.mysql.jdbc.PreparedStatement.executeInternal(PreparedStatement.java:1858)   ~[mysql-connector-java-
5.1.46.jar:5.1.46]
        at   com.mysql.jdbc.PreparedStatement.executeUpdateInternal(PreparedStatement.java:2079)   ~[mysql-connector-
```

```
java-5.1.46.jar:5.1.46]
        at com.mysql.jdbc.PreparedStatement.executeUpdateInternal(PreparedStatement.java:2013) ~[mysql-connector-
java-5.1.46.jar:5.1.46]
        at com.mysql.jdbc.PreparedStatement.executeLargeUpdate(PreparedStatement.java:5104) ~[mysql-connector-java-
5.1.46.jar:5.1.46]
        at com.mysql.jdbc.PreparedStatement.executeUpdate(PreparedStatement.java:1998) ~[mysql-connector-java-
5.1.46.jar:5.1.46]
        at com.zaxxer.hikari.pool.ProxyPreparedStatement.executeUpdate(ProxyPreparedStatement.java:61) ~[HikariCP-
2.7.9.jar:na]
        at com.zaxxer.hikari.pool.HikariProxyPreparedStatement.executeUpdate(HikariProxyPreparedStatement.java)
~[HikariCP-2.7.9.jar:na]
        at org.hibernate.engine.jdbc.internal.ResultSetReturnImpl.executeUpdate(ResultSetReturnImpl.java:175)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        ... 69 common frames omitted
```

O erro apresentado no Código 13 é um dos mais comuns ao se trabalhar com Banco de Dados. Antes de realizar um acesso ao SGBD, nós precisamos mapear as tabelas existentes em nosso Banco de Dados. A causa raiz desse *Stack Trace* indica que não existe uma coluna de nome usr_nomo na tabela usr_usuario. Isso indica que cometemos um erro ao mapear essa tabela em nossa aplicação. Para resolver esse problema, o procedimento mais comum seria buscar usr_nomo em todo o projeto e verificar cuidadosamente todos os arquivos envolvidos (esse tipo de erro não costuma vir sozinho).

Código 13 – Mapeamento incorreto

```
org.springframework.beans.factory.BeanCreationException: Error creating bean with name 'entityManagerFactory' defined
in class path resource [org/springframework/boot/autoconfigure/orm/jpa/HibernateJpaConfiguration.class]: Invocation of
init method failed; nested exception is javax.persistence.PersistenceException: [PersistenceUnit: default] Unable to
build Hibernate SessionFactory; nested exception is org.hibernate.tool.schema.spi.SchemaManagementException: Schema-
validation: missing column [usr_nomo] in table [usr_usuario]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.initializeBean(AbstractAutowireCapableBea
nFactory.java:1699) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.doCreateBean(AbstractAutowireCapableBeanF
actory.java:573) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.createBean(AbstractAutowireCapableBeanFac
tory.java:495) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractBeanFactory.lambda$doGetBean$0(AbstractBeanFactory.java:317)
~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.DefaultSingletonBeanRegistry.getSingleton(DefaultSingletonBeanRegistry.java:
222) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at org.springframework.beans.factory.support.AbstractBeanFactory.doGetBean(AbstractBeanFactory.java:315)
~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at org.springframework.beans.factory.support.AbstractBeanFactory.getBean(AbstractBeanFactory.java:199)
~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.context.support.AbstractApplicationContext.getBean(AbstractApplicationContext.java:1089) ~[spring-
context-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.context.support.AbstractApplicationContext.finishBeanFactoryInitialization(AbstractApplicationCont
ext.java:859) ~[spring-context-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.context.support.AbstractApplicationContext.refresh(AbstractApplicationContext.java:550) ~[spring-
context-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at org.springframework.boot.SpringApplication.refresh(SpringApplication.java:762)        [spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at org.springframework.boot.SpringApplication.refreshContext(SpringApplication.java:398)        [spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at org.springframework.boot.SpringApplication.run(SpringApplication.java:330)        [spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at org.springframework.boot.SpringApplication.run(SpringApplication.java:1258)        [spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at org.springframework.boot.SpringApplication.run(SpringApplication.java:1246)        [spring-boot-
2.0.4.RELEASE.jar:2.0.4.RELEASE]
        at br.gov.sp.fatec.SpringDataJpaApplication.main(SpringDataJpaApplication.java:17) [classes/:na]
Caused by: javax.persistence.PersistenceException: [PersistenceUnit: default] Unable to build Hibernate
SessionFactory; nested exception is org.hibernate.tool.schema.spi.SchemaManagementException: Schema-validation:
missing column [usr_nomo] in table [usr_usuario]
        at
org.springframework.orm.jpa.AbstractEntityManagerFactoryBean.buildNativeEntityManagerFactory(AbstractEntityManagerFact
oryBean.java:402) ~[spring-orm-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.orm.jpa.AbstractEntityManagerFactoryBean.afterPropertiesSet(AbstractEntityManagerFactoryBean.java:
377) ~[spring-orm-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.orm.jpa.LocalContainerEntityManagerFactoryBean.afterPropertiesSet(LocalContainerEntityManagerFacto
ryBean.java:341) ~[spring-orm-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.invokeInitMethods(AbstractAutowireCapable
BeanFactory.java:1758) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.initializeBean(AbstractAutowireCapableBea
nFactory.java:1695) ~[spring-beans-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        ... 15 common frames omitted
Caused by: org.hibernate.tool.schema.spi.SchemaManagementException: Schema-validation: missing column [usr_nomo] in
table [usr_usuario]
        at
org.hibernate.tool.schema.internal.AbstractSchemaValidator.validateTable(AbstractSchemaValidator.java:136)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at
org.hibernate.tool.schema.internal.GroupedSchemaValidatorImpl.validateTables(GroupedSchemaValidatorImpl.java:42)
```

```
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at
org.hibernate.tool.schema.internal.AbstractSchemaValidator.performValidation(AbstractSchemaValidator.java:89)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at  org.hibernate.tool.schema.internal.AbstractSchemaValidator.doValidation(AbstractSchemaValidator.java:68)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at
org.hibernate.tool.schema.spi.SchemaManagementToolCoordinator.performDatabaseAction(SchemaManagementToolCoordinator.ja
va:191) ~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at
org.hibernate.tool.schema.spi.SchemaManagementToolCoordinator.process(SchemaManagementToolCoordinator.java:72)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at      org.hibernate.internal.SessionFactoryImpl.<init>(SessionFactoryImpl.java:312)     ~[hibernate-core-
5.2.17.Final.jar:5.2.17.Final]
        at           org.hibernate.boot.internal.SessionFactoryBuilderImpl.build(SessionFactoryBuilderImpl.java:462)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at
org.hibernate.jpa.boot.internal.EntityManagerFactoryBuilderImpl.build(EntityManagerFactoryBuilderImpl.java:892)
~[hibernate-core-5.2.17.Final.jar:5.2.17.Final]
        at
org.springframework.orm.jpa.vendor.SpringHibernateJpaPersistenceProvider.createContainerEntityManagerFactory(SpringHib
ernateJpaPersistenceProvider.java:57) ~[spring-orm-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.orm.jpa.LocalContainerEntityManagerFactoryBean.createNativeEntityManagerFactory(LocalContainerEnti
tyManagerFactoryBean.java:365) ~[spring-orm-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        at
org.springframework.orm.jpa.AbstractEntityManagerFactoryBean.buildNativeEntityManagerFactory(AbstractEntityManagerFact
oryBean.java:390) ~[spring-orm-5.0.8.RELEASE.jar:5.0.8.RELEASE]
        ... 19 common frames omitted
```