“Exception first”

Stabilisiere deinen Code mit mehr Exceptions

About me

- 2012-2016 Development for a Proof of Concept MMORPG
- 2016-2018 Senior Software Developer (Shop Systeme)
- 2019-2020 Advanced Software Engineer (Mobile & Medical Applications)
- Ende 2020 Selbständig & Full Stack Engineer (Individual Software)

About me

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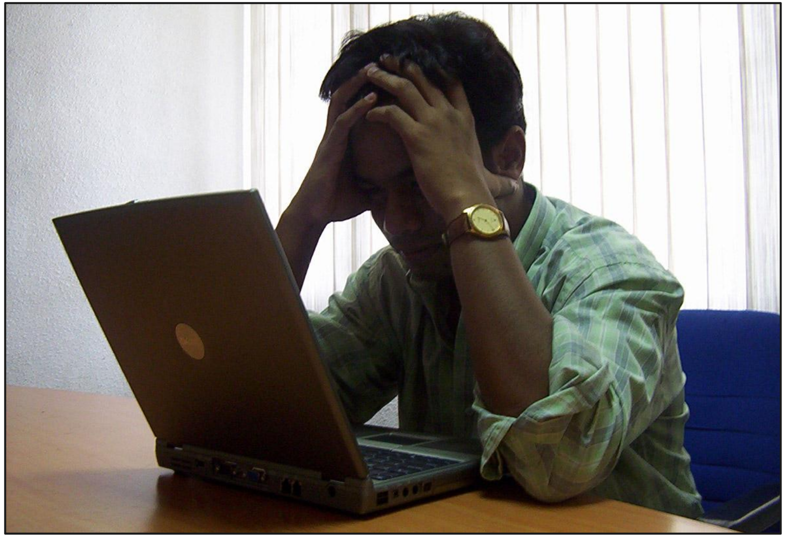
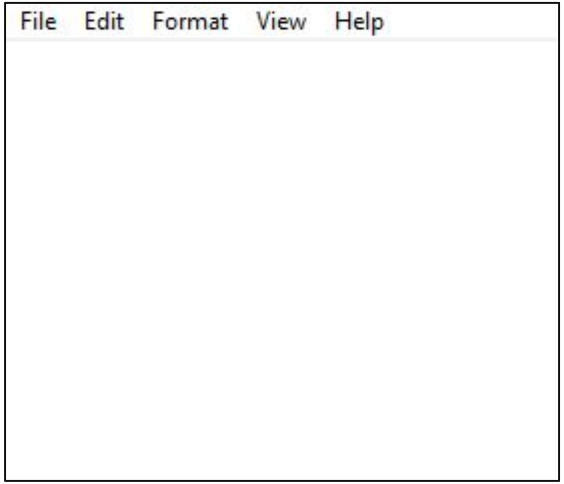
Fehler



Log-File

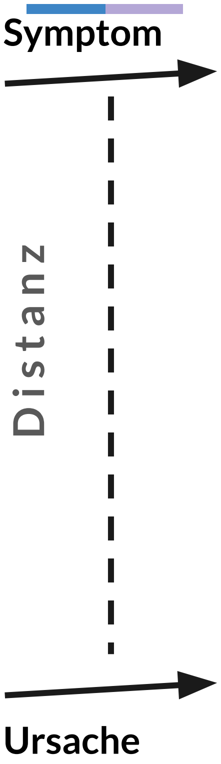


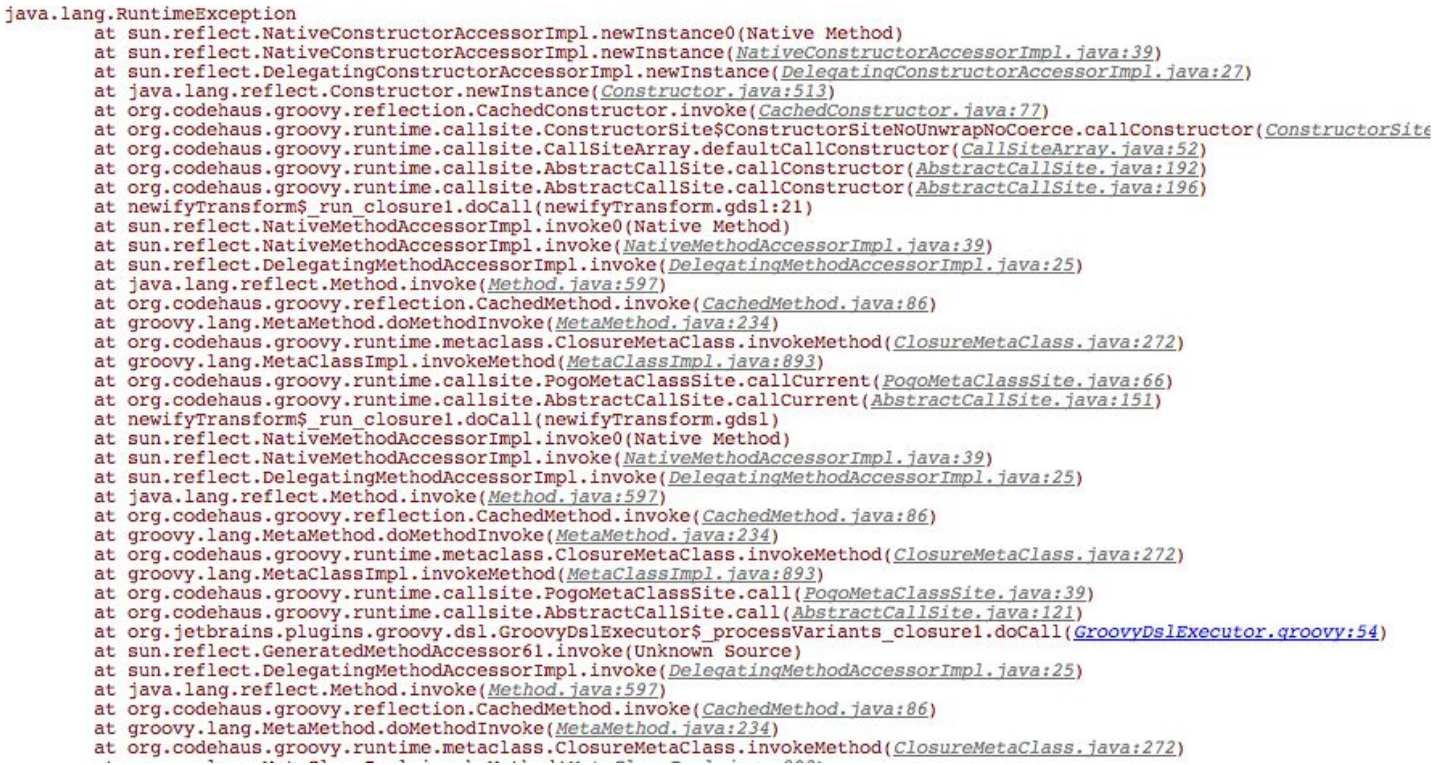
Das Abenteuer kann beginnen

Fehler messen?

Zeit messen

Distanz messen





```
java.lang.RuntimeException
        at sun.reflect.NativeConstructorAccessorImpl.newInstance0(Native Method)
        at sun.reflect.NativeConstructorAccessorImpl.newInstance(NativeConstructorAccessorImpl.java:39)
        at sun.reflect.DelegatingConstructorAccessorImpl.newInstance(DelegatingConstructorAccessorImpl.java:27)
        at java.lang.reflect.Constructor.newInstance(Constructor.java:513)
        at org.codehaus.groovy.reflection.CachedConstructor.invoke(CachedConstructor.java:77)
        at org.codehaus.groovy.runtime.callsite.ConstructorSite$ConstructorSiteNoUnwrapNoCoerce.callConstructor(ConstructorSite
        at org.codehaus.groovy.runtime.callsite.CallSiteArray.defaultCallConstructor(CallSiteArray.java:52)
        at org.codehaus.groovy.runtime.callsite.AbstractCallSite.callConstructor(AbstractCallSite.java:192)
        at org.codehaus.groovy.runtime.callsite.AbstractCallSite.callConstructor(AbstractCallSite.java:196)
        at newifyTransform$_run_closure1.doCall(newifyTransform.gdsl:21)
        at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
        at sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:39)
        at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:25)
        at java.lang.reflect.Method.invoke(Method.java:597)
        at org.codehaus.groovy.reflection.CachedMethod.invoke(CachedMethod.java:86)
        at groovy.lang.MetaMethod.doMethodInvoke(MetaMethod.java:234)
        at org.codehaus.groovy.runtime.metaclass.ClosureMetaClass.invokeMethod(ClosureMetaClass.java:272)
        at groovy.lang.MetaClassImpl.invokeMethod(MetaClassImpl.java:893)
        at org.codehaus.groovy.runtime.callsite.PogoMetaClassSite.callCurrent(PogoMetaClassSite.java:66)
        at org.codehaus.groovy.runtime.callsite.AbstractCallSite.callCurrent(AbstractCallSite.java:151)
        at newifyTransform$_run_closure1.doCall(newifyTransform.gdsl)
        at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
        at sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:39)
        at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:25)
        at java.lang.reflect.Method.invoke(Method.java:597)
        at org.codehaus.groovy.reflection.CachedMethod.invoke(CachedMethod.java:86)
        at groovy.lang.MetaMethod.doMethodInvoke(MetaMethod.java:234)
        at org.codehaus.groovy.runtime.metaclass.ClosureMetaClass.invokeMethod(ClosureMetaClass.java:272)
        at groovy.lang.MetaClassImpl.invokeMethod(MetaClassImpl.java:893)
        at org.codehaus.groovy.runtime.callsite.PogoMetaClassSite.call(PogoMetaClassSite.java:39)
        at org.codehaus.groovy.runtime.callsite.AbstractCallSite.call(AbstractCallSite.java:121)
        at org.jetbrains.plugins.groovy.dsl.GroovyDslExecutor$_processVariants_closure1.doCall(GroovyDslExecutor.groovy:54)
        at sun.reflect.GeneratedMethodAccessor61.invoke(Unknown Source)
        at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:25)
        at java.lang.reflect.Method.invoke(Method.java:597)
        at org.codehaus.groovy.reflection.CachedMethod.invoke(CachedMethod.java:86)
        at groovy.lang.MetaMethod.doMethodInvoke(MetaMethod.java:234)
        at org.codehaus.groovy.runtime.metaclass.ClosureMetaClass.invokeMethod(ClosureMetaClass.java:272)
```

Beispiel 1 - Distanz

```
1 public class Stack {
2   public static void main(String[] args) {
3       System.out.println(10/0);
4   }
5 }
```

```
Exception in thread "main" java.lang.ArithmeticException: / by zero
        at Stack.main(Stack.java:3)
```

Beispiel 2 - Distanz

```
 1 public class Stack {
 2   public static void main(String[] args) {
 3       int x = 10;
 4       int y = 0;
 5       System.out.println(Stack.Divide(x, y));
 6   }
 7
 8   public static int Divide(int f, int s) {
 9       return f / s;
10   }
11 }
```

```
Exception in thread "main" java.lang.ArithmeticException: / by zero
	at Stack.Divide(Stack.java:9)
	at Stack.main(Stack.java:5)
```

Beispiel 3 - Distanz

```
 1 public class Stack {
 2   public static void main(String[] args) {
 3       int x = Stack.ReadX();
 4       int y = Stack.ReadY();
 5       System.out.println(Stack.Divide(x, y));
 6   }
 7
 8   public static int Divide(int f, int s) {
 9       return f / s;
10   }
11
12   public static int ReadX() {
13       return 10;
14   }
15
16   public static int ReadY() {
17       return 0;
18   }
19 }
```

```
Exception in thread "main" java.lang.ArithmeticException: / by zero
        at Stack.Divide(Stack.java:9)
        at Stack.main(Stack.java:5)
```

Beispiel 3 - Distanz

```
 1 public class Stack {
 2   public static void main(String[] args) {
 3       int x = Stack.ReadX();
 4       int y = Stack.ReadY();
 5       System.out.println(Stack.Divide(x, y));
 6   }
 7
 8   public static int Divide(int f, int s) {
 9       return f / s;
10   }
11
12   public static int ReadX() {
13       return 10;
14   }
15
16   public static int ReadY() {
17       return 0;
18   }
19 }
```

```
Exception in thread "main" java.lang.ArithmeticException: / by zero
	at Stack.Divide(Stack.java:9)
	at Stack.main(Stack.java:5)
```

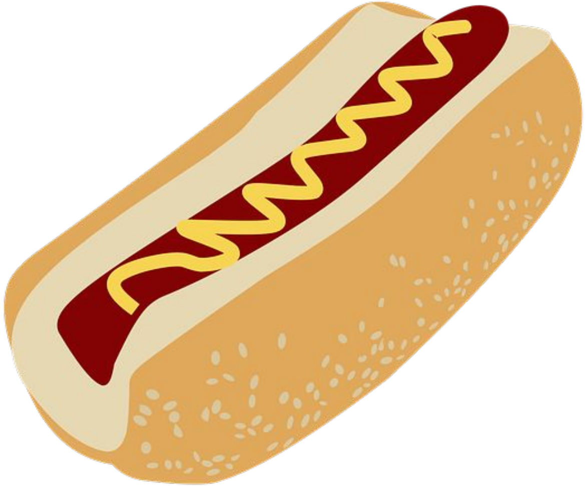
Validierung

- Annahmen definieren
- Exception werfen
- Distanz reduzieren
- Fehlerfindung erleichtern

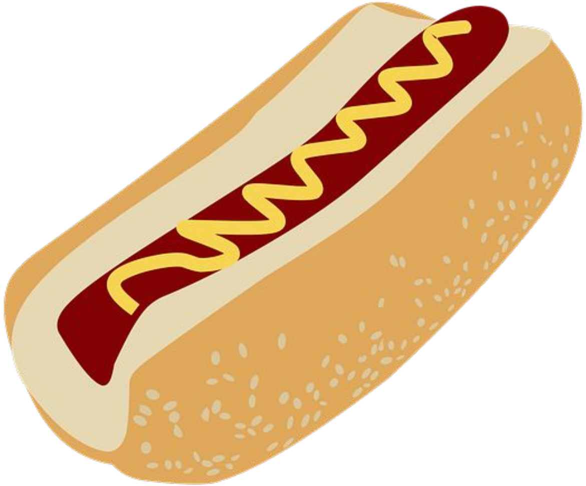
nesting

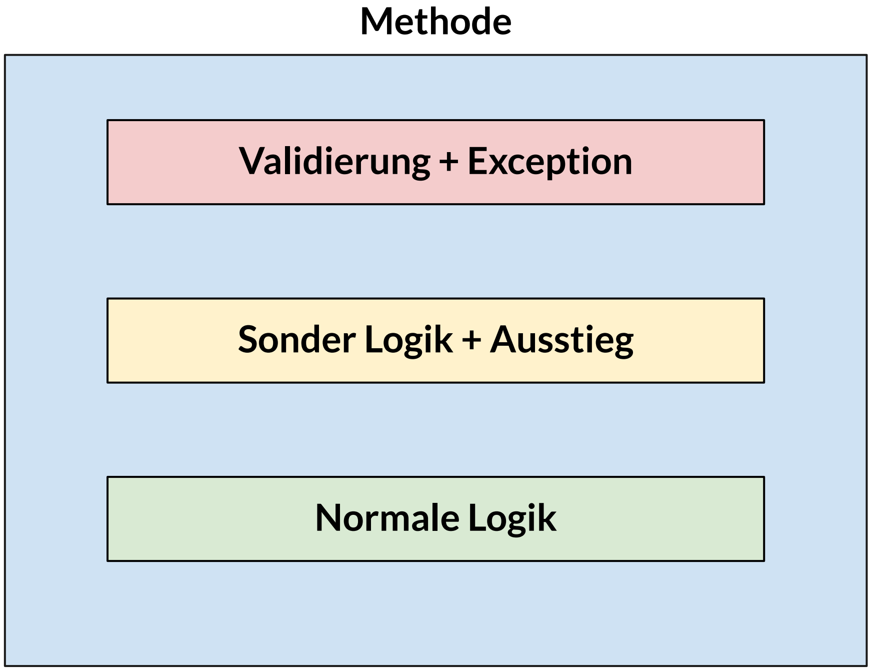
```
public double getPayAmount(Person person) {
   var result = 0.0;
   if (person.isDead())
       result = deadAmount();
   else {
       if (person.isRetired())
           result = retiredAmount();
       else {
           if (person.isChild())
               result = childAmount();
           else
               result = workerAmount();
       }
   }
   return result;
}
```

Concept



Concept





Methode

Validierung + Exception

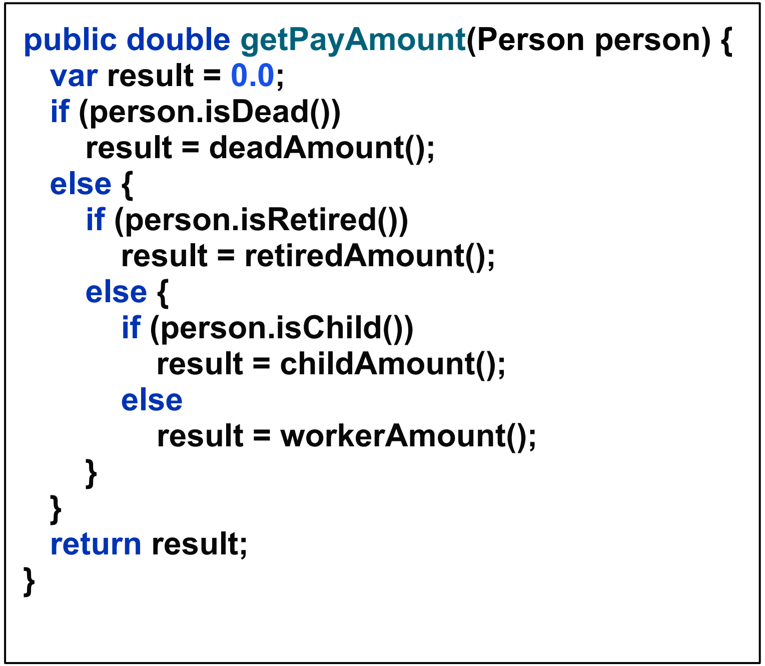
Sonder Logik + Ausstieg

Normale Logik

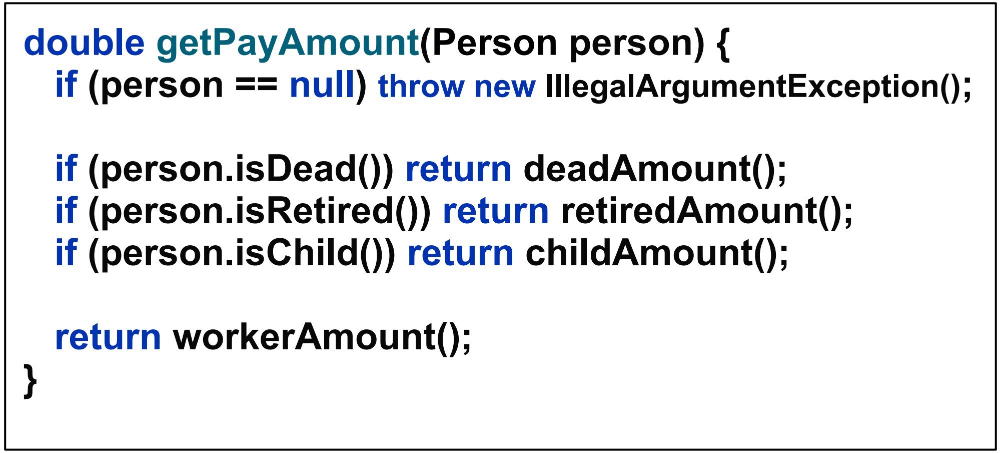
nesting

```
public double getPayAmount(Person person) {
   var result = 0.0;
   if (person.isDead())
       result = deadAmount();
   else {
       if (person.isRetired())
           result = retiredAmount();
       else {
           if (person.isChild())
               result = childAmount();
           else
               result = workerAmount();
       }
   }
   return result;
}
```

nesting



```
public double getPayAmount(Person person) {
   var result = 0.0;
   if (person.isDead())
      result = deadAmount();
   else {
      if (person.isRetired())
         result = retiredAmount();
      else {
         if (person.isChild())
            result = childAmount();
         else
            result = workerAmount();
      }
   }
   return result;
}
```



```
double getPayAmount(Person person) {
   if (person == null) throw new IllegalArgumentException();

   if (person.isDead()) return deadAmount();
   if (person.isRetired()) return retiredAmount();
   if (person.isChild()) return childAmount();

   return workerAmount();
}
```

testing

```
double getPayAmount(Person person) {
  if (person == null) throw new IllegalArgumentException();

  if (person.isDead()) return deadAmount();
  if (person.isRetired()) return retiredAmount();
  if (person.isChild()) return childAmount();

  return workerAmount();
}
```

nulls

```
public class Controller {

    public double getPayAmount(Person person) {
        if (person == null)
            throw new IllegalArgumentException();

        /* do something */
    }
}
```

nulls

```
public class Controller {

   private ILogger logger;

   public Controller(ILogger logger) {
       if (logger == null)
           throw new IllegalArgumentException();

       this.logger = logger;
   }

}
```

pre conditions

```
public void register(String token) {
   if (StringUtils.IsBlank(token))
       throw new IllegalArgumentException("Missing token");

   /* do something */
}
```

intermediate conditions

```
public void register(String token) {
   var response = client.getUser(token);

   if (StringUtils.IsBlank(response.email()))
       throw new IllegalArgumentException("Missing email");

   /* Register the user */
}
```

combined conditions

```
public void register(String token) {
   if (StringUtils.IsBlank(token))
       throw new IllegalArgumentException("Missing token");

   var response = client.getUser(token);

   if (StringUtils.IsBlank(response.email()))
       throw new IllegalArgumentException("Missing email");

   /* Register the user */
}
```

post conditions

```
double calculatePrice(Order order) {
  var result = 0.0;

  /* calculation */

  return Math.abs(result);
}
```

post condition

```
double calculatePrice(Order order) {
   var result = 0.0;

   /* calculation */

   return Math.abs(result);
}
```

```
public double calculatePrice(Order order) {
   var result = 0.0;

   /* calculation */

   if (result < 0)
       throw new IllegalArgumentException("Negative result");

   return result;
}
```

state changes

```
public enum GameState {
    OPEN,
    PROCESS,
    CLOSED
}
```

```
public void toProcess(Game game) {
    if (!game.state.equals(GameState.OPEN)) {
        throw new IllegalStateException("Forbidden state: " + game.state);
    }
    /* do something */
}
```

switch cases

```
public enum Color {
   GREEN,
   YELLOW,
   RED
}
```

```
switch (color) {
   case GREEN -> {
      /* do something */
   }
   case YELLOW -> {
      /* do something */
   }
   case RED -> {
      /* do something */
   }
}
```

switch cases

```
public enum Color {
   GREEN,
   YELLOW,
   RED,
   BLACK
}
```

```
switch (color) {
   case GREEN -> {
      /* do something */
   }
   case YELLOW -> {
      /* do something */
   }
   case RED -> {
      /* do something */
   }
}
```

switch cases

```
public enum Color {
   GREEN,
   YELLOW,
   RED
}
```

```
switch (color) {
   case GREEN -> {
      /* do something */
   }
   case YELLOW -> {
      /* do something */
   }
   case RED -> {
      /* do something */
   }
   default -> throw new IllegalStateException("Unexpected value: " + color);
}
```

pitfall

primitive obsession

```
public void prepare(int amount) {
  if (amount < 1 || amount > 100)
     throw new IllegalArgumentException("Invalid amount");

  /* do something */
  calculate(amount);
}

public void calculate(int amount) {
  if (amount < 1 || amount > 100)
     throw new IllegalArgumentException("Invalid amount");

  /* do something */
}
```

value types

```
public record ItemAmount(int amount) {

  public ItemAmount {
     if (amount < 1 || amount > 100)
        throw new IllegalArgumentException("Invalid amount");
  }
}
```

value types

```
public record ItemAmount(int amount) {

   public ItemAmount {
       if (amount < 1 || amount > 100)
           throw new IllegalArgumentException("Invalid amount");
   }
}
```

```
public void prepare(ItemAmount amount) {
   /* do something */
   calculate(amount);
}

public void calculate(ItemAmount amount) {
   /* do something */
}
```

exception

🙂

Fehlerfall

Ausführungsunterbrechung

🚫

Logic Vehicle

prod vs. dev

- Guards disablen?

prod vs. dev

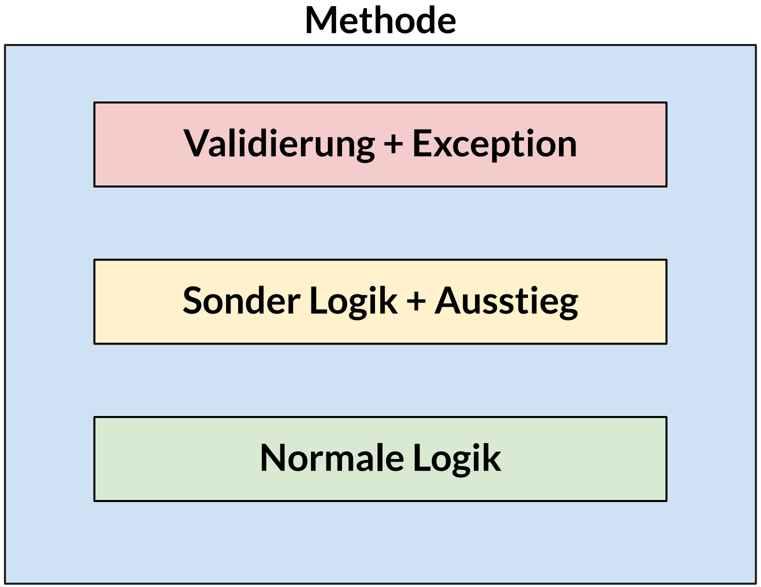
- Guards disablen?

prod vs. dev

- **Guards disablen?**
  - Global Error Wrapper
  - Logs
  - Analytics
  - Redirect

guideline

1. Global Error Wrapper
2. GuardUtil erstellen
3. Validierung einbauen
    a. Bugs anfangen
    b. Neu features
    c. Ausweiten
4. Aufpassen
    a. Kurzfristig höhere Instabilität
    b. Mehr Serverabstürze
    c. Deutlich bessere Datenqualität
    d. Schnellere Fehlersuche



Bildquellen

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