

Case Study: GContracts

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Closure Annotation Parameters

Groovy 1.8

GContracts

- Design by Contract™ for Groovy
- <http://github.com/andresteingress/gcontracts>

GContracts

```
import org.gcontracts.annotations.*
```

```
@Invariant({ speed >= 0 })
```

```
class Ariane5 {
```

```
    long speed = 0
```

```
    boolean engineStarted = false
```

```
    @Requires({ increase > 0 && engineStarted == true })
```

```
    @Ensures({ old.speed < speed })
```

```
    void accelerate(increase) {
```

```
        speed += increase
```

```
    }
```

```
    @Requires({ engineStarted == false })
```

```
    @Ensures({ engineStarted == true })
```

```
    void startEngine() {
```

```
        engineStarted = true
```

```
    }
```

```
}
```

@Precondition

Precondition in a Nutshell

- Pre-Method Assertion
 - Boolean Expression
- Evaluated at Run-Time

```
@Precondition(???)  
def deposit(...)
```

Java Annotation Param Types

- Strings
- Primitives
- Annotations
- Classes
- Arrays of these

Java Annotation Param Types

- **Strings**
- Primitives
- Annotations
- **Classes**
- Arrays of these

Java

`@Precondition(PreconditionImpl.class)`

Java

```
class PreconditionImpl ... {  
    void validate(def thisObject, def params) {  
        assert << boolean expr >>  
    }  
}
```

Groovy Annotation Param Types

- Strings
- Primitives
- Annotations
- Classes
- Arrays of these
- **Closures**

Groovy

`@Precondition({ << boolean expr >> })`

Groovy

@Precondition

(BankAccount\$_deposit_closure | .class)

AST Transformation

Example

@Precondition({ ... })

- ✓ Annotation Type
- ✓ AST Transformation Class
- ✓ Test Cases


```
@Precondition({  
    amount >= 0.0  
})
```

```
def deposit(def amount)
```

```
def deposit(def amount) {  
    assert amount >= 0.0  
    // ...  
}
```

```
@Precondition(  
    amount >= 0.0  
)
```

```
def deposit(def amount)
```

AnnotationNode

```
@Precondition({  
    amount >= 0.0  
})
```

```
def deposit(def amount)
```

ClosureExpression

```
@Precondition({  
    amount >= 0.0  
})
```

```
def deposit(def amount)
```

ExpressionStatement

```
@Precondition({
```

```
    amount >= 0.0
```

```
})
```

```
def deposit(def amount)
```

```
    BinaryExpression
```

Example

@

github/gsamples