

# SMA: Software Modeling and Analysis

*Practical Session*  
**Week 06**

# Assignment 06

## ***Discussion***

# A06 - Exercise 01 | Metrics

## General *knowledge*.

- What is cyclomatic complexity? Explain!

$$M = E - N + 2P$$

*M is metric*

*E are the CFG edges (potential execution flows)*

*N are the nodes (instructions)*

*P is amount of connected components (1 for now)*

*Benefits: reports complexity of code, easy to apply*

*Drawbacks: simplifies real world*

# A06 - Exercise 01 | Metrics

- Which other metrics do you know?  
*LOC, TIME, COHESION, SIZE, ...*
- Do metrics always express problems?  
*No! They do frequently lack context.*
- How and when are nowadays metric checks in place?  
*Development: IDE plug-in*  
*Build process: automated verification during build*  
*Release: evaluation of customer feedback*

# A06 - Exercise 02 | Evaluation of metrics

## First, write a query to...

- retrieve all classes with more than 42 methods.

```
self allModelClasses select: [ :aClass | aClass methods size > 42 ].
```

- find all methods with a CYCLO larger than 84.

```
self allMethods  
  select: [ :aMethod | aMethod cyclomaticComplexity > 84 ].
```

# A06 - Exercise 02 | Evaluation of metrics

## Then respond...

- What methods suffer from such a complexity?  
*None, but there exist classes with a value > 40:*
  - *C# file scanner*
  - *Synchronization tests*
- Is 84 a large CYCLO value?  
*Yes! Evaluation and refactoring needed.*

# A06 - Exercise 03 | Evaluation of metrics BONUS

## **Write a query to...**

- obtain classes that call deprecated methods.
- obtain all attributes that show certain properties, but are not declared as final.
- obtain a list of methods that make more than one call to deprecated classes.

*please consider the assignment sheet*

# Assignment 07

## *Preview*



**You have to attend the lecture to reveal such slides.\***

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*\*Disclaimer:*

*The content that has been shown on this slide is irrelevant for the exam.*

# A06 - Exercise 01 | General knowledge

***Multiple-choice*** questions.

*You will find all the details in the current assignment sheet.*

# A06 - Exercise 02 | Social-technical aspects

***Multiple-choice*** questions.

*You will find all the details in the current assignment sheet.*

# A06 - Exercise 03 | PyDriller

***Multiple-choice*** questions.

***PyDriller***

***<https://pydriller.readthedocs.io/en/latest/>***

***You will find all the details in the  
current assignment sheet.***