SMA: Software Modeling and Analysis

Practical Session

Week 06
Assignment 06

Discussion
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.

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

• find all methods with a CYCLO larger than 84.

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

*Disclaimer:
The content that has been shown on this slide is irrelevant for the exam.
Multiple-choice questions.

You will find all the details in the current assignment sheet.
Multiple-choice questions.

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PyDriller
https://pydriller.readthedocs.io/en/latest/

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