**SMA oral exam**

*General questions*

1. What is a meta-model? Why do we have one?
2. What is the difference between introspection and intercession? (later supports also state changes)
3. What is static / dynamic / hybrid code analysis?

*Smalltalk*

1. Transcript show: ‘Hello World’.  
   What is each element in this statement? How does it work? What is the execution order?
2. Write a conditional statement in Smalltalk.
3. What is a block closure in the Pharo?
4. Can you name a few key elements of Pharo’s Smalltalk class hierarchy? (class side / instance side)
5. Explain briefly the elements and their purpose!

aString = ‘isValid’

ifTrue: [ result := ’yes’ ]

ifFalse: [ result := ’no’ ].  
  
sorted: [ :a :b | a value > b ] value ]

1. Name one benefit and one drawback of the Pharo environment.

*Code Analysis*

1. What is a code metric, and what is the role of a code metric in analyzing source code?
2. Name 3 different code metrics.
3. Explain them and mention one benefit and one drawback for each.
4. What is one major use case for cyclomatic complexity? (test coverage, …)
5. What is code duplication and how does it relate to code complexity?

*Test Code Smells*

1. What are mistakes in test code that should be avoided? Why?

*Compiler Optimizations*

1. We provide a sample method in Java with some imperfections: What are the imperfections, and how could a compiler optimize them?
2. What is an intermediate-representation language? Can you name one?
3. What is its purpose?

*Plots*

1. We show three plots (sunburst / node-link / treemap). Which is which?
2. What is one peculiarity that you can see in the sunburst plot? Why is it a peculiarity?
3. Do you think a Treemap makes sense for hierarchical data? Why, or why not? (no it does not -> hard to relate hierarchy levels)

*Socio-Technical Aspects*

1. Comment on Conway’s law with a real-life example: “Any organization that design a system will produce a design whose structure is a copy of the organization’s communication structure.”