Exploiting Pharo’s reflexive capabilities to ease source code generation
Pharo Code Generator

- [https://github.com/juliendelplanque/PharoCodeGenerator](https://github.com/juliendelplanque/PharoCodeGenerator)
- DSL to generate Pharo code in Pharo.
- In alpha stage :-)
- ‘PCG’ will be used as shortcut for Pharo Code Generator during this presentation.
How it works?

1. Describe the code to generate via the DSL

```plaintext
(PCGMethodNode selector: #answerToEverything)
bodyBlock: [:body |
  body << 42 asPCG returnIt ]
```

2. Execution generates PCG AST objects

3. Trigger translation to Pharo’s AST

4. Install generated code in the system
**API overview**

```plaintext
ast := (PCGMethodNode selector: #answerToEverything)
  bodyBlock: [:body | 
    body << 42 asPCG returnIt ]

ast realAst • Builds the Pharo AST corresponding to description made in DSL

ast checkAst • Checks if the AST is ready for translation to Pharo AST. Raises an error if not.

ast sourceCode • Returns a String holding source code resulting from generation.

ast withGeneratedPragma: true|false • Adds or not <generated> pragma in method source code.
```

`answerToEverything ^ 42`
Template support

```plaintext
(template substituteParametersWith: {
  #answerSelector -> #answerToEverything. #answer -> 42 asPCG }) sourceCode.
```

```
(template substituteParametersWith: {
  #answerSelector -> #answerToEverythingInParallelUniverse. #answer -> 43 asPCG }) sourceCode.
```

**Answer to Everything**

\[ ^{42} \]

**Answer to Everything in Parallel Universe**

\[ ^{43} \]
Do not start from scratch

If you saw a method in your project that can be used as a basis for code generation, PCG can help you
Do not start from scratch

1. Describe the code to generate via the DSL
   (PCGMethodNode selector: #answerToEverything)
   bodyBlock: [:body |
     body << 42 asPCG returnIt ]

2. Execution generates PCG AST objects

3. Trigger translation to Pharo’s AST

4. Install generated code in the system

Pharo’s AST

Generates

PCG visitors

- Checks validity
- Perform translation

PCG AST

Generate PCG AST from Pharo AST
Do not start from scratch

\[
\text{pcgAst} := (\text{Object} \gg \text{yourself}) \text{ asPCGAST}
\]

\[
\text{pcgAst sourceCode} \xrightarrow{\text{generates}} \text{yourself}
\]

\[
\text{<generated> ^ self}
\]
Do not start from scratch

```plaintext
pcgAst := (Object >> yourself) asPCGAST

pcgAst meta sourceCode

generates

(PCGMethodNode selector: yourself)
  bodyBlock: [ :body | body << self asPCGNode returnIt ];
  protocol: #accessing;
  yourself

You can easily get the code required to generate Object >> yourself via PCG DSL and tweak it.
```