

# Code Generation

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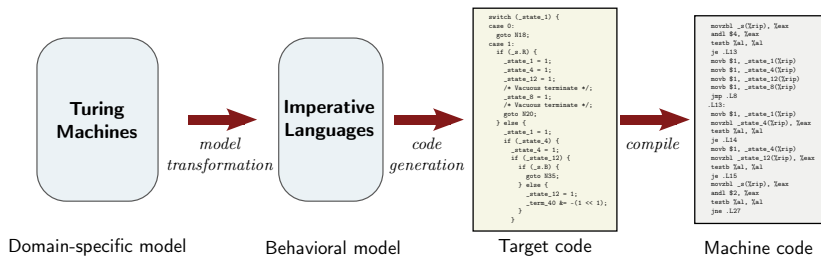


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# Previously on This Program...

Remember the Compiler Pipeline



# Outline

- 1 Xtend's Code Generation Features
- 2 Generating Code for an Imperative Program

# Outline

① Xtend's Code Generation Features

② Generating Code for an Imperative Program

# Template Expressions

## Simplest Form

```
def generateCode(model) '''
    <html>
        <head>
            <title>«model.name»</title>
        </head>
        <body>
            <p>
                «model.paragraph.text»
            </p>
        </body>
    </html>
'''
```

# Template Expressions

## Conditionals

```
def generateCode(model) '''
    <html>
      <head>
        <title>«model.name»</title>
      </head>
      <body>
        «IF model.heading != null»
          <h1>«model.heading»</h1>
        «ENDIF»
        <p>
          «model.paragraph.text»
        </p>
      </body>
    </html>
  '''
```

# Template Expressions

## Loops

```
def generateCode(model) '''
    <html>
      <head>
        <title>«model.name»</title>
      </head>
      <body>
        «IF model.heading != null»
          <h1>«model.heading»</h1>
        «ENDIF»
        «FOR paragraph : model.paragraphs»
          <p>
            «paragraph.text»
          </p>
        «ENDFOR»
      </body>
    </html>
  '''
```

# Outline

① Xtend's Code Generation Features

② Generating Code for an Imperative Program





# How Should the Transformation Work?

## Some Hints to Get You Started

- Generate code to initialize input variables
- Transform `Program` to a method
- Write code generation methods for each type

# One Last Thing

## Dispatch Methods

```
def generateCode(VarExpression e) {  
  if (e instanceof IndexedVarExpression) {  
    '''  
    ...  
    '''  
  } else {  
    '''  
    ...  
    '''  
  }  
}
```

# One Last Thing

## Dispatch Methods

```
def generateCode (VarExpression e) '''  
    ...  
'''
```

```
def generateCode (IndexedVarExpression e) '''  
    ...  
'''
```

# One Last Thing

## Dispatch Methods

```
def dispatch generateCode (VarExpression e) '''  
    ...  
'''  
  
def dispatch generateCode (IndexedVarExpression e) '''  
    ...  
'''
```