

# Development Document for DafnyR

Yuyan Bao

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## Abstract

DafnyR is an experimental tool for sequential program specification and verification. It is a variant of Dafny, and is inspired by region logic and separation logic. DafnyR is built on a fine-grained region logic and allows one to write different styles of specifications.

## 1 Adding Region To Dafny

This section states the changes to Dafny source code.

1. *parser* and *emphscanner*: add new syntax to allow region expressions by changing the file `Dafny.atg` and running the tool `CoCo/R`, which generates a new *parser* and a new *scanner*.
2. *Resolver*: adding the new type **Region**.
3. *Translator*: changes to translate Dafny programs with regions to appropriate Boogie programs.
4. *Other changes* changes related to the *printer* and syntax highlighters for the keywords.
5. *Test* adding test cases for new features

Table 1: \*  
syntax & expression classes

Syntax	Expression Class	Resolved Expression
null	LiteralExpr	InferredTypeProxy ?
<b>this</b>	ThisExpr	ThisExpr
<b>this.val</b>	ExprDotName	MemberSelectExpr

## 2 Development Environment

### 2.1 How to Debug Visual Studio Extensions

1. Right click on the project and select Properties
2. Go to the Debug Tab
  - (a) Click on the radio button for *Start External Program*
  - (b) Point it to the *devenv.exe* binary, i.e., C:\Program Files (x86)\Microsoft Visual Studio 10.0 \Common7 \IDE\devenv.exe.
  - (c) set the command line arguments to /rootsuffix Exp

### 2.2 How to Run Coco/R

1. Copy *Coco.exe*, *Parse.frame* and *scanner.frame* to a folder
2. run "Coco.exe Dafny.atg -namespace Microsoft.Dafny"