Dafny Instalation

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Objectives

- Installation of Dafny step by step

- Run some examples

Dafny (`https://dafny.org/`) is an object-oriented programming language developed by *Microsoft Research* designed for reasoning. It includes constructs for both imperative and functional programming, as well as for writing specifications, defining pieces of mathematics, stating lemmas, and writing proofs.

1 Installation

1. Install VS Code onto your machine. If you don't have it, you can download it from here.

2. Click the *Extensions* button, search for the Dafny extension from *dafny-lang*, and click to install it.

   Remark 1 *After you install the Dafny extension, you can look for more shortcuts that make Dafny work (e.g. compile, run, show counterexamples).*

3. You should also have installed *.NET 6.0* or *7.0* depending on what platform you're using (Windows, Linux or Mac).

4. To get more specific informations about installation of Dafny, you can visit https://github.com/dafny-lang/dafny/wiki/INSTALL.

2 Example

After installation, we will try to **verify** a simple code. Create a `.dfy` file in VS Code and write the following code. It should look like in Figure 1.

Dafny can be used also as a programming language alone. For this, one should write a method `Main`. To compile and run the program, in VS Code you should do something like In Figure 2.
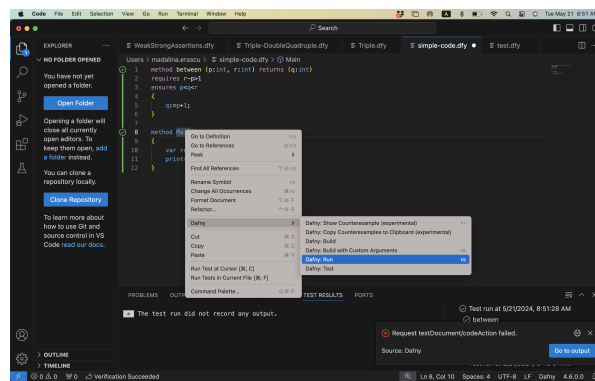
Figure 1: Simple code to verify

Figure 2: Simple code to compile and run

1. What does the program do? What is the precondition? What is the postcondition?

2. What happens if you change the body of the method with `q := p + 2`? Give a counterexample.

3. What happens if you change the precondition with `r-p>=1`? Give a counterexample.