Section 1: Week 3: Domain Specific Languages

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# Domain Specific Languages

A Domain Specific Language (DSL) is a mechanism for concisely describing the interaction with a well-defined context. Perhaps without knowing, even the most novice of computer programmers uses dozens of these languages.

A General-Purpose Languages (GPL) is a mechanism for describing a problem which spans multiple application domains. They tend to be more verbose than DSL due to needing to specify both the context and the interaction.

Consider building a simple webpage, which is written in HTML and CSS. These simple languages describe how a document should be structured and presented. When updates are ready for publishing the authors kick off a shell script, another DSL. Within that script regular expressions are used to transform place holders into final values in the configuration file. Both the RegEx and configuration file are also exampling of DSL.

The server-side code might be written in C# and use the ASP.net framework. To simplify the code behind development, programmers can write Razor templates to describe data binding scenarios in a mash of up XML and C#.

Both C# and XML are GPL languages as they are used across a wide range of software contexts such as client applications, automotive systems, and data science pipelines. The Razor templates are a DSL language as they are only used within ASP.net data binding scenarios. It does not matter that the Razor templates are using C# as their syntax and implementation. The key distinction here is the contextual use case.

# Categories of DSL

Domain Specific Languages can be categorized into distinct groups markup, modeling, and programming.

## Markup

Markup languages such as HTML, LaTex, and Markdown add metadata – such as formatting and font sizes, to a textual document.

## Modeling

Modeling languages describe an object hierarchy and their relationships. XML and JSON configuration files are common examples but can also appear in more English sentence form.

## Domain Scripting

Domain Programming languages extend modeling languages to also add control flow such as branching and loops. TradeStation’s EasyLanguage allows business users to automate stock trading strategies. These users can specify IF current\_price < desired\_price THEN BUY 100 SHARES OF APPLE AT MARKTET PRICE.

The intent of that statement is instantly understandable to both the programmer and the domain expert. This clarity allows those experts to become more deeply integrated into the development cycle and ensure business rules are properly implemented.

## Internal vs External