3a. Overview and Goals

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The upcoming Chapters 3 and 4 will cover three core tools for programming: functions, conditional statements, and for-loops. Chapter 3 in particular focuses on **functions**, which constitute the backbone of Julia programming. As they're tightly linked to achieving high performance, we'll dedicate considerable time to discussing their usage.

Our coverage of functions will be organized into three categories, based on who defines them:

i) built-in functions,

ii) third-party functions, and

iii) user-defined functions.

The first two types of functions become available in the workspace via packages, which may be loaded implicitly or explicitly. This connection between packages and functions leads us into exploring the concepts together in Section 3b. Instead, user-defined functions are left for Section 3c.

A firm grasp of functions requires understanding variable scope, including the distinction between global and local variables. By establishing this difference, we'll frame functions as self-contained mini-programs designed to perform a specific task. Both subjects are presented together in Section 3d. This perspective on functions will lead to the identification of good practices for using functions, which will have significant implications for the structure of code as we progress. At this point, nonetheless, it suffices if you start becoming familiar with this view.

Finally, we'll introduce the concept of broadcasting in Section 3e. Mastering this technique is crucial, as it lets you seamlessly apply the same function to each element in a collection. Broadcasting is a widely used technique not only in Julia, but also in other programming languages like Python.