R environments

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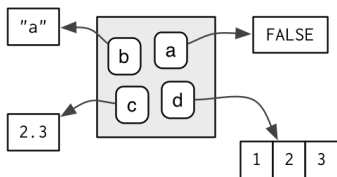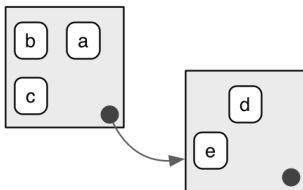
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Why bother?

- Sometimes things don't work as expected.
- When writing functions it is important to know how R looks for variables.
- When writing packages it is important to know how R looks for functions.

What is an environment?

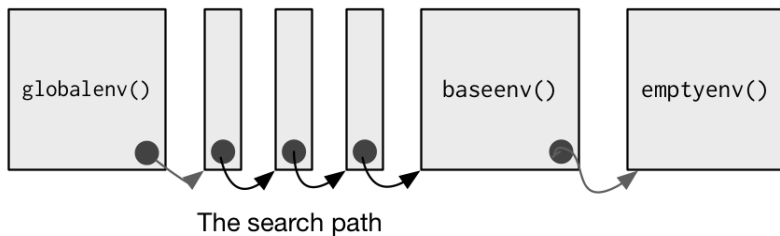- ▶ A 'frame', i.e. the name-object bindings

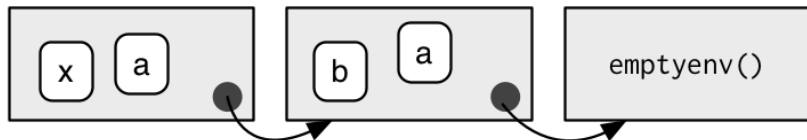- ▶ A parent, i.e. a pointer to another environment

- ▶ Exception: the empty environment - the grandfather of all environments.

The environment tree

The search path

Searching for variables

- Which 'a' is used ?
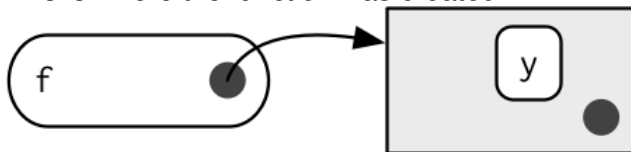- How to find 'b' ?
- How to find 'x' ?

Functions and their environments

A function has 4 associated environments:

- ► The enclosing environment - where the function was created
- ► The binding environment - where the function have a name
- ► The execution environment - the temporary environment used during execution containing local variables
- ► The calling environment - the environment where the function was called

The enclosing environment
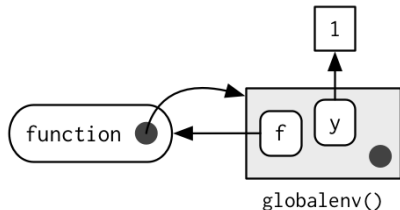
► This is where the function was created

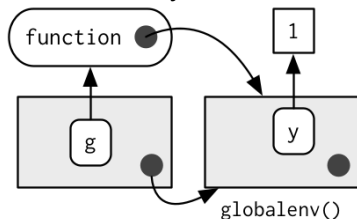

globalenv()

Determines how the function finds its values

The binding environment
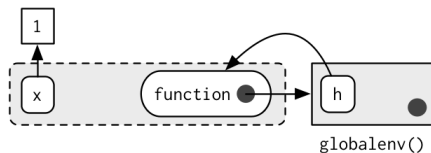
- This is where the function have a name - determines how

globalenv()

we can find the function

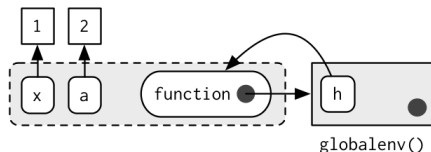- Not necessarily the same as the enclosing environment

globalenv()
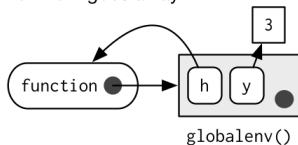
The execution environment
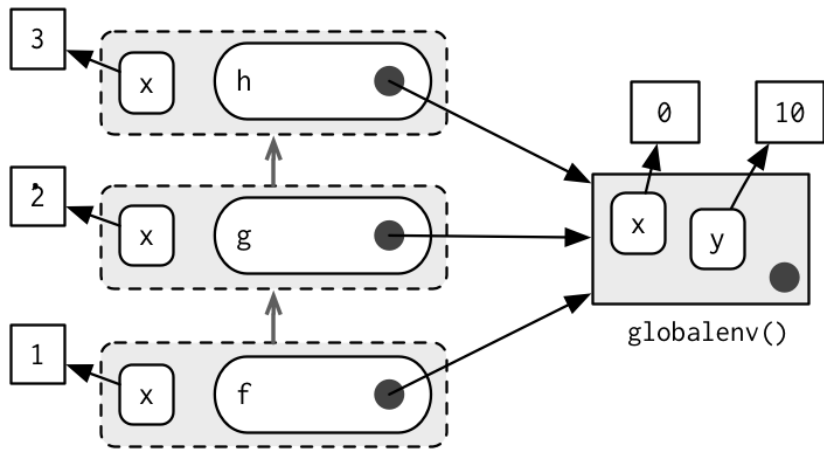
1. Function called with x = 1

globalenv()

2. a assigned value 2

globalenv()

3. Function completes returning value 3.
Execution environment goes away.

globalenv()

The calling environment

Packages and environments

There are two environments associated with a package:

- A package environment - a binding environment
- A namespace - an enclosing environment

Package environment

- exported functions bound to this environment
- where these functions are found (by name)
- inserted below the global environment in the environment stack
- have a special parent - an 'imports environment'

Namespace

- exported functions are enclosed by this environment
- the 'creation' environment for the functions
- where variables and other functions are looked for
- inserted above the global environment in the environment stack during function call

namespace vs package environment