



# While-loops

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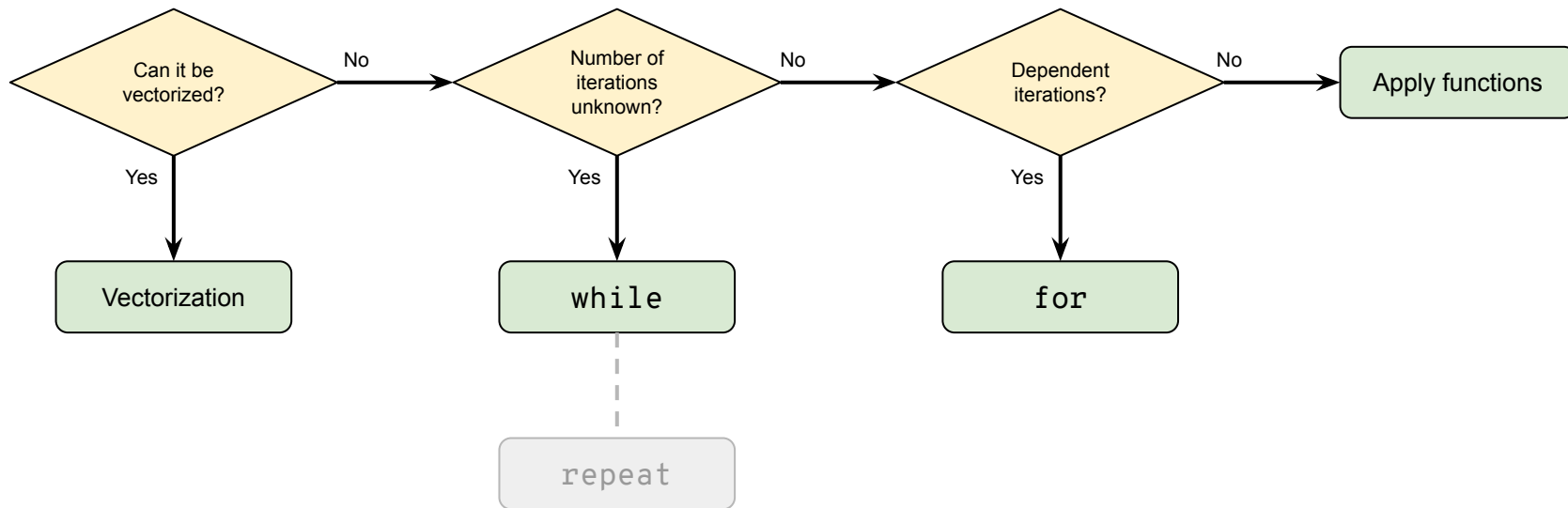


# Developing Iterative Code

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# Choosing an Iteration Strategy




Use recursion sparingly, for problems that are naturally recursive.

# Developing Iterative Code

1. Write the code for just one iteration.
  - Don't use an apply function or loop yet.
  - Test that your code actually works.
2. Modify your code for iteration with an apply function or loop.
  - Look for expressions that change from one iteration to the next.
3. If your code doesn't work, figure out which iteration causes trouble.
  - Use `message()` to print diagnostics, or use R's debugger.
  - Fix the broken iteration!
  - Repeat this step until everything works.

# R Iteration Best Practices

- Use vectorization whenever possible
- Minimize code inside apply functions and loops
  - Preallocate result vectors
- Only use indices when necessary
  - Especially important with apply functions
  - Iterate directly over vectors
- Use `seq_len(n)` instead of `1:n`



# Messages, Warnings, and Errors

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# Preventing Bugs

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# The R Debugger

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