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Recursion vs. Iteration

This section compares the two approaches and discusses why you might choose one approach over the other in a particular situation.

Both iteration and recursion are based on a control statement: Iteration uses a repetition structure; recursion uses a selection structure.

Both iteration and recursion involve repetition: Iteration explicitly uses a repetition structure; recursion achieves repetition through repeated function calls.

Iteration and recursion both involve a termination test: Iteration terminates when the loop-continuation condition fails; recursion terminates when a base case is recognized.

Iteration with counter-controlled repetition and recursion both gradually approach termination: Iteration modifies a counter until the counter assumes a value that makes the loop-continuation condition fail; recursion produces simpler versions of the original problem until the base case is reached.

Both iteration and recursion can occur infinitely: An infinite loop occurs with iteration if the loop-continuation test never becomes false; infinite recursion occurs if the recursion step does not reduce the problem during each recursive call in a manner that converges on the base case.