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CodeRage® X

Develop Anything, Anytime, Anywhere

Simplify Parallel Programming with Patterns

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Multithreading is Hard

“New programmers
are drawn to multithreading
like moths to flame,
with similar results.”

- Danny Thorpe

Solution

- Extract all hard parts into a boilerplate code.
- Test it. Test again. Test repeatedly.
- Reuse as much as possible.
- Test again. Don’t stop testing.

– or –

- Use existing library.

Bugs Away!

“The code that you don’t write, contains no bugs.”

- Primož Gabrijelčič

Adapt the Algorithm to the Pattern

- don‘t write the code for your algorithm
- decompose the algorithm into the patterns

- when everything fails, go low-level
  - tasks first [CodeRage 9: Parallel Programming Library]
  - threads last

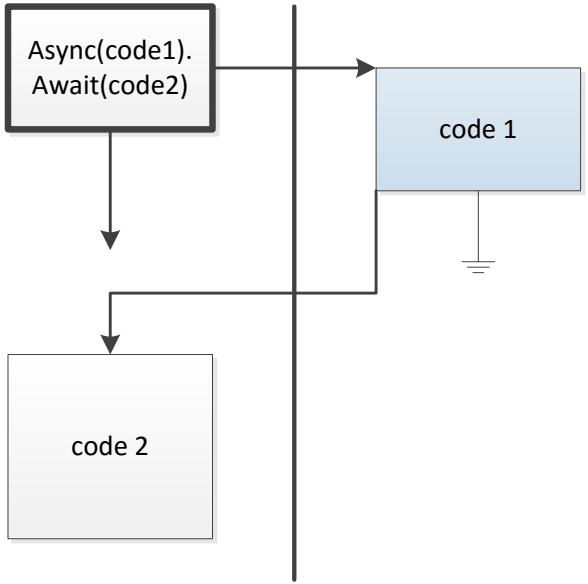
Frameworks

- PPL
  - Parallel Programming Library
  - XE7+, all platforms, RTL license
  - patterns: For, Future, Join
- OTL
  - OmniThreadLibrary
  - 2009+ (patterns), 2007+ (tasks), Windows (VCL/console/service) only (but working on that), OpenBSD license
  - patterns: Async[/Await], Background worker, For, Fork/Join, Future, Join, Map, Parallel task, Pipeline

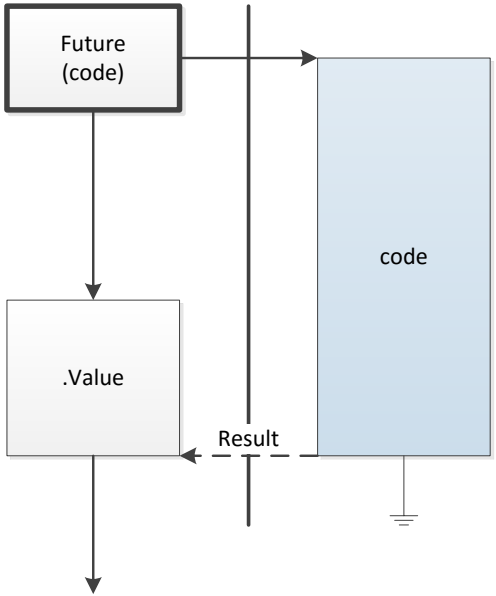
Patterns

- Async/Await
  - Fire asynchronous tasks
- Future
  - Execute long calculation in background
    https://en.wikipedia.org/wiki/Futures_and_promises
- For
  - Use all of available CPUs when processing large data
    https://en.wikipedia.org/wiki/Embarrassingly_parallel
- Map
  - Converting data in parallel

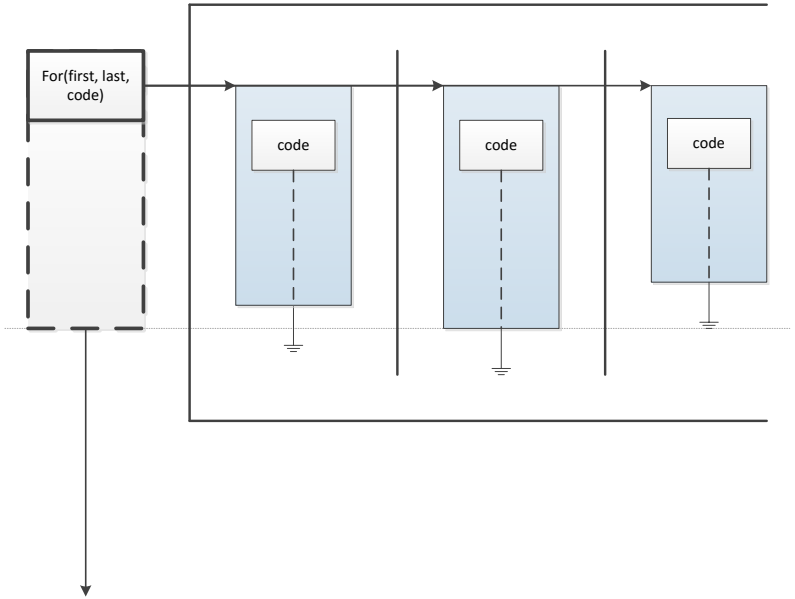
Async/Await



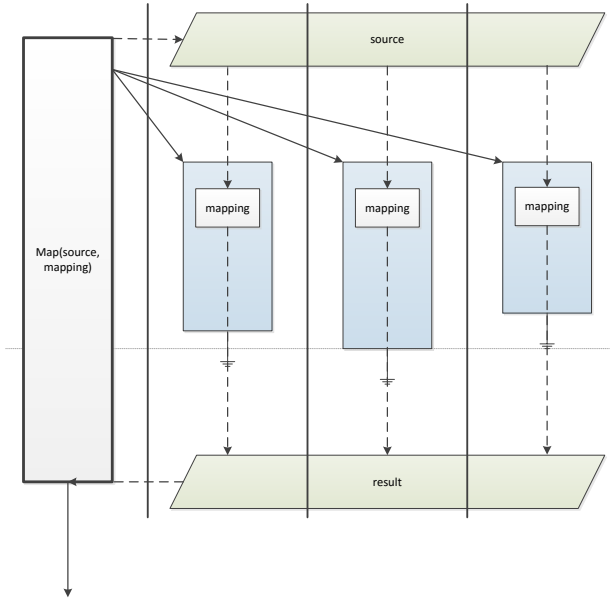
Future



For



Map



Important Facts We Learned Today

- Don’t write boilerplate code – use patterns
- Be careful when accessing shared data
- Never access the GUI from a background thread!

Q&A

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