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Options for lambdas

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Options for lambdas

ISO/IEC JTC 1/SC 22/WG14 **N2893**

WG21

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<https://modernc.gforge.inria.fr/>

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Closure

Explicit captures

- *identifier capture*: access an outer variable `[&id0,...]`
- *value capture*: frozen value of an expression `[id0 = expr,...]`

where "`,...`" is empty or a mixed list of both types of explicit captures.

Syntax

Ambiguities

not so bad

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Closure

Implicit captures and explicit captures

- default identifier captures [&,...]

where "`,...`" is empty or a mixed list of value or shadow captures.

- default shadow captures [=,...]

where "`,...`" is empty or a mixed list of value or identifier captures.

Explicit shadow captures

- frozen value of an automatic variable [id0,...]

where "`,...`" is empty or a mixed list of all three types of explicit captures.

Syntax

Ambiguities

Explicit shadow captures introduce new syntax ambiguities with

- designated initializers (bounded lookahead)
- attributes (unbounded lookahead)

Disambiguation

- Force consecutive [[tokens to be the start of an attribute



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Default captures

Migration

- users of nested functions and expression statements (`{ ... }`)
=> use `&`
- users of the block extension (clang)
=> use `=`

Please!

Possible future extensions

- together with wide function pointers
=> standardize nested functions and expression statements

Expressivity

- provides framework for other extensions, such as `defer`

Explicit shadow captures

Coding style

- Better to have an explicit list of shadow captures than [=] improve code after default migration

C++ compatibility

Grammar disambiguation

Explicit shadow capture

- Only really needed when these are introduced

C++ compatibility