Techniques for Optimisation

2. Identifying work that can be combined

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- Evaluate in parallel

- Execute using SIMD instructions (single instruction, multiple data)

- Combine work in an algorithm:

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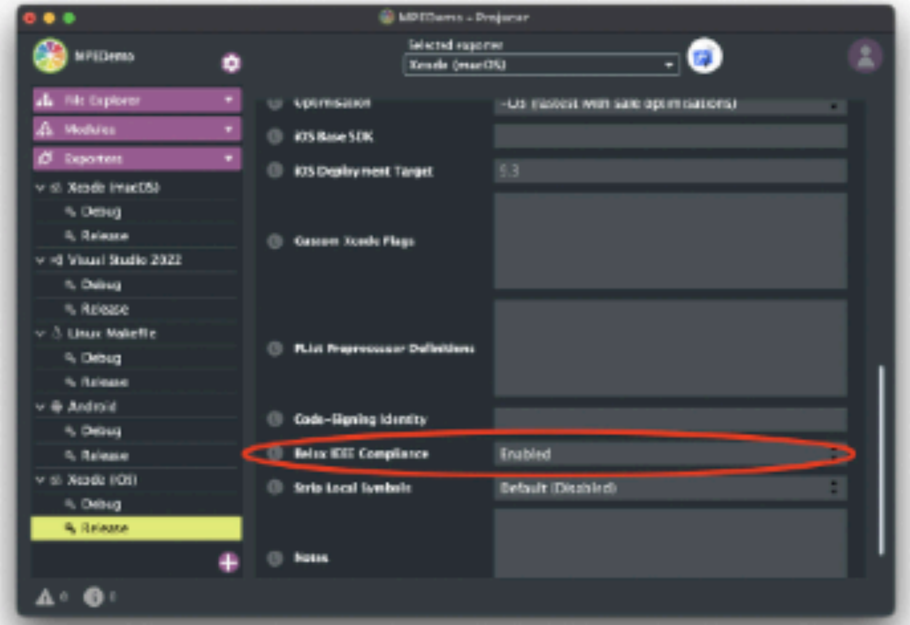
Author of `SIMDRegister` here: I'd just like to add that before embarking on `SIMDRegister`, check that your compiler isn't already auto-vectorizing the tight loops in your code. In my experience, the compiler does a good job auto-vectorizing even moderately complex loops (but see my note at the end of this post).

To ensure that the compiler is allowed to even auto-vectorize your code, be sure that:

1. You are building in release mode (i.e. at least optimisation level -O3)
2. You have "Relax IEEE compliance" enabled in the Projucer. This is absolutely crucial, especially on arm/arm64, as SIMD instructions do not have the same denormal/round-to-zero (arm) and/or multiply-accumulate rounding (x86/arm) behaviour as normal IEEE compliant floating point instructions. Hence, the compiler is not allowed to replace your loops with SIMD instructions if it needs to ensure IEEE compliance.



> Note if you are compiling with `-Ofast` then "Relax IEEE compliance" will be enabled regardless of the Projucer setting.

To check if your code is being auto-vectorized, you need to look at the assembly. I recommend doing this, even when using `SIMDRegister`, as you will often have unexpected results.

I highly recommend `godbolt.org` for this: `godbolt.org` has the advantage that you can change