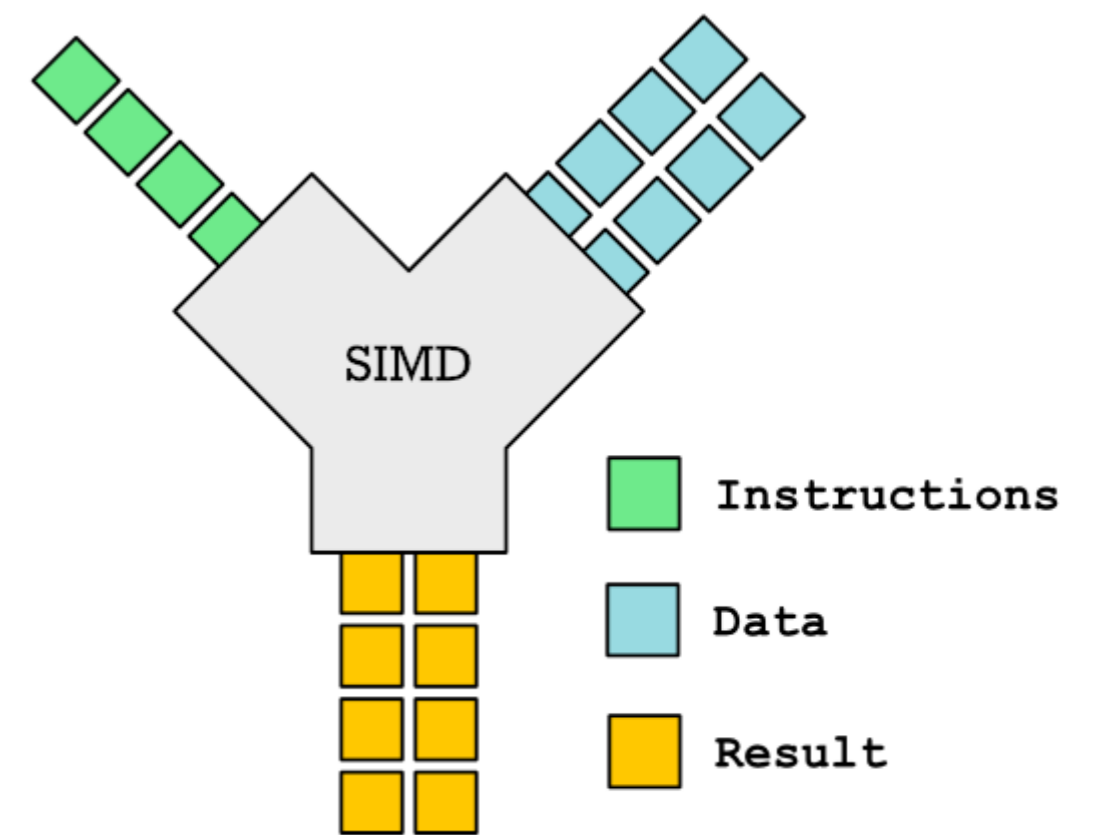


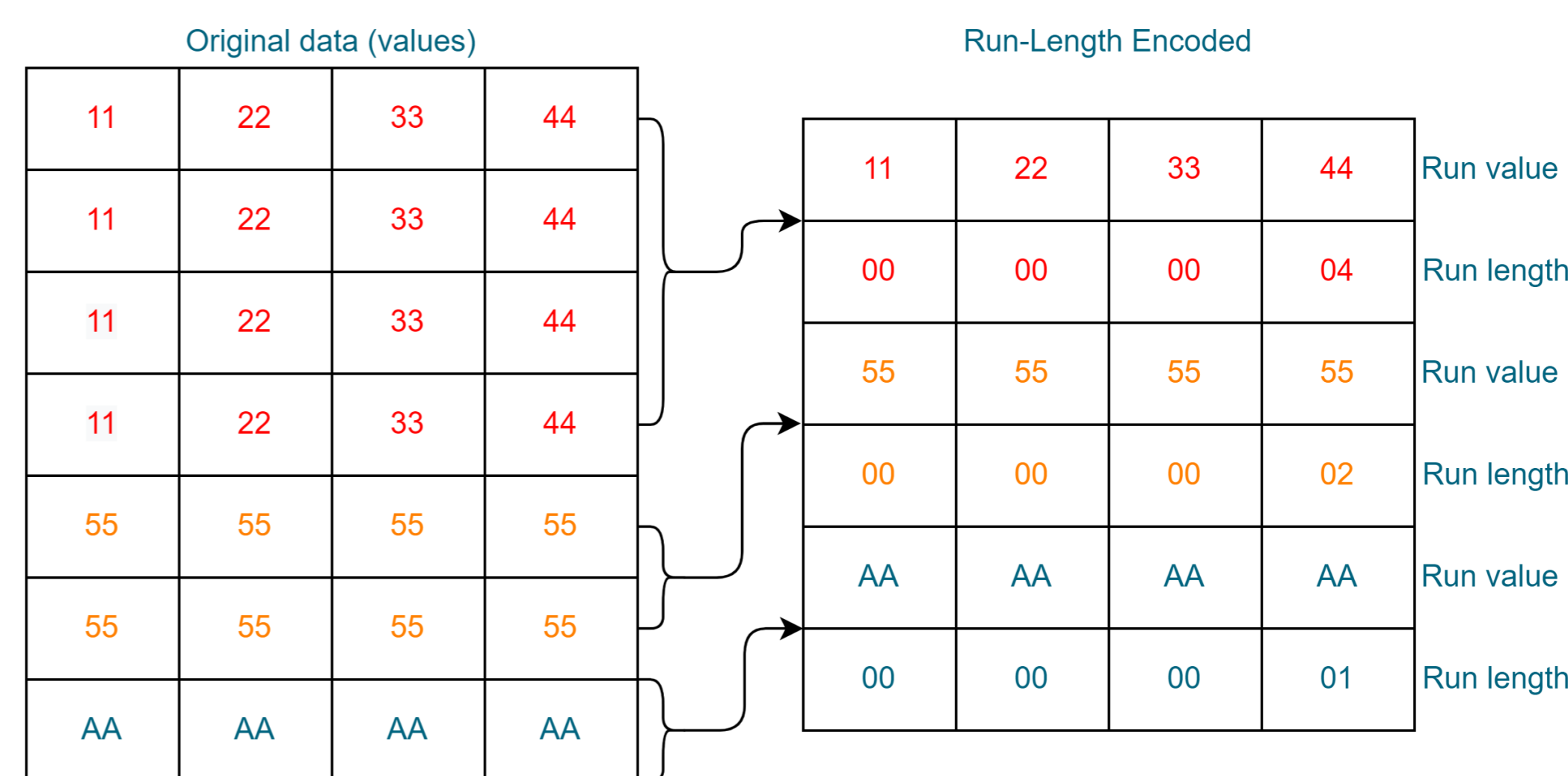
Single Instruction Multiple Data with Run-Length-Encoding

Single Instruction Multiple Data (SIMD) is a type of parallel processing, where a single instruction is applied on multiple data. This instruction is not an aggregation, which means as you can see in *Figure on the right* that n -Input on a single instruction should produce n -outputs.

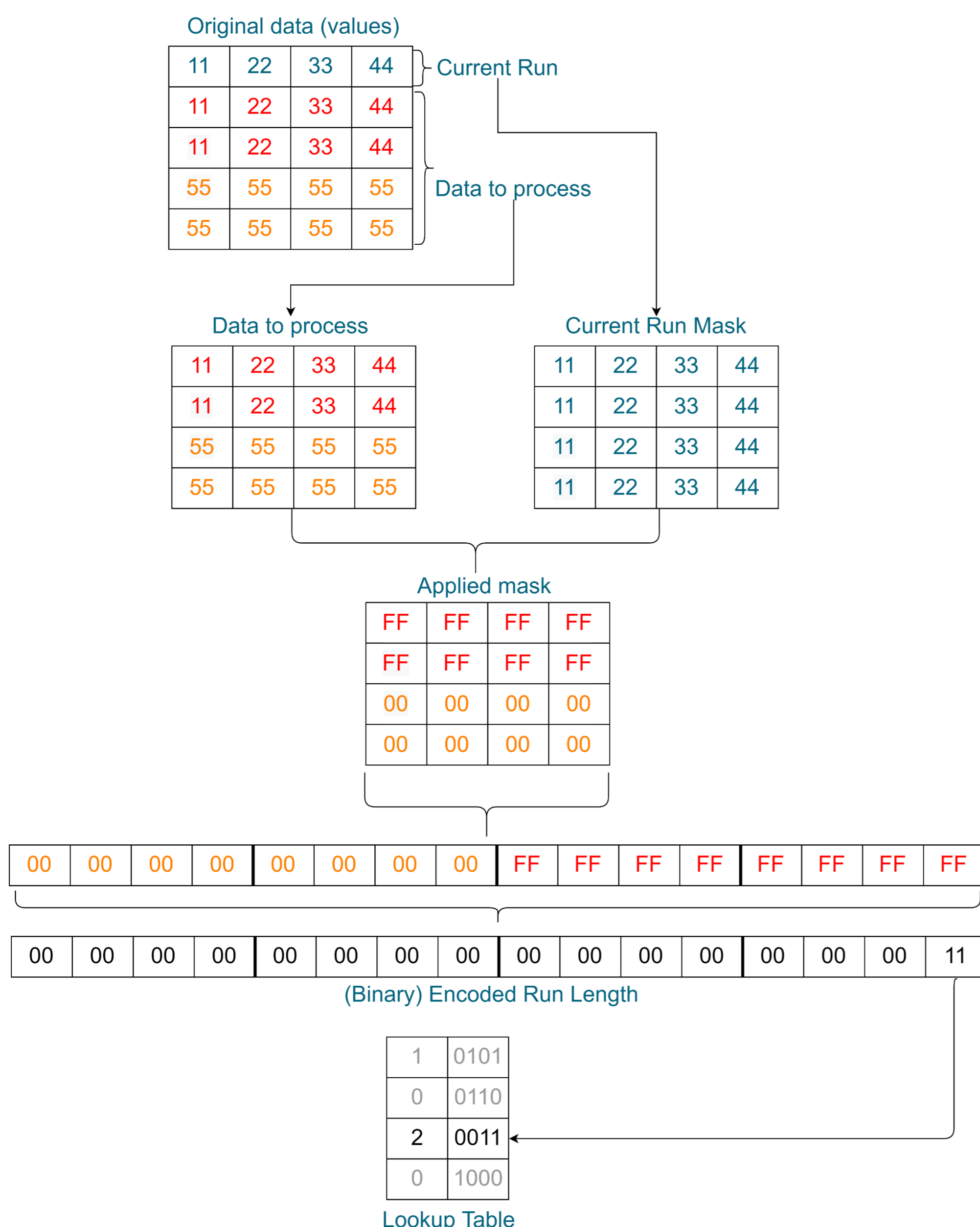


High throughput is one of the biggest advantages of SIMD and is needed for in-memory data storage. To realize in-memory data storage the concept of SIMD is implemented with vectors as the format. To apply the SIMD concept to this format, different types of algorithms can be used.

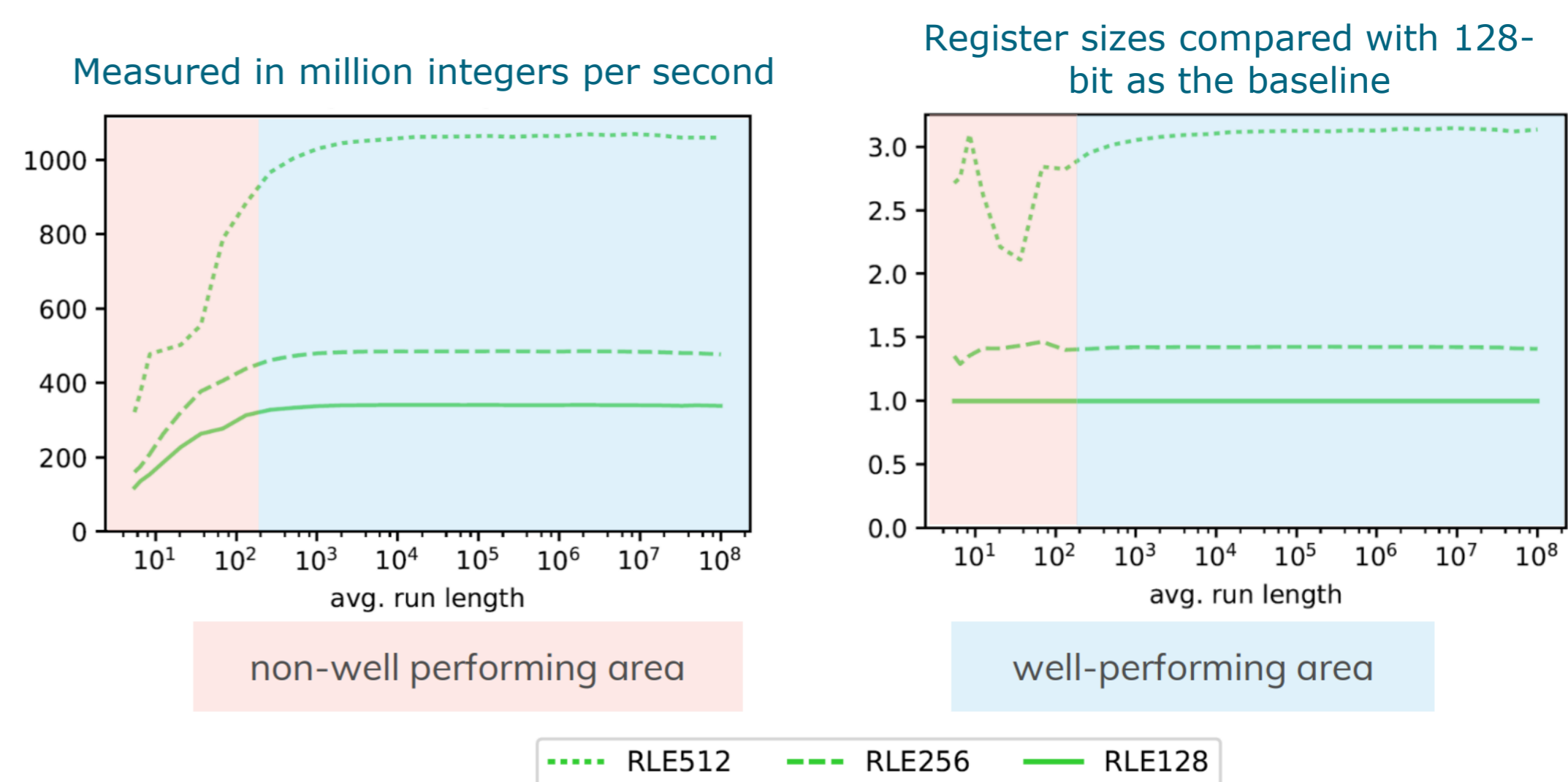
Run-Length Encoding (RLE) is one of those algorithms, which counts the number of occurrences of the same value. Each *Run* is represented by the value and number of occurrences. Most variations of the algorithm have been proposed with 128-Bit SIMD registers, which means for an element size of 32-Bit, the algorithm can process 4 elements at a time. But the concept of the algorithms allows the usage of different sizes of SIMD registers, like 256-Bit or 512-Bit.



Example run with 128-bit register



Evaluation for different register sizes



Close up for the non-well performing areas

