Maths Circle India

TIFR-STCS Maths Circle Team

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1 And the two are mixed

More than two thousand years ago, Piṅgala, while describing patterns of prosody in poems, asked how many prosody patterns there are of a given length.

Such a pattern consists of some "long" units, each of which counts as two units of time, and some "short" units, each of which counts as one unit of time. As an example, the pattern for the first line of the national anthem is given below, and has a total length of 16:

How many patterns are there of total length 1? 2? 3? …10? …16? …20?