Two-Bit Cube Calculator Using Vedic Formula for Application-Specific Integrated Circuits

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Abstract:
This paper proposes a basic two-bit cube calculator designed for application-specific integrated circuits (ASICs). A squaring circuit does the cube computation by multiplying the same binary value by itself three times using the Vedic formula Urdhava Tiryakbhyam. This is because cubing means multiplying the same number three times. The proposed design is verified using the Xilinx ISE Design Suite 14.7 and practically implemented on a Xilinx Spartan-3E (Nexys-2 FPGA) development kit. The results confirm the correctness of the proposed methodology. The key benefit of this design is its simplicity and straightforwardness. Although the approach appears simple compared to existing large-scale processors, it could serve as the basis for more advanced multiplication systems in the future.

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