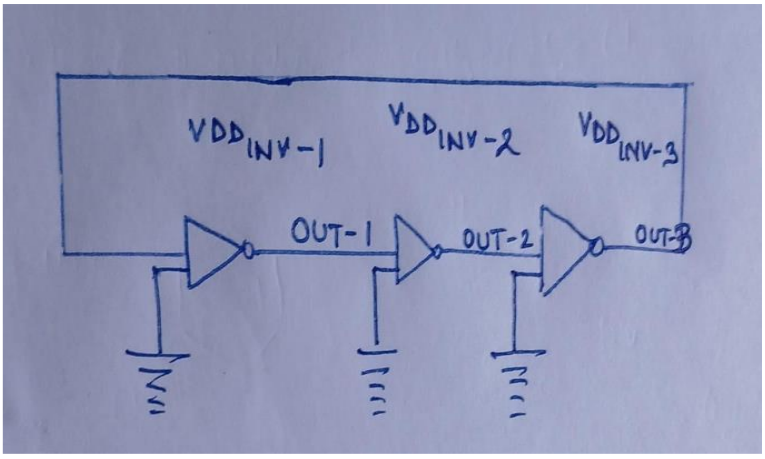
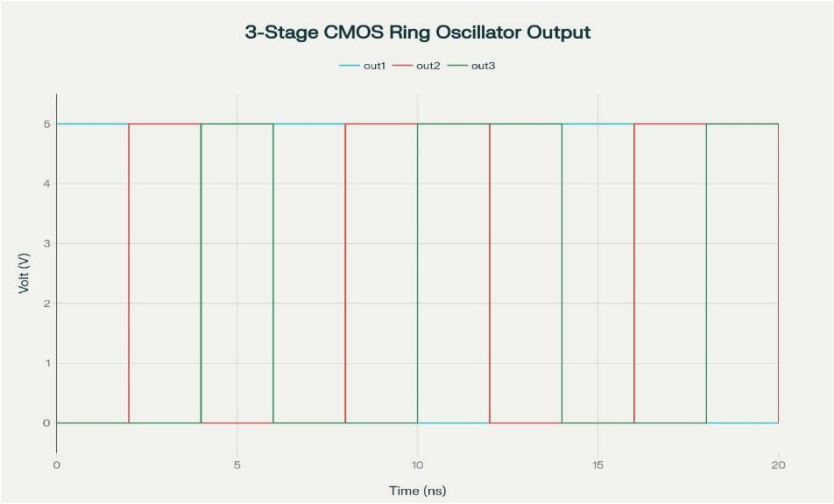
PROJECT TITLE : RING OSCILLATION

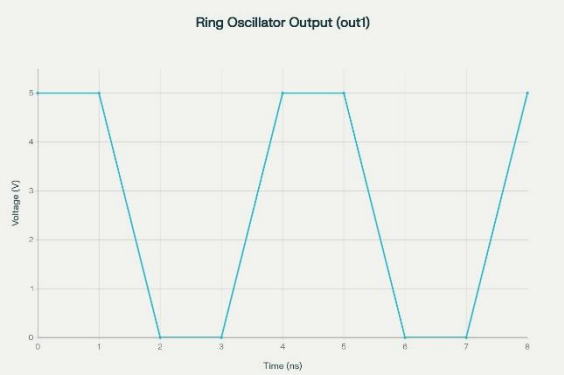
OBJECTIVE : To design, implement, and simulate a 3-stage CMOS ring oscillator using eSim, with the aim of analyzing its oscillatory behavior, verifying signal propagation through the inverter stages, and demonstrating basic oscillator functionality for use in timing circuits and clock generation.

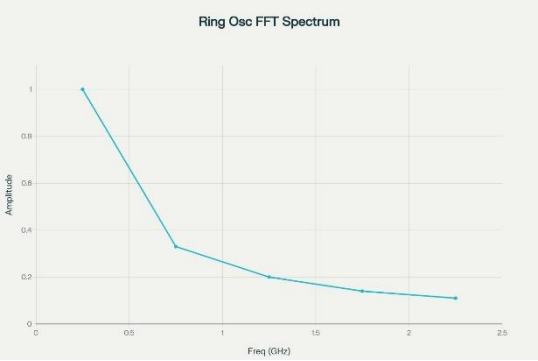
CIRCUIT SCHEMATIC :



SIMULATION RESULTS :







CONCLUSION : The 3-stage CMOS ring oscillator achieves continuous oscillation by using an odd number of inverters connected in a closed feedback loop. Simulation results confirm the generation of a periodic square waveform, with outputs phase-shifted among the three stages and a clear fundamental frequency observed in the spectral analysis. This experiment demonstrates the principle of electronic oscillators without external clock input and shows the practical utility of ring oscillators for timing, clock generation, and performance testing in integrated circuit design. The project provides hands-on experience in circuit simulation and understanding key concepts in digital electronics.

GITHUB LINKS : https://github.com/coder24072005/RingOscillator_eSim/blob/main/LICENSE

https://github.com/coder24072005/RingOscillator_eSim/blob/main/README.md