WES237C: Phase Detector Report

- **Question 1:** ***What is the throughput of your Phase Detector? How does that relate to the individual components (FIR, CORDIC, etc.)? How can you make it better?***

| **FIR** | **Resource Utilization** | **Performance** |
|---|---|---|
| Baseline | BRAM: 8<br>DSP: 20<br>LUT: 4126<br>FF: 3259 | DFT/sec: 761436.464<br>Latency: 1.800e3 ns<br>Clock Cycle: 180 |

| **CORDIC** | **Resource Utilization** | **Performance** |
|---|---|---|
| Optimized | BRAM: 0<br>DSP: 5<br>LUT: 4036<br>FF: 1100 | DFT/sec: 1208947.37<br>Latency: 1.130e3 ns<br>Clock Cycle: 113 |

| **Phase Detector** | **Resource Utilization** | **Performance** |
|---|---|---|
| Optimized CORDIC<br>**AND**<br>Baseline FIR | BRAM: 8<br>DSP: 45<br>LUT: 22410<br>FF: 24433 | DFT/sec: Unable to calculate<br>Latency: Timing Violation<br>Clock Cycle: Timing Violation |

I am unable to calculate throughput for my Phase Detector because I had a time violation. Specifically, I did not meet the Target time of 10 ns as my Estimated time was 9.305 ns and Uncertainty was 2.70 ns. To fix this, I could use an optimized version of the FIR filter in order to make my target time.