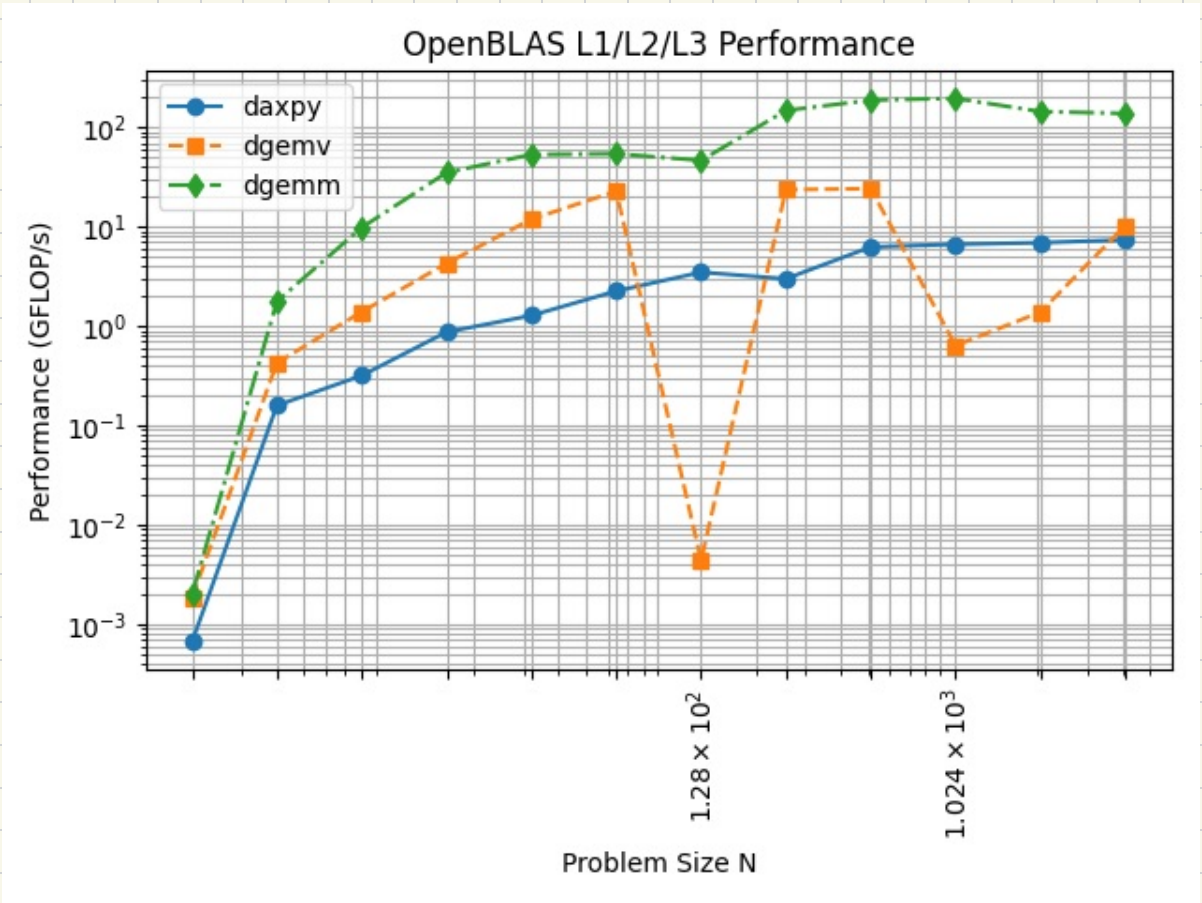
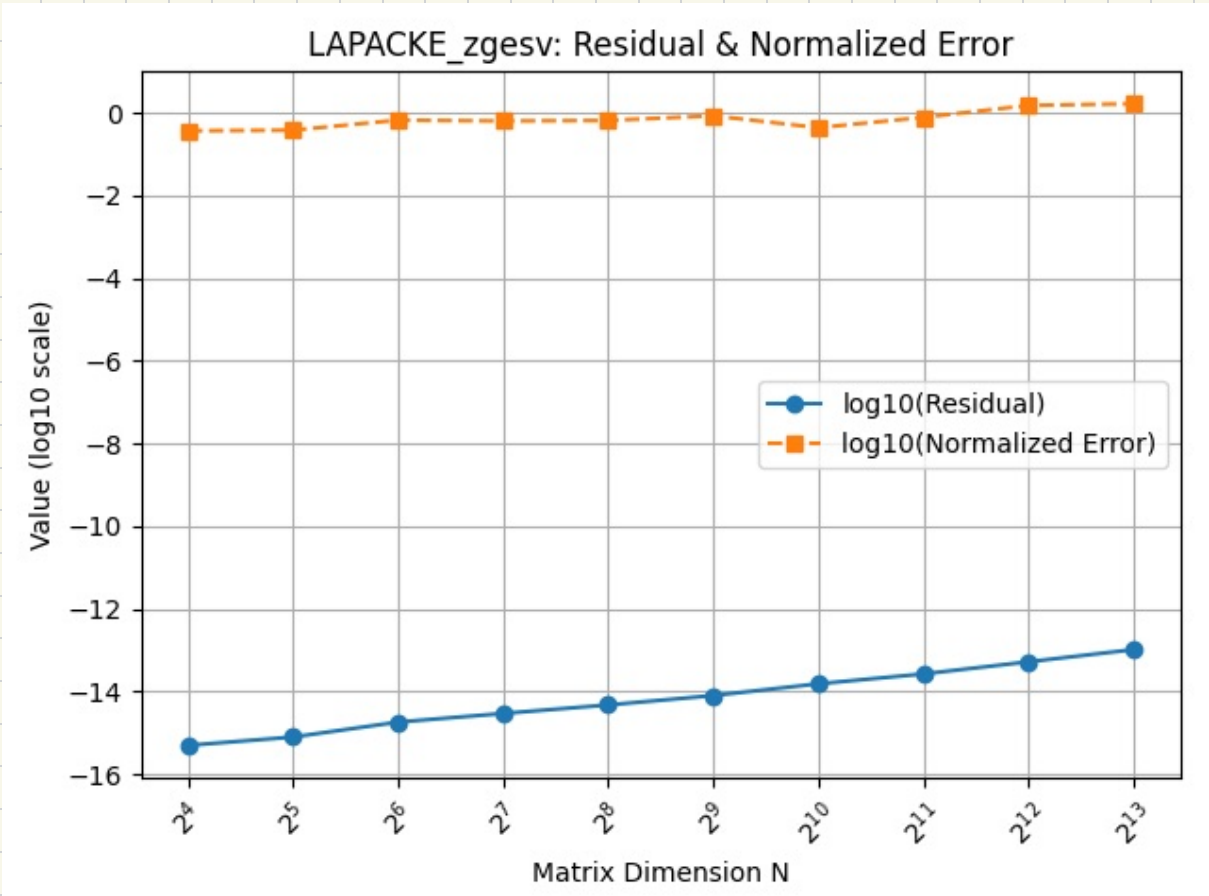
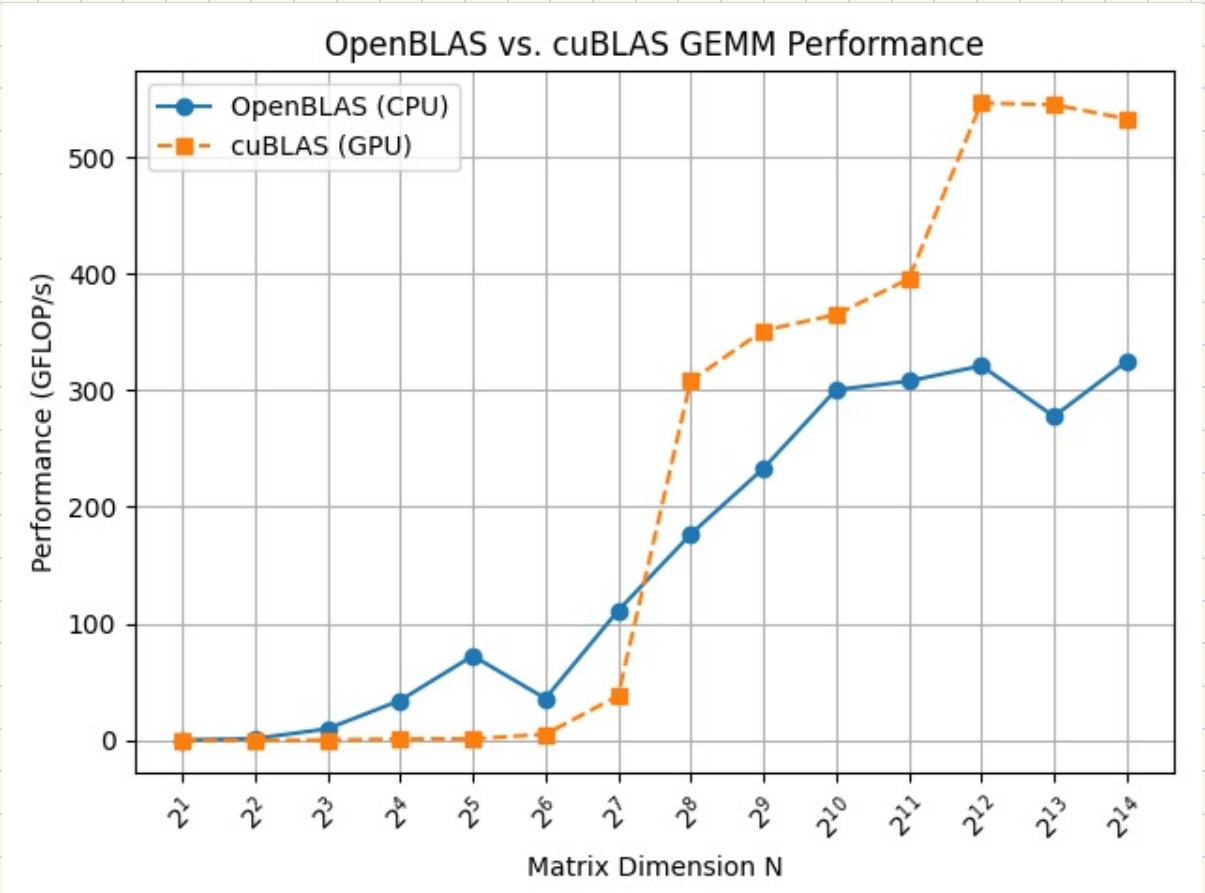
Problem 1


OpenBLAS L1/L2/L3 Performance
daxpy
dgemv
dgemm
Performance (GFLOP/s)
10^{2}
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
1.28×10^{2}
1.024×10^{3}
Problem Size N

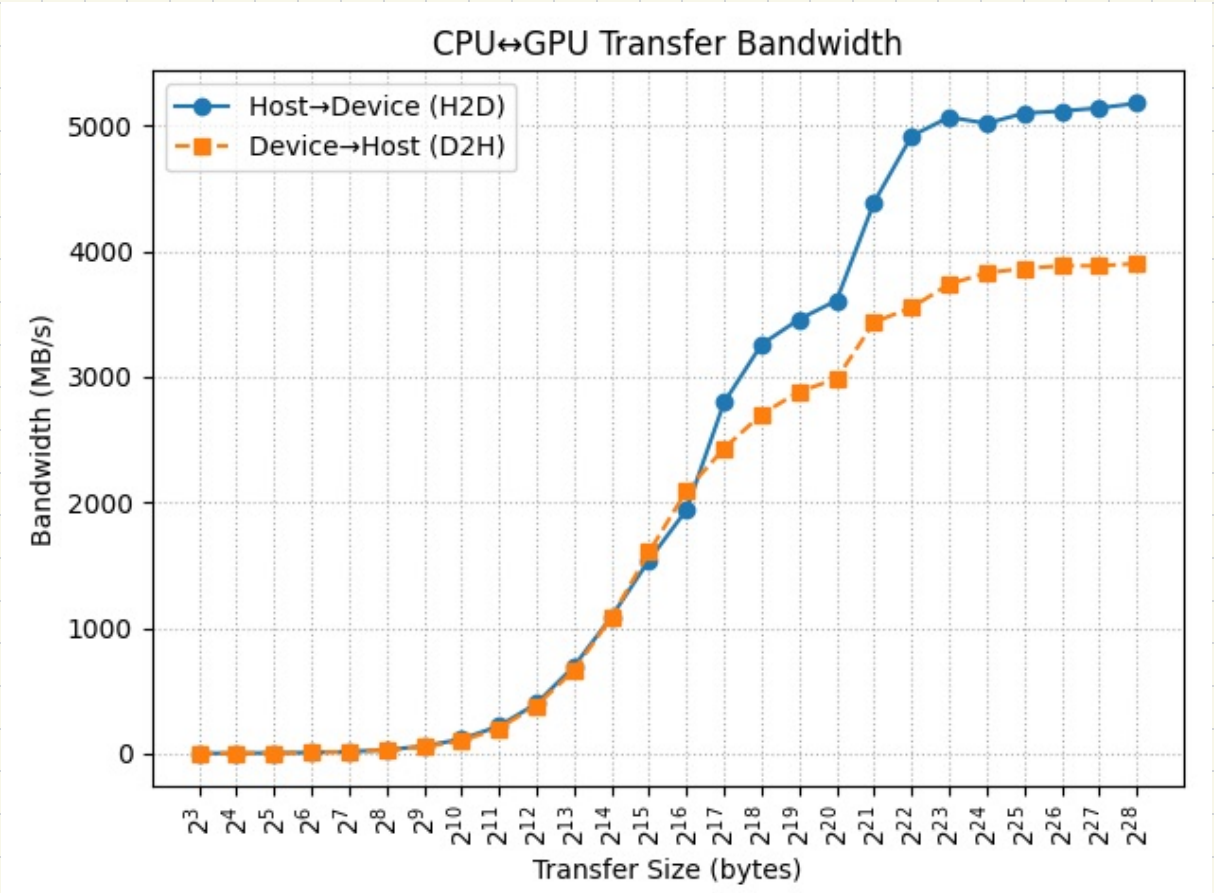
Problem 2


LAPACKE_zgesv: Residual & Normalized Error
Value (log10 scale)
0
−2
−4
−6
−8
−10
−12
−14
−16
log10(Residual)
log10(Normalized Error)
2^4
2^5
2^6
2^7
2^8
2^9
2^10
2^11
2^12
2^13
Matrix Dimension N

Problem 3


OpenBLAS vs. cuBLAS GEMM Performance
OpenBLAS (CPU)
cuBLAS (GPU)
Performance (GFLOP/s)
0
100
200
300
400
500
2^1
2^2
2^3
2^4
2^5
2^6
2^7
2^8
2^9
2^{10}
2^{11}
2^{12}
2^{13}
2^{14}
Matrix Dimension N

Problem 4


CPU↔GPU Transfer Bandwidth
Host→Device (H2D)
Device→Host (D2H)
Bandwidth (MB/s)
0
1000
2000
3000
4000
5000
2^3 2^4 2^5 2^6 2^7 2^8 2^9 2^{10} 2^{11} 2^{12} 2^{13} 2^{14} 2^{15} 2^{16} 2^{17} 2^{18} 2^{19} 2^{20} 2^{21} 2^{22} 2^{23} 2^{24} 2^{25} 2^{26} 2^{27} 2^{28}
Transfer Size (bytes)