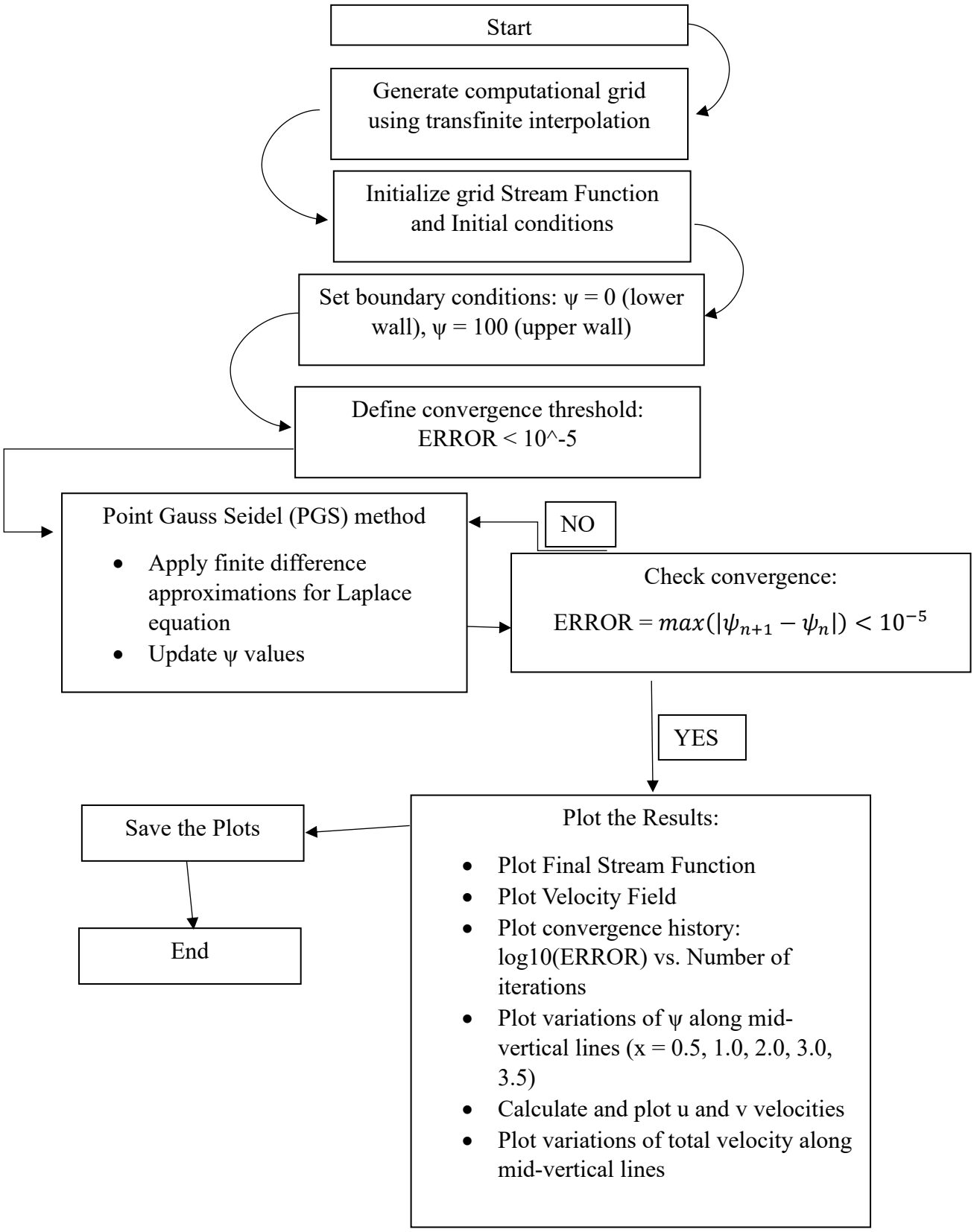
FLOW CHART


Start
Generate computational grid using transfinite interpolation
Initialize grid Stream Function and Initial conditions
Set boundary conditions: ψ = 0 (lower wall), ψ = 100 (upper wall)
Define convergence threshold: ERROR < 10^-5
Point Gauss Seidel (PGS) method
Apply finite difference approximations for Laplace equation
Update ψ values
NO
Check convergence:
ERROR = $max(|\psi_{n+1} - \psi_n|) < 10^{-5}$
YES
Plot the Results:
Plot Final Stream Function
Plot Velocity Field
Plot convergence history: log10(ERROR) vs. Number of iterations
Plot variations of ψ along mid-vertical lines (x = 0.5, 1.0, 2.0, 3.0, 3.5)
Calculate and plot u and v velocities
Plot variations of total velocity along mid-vertical lines
Save the Plots
End