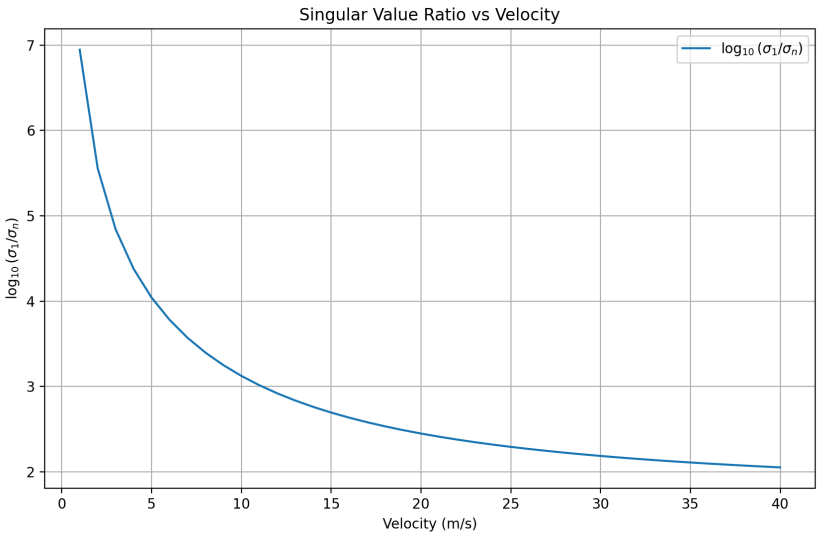
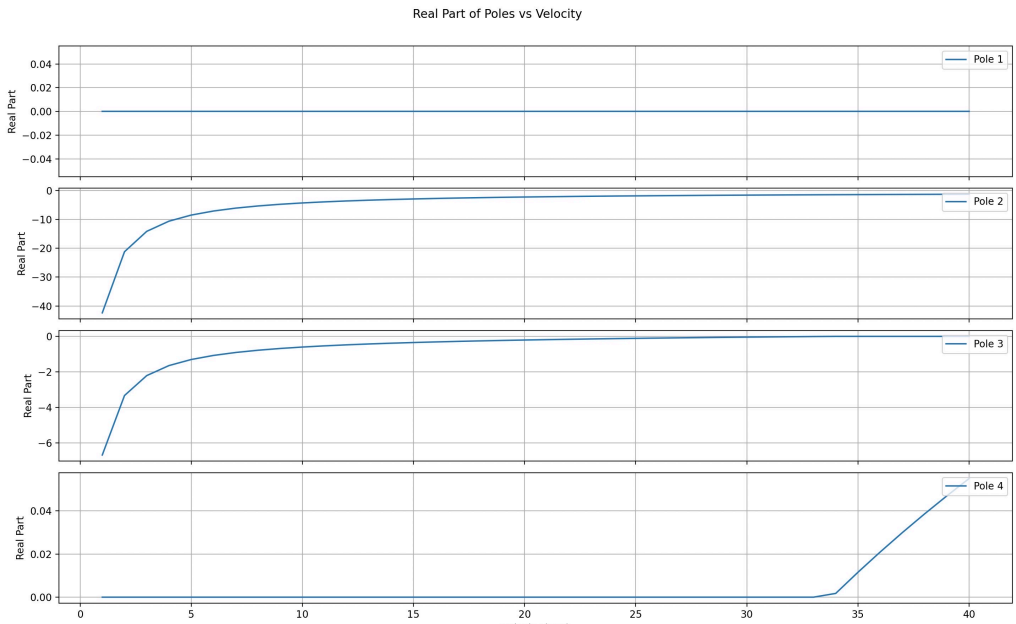
# Exercise 1.

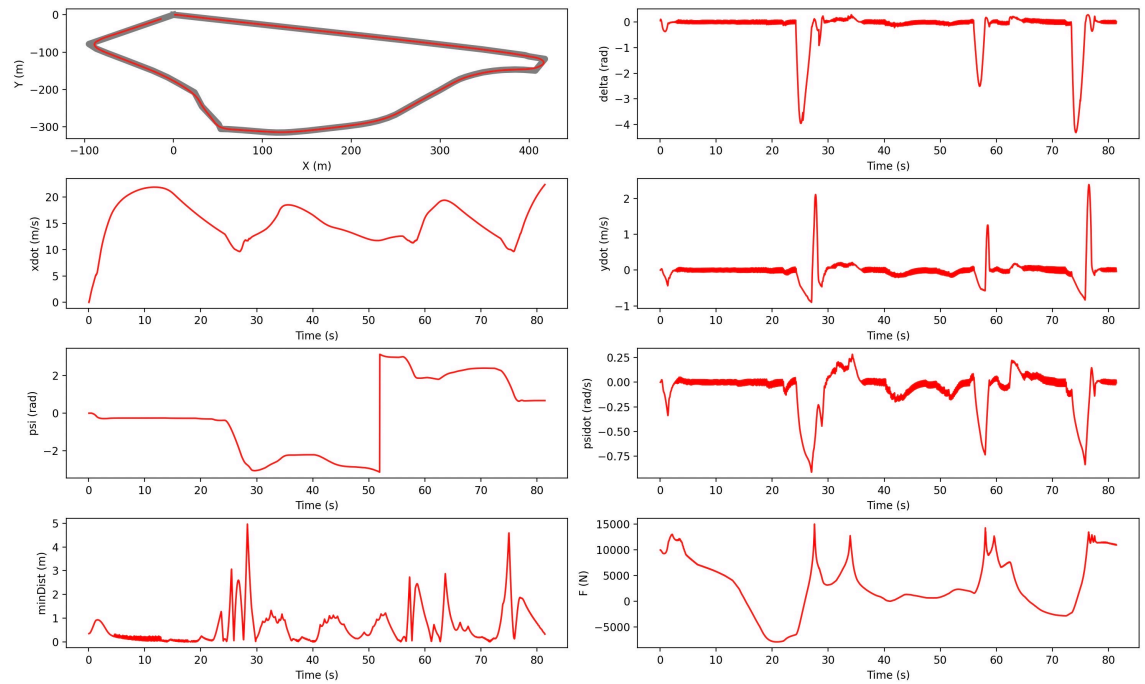
Controllability and Observability Results:
Velocity 2 m/s -> Controllable: True, Observable: True
Velocity 5 m/s -> Controllable: True, Observable: True
Velocity 8 m/s -> Controllable: True, Observable: True




The system is controllable and stable across the velocity range, but both controllability and stability degrade as velocity increases. At lower speeds, the system exhibits strong controllability and stability. However, as velocity increases, the controllability weakens, and stability reduced. At very high speeds, there is a risk of instability as some poles approach which control may become challenging at higher velocities.

# Exercise 2:




Evaluating...
Score for completing the loop: 30.0/30.0
Score for average distance: 30.0/30.0
Score for maximum distance: 30.0/30.0
Your time is  81.408
Your total score is : 100.0/100.0
total steps:  81408
maxMinDist:  4.960608708286313
avgMinDist:  0.6578674221832601
INFO: 'main' controller exited successfully.