All the reports need to be done in word or latex and submitted in pdf format

Part 1

1. Write the direct kinamtic equations in minimum parametrization.
2. Write the differential kinematic equations.
3. Is the geometric Jacobian the same of the analytic one? Explain why.

The analytical jacobian and the geometric one is the same since the orientation part does not change and it is represented by a single angle.

1. Plot the the joint variables and the errors in the operational space.

Part 2

Relaxing the orientation component

1. Explain how you relaxed the phi and how you would write the jacobian pseudo-inverse
2. Write how you choose once relaxed z to obtain the maximum distance from the end joints
3. Plot the joint variables and errors in the operational space. Explain the how the constraints are satisfied relaxing that component

Relaxing the z component

1. Explain how you would write the jacobian pseudo-inverse supposing that there is a sphere located at  with radius 0.2 m. Assume you relax the z component in this case.
2. Plot the joint variables and errors in the operational space. Explain the how the constraints are satisfied from the plots you have obtained.