José Corona

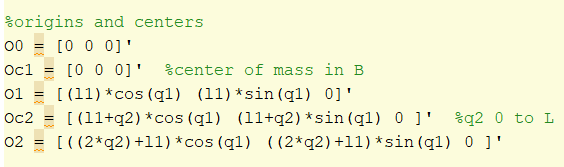
HomeTask5

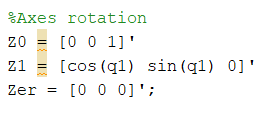
Task1

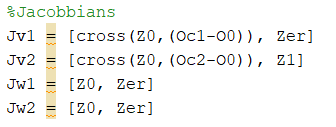
My program is the file with name “Main.m”.

Point B is a revolute joint, with variable q1 (“phi”). Point L is a prismatic joint, with variable q2 (“s”)

q2 goes from “B” to ”S”. And B is the center of mass of the first link.

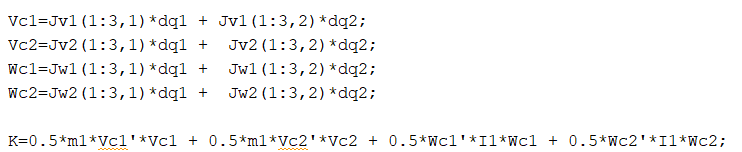


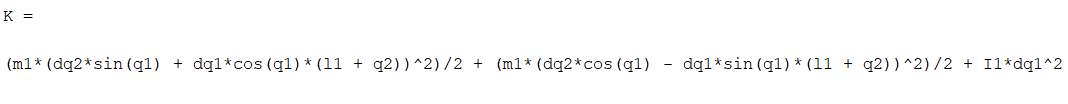




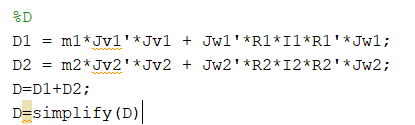
We could try to calculate K

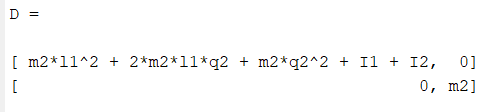




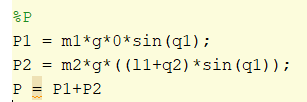


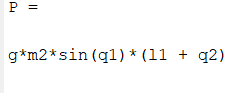
And matrix D is:



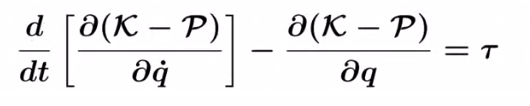


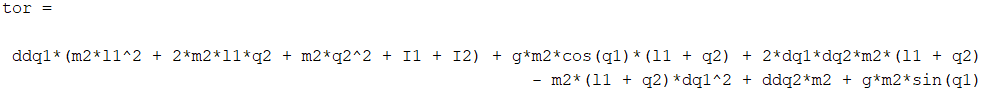
And P





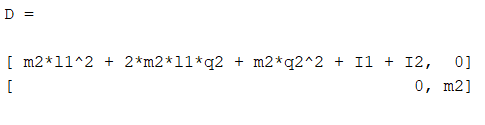
So the torques are

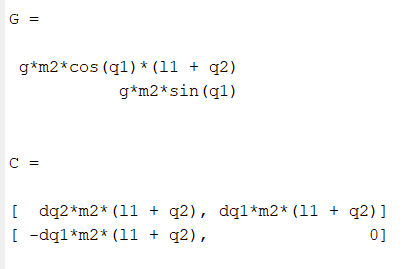


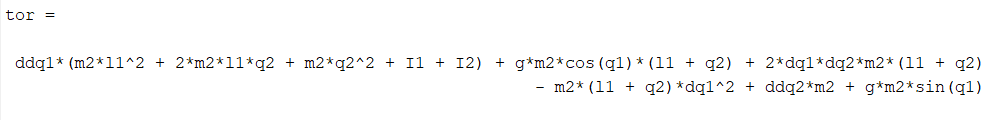


Task2



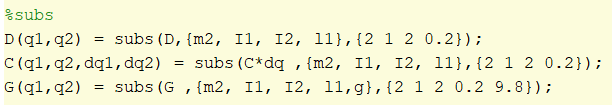




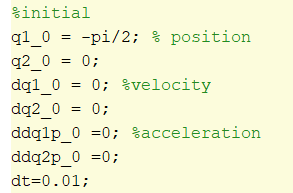


Task3

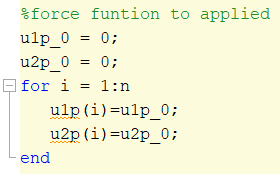
First we substitute the values



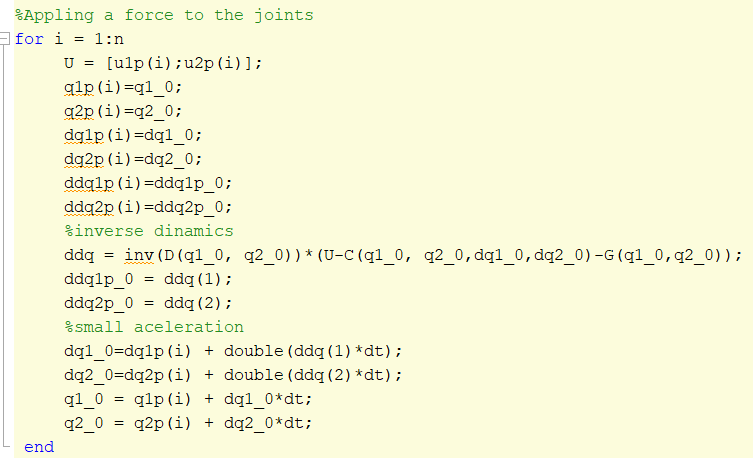
Select initial condition. In this case the position is down



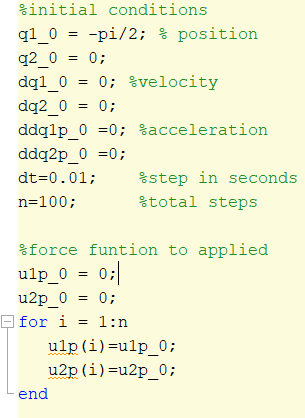
Select a torque to apply.



Solve the inverse dynamics to get the positions, velocities and accelerations functions of the joints



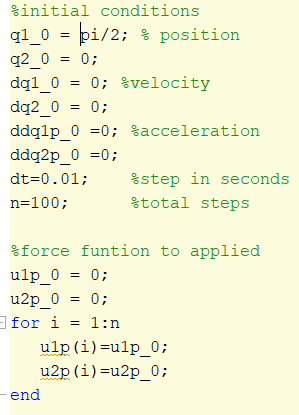
So appling no force, and in down position we get this graphic. Since is no restriction in q2, not define q2 max, the mass pointing down falls in the plane vertically; the acceleration of q2 is positive since the axis of this link is pointing down.





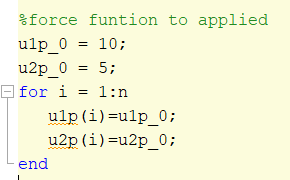


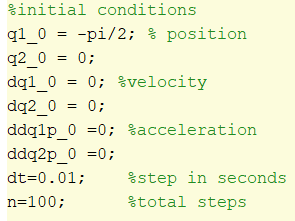
So if we put the robot in “up” position, q1=pi/2 , the acceleration of q2 is negative since the axis of this link is pointing up.





Appling a constant force in q1 and q2, with initial down position.

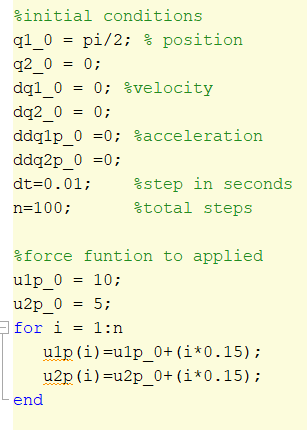








Appling a constant increment force in q1 and q2, with initial up position.



Link:

<https://github.com/Jose-R-Corona/Hometask5>