Devansh Gupta dxg397 EECS 473: PS5 Report

Description of your theory of operation of my reactive program: -

1. First I take the user input for the desired x and y coordinates where the user wants the robot to push the gear part.
2. After getting the target coordinates, then the radius and an offset value is found using hit and trial method.
3. The values of radius found is range [0.055, 0.07] and the offset range is [0.036, 0.06].
4. The radius is necessary so that the robot can know in which direction to push. This is achieved by comparing the current coordinates with the target coordinates of the gear.
5. If the current coordinates are less than the value of the target, then the robot position to push must be negative meaning it must push in the negative x direction and similarly for y-direction.
6. Due to sudden jerks and push an offset value id decided. For example, if I have to reach from the point 0.2 to 0.15 in the x-axis direction then the robot mush stop pushing before 0.15-0.04 = 0.11 point at the axis and similarly for the y-axis.

Observations regarding its behavior: -

1. The range of the robot is very limited.
2. It has a high collision rate with the gear part instead of moving it if wrong radius and offsets are computed.

Comments regarding achievable precision of your pushing program: -

As seen in the video the error is around 0.003 at both the axes.
The given target values were x = 0.12 and y = 0.13.
The achieved values are x = 0.120386 and y = 0.130377.