# About the code

During my work with the code, the following has been observed/changed.

* Based on the file given, the task commander, I modified it by extracting the duplicate of the part where it controls and move the robot and put it into a separate function.
  + I found that with the current giving, I must make some additional variables global in order to seemingly transform. Including:
    - pCartTrajPlanner, goal\_flange\_affine, g\_q\_vec\_arm\_Xd, optimal\_path
    - The publisher was made global so that we can publish within the void function without creating a publisher every time void is called
  + One variable has to be created in order to achieve the original kill switch function, since I chose my function to be void instead of int and returning an integer
* In order to better meet my need of the robot motion, a new function is created by extracting the code from the previous daunting coding
  + It takes 5 variables:
    - X,Y,Z for 3D coordinates; the step size for calculating step and producing smooth movement, and the time given for the robotics arm to move
  + The function will publish when it is called
* I chose to draw a heart by the robot just to show some actual fun.
  + The heart function is basically two function of linear combination of sinusoidal functions. I do have to use some magic number so that the placement is ideal for observation.
  + The initial pose of the robotics arm is changed since I think in the future if a paint head is installed, this will be better.
    - To change the initial position, I simply changed the initial 3x3 matrix, referring to line 140
  + Since I am drawing a heart, it is more about circular non linear motion, instead of using large nsteps, I opt to change starting from the clock t generator so that I could give enough point to the robot so that I can have a smooth outline even when the robot is majorly interpolating line solutions.
    - With that said, the step size doesn’t affect too much, since relatively a lot of points are given to the robot.
    - Additionally, time does not affect too much since the locational difference is minor.

# Videos, etc

Videos can be found here:

https://youtu.be/5lbOHoOR7zA

Screenshot:

https://github.com/frank-qcd-qk/EECS473-PS4/blob/master/\_Writeup/Screenshot%20from%202018-10-15%2021-16-43.png