

# Project Summary

## Original Design Problems

1. Problem: The robotic arm should be able to hold various utensils.  
Solution: Adjustable bolt and nut that holds any utensils.
2. Problem: The Arduino is limited to 256KB of memory.  
Solution: 32 GB SD card can be integrated with the Arduino.
3. Problem: User found a desirable image, but how are they supposed to upload it?  
Solution: Gcode converter software translates from an image data to Gcode.
4. Problem: The arm should be able to move vertically and horizontally.  
Solution: Two degrees of freedom joints are for horizontal movements and a SG90 servo is for vertical movements.

## Approach to the Project

Our team comprised four members and we began by designing an overall block diagram featuring eight blocks. Each team member took charge of two blocks, ensuring that all blocks were properly interconnected with appropriate inputs and outputs. Though we had no trouble getting each block to function independently, we encountered unexpected challenges when we combined them. Despite our team's efforts to address the issues, each problem we solved seemed to reveal new ones. While the project gradually improved, we were constrained by time, resulting in a somewhat functional but incomplete end product.

## Key lessons

1. We found the G-code portion of the project to be more challenging than anticipated. It became apparent that G-code cannot be executed independently and requires Arduino code to run it. As a result, we had to acquire a basic understanding of Gcode concepts.
2. In preparing for our project, it was crucial to anticipate the need for spare parts, as some parts were prone to breakage during the work process. To minimize such occurrences, we made a point of selecting robust parts.
3. Unforeseeable setbacks occurred during our group project. Two of our team members were affected by Covid, causing delays. Additionally, we faced shipping delays from some vendors, leading us to reorder from a different vendor and hope for timely delivery.

- ## The Project Timeline

