Mechatronics Engineer Challenge

You will need:

- Latest KiCAD installation (9.0.4 or later)
- SolidWorks (consider signing up for a free trial) or alternative CAD software
- The components package (Mechatronics Engineer Challenge.zip)

Electronics

Our main Electronics design tool is KiCAD. This section is meant to evaluate knowledge of the tool. Submit your answer by creating a GitHub repository and sending us the link as part of the answer email.

1. In KiCAD create a simple PCB adding the following components, making sure the footprint is accurate and the 3D model shows when the PCB is viewed in 3D.
    a. KiCAD default LED symbol
        i. Footprint: LED_minPLCC_2315
    b. TCAN4551-Q1
        i. For this component you will need to create a custom footprint and symbol library and linked them to your project
    c. KiCAD default MCIMX6D4AVT symbol

2. Apply a custom design rule defining the micro via geometry for the BGA component placed in 1c. The rules should include the following:
    a. Minimum 2mil for the annular width
    b. Minimum 8mil for the via diameter
    c. Minimum 4mil for the via hole

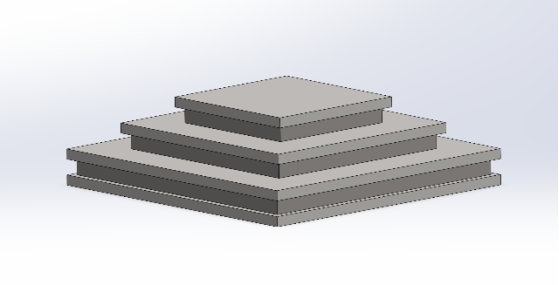
3. Bonus: Create a second repository containing the library you created for 1b. Mount it as a submodule inside of the your repository

Mechanical

Our main mechanical design tool is Solidworks as such we would like for you to complete the following 3 challenges. All the required files should be included in your submission, no missing files or broken references. The file name should be in the following format: FIRSTNAME_LASTNAME_ans

1. Using the part in the Mechanical_1 folder create the following part.

    a. All the sketches need to be fully defined. (No blue line when opening the sketch)
    b. No more than one type of sketch references can be used
    c. No new dimension can be created

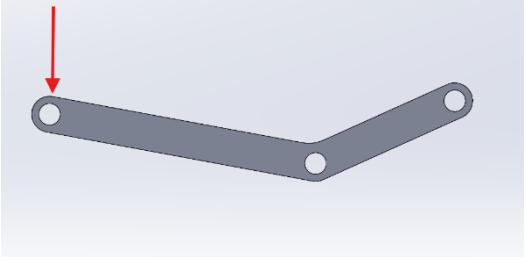


2. Using the parts located in Mechanical_2 folder create the following assembly

    a. Use the Mechanical_2 Assembly file as a starting point
    b. The assembly should be moveable

3. Using the part found in the Mechanical_3 folder create a simple FEA simulation.

    a. 1 hole should be fixed
    b. 1 hole should have a 1kN downward force applied to it.
    c. Briefly explain the results



General

Part of this role will require contacting and creating good working relationships with various supplier.

1. Please write an email to John Smith from MetalXYZ asking for a quote for a bent sheet metal enclosure. In your email include the following elements:
    a. We unfortunatly do not have the any mechanical drawing only .step files of the project
    b. Mention the time sensitive nature of the project and ask how long should we expect before getting a quote back.