

DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION
ENGINEERING

UNIVERSITY OF MORATUWA

EN2160 - Electronic Design Realization



Report - Preliminary Design

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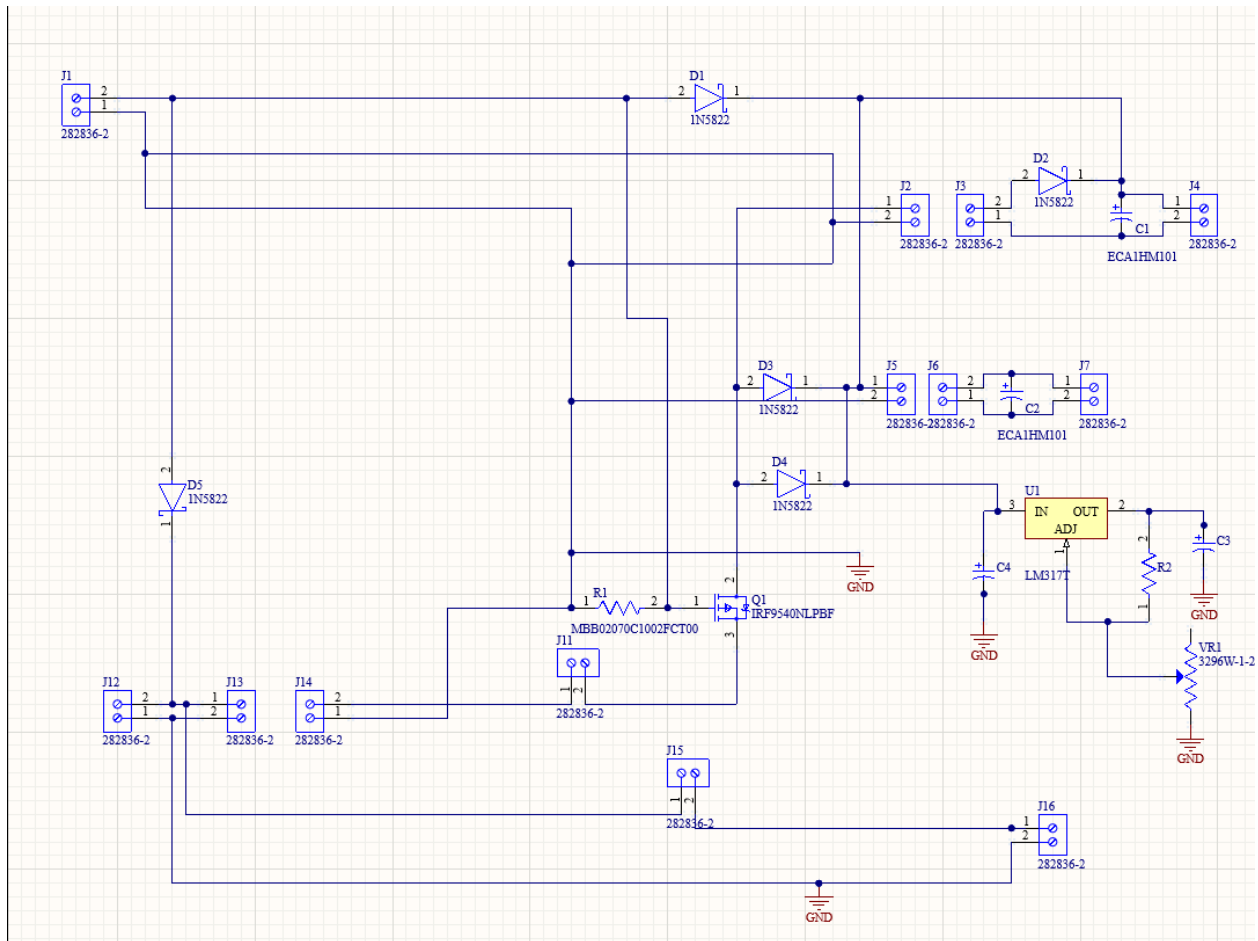
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15th June 2023

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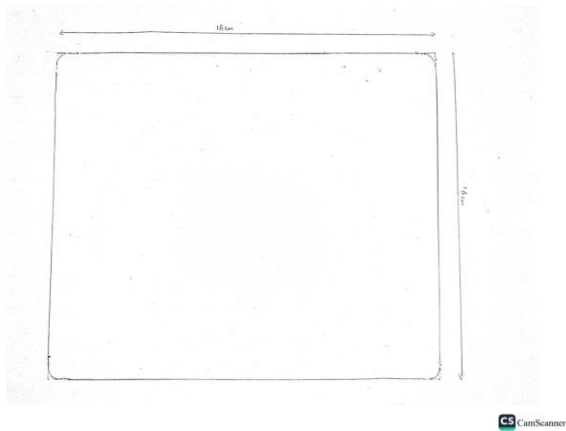
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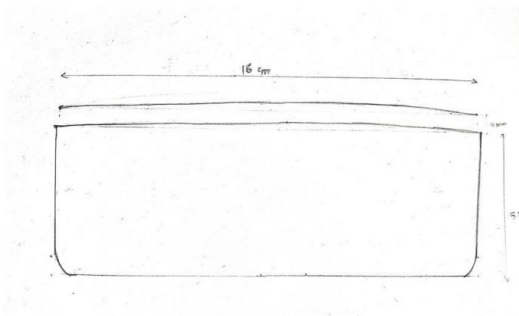
Solid work design of the implemented design.

Hand sketches used.

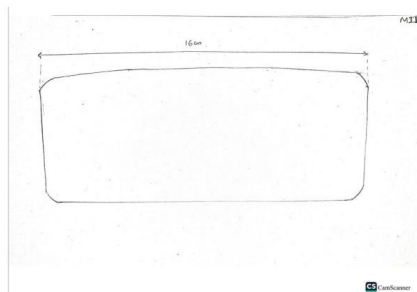
Top view



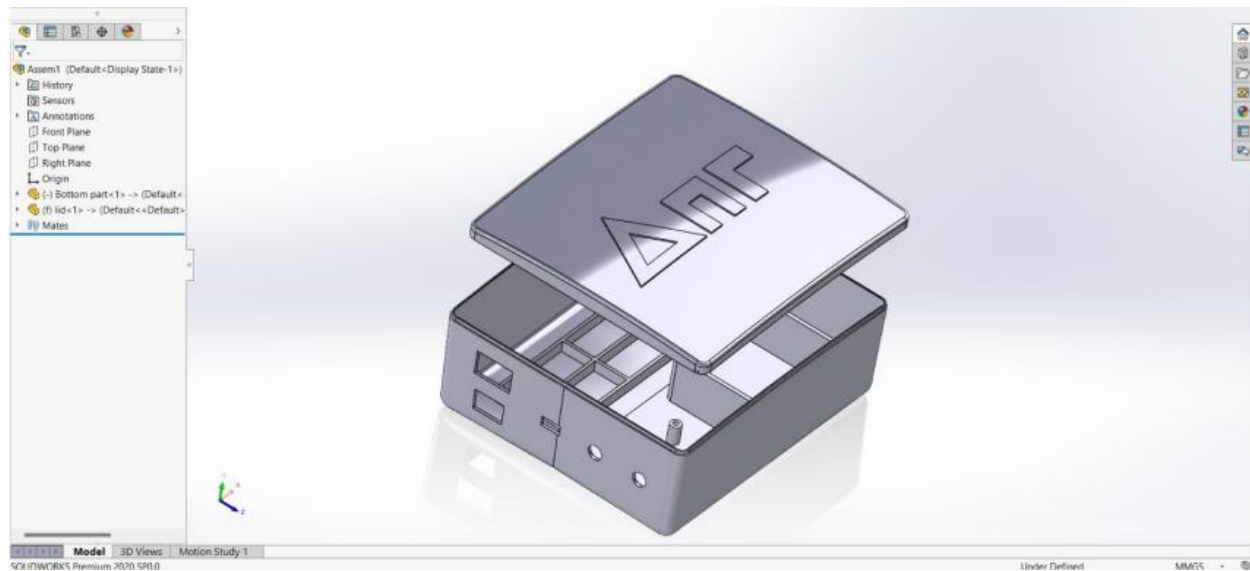
SIDE VIEW SKETCH



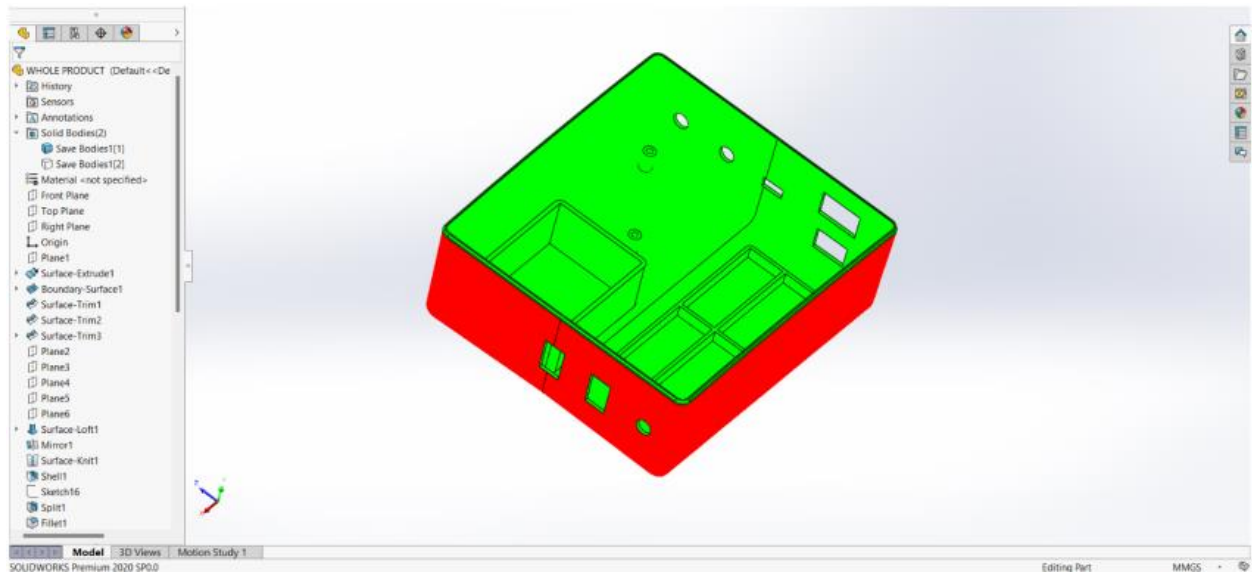
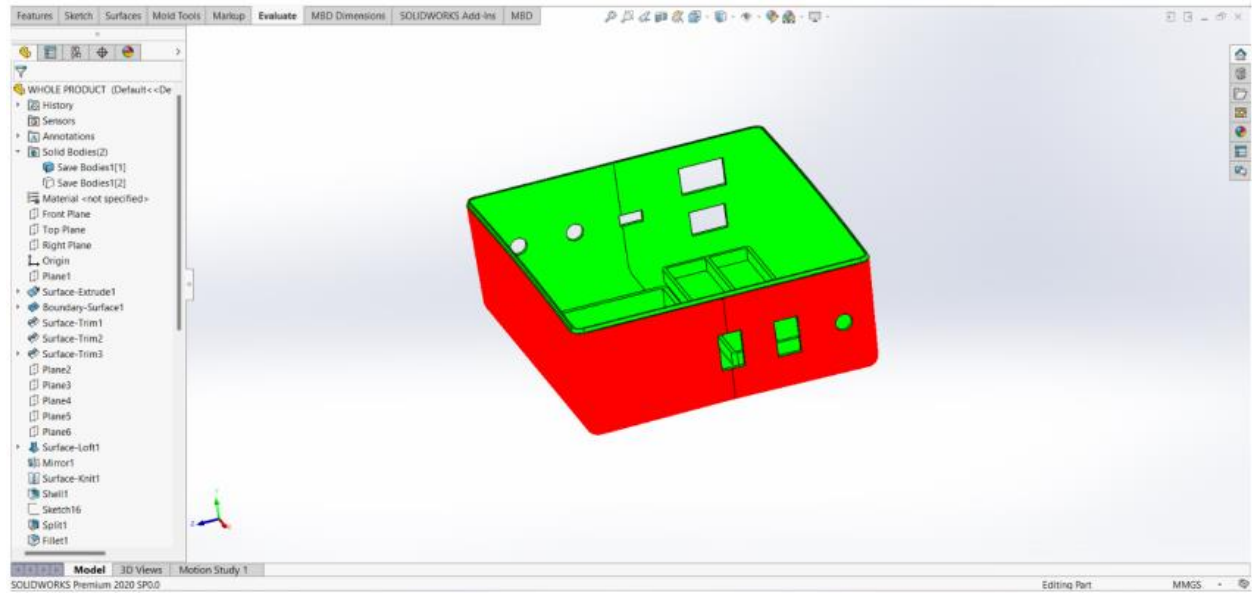
FRONT VIEW SKETCH

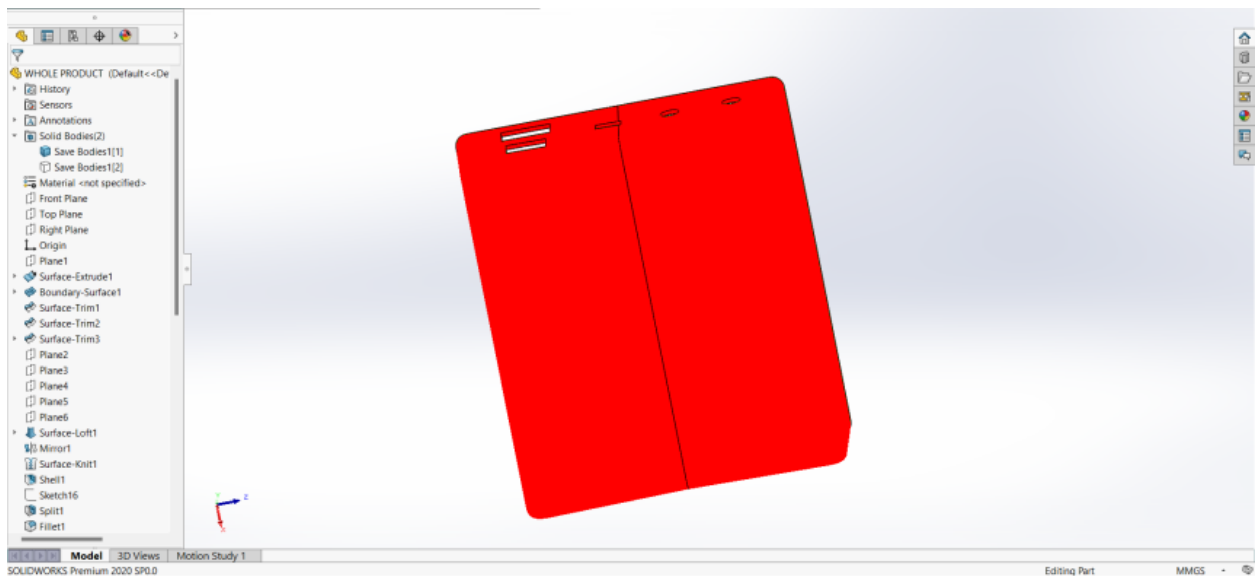
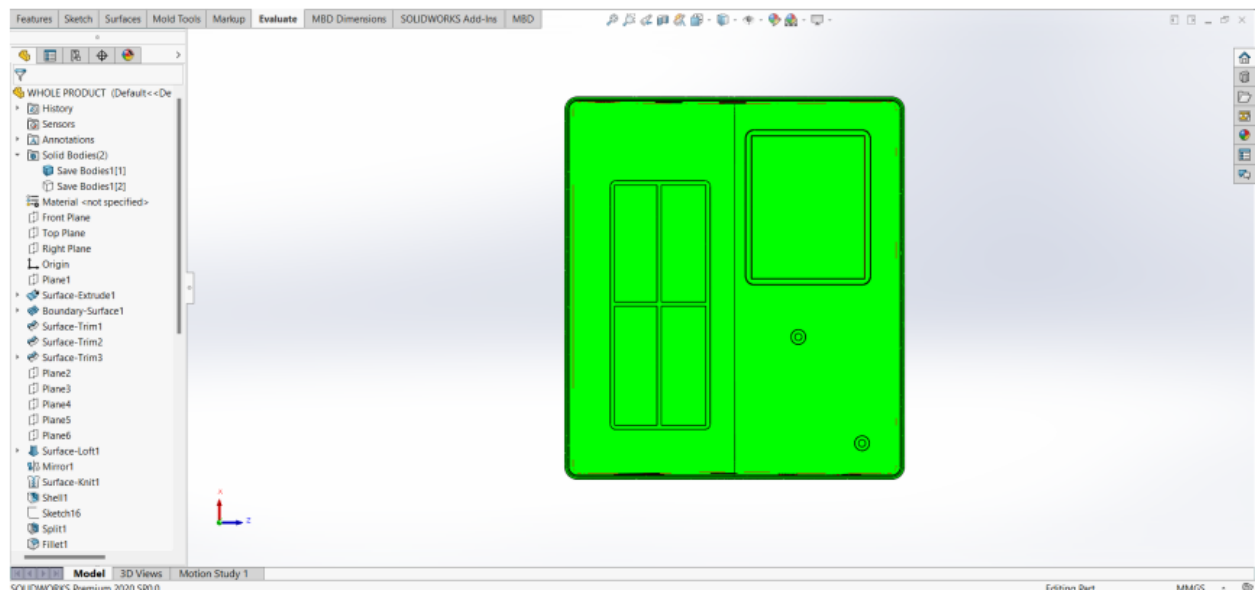


Solid works Design – Different Views

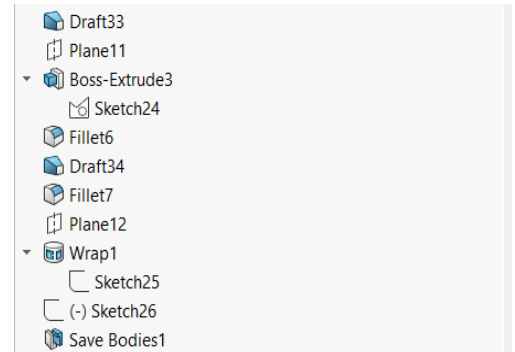
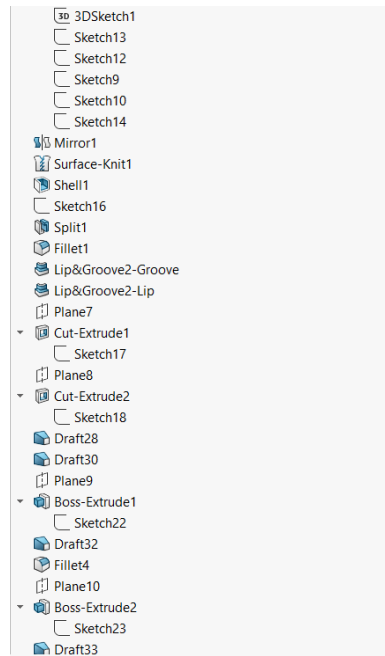
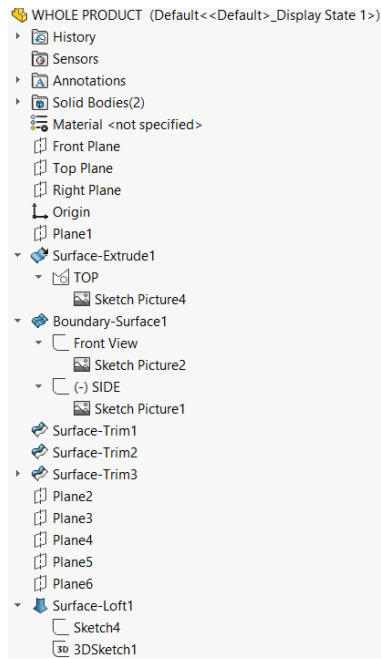


Draft Analysis





Model Tree – Solidworks



Problems identified by considering the course content.

Upon reviewing the course content, a number of issues have been discerned in the preliminary design of the Mini UPS, predominantly pertaining to its usability and manufacturability. In order to tackle these challenges, the following modifications are proposed.

Moldable Enclosure: To ensure successful commercial production of the mini-UPS, it is vital to create an enclosure design that simplifies the molding process. The existing design may present challenges in terms of manufacturability. By incorporating moldability considerations during the initial design stages, we can enhance the ease of mass-producing mini-UPS components and guarantee a uniform level of quality.

Schematic Designing techniques: The design of printed circuit boards (PCBs) holds significant importance in the process of product design. One of the major errors we made in this area was not following the proper techniques, such as the Top to Bottom and Left to Right approach, as well as the appropriate arrangement of component symbols. However, through the lecture, we acquired knowledge of these techniques, which has enabled us to overcome these obstacles in our PCB designs.

Iterative Design Process: The development of a product that possesses both practical functionality and aesthetic appeal necessitates the undertaking of multiple iterations in the design process. It is imperative to perceive this process as a continuous cycle rather than a solitary event. Each iteration presents an opportunity to enact improvements and modifications based on user feedback, performance testing, and considerations pertaining to the feasibility of manufacturing. Embracing an iterative approach is vital to attaining an optimal design for the mini-UPS, as it facilitates the resolution of identified issues and the incorporation of suggested alterations. This, in turn, enhances usability, manufacturability, and the overall efficacy of the design process.

Problems/Improvements identified/proposed by members of your group.

After discussing the initial design with our group members, they have suggested several additional modifications for the mini-UPS. These suggestions are as follows:

Problem	suggestion
Aesthetics failure	should do another design.
Volume is too much.	reduce volume.
Using metal 12V connector jack.	use plastic connectors.
The wiring was not properly handled	wiring must be done in proper manner.

By considering these suggestions, the mini-UPS design can be further improved to enhance user control, stability, and functionality.

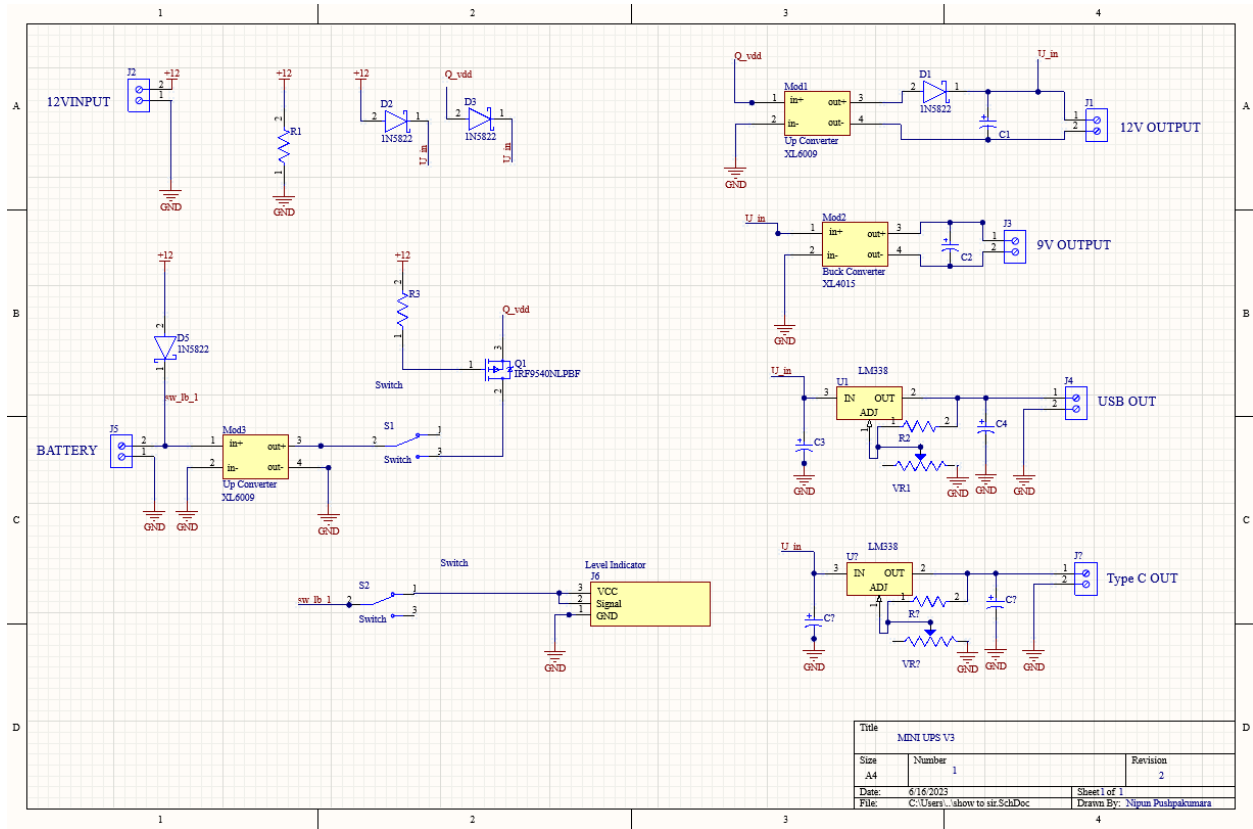
Problems/Improvements identified/proposed by users.

According to the survey conducted and the suggestions provided, there are a few additional improvements that can be considered for the mini-UPS design:

Problem	suggestion
Not portable	reduces the volume and changes the enclosure design.
Wiring was not properly handled	wiring should be done in proper manner.
Type C ports are not included	type C port should be included.
Aesthetic	re design the enclosure.
Weigh is too much	re design the enclosure.
Batteries should be properly covered	use battery cover.
Batteries should be easily replaceable	use connectors to connect the battery to the PCB

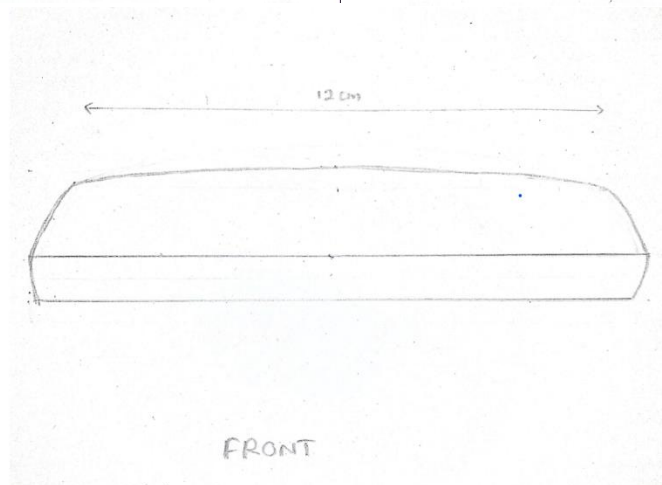
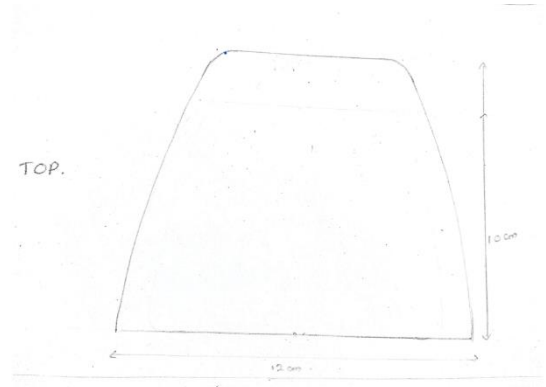
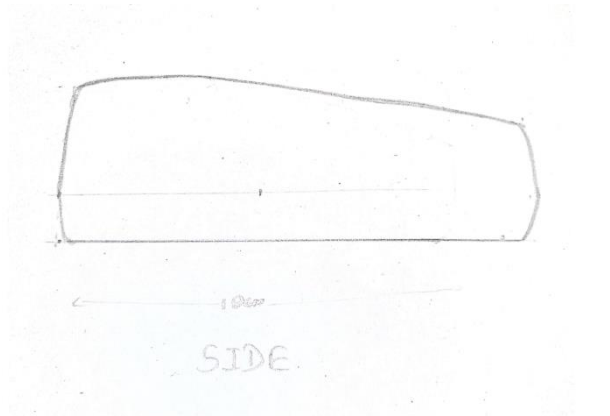
After Consideration of these additional suggestions, the mini-UPS design can be further enhanced to provide more user-friendly features, customization options this product will become a marketable product.

Schematic design of the improved design.

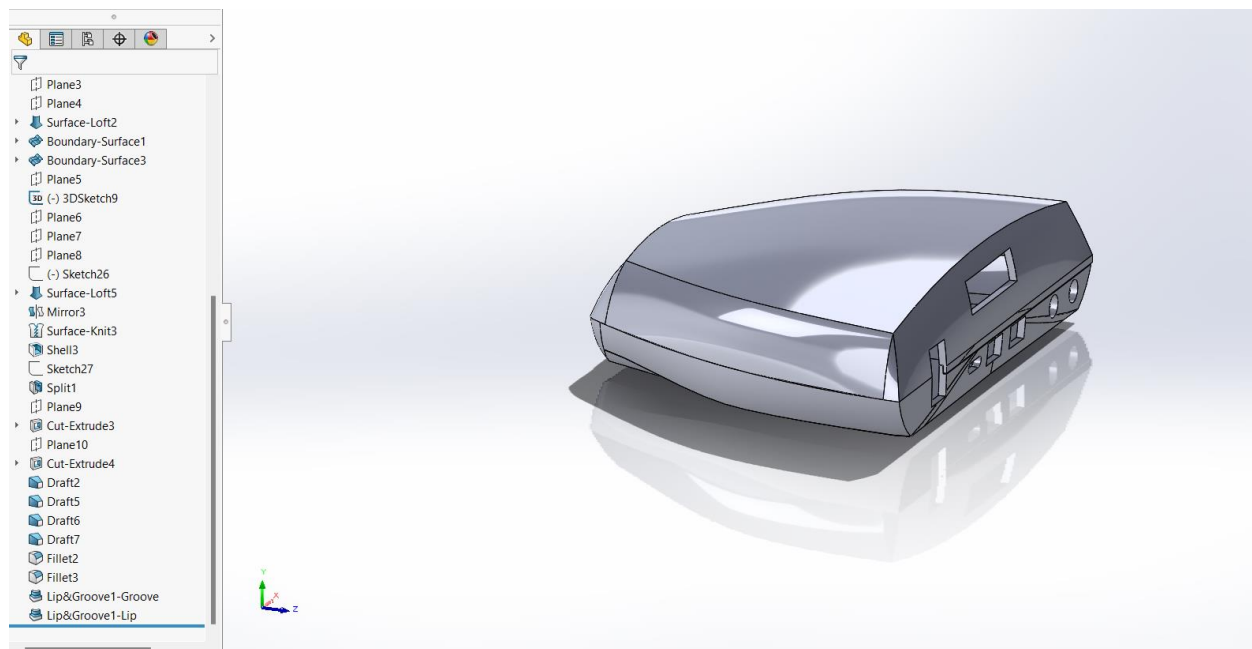
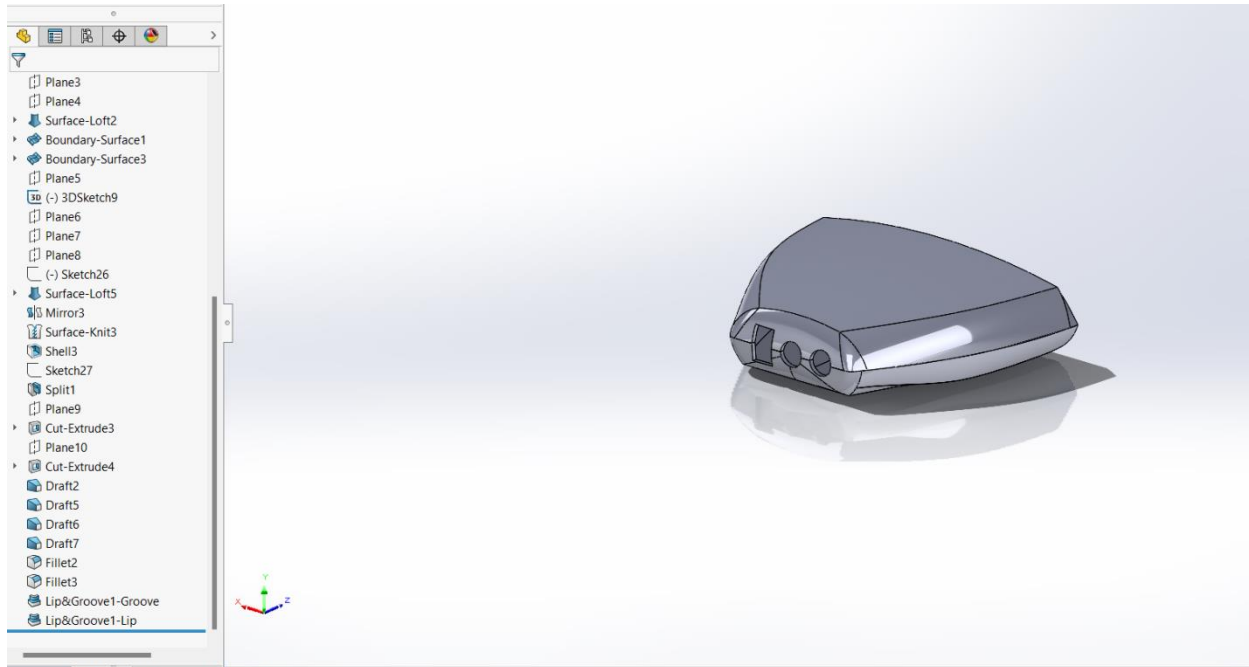


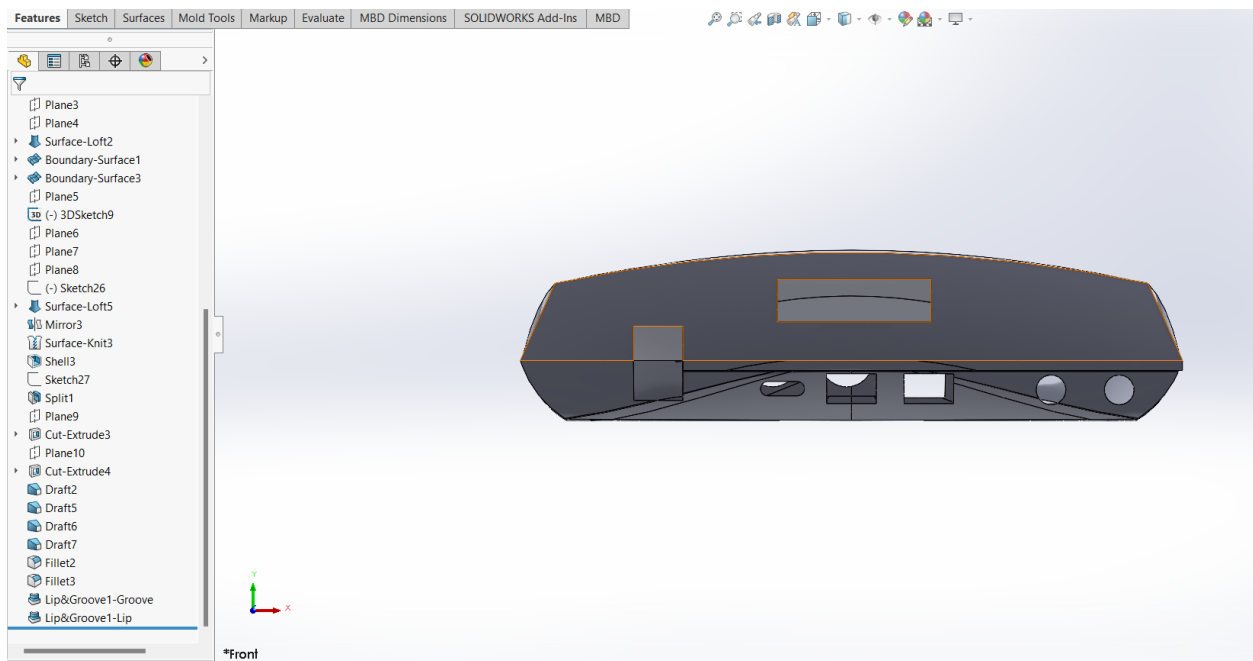
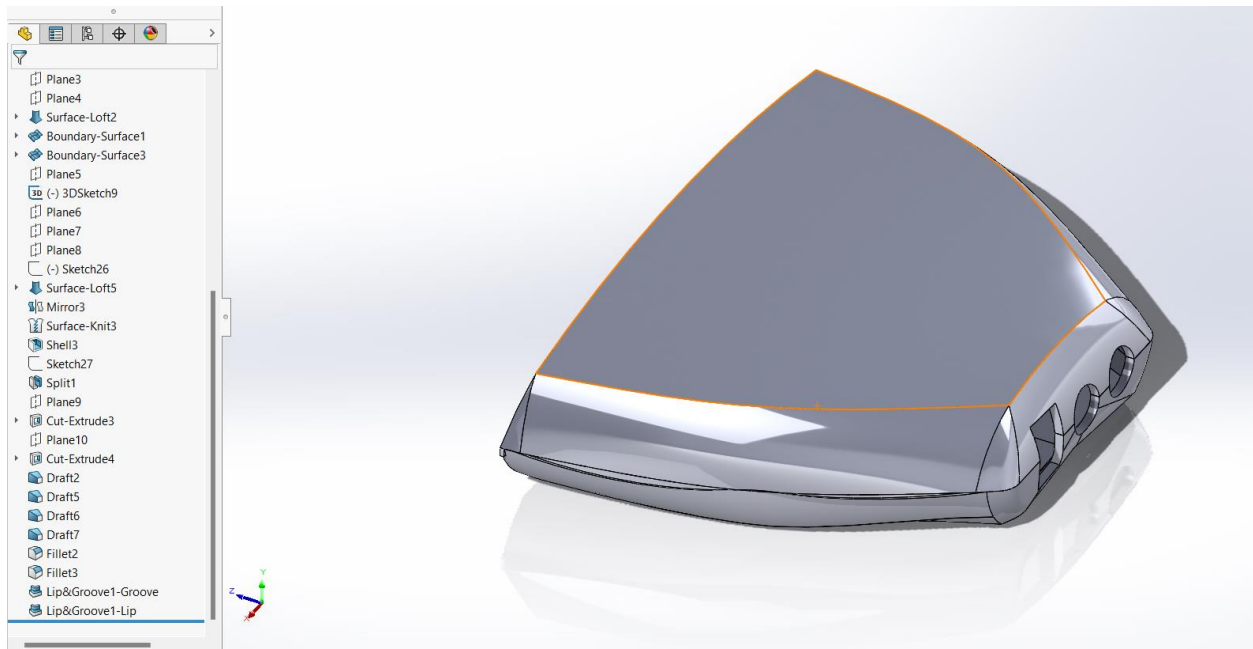
Solid work design of the improved design.

Hand sketches used.

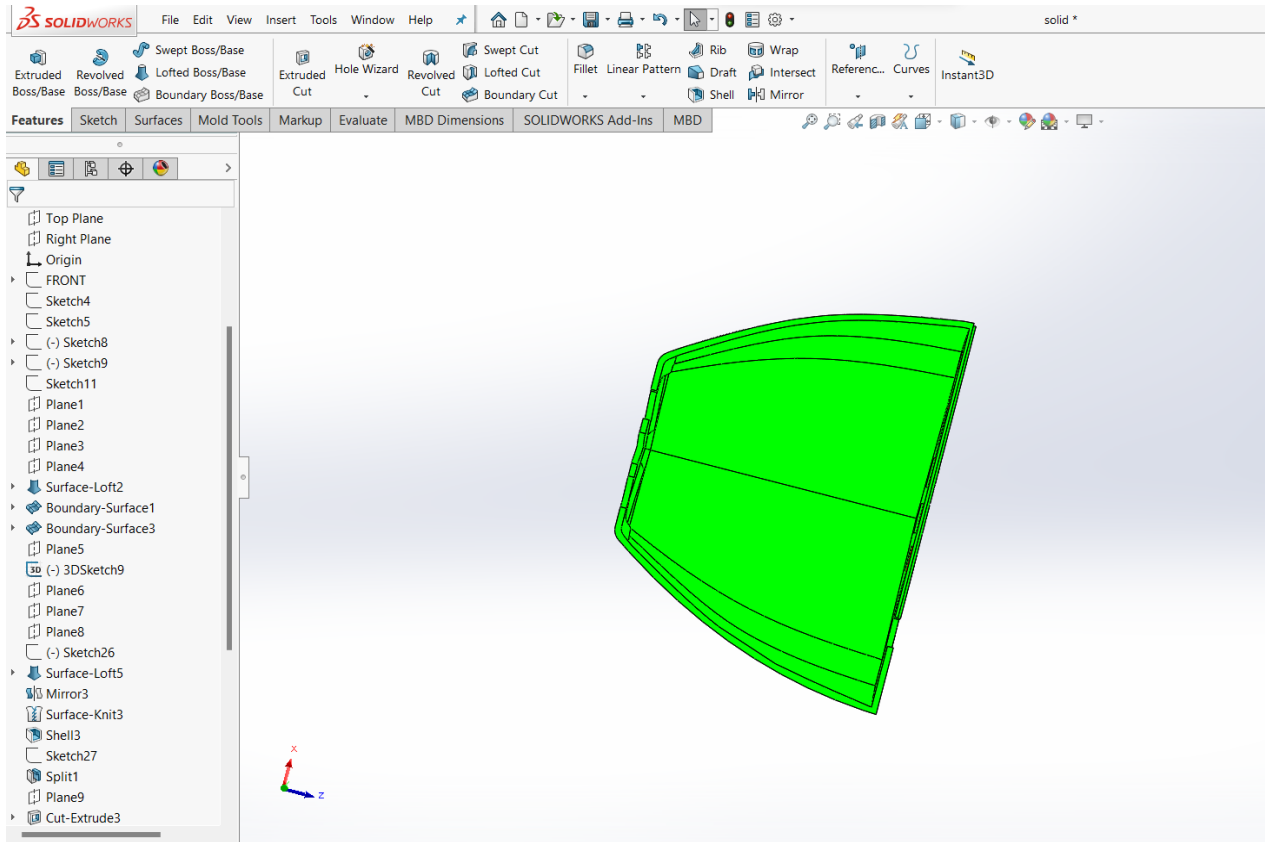
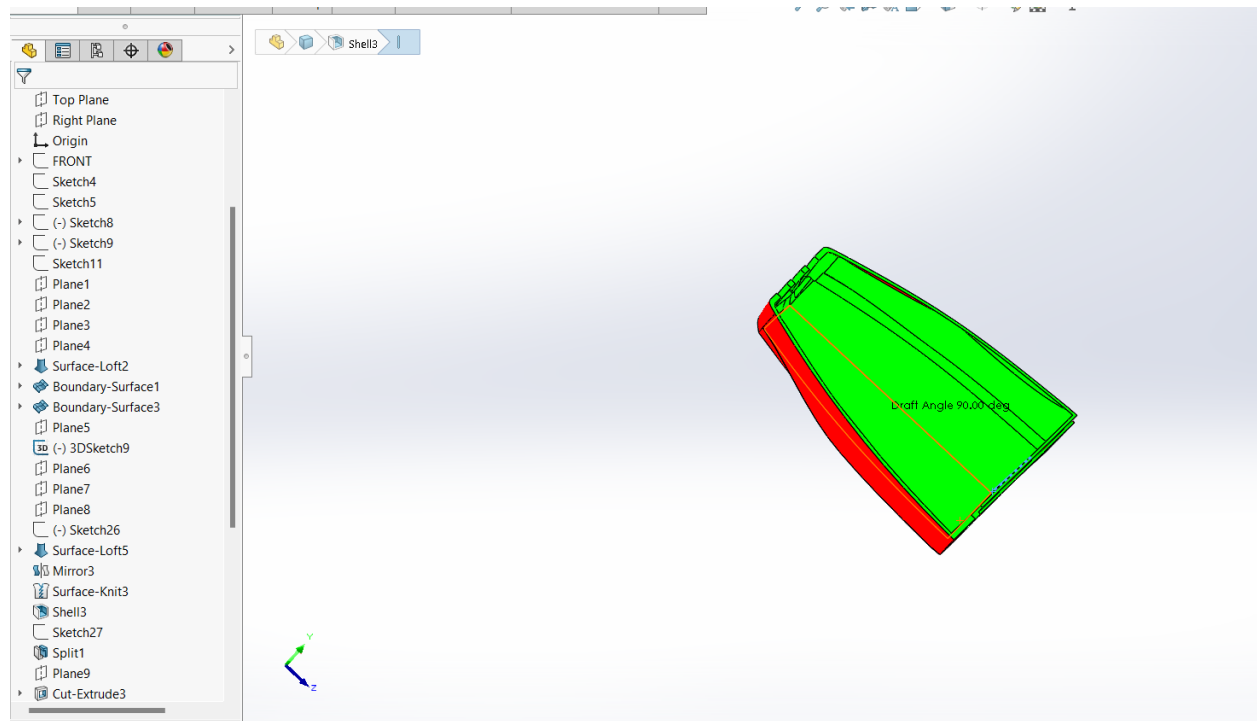


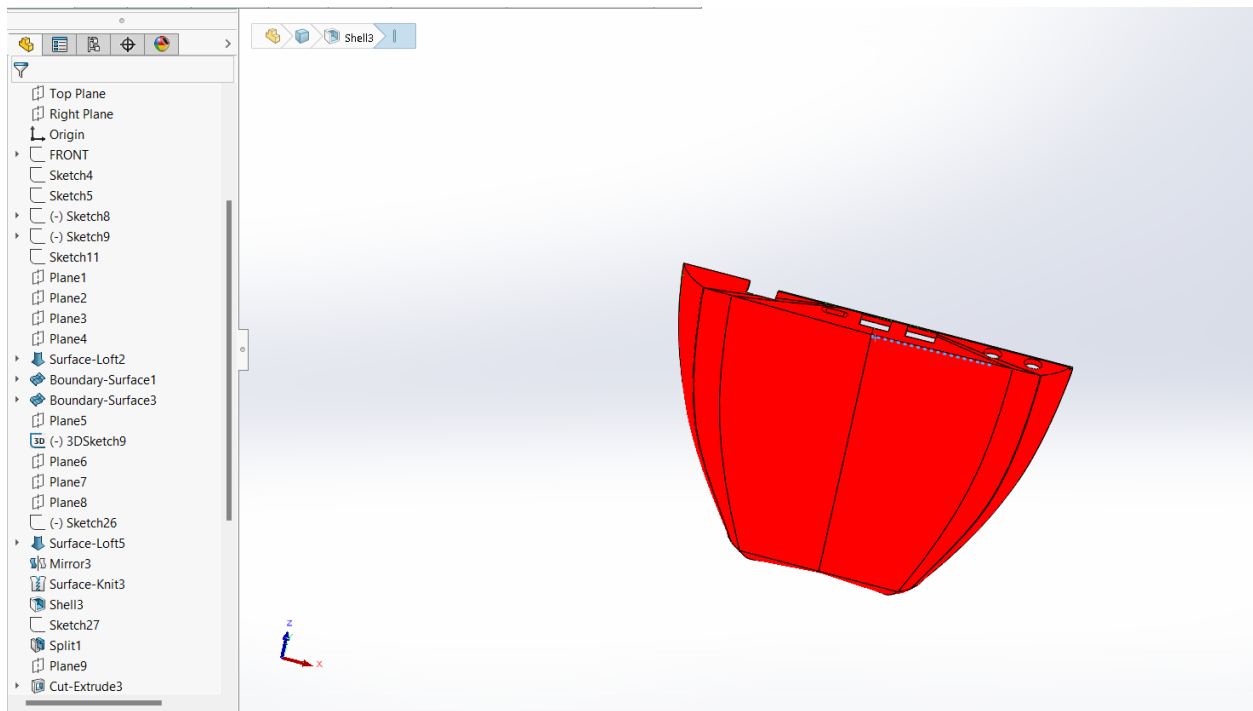
SolidWorks Design of the improved Design





Draft Analysis





Model Tree

