Introduction
Marvair is a manufacturer of self-contained heating, ventilation and air conditioning products for various markets. One of these plants, located in Cordelle, GA, manufactures several different models of air conditioners and heat pumps. One of Marvair’s assembly lines, referred to as Line 1, is very vital to the company’s productivity. Line 1 is a mixed-model assembly line that produces air conditioning units. The line consists of 15 different stations with 1 to 3 employees working at each. Although Marvair is doing well with maintaining business, Line 1 is underperforming. At the start of the project, the line was producing 55-38 units per day with a takt time of 12.15 minutes. The line should have been producing an average of 56 units per day with a takt time of 10 minutes per unit. Among other issues, the line contained excess inventory and WIP (Work in Progress), several bottlenecks were present, there was a lack of standard work, and worker turnover was high. Since Line 1 wasn’t performing up to standard, Marvair tasked our team to redesign the line to increase its productivity.

Bottlenecks and Work Utilization
Through visual and tangible observations, the team observed many areas along the line that bottlenecked and had a lot of nomadic employees (despite the fact that some employees have an overwhelming workload). The team had plans to finish their data collection and implement a developed plan but was prevented from doing this due to the Coronavirus. If the team was able to implement their plan, they would have made improvements to the major bottlenecking stations (Wiring and Control Box) through Poka-yoke (error-proofing) methods and worker or task redistribution. The tests to check the success of the bottleneck improvements and work utilization adjustments would have been done using visual observations, data collection, and employee feedback that would be placed on a numerical scale. For example, the work utilization success categories would have included the following: Non-Utilized, Longer Cycle Times, Overburdened Stations, and Reversion to Previous Methods.

Job Satisfaction Surveys
The team developed a job satisfaction survey to gain valuable insight on the sentiments Line 1 employees have towards their job and the company. The team collected a total of 24 surveys. There were approximately 13 employees working on Line 1 each day, so the survey results take into account the opinion of the vast majority of the line. The information obtained from the survey was very helpful to the project because employee motivation determines how well someone is going to perform their job. The survey included questions regarding the employee’s job satisfaction, incentives they’d like to see provided by management, and any suggested improvements they have that would better Line 1’s overall process efficiency. The results from the survey helped the team determine what makes the employees on the line feel motivated. That information could be used by Marvair to make improvements within the company and along the line that satisfies the employees.

Conclusions
Overall, the team is satisfied with the completion of the project. The team was able to give their client a deliverable that satisfies the project requirements. Within the deliverable, there are various recommendations developed from the team’s analysis, data collection, and observations of Line 1. If implemented, these recommendations should improve the line’s overall efficiency and productivity.

Acknowledgements
Our team would like to extend a special thanks to Dr. Scott Schultz and Dr. Melinda Hollingshed for all of the wisdom and guidance as the team took on this project. Our team would also like to extend our gratitude to our client, Earl Barthel, Marvair’s Lean Leader for all of his assistance. Additionally we would like to thank Dr. Laura Moody and any other professors and faculty who helped us along the way.