# Project Contribution

I worked on the following parts in this project:

- **Code Development:** Actively participated in the development of the codebase, focusing on implementing the machine hierarchy representation, including parent-child relationships and operations logic. This involved structuring the data and implementing communication protocols using MPI4Py for parallel processing.
- **Algorithm Design:** Contributed to designing the algorithmic approach for simulating production cycles within the code. Devised efficient ways to handle multiple machines, their operations, and factor calculations within each cycle.
- **Documentation:** Played a significant role in documenting the codebase, creating inline comments to enhance code readability and comprehension for future reference. Also contributed to writing the README file, detailing installation instructions and command usage.
- **Testing and Validation:** Actively participated in testing various scenarios of the production simulation, ensuring the code's functionality across different machine configurations and production cycle setups.
- **Report Contribution:** Contributed to drafting sections of the project report, specifically focusing on detailing the design choices, algorithmic approach, and advantages of parallel programming within the context of the project.
- **Review and Collaboration:** Collaborated with team members, engaging in code reviews, discussing design choices, and providing feedback to enhance the overall project quality and effectiveness.
- **Bonus Question:** Contributed insights and considerations for the bonus question regarding challenges in implementing a digital twin for an Industry 4.0 project. Highlighted potential obstacles and possible solutions.

My involvement in these aspects aimed to ensure a comprehensive and functional project outcome while contributing meaningfully to different facets of the project's development, documentation, and analysis.