The First Progress Report (FPR) will be submitted at the end of the Fall Semester. As your project is a work in progress, you will build on your Project Proposal Report (PPR). FPR should contain the seven sections that you had in your PPR with an optional Appendix at the end. For the seven sections, you will need to:

- Extend some of these sections with the new work you have performed.
- Update the sections with new information (if needed).

While making changes in your reports, do not keep any information that was once relevant to your project but now totally irrelevant. Your project reports are not a place to log the historical changes you had throughout two semesters. If one wishes to track your changes, they could browse through your earlier reports.

*Please follow the instructions described in the document called "**Report Format**" while preparing your report. **Make sure that neither the format information nor the below description affects the way that you select the section titles that you use in your text. We expect you to select those to reflect your project work rather than being generic.***

The report is expected to include the following information - here presented in mainly eight sections for convenience:

1. **Description of the System:** We do expect a clear, concise description of the system you have been considering during the semester. Hence, we do not expect any major changes in this section form the proposal if things are settled; however, you should update it if needed.

2. **Current System Analysis and Problem Definition:** After you make your proposal presentation to the company, the problem definition may require minor/major updates, or perhaps with some new datasets from the current system, you may do further analysis of the current system. Considering these cases, this part should be extended or updated. Make sure that the material you present here gives consistent information with what you are proposing.

3. **Review of Resources:** As you make progress in the project, you will survey more resources and engineering standards and this section should get extended with these new resources. Make sure you also cite and have them in the References. However, some of the resources you had in the PPR may no longer be used in your project. You should remove these resources from this section.
   A. **Relevant Work in the Literature:** Update if needed.
   B. **Engineering Standards and Regulations:** Update if needed.

4. **Proposed Solution Strategy:** Follow the specific directives for updates per subsection.

   A. **Critical Assumptions**: Update if needed.
   B. **Major Constraints:**
      i. **Company Regulations or Restrictions:** Update if needed.
      ii. **Relevant Engineering Standards:** Update if needed.
   C. **Objectives:** Update if needed.
   D. **Solution Approach:** This is the subsection that we expect to see majority of the progress. Now, you should have sub-subsections to clearly present your progress.

I. **Conceptual Model:** Provide a high level abstraction of your proposed solution approach. It should contain a simple flowchart that schematically describes the relationship and interaction between the major components (or subsystems, elements) of your system along with the inputs and the outputs of your system.

II. **Mathematical Model(s):** Present the model(s) you will use to tackle the problem. This model could be a linear programming model, a forecasting model, an inventory model, a heuristic algorithm or any other mathematical model depending on the requirements of the problem you defined as well as the expectations of the company. In case if you have separate models used in different major components make sure to explain them in separate subsections.

III. **Solution Method:** Describe the tools used to obtain results from your Mathematical Model(s). Also you may provide the preliminary results, though this may not be complete by the time you write this report. Nevertheless, for those which are not complete, make sure that you give sufficient details.

E. **Verification:** You built a model with the expectation that it represents certain trade-offs you observe, and it yields results that are meaningful and comparable. Verification stage does not need any real data, but you need to make sure that the model is working as intended, even in some "extreme" situations that you will not expect to observe very frequently in real life. This stage will make the model potentially useful. **We expect this stage to be completed by the end of the Fall semester.**

F. **Validation:** In order your model to be acceptable, you need to show that under a given set of conditions, your model results are identical (similar, close enough) to the results obtained in the real system under the same set of conditions. There are numerous ways to reach a valid model. This stage will give credibility (a synonym for validation in some dictionaries) to the model. **We expect you to provide a validation plan for the next semester.**

5. **Outcome and Deliverables:**
  A. **Outcome:** Update if needed.
  B. **Deliverables:** It may be a good idea to start making progress on the deliverables.
  C. **Benchmarking and Benefits to the Company:** Once you validate your model, now you can compare the results of the "credible" model under different conditions with the current system. In other words, you now have a standard for measuring or judging other things of the same type – called benchmarking. After benchmarking studies, one will be able to **measure the benefit the proposed approach compared to the current system.** As benchmarking is a natural consequence of the validation step, **we expect you to provide a benchmarking plan for the next semester.**

6. **Project Plan and Work Package Assignments**: As you make progress in your project, this plan must be updated all the time. Some previously set tasks may already be performed, or may be delayed. Some tasks might be further divided into smaller sub tasks. Also, the tentatively planned later stages become clearer to plan. Once again, consider the deadlines provided in the course syllabus and the deadlines of the second semester provided in the first presentation as a guide to determine the stages that are expected to be completed in your project. Remember that you are a group of 6 or 7 students. The work package assignments should be made in such a way that will allow for parallel tasks to be handled simultaneously by different members.

7. **References:** This section should contain a list of references that you cited throughout your report.

8. **Appendix:** The Appendix section should be used to present the material relevant but not necessarily a part your major findings. As this section is optional, the material in this section should also be considered as optional for the general reader, as well. This means, this section should never have any material, absence of which will cause major problems in following the body of the report. Please make

sure that each appendix clearly (and independently) describes the information you place. This means that you may need to explain figures and help the reader to follow what you intend to have in the appendix.