Initial Steps for Milestone 1 Deliverables

To successfully complete Milestone 1: Problem Identification by June 16, our team should follow these initial steps, leveraging the structured approach and the selected project on student engagement in online learning. This outline provides a clear roadmap for addressing each deliverable.

Step 1: Team Alignment and Understanding (June 7 - June 8)

Before diving into the deliverables, ensure all team members are on the same page regarding the project and the Milestone 1 objectives.

1. **Review Provided Documents:** All team members should thoroughly read the `milestone1_guide.pdf` (the comprehensive guide for Milestone 1) and `project_selection.md` (detailing the selected project: "Addressing Student Engagement in Online Learning Environments"). This will ensure a shared understanding of the problem, the proposed research question, and the structured approach.

2. **Discuss and Clarify:** Hold a team meeting to discuss any questions or ambiguities regarding the project, the problem statement, the systems thinking summary, or the actionable research question. Ensure everyone understands the rationale behind the chosen project and its relevance.

3. **Revisit Planning Documents:** Review existing group norms, learning goals, constraints, and communication plan. Make any necessary adjustments to accommodate the focus on the selected project and the demands of Milestone 1.

Step 2: Deep Dive into Domain Research (June 9 - June

12)

This step focuses on fulfilling the requirement for “A thorough background review of research domain in the `0_domain_research` folder of our repository.”

1. **Create `0_domain_research` Folder:** In our team’s GitHub repository, create a new folder named `0_domain_research` at the root level.

2. **Divide Research Tasks:** Assign specific sub-topics related to “Student Engagement in Online Learning Environments” to individual team members for in-depth research. Potential sub-topics include:

- **Online Learning Platforms and Technologies:** Research common LMS platforms (e.g., Canvas, Moodle, Blackboard), their features related to engagement tracking, and emerging technologies (AI tutors, VR in education).

- **Theories of Student Engagement:** Explore educational psychology theories (e.g., Self-Determination Theory, Flow Theory) that explain student motivation and engagement in learning.

- **Metrics and Indicators of Engagement:** Investigate how student engagement is currently measured in online settings (e.g., login frequency, time on task, forum participation, assignment completion rates, quiz scores).

- **Impact of Disengagement:** Gather statistics and case studies on the effects of low engagement (e.g., dropout rates, academic performance disparities).

- **Intervention Strategies:** Research successful strategies and best practices for improving online student engagement (e.g., personalized feedback, gamification, collaborative activities, instructor presence).

- **Data Privacy and Ethics in Educational Data:** Understand the ethical considerations and regulations (e.g., FERPA in the US, GDPR in Europe) related to collecting and analyzing student data.

3. **Conduct Research and Document Findings:** Each team member should

conduct thorough research on their assigned topics, synthesizing information from academic papers, industry reports, reputable educational organizations, and relevant news articles. Document findings in well-organized Markdown files within the `0_domain_research` folder. Include citations for all sources.

4. **Collaborate and Consolidate:** Regularly share findings within the team. This can be done through brief presentations, shared documents, or dedicated discussion sessions. The goal is to collectively build a comprehensive understanding of the domain.

Step 3: Synthesize and Summarize (June 13 - June 14)

This step focuses on synthesizing the research and preparing the core deliverables for the `README.md`.

1. **Draft Problem Statement:** Based on the initial problem statement provided in `project_selection.md` and our deeper understanding from the domain research, refine and finalize our team's problem statement. Ensure it reflects our collective personal experiences and observations.

2. **Develop Systems Thinking Summary:** Collaboratively write "A summary of our group's understanding of the problem domain," explicitly applying systems thinking. This should elaborate on the events, patterns, structures, and mental models related to student disengagement in online learning, as outlined in `project_selection.md`.

3. **Refine Actionable Research Question:** Review the proposed actionable research question: "How do specific student interaction patterns with online course materials and discussion forums predict academic performance and course completion rates in MIT Emerging Talent Program's online modules, and what interventions can be designed to improve these metrics?" Discuss its specificity, measurability, achievability, and relevance. Make minor adjustments if necessary, ensuring it remains actionable and aligned with data science methodologies.

4. **Prepare `README.md` Content:** Consolidate the finalized problem statement, systems thinking summary, and actionable research question into a single Markdown file. This content will eventually be placed in our repository's `README.md`.

Step 4: Finalization and Submission Preparation (June 15 - June 16)

This final step ensures all deliverables are ready for submission.

1. **Complete Retrospective:** Conduct a team retrospective for Milestone 1. Discuss what went well, what could be improved, and any challenges faced. Document this in a dedicated Markdown file within our repository.

2. **Ensure GitHub Repository Compliance:** Verify that:

- The `0_domain_research` folder contains all background review documents.
- Our `README.md` file includes the problem statement, systems thinking summary, and actionable research question.
- All planning documents are up-to-date.

3. **Create Git Tag:** Before the deadline (June 16), create a labeled Git tag for Milestone 1. This is crucial for assessment.

4. **Complete Milestone Survey:** Ensure all team members complete the Milestone 1 survey as required.

By diligently following these steps, our team will not only meet all the requirements for Milestone 1 but also build a solid foundation for the subsequent phases of the data science project.