Development Plan
SFWRENG 4G06

Team 28, Cowvolution Minds
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Table 1: Revision History

Date	Developer(s)	Change
Date1	Name(s)	Description of changes
September 22	Harshpreet Chinjer	Added meeting plan, Expected technology and Coding standard
...	...	...

1 Confidential Information?

2 IP to Protect

3 Copyright License

4 Team Meeting Plan

1 Frequency of Meetings

- **Team Meetings**: The team will meet virtually once a week at discussed time, with in-person meetings if required
- **Industry Supervisor Meetings**: Meetings with the industry supervisor will occur virtually once a week, with additional meetings or cancellations based on the supervisor's availability and project progress.
- **Additional Meetings**: The team or supervisor may call extra meetings as needed, especially during critical project milestones.

2 Meeting Location

- **Virtual Meetings**: Conducted via platforms Discord or Microsoft Teams.
- **In-Person Meetings**: Arranged at a mutually agreed location like Mills Memorial Library, H.G. Thode Library and ITB Hallway Space

3 Meeting Structure

- **Chair Rotation**: Each team member will take turns chairing the meetings. This includes leading discussions, ensuring the agenda is followed, and managing time.

- **Agenda**: The chair of the upcoming meeting is responsible for preparing the agenda and circulating it to all members at least **24 hours prior** to the meeting. The agenda will include:
  - Project updates
  - Task allocation
  - Deadlines review
  - Challenges and risks
  - Next steps
  - Supervisor queries (for meetings with the industry advisor)

4 Meeting Protocol

- **Attendance**: All members are expected to attend unless unable, in which case they should inform the members ahead of time.

- **Minutes**: One team member will be assigned to take minutes, including key decisions, action items, and next steps. Minutes will be shared within **24 hours** after the meeting on GitHub.

5 Team Communication Plan

[Issues on GitHub should be part of your communication plan. —SS]

6 Team Member Roles

[You should identify the types of roles you anticipate, like notetaker, leader, meeting chair, reviewer. Assigning specific people to those roles is not necessary at this stage. In a student team the role of the individuals will likely change throughout the year. —SS]

7 Workflow Plan

- How will you be using git, including branches, pull request, etc.?

- How will you be managing issues, including template issues, issue classification, etc.?

- Use of CI/CD

8   Project Decomposition and Scheduling

- How will you be using GitHub projects?

- Include a link to your GitHub project

[How will the project be scheduled? This is the big picture schedule, not details. You will need to reproduce information that is in the course outline for deadlines. —SS]

9   Proof of Concept Demonstration Plan

What is the main risk, or risks, for the success of your project? What will you demonstrate during your proof of concept demonstration to convince yourself that you will be able to overcome this risk?

10   Expected Technology

Initial Implementation Plan

- **Programming language**: The project will primarily use **Python** due to its strong support for machine learning and data science tasks.

- **Libraries**: Expected key libraries include **Pandas** and **Numpy** for data manipulation, **Scikit-learn**, **TensorFlow**, or **PyTorch** for building the machine learning model, and **Matplotlib** or **Seaborn** for data visualization.

- **AI Model**: The project will create a **custom AI model** specifically tailored to dairy farming data, focusing on predicting outcomes such as breeding success rates and herd attrition.

- **Linter**: **Flake8** or **Black** will be utilized to maintain code quality and ensure adherence to Python's PEP 8 standards.

- **Unit testing framework**: **PyTest** will be used to implement unit tests, focusing on validating data pipelines, model training, and prediction accuracy.

- **Continuous Integration (CI)**: **GitHub Actions** will be used to automate tests and ensure code quality in a continuous integration pipeline.

- **Version Control and Project Management**: **Git** will be used for version control and **GitHub** for repository management and collaboration throughout the project.

11 Coding Standard

The project will follow the **PEP 8** coding standard for Python, which is the official style guide for Python code. PEP 8 outlines guidelines and best practices for writing clean, readable, and maintainable Python code. Key recommendations include:

- Using 4 spaces per indentation level.

- Limiting line length to 79 characters.

- Proper use of blank lines to separate functions and classes.

- Consistent use of lower_case_with_underscores for variable and function names.

- Avoiding extraneous whitespace.

- Using meaningful comments to explain the purpose of code blocks.

- Keeping code simple and readable, and adhering to Python's philosophy of clarity.

For a full reference to PEP 8 guidelines, visit the official document: PEP 8 Style Guide.

Appendix — Reflection

The purpose of reflection questions is to give you a chance to assess your own learning and that of your group as a whole, and to find ways to improve in the future. Reflection is an important part of the learning process. Reflection is also an essential component of a successful software development process.

Reflections are most interesting and useful when they're honest, even if the stories they tell are imperfect. You will be marked based on your depth of thought and analysis, and not based on the content of the reflections themselves. Thus, for full marks we encourage you to answer openly and honestly and to avoid simply writing "what you think the evaluator wants to hear."

Please answer the following questions. Some questions can be answered on the team level, but where appropriate, each team member should write their own response:

1. Why is it important to create a development plan prior to starting the project?

2. In your opinion, what are the advantages and disadvantages of using CI/CD?

3. What disagreements did your group have in this deliverable, if any, and how did you resolve them?

Appendix — Team Charter

[borrows from University of Portland Team Charter —SS]

External Goals

[What are your team's external goals for this project? These are not the goals related to the functionality or quality fo the project. These are the goals on what the team wishes to achieve with the project. Potential goals are to win a prize at the Capstone EXPO, or to have something to talk about in interviews, or to get an A+, etc. —SS]

Attendance

Expectations

[What are your team's expectations regarding meeting attendance (being on time, leaving early, missing meetings, etc.)? —SS]

Acceptable Excuse

[What constitutes an acceptable excuse for missing a meeting or a deadline? What types of excuses will not be considered acceptable? —SS]

In Case of Emergency

[What process will team members follow if they have an emergency and cannot attend a team meeting or complete their individual work promised for a team deliverable? —SS]

Accountability and Teamwork

Quality

[What are your team's expectations regarding the quality of team members' preparation for team meetings and the quality of the deliverables that members bring to the team? —SS]

Attitude

[What are your team's expectations regarding team members' ideas, interactions with the team, cooperation, attitudes, and anything else regarding team member contributions? Do you want to introduce a code of conduct? Do you want a conflict resolution plan? Can adopt existing codes of conduct. —SS]

Stay on Track

[What methods will be used to keep the team on track? How will your team ensure that members contribute as expected to the team and that the team performs as expected? How will your team reward members who do well and manage members whose performance is below expectations? What are the consequences for someone not contributing their fair share? —SS]

[You may wish to use the project management metrics collected for the TA and instructor for this. —SS]

[You can set target metrics for attendance, commits, etc. What are the consequences if someone doesn't hit their targets? Do they need to bring the coffee to the next team meeting? Does the team need to make an appointment with their TA, or the instructor? Are there incentives for reaching targets early? —SS]

Team Building

[How will you build team cohesion (fun time, group rituals, etc.)? —SS]

Decision Making

[How will you make decisions in your group? Consensus? Vote? How will you handle disagreements? —SS]