Sprint 3 Report: AI-driven Traffic Management

Introduction

Sprint 3 served as the final sprint in the AI-driven Traffic Management project, concluding with a fully functional and optimized traffic simulation. The primary goals of this sprint were to finalize key components, including user input integration, optimization, and CI/CD setup, while also organizing the codebase and preparing the project for delivery. Our approach was once again guided by Agile methodologies, particularly using Scrum, which enabled us to adapt to changes and continually improve throughout the project lifecycle. This sprint marked the peak of our efforts to build an effective and efficient traffic management system.

Agile Methods in Practice

Throughout the development process, Agile played a pivotal role in organizing the team's work and ensuring that each sprint delivered incremental improvements to the project. Agile's iterative nature allowed us to focus on small, manageable tasks, while continuously evaluating our progress and adjusting our approach when necessary.

Why We Chose Agile

Agile's flexibility made it an ideal choice for our project. As our traffic management simulation evolved, Agile allowed us to quickly respond to new requirements and fine-tune the application based on feedback. Instead of committing to a rigid, long-term plan, we could focus on delivering smaller, working pieces of the simulation during each sprint, ensuring steady progress.

Using Agile, we benefited from:

- **Frequent Iterations**: With each sprint, we focused on delivering functional aspects of the project, such as the initial simulation setup, UI improvements, and, finally, optimization and user input.
- **Collaboration**: Regular team check-ins ensured that we stayed aligned and communicated effectively.

- **Transparency**: Daily stand-ups and sprint reviews allowed the team to stay on the same page, ensuring everyone was aware of the project's status and upcoming tasks.

Team Contributions in Sprint 3

Sprint 3 was divided into clearly defined tasks, with each team member responsible for critical components of the final deliverable.

- **Nicole**: Nicole focused on the user interface aspect by creating a class that generates a pop-up window for user input. This window allows users to input variables such as the number of cars in the simulation, providing flexibility and control over the simulation's parameters. The input values are then passed to the main project for integration into the simulation, allowing users to interact with and influence the simulation's behavior.
- **Nic**: Nic developed a pipeline that automates the Build and Test stages, ensuring that the project is consistently tested and can be built easily whenever new updates are made. This CI/CD pipeline helps to maintain the integrity of the project as it evolves.
- **Magdalena**: Magdalena's task for this sprint involved creating a PowerPoint presentation and report on Agile methods. These deliverables were prepared for the Demis, providing an overview of how Agile principles were applied throughout the development process. The presentation focused on the use of sprints, daily stand-ups, sprint reviews, and retrospectives, demonstrating how Agile guided the team's workflow and helped maintain progress.
- **Brad**: Brad focused on cleaning up the project's codebase, particularly organizing the traffic light system. He grouped the traffic lights to ensure easier management, enhancing the system's scalability and functionality.
- **William**: William led the optimization efforts, focusing on improving the simulation's performance. His primary task was to enhance how cars moved through intersections, ensuring smoother traffic flow and faster response times.

The Role of Agile in Sprint 3

Agile provided a clear structure and framework for completing Sprint 3's goals. The Scrum events that included sprint planning, regular stand-ups and retrospectives kept the team focused on the sprint's key objectives. Here's how Agile guided our progress:

- **Sprint Planning**: At the beginning of the sprints, we clearly defined the tasks for each team member. This allowed us to focus on specific, measurable outcomes that aligned with the sprint's overall goal of finalizing the project. Each team member had clearly defined responsibilities that contributed to the project's completion.
- **Regular Stand-ups**: Regular meetings kept the team aligned and provided an opportunity to address any blockers early.
- **Sprint Retrospectives**: We concluded the sprint with a retrospective, reflecting on the successes of the final sprint and how the project had evolved since the first sprint.

Final Deliverables

At the conclusion of Sprint 3, the team delivered a fully functional and optimized traffic management system. The final deliverables included:

1. **User Input Integration**: A pop-up window was successfully integrated into the simulation, allowing users to input key variables (example number of cars) and influence the behavior of the simulation.
2. **CI/CD Pipeline**: Nic's CI/CD implementation ensured that the project could be continuously tested and built
3. **Traffic Light Grouping**: Brad successfully grouped the traffic lights, making them easier to manage within the simulation, enhancing overall organization and performance.
4. **Performance Optimization**: William's optimization efforts ensured that the simulation ran smoothly, reducing response times and improving efficiency.
5. **Agile Presentation and Report**: The presentation and report on Agile methods showcased how the team applied Agile principles throughout the project, highlighting the approach that led to the project's successful completion.

Conclusion

Sprint 3 served as the final stage in the AI-driven Traffic Management project, where all key components were finalized, and the simulation was optimized for performance. By utilizing Agile methods, the team was able to maintain steady progress, adapt to new requirements, and deliver a functional and effective traffic management system. The use of Agile provided structure and flexibility, allowing us to deliver the final product on time

and with the expected features. The result is an optimized and interactive traffic simulation that meets the project's original goals.