**Planning the Assemblies and Workflow**

Given the constraints of a two-person team and the short timeframe, the planning and workflow will be streamlined to ensure efficient use of time and resources. This plan includes testing all algorithms but focusing on the Modified Picard-Chebyshev Iteration (MCPI) ,Verner’s Methods(ODE78) and ODE45 (Dormand-Prince Method).

**1. Planning the Assemblies**

**Algorithm Selection and Implementation:**

* **Responsibilities:** Both team members will collaborate on the implementation of all six algorithms (Runge-Kutta 4th Order – RK4, Runge-Kutta 8th Order – RK8, Dormand-Prince Method – ODE45, Verner’s Method – ODE78, Adams-Bashforth-Moulton Solver – ODE113 and the Modified Picard-Chebyshev Iteration – MPCI in C and C++. One member will focus on coding and testing the algorithms, while the other will handle data integration, validation, and documentation.
* **Initial Setup:** Define the scope of testing for each algorithm, including specific criteria for evaluating accuracy and computational efficiency.

**Simulation Environment Setup:**

* **Development:** Create a comprehensive simulation environment in C and C++ that includes the implementation of all six algorithms.
* **Integration:** Incorporate existing data on satellite positions and space debris into the simulation setup.
* **Validation:** Perform preliminary checks to ensure that the simulation environment and data are correctly set up.

**Testing and Evaluation:**

* **Scenario Design:** Develop a set of test scenarios to evaluate the performance of all six algorithms in various conditions.
* **Execution:** Carry out tests in a small CubeSat at Braude College to compare the accuracy and efficiency of each algorithm.

**Iterative Analysis and Refinement:**

* **Testing Cycles:** Conduct iterative cycles of testing, focusing on refining the MCPI,ODE45 and ODE78 algorithms based on the initial findings.
* **Meetings:** Hold regular meetings to review progress, address issues, and adjust testing strategies.