4. Assembly Layer

Once individual units pass validation, the system enters the **final assembly phase**:

- **Backtrack & Link Sub-Problems**: Individual units are integrated, linking sub-components into larger modules.
- **Assemble Complete Project**: The full project is built by combining all validated components.
- **Final Testing & Validation**: Comprehensive system-level testing is performed to ensure that the complete project meets the user's requirements.
- If requirements are met, the process concludes successfully; otherwise, the system loops back for corrections.

Data Flow Summary

1. User inputs requirements.
2. Input is validated against token constraints.
3. System decomposes tasks into granular sub-problems.
4. Each unit is coded, stored, and tested iteratively.
5. Validated units are linked to form the complete system.
6. Final validation ensures correctness before completion.

Key Advantages of This Design

- **Scalability** – Handles projects of any size by breaking input into manageable parts.
- **Error Resilience** – Iterative refinement ensures correctness before integration.
- **Modularity** – Components are designed and tested independently, reducing complexity.
- **Automation & Efficiency** – Automated test case generation and validation accelerate development.
- **Reliability** – The final project passes multiple layers of validation before delivery.