Problem Statement: Sandboxing Framework for Experimental Feature Development and Production Use

I am developing a framework that allows for the sandboxing of experimental features during both the development and production stages, ensuring that features can be isolated without affecting the stability of the core codebase. The framework maintains clear project structure and compatibility with established testing methodologies such as Test-Driven Development (TDD) and Behavior-Driven Development (BDD), while also allowing the secure deployment of experimental features in production environments.

Formalized Problem Statement:

This project aims to create a flexible and robust sandboxing framework designed for isolating experimental features, applicable during both development and production phases. The framework allows developers to introduce, test, and refine new functionalities within a controlled sandbox environment, minimizing the risk of disrupting the core application. By maintaining compatibility with standard project structuring and testing practices, such as TDD and BDD, the sandbox framework ensures that any experimental feature can be safely isolated, tested, and eventually merged into the production environment.

The sandbox environment is designed to handle multiple features in parallel, providing modular containment. Additionally, the framework supports production use cases, where experimental features may be exposed to users in a limited or controlled manner. This production sandboxing ensures that features can be safely trialed, without impacting the overall system performance or causing regressions.

Objectives:

- **Development Phase**: Enable multiple experimental features to be sandboxed simultaneously, ensuring the features remain isolated from the core codebase during development.
- **Production Use**: Allow for secure deployment of sandboxed features in production, enabling controlled trials of new functionalities while minimizing risk to the live system.

- **Testing Methodologies**: Maintain adherence to testing frameworks such as TDD and BDD, ensuring all features are properly tested within their respective sandboxes before release.
- **Modular Containment**: Ensure sandboxed features are modular, easily activated or deactivated, and can be iterated upon without affecting system-wide functionality.
- **Feature Release**: Provide a pathway for experimental features to transition from sandboxed isolation into full integration within the core system once thoroughly tested and validated.

By integrating this sandboxing framework, development and deployment teams will have a powerful tool to innovate and test features in both development and production environments, preserving stability and fostering continuous feature evolution.