



KFSCIS

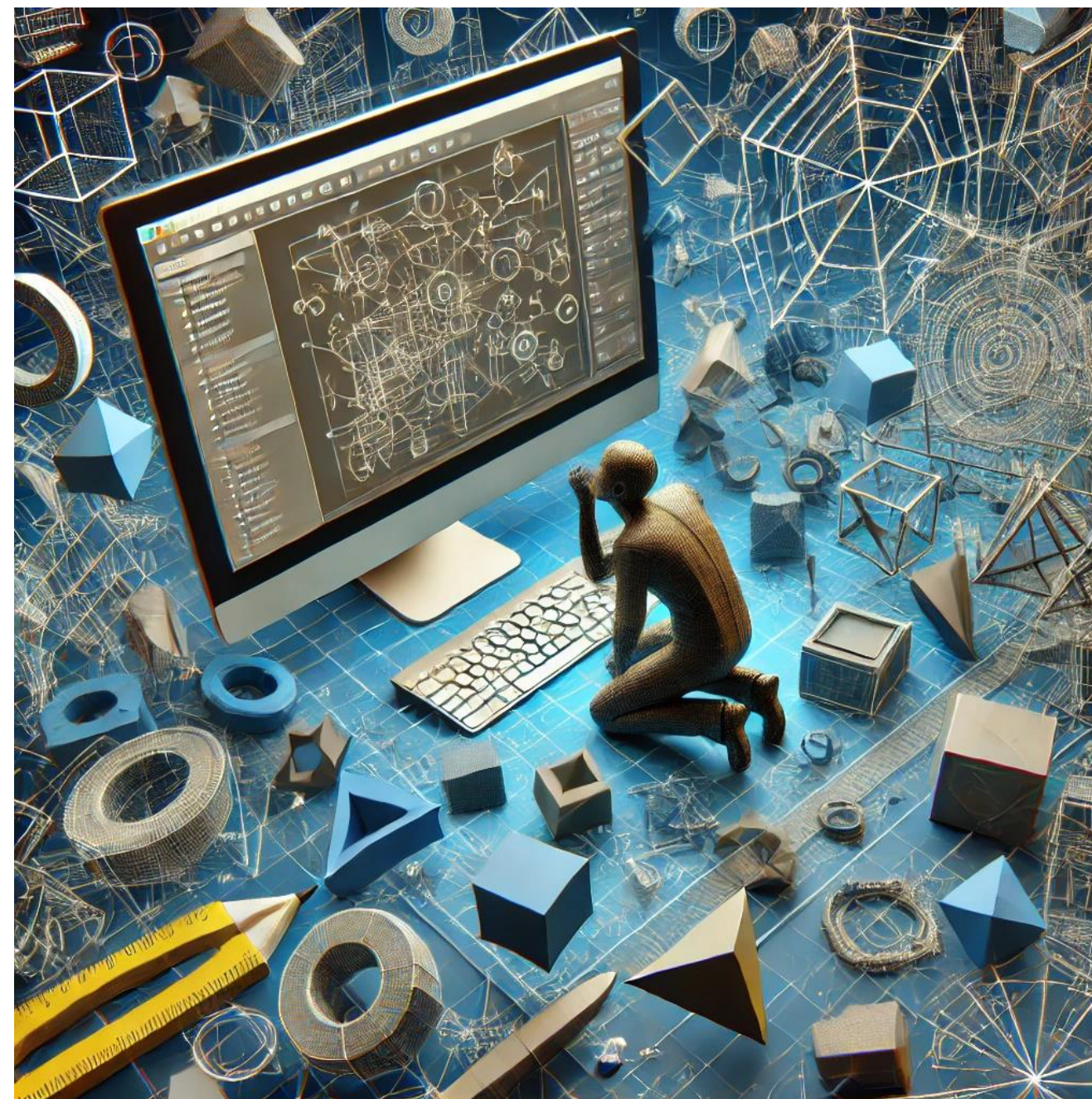
Summer 2024 Capstone II

Simulating Designs in Virtual Reality to Measure Excitement

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PROBLEM



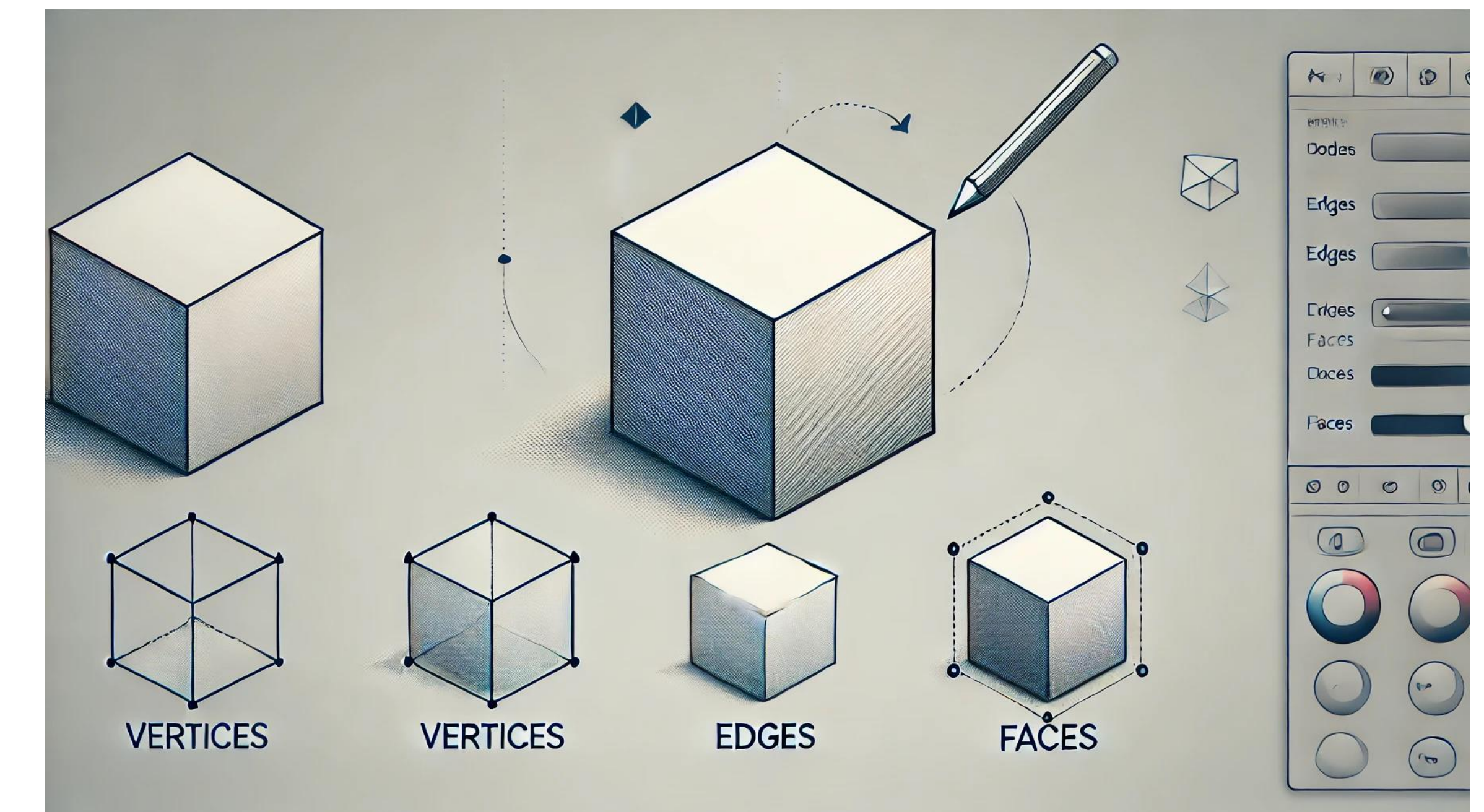
The goal of this capstone project is to develop an application in Unity that allows users to create compositions of 3D geometric forms. The application should provide a user-friendly interface for manipulating and combining various 3D objects, enabling users to explore spatial relationships and artistic compositions in a virtual environment.

CURRENT SYSTEM



Currently, there are limited applications available that offer intuitive tools for creating and manipulating 3D geometric compositions. Existing systems often lack user-friendly interfaces, making it challenging for users without extensive 3D modeling experience to create complex compositions. This project aims to bridge this gap by providing an accessible and interactive platform for 3D design.

REQUIREMENTS



The application must support:

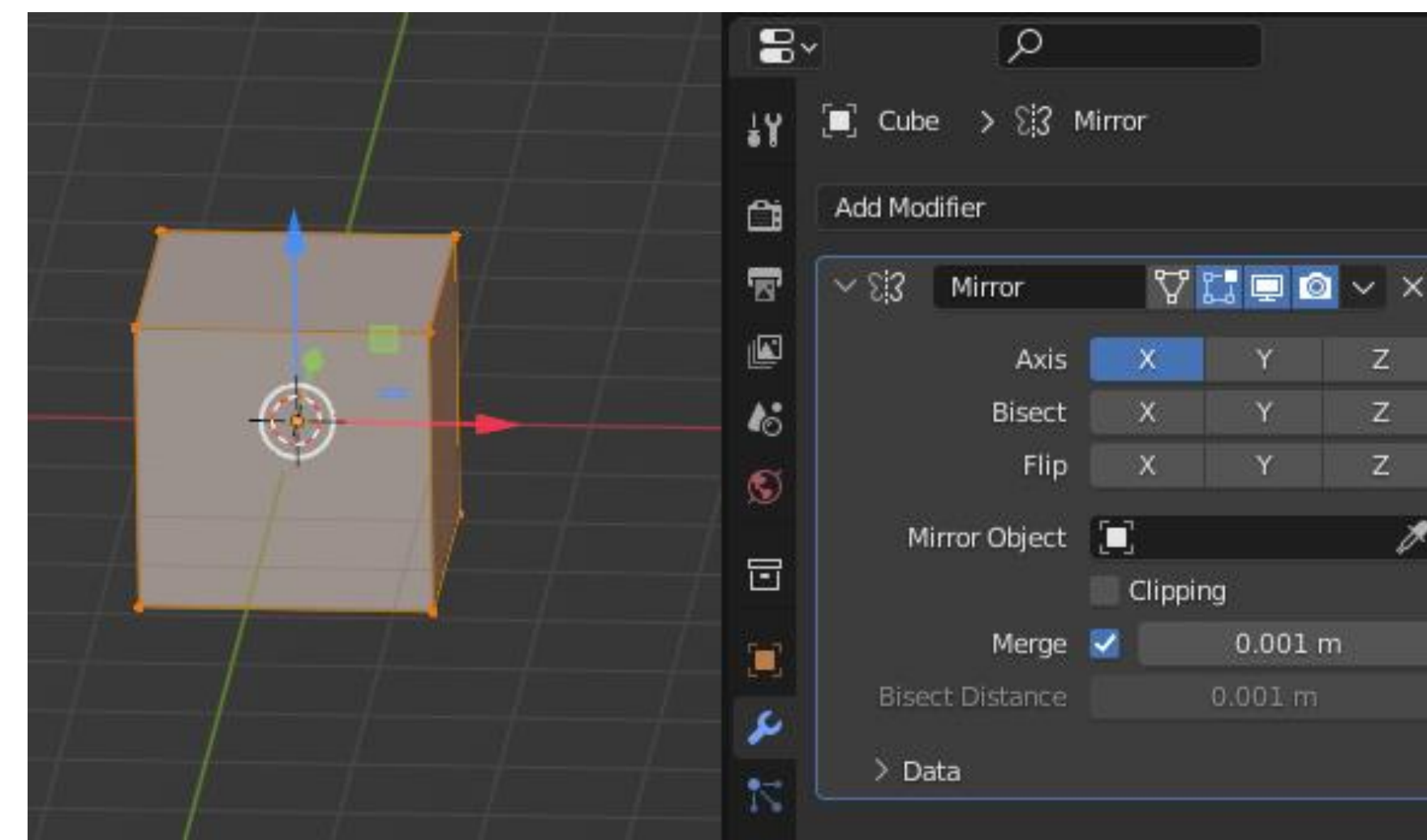
- A variety of 3D geometric shapes (e.g., cubes, spheres, cylinders).
- Tools for manipulating objects (e.g., scaling, rotating, translating).
- An intuitive user interface that is easy to navigate.
- Options for saving and loading compositions.
- Real-time rendering of 3D objects to provide immediate visual feedback

SYSTEM DESIGN



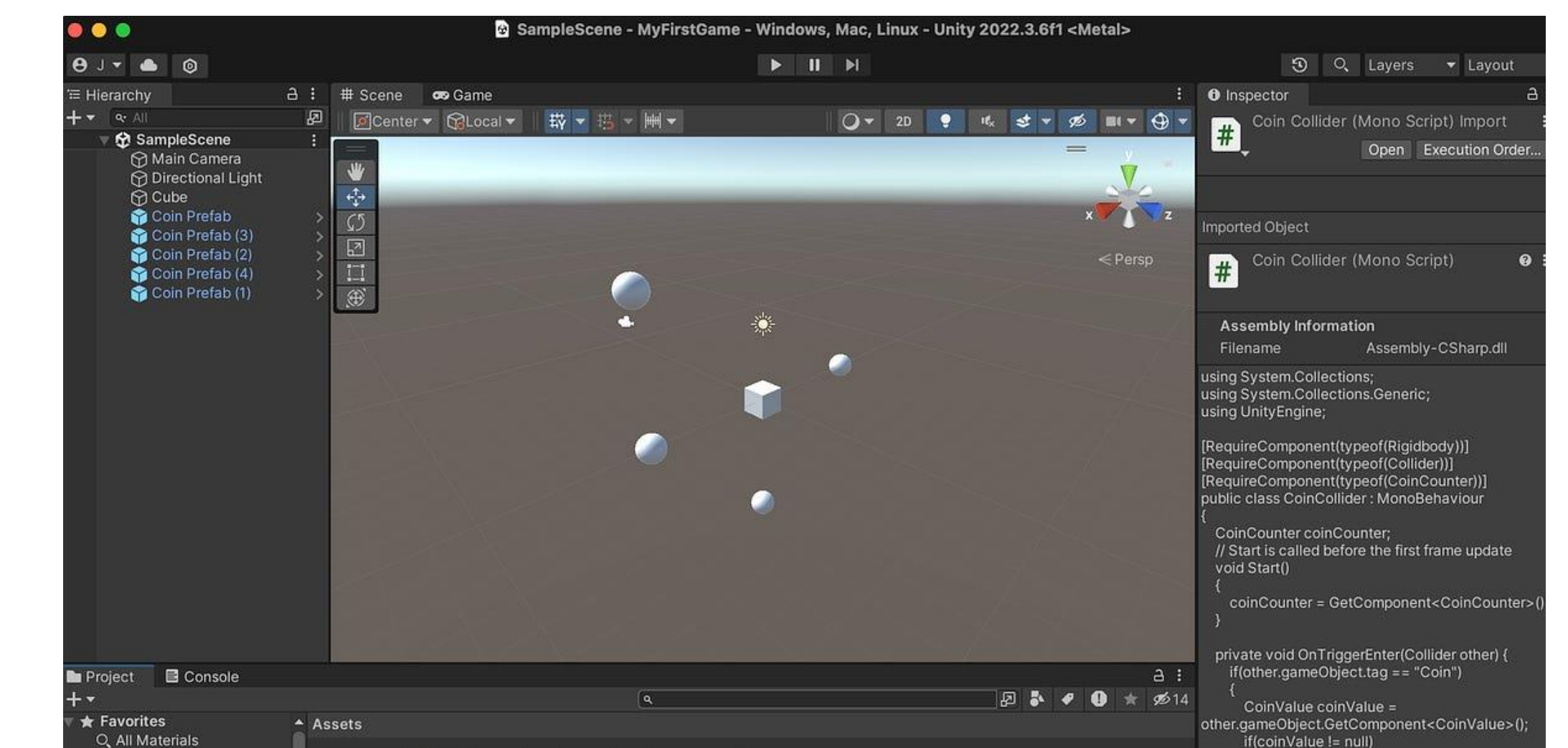
The system design involves creating a modular architecture within Unity that separates the user interface, object manipulation tools, and rendering engine. This approach ensures that each component can be developed and tested independently, facilitating easier debugging and future enhancements.

UI DESIGN



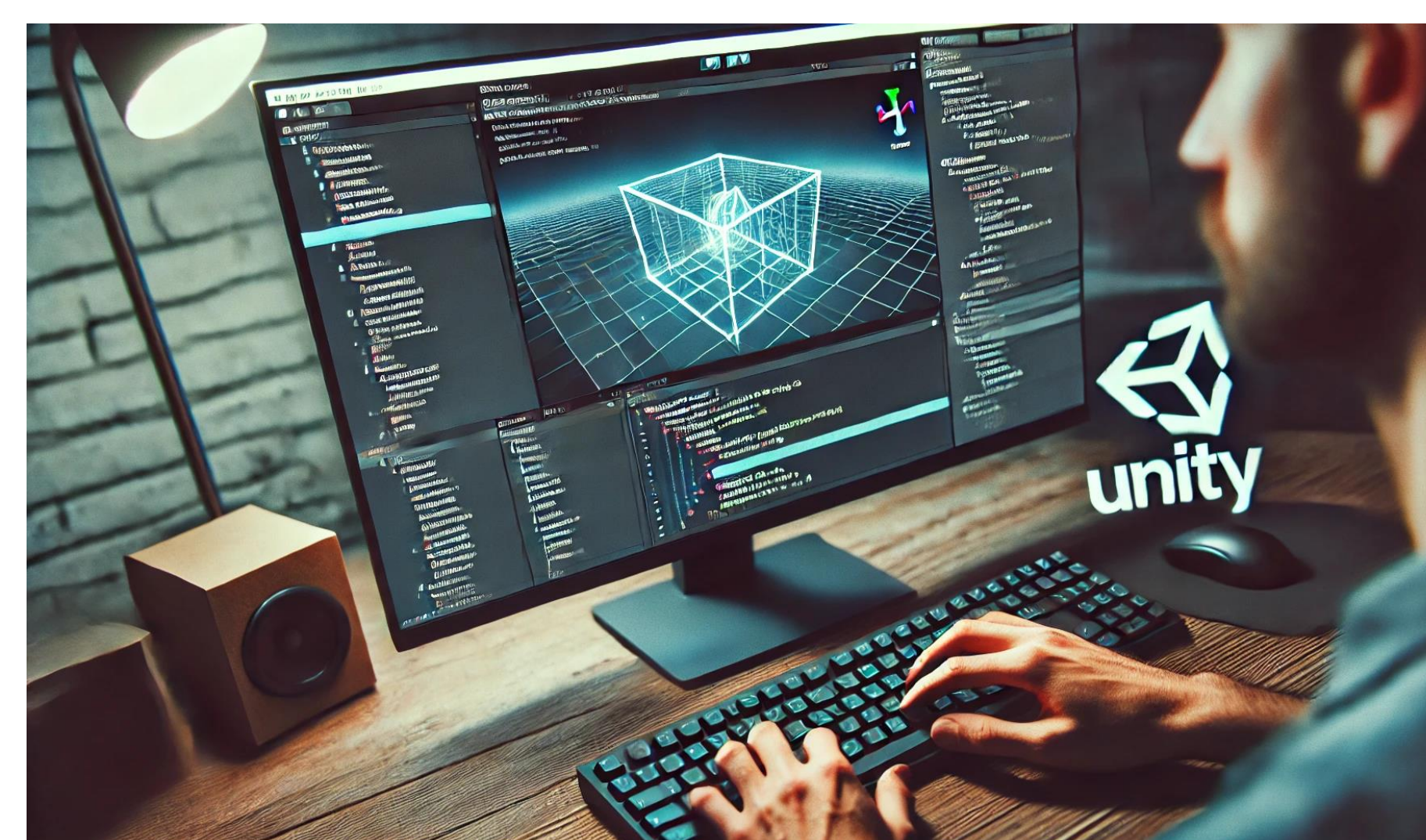
Object design focuses on defining the properties and behaviors of the 3D geometric shapes. Each object will have attributes such as position, rotation, scale, and color. Additionally, objects will be designed to interact with user inputs, allowing for dynamic manipulation and composition creation.

IMPLEMENTATION



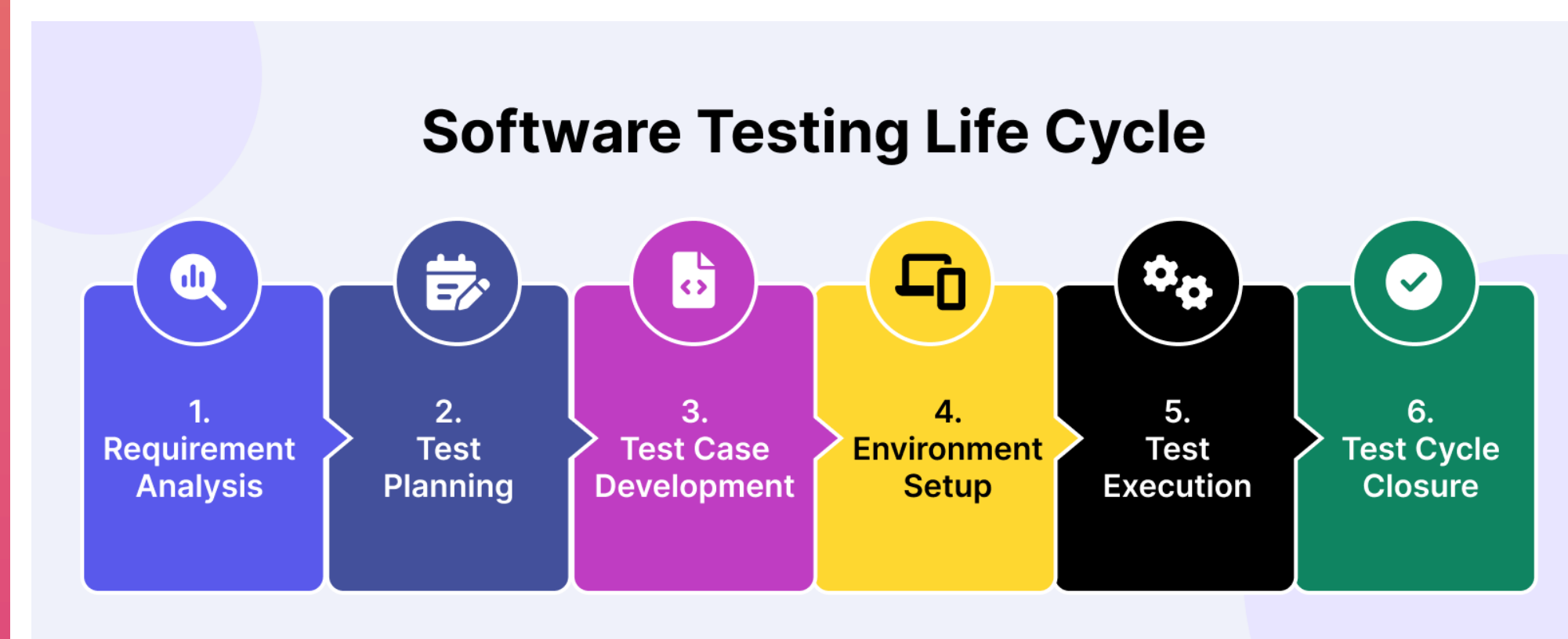
The implementation phase involves coding the application in Unity using C#. Key features include the development of the user interface, integration of object manipulation tools, and optimization of the rendering engine for smooth performance. User input handling and real-time feedback are critical components of this phase.

SUMMARY



This capstone project aims to deliver a user-friendly application for creating 3D geometric compositions in Unity. By addressing the limitations of existing systems, this application provides an accessible platform for users to explore and create complex 3D designs. The successful implementation and verification of this project demonstrate the potential for interactive 3D modeling tools in various fields.

VERIFICATION



Verification involves rigorous testing to ensure that the application meets all functional requirements and performs reliably. This includes unit testing individual components, integration testing to ensure components work together seamlessly, and user testing to gather feedback and identify any usability issues.

REFERENCES

- DCA 2018 Paper 50. "Digital Design and Fabrication for Architectural Education.
- Unity Documentation. "3D Modeling and Composition in Unity.
- Thorndike, E. "Law of Effect and Reinforcement Learning."

ACKNOWLEDGEMENT

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