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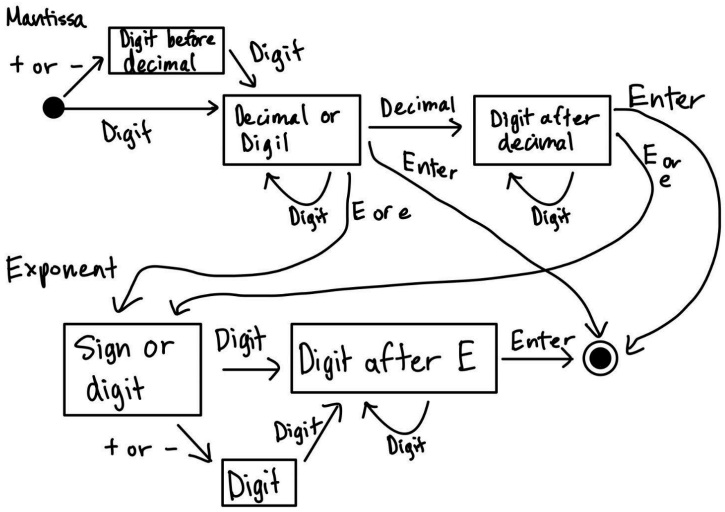
Problem 1:
A component-based architecture focuses on breaking down an application into reusable, self-contained components that can be independently developed, deployed, and maintained. These components communicate with each other through well-defined interfaces. In contrast, a service-oriented architecture emphasizes the use of services, which are self-contained, loosely coupled units of functionality that are accessed over a network and can be combined and orchestrated to create complex applications. While both architectures promote modularity and reusability, SOA places a stronger emphasis on service granularity and interoperability.

Problem 2:
For a phone application like tic-tac-toe with high scores stored locally, a component-based architecture would be suitable. Components can handle the game logic, user interface, and high score display separately, allowing for easier development and maintenance. Since there's no need for external database access, a service-oriented architecture might be unnecessarily complex.

Problem 3:
For a chess game allowing two users to play over the Internet, a service-oriented architecture would be more appropriate. Each player's actions can be treated as service requests sent over the network, processed by a central server, and broadcasted to the opponent. This architecture facilitates real-time communication, synchronization, and scalability.

Problem 4:
The ClassyDraw application would store the drawings to separate files, so it wouldn't necessarily need a database. Windows or other operating systems have tools that let users manage files. Document-centric approach. It could also create a temp file while user is editing or creates a new drawing, then if program crashes, it can ask user to restore the temp file instead of just having no file stored.

Problem 5 State machine Diagram:



Problem 6:
They all represent things that are drawn, so possibly colors, like background color or texture. All of these classes could also define their position in the piece, or have a size.

Some of these classes need more data than others to draw specific types of shapes. Text needs font info for every character.

Some properties cannot be shared. Like The basic shapes can be filled, but a line does not have a fill color but one singular color.

Problem 7 Draw inheritance diagram