<Name-of-Software-Application>
CS 230 Project Software Design Template
Version 1.0

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Document Revision History

Version	Date	Author	Comments
1.0	11/10/2023	Mohannad Osman	

Instructions
Fill in all bracketed information on page one (the cover page), in the Document Revision History table, and below each header. Under each header, remove the bracketed prompt and write your own paragraph response covering the indicated information.

Executive Summary

Creative Technology Solutions (CTS) is excited to join The Gaming Room's digital journey using software magic. Your task is to change Draw It or Lose It's Android game into a multi-platform one. Your special skill is adding originality to the game. Picture teams moving through digital worlds, each with a unique identity. Team names and game nicknames aren't just labels but also special coordinates. This ensures that only one game is happening at a time in the vast memory space. It's like a digital disguise where each player, team, and game wears a secret mask. This makes them seem like mysterious characters in the big code opera, not just regular participants.

Requirements

< Please note: While this section is not being assessed, it will support your outline of the design constraints below. *In your summary, identify each of the client's business and technical requirements in a clear and concise manner.>*

Design Constraints

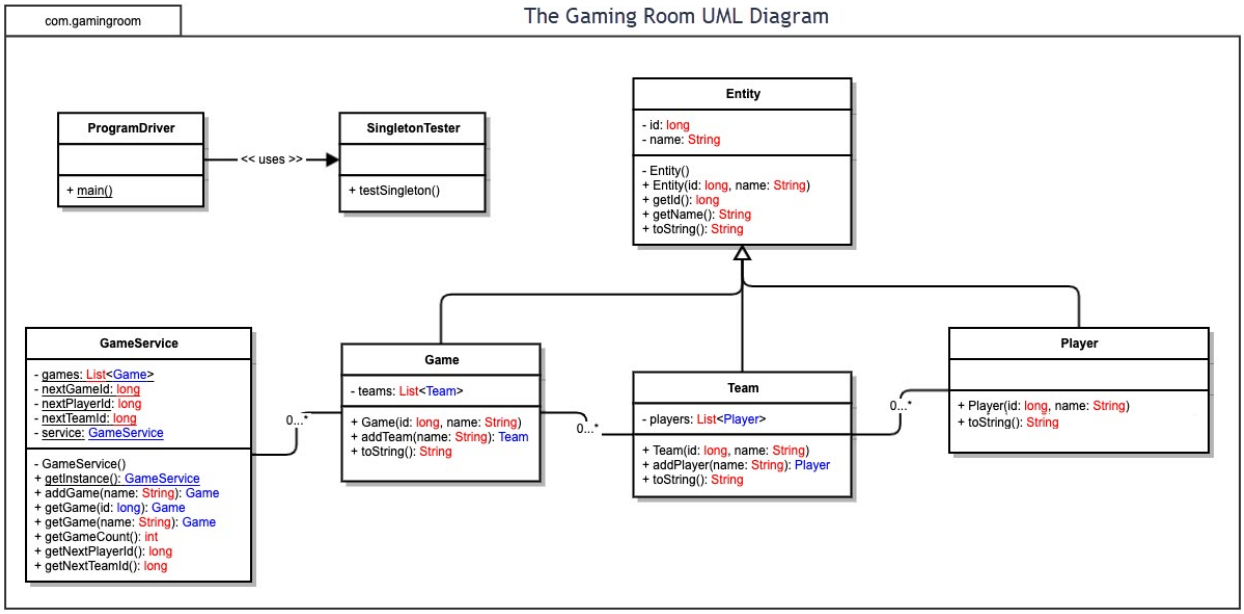
Web-based game development is limited by issues like bandwidth and network latency, which affect multimedia quality and real-time interactivity. A consistent gaming experience requires compatibility across all platforms and browsers; in order to protect user data and transactions, security issues must be addressed. The constraints of web-based distributed game creation must be navigated by balancing scalability for expanding user bases, addressing browser performance fluctuation, and adopting offline accessibility solutions, such as offering offline play options.

System Architecture View

Please note: There is nothing required here for these projects, but this section serves as a reminder that describing the system and subsystem architecture present in the application, including physical components or tiers, may be required for other projects. A logical topology of the communication and storage aspects is also necessary to understand the overall architecture and should be provided.

Domain Model

In the provided UML diagram, there is a "Programmer" class with a usage arrow pointing towards a "SingletonTester." This suggests that instances of the Programmer class utilize or interact with the SingletonTester. Additionally, there is an "Entity" superclass, which encompasses the "Game," "GameService," "Team," and "Player" classes as subclasses. The "0 to many" connections between these subclasses indicate that a single entity instance can be associated with multiple instances of Game, GameService, Team, and Player classes.



Evaluation

Using your experience to evaluate the characteristics, advantages, and weaknesses of each operating platform (Linux, Mac, and Windows) as well as mobile devices, consider the requirements outlined below and articulate your findings for each. As you complete the table, keep in mind your client's requirements and look at the situation holistically, as it all has to work together.

In each cell, remove the bracketed prompt and write your own paragraph response covering the indicated information.

Development Requirements	Mac	Linux	Windows	Mobile Devices
Server Side	A smaller user base and limited software compatibility are two of Mac's disadvantages, which could cause problems for some development tools and community support. On the other hand, Macs' elegant design and simple interface make them an excellent choice for hosting web-based software applications.	Linux is a strong option for hosting web-based software applications with an emphasis on customisation and dependability because of its open-source nature, security features, and flexibility. However, different software compatibility—especially with proprietary applications—and a more difficult learning curve for users who are not accustomed to Linux settings could provide problems.	Windows is a flexible option for hosting web-based software applications because it excels at offering a broadly compatible platform with extensive software support. For a flawless hosting experience, developers must carefully consider potential security risks with the system and the possibility of periodic updates causing disruptions or compatibility problems.	Because mobile platforms like iOS and Android are widely accessible through smartphones and tablets, they provide a dynamic environment for hosting web-based software applications. However, there might be difficulties handling different device specs, fragmentation of the operating system, and possible processing power constraints in comparison to desktop environments.
Client Side	Web application users can enjoy a pleasant and visually appealing experience on Mac computers. However, it's crucial to remember that not all software is compatible with Macs, so picking the appropriate tools may be something to consider.	Linux provides users interacting with web applications with a simple and effective client-side experience. However, it's important to keep in mind that not all software is compatible with Linux, so making an informed tool selection is crucial.	Using web applications is made friendly and simple for users of Windows. But, it's good to know that some software might work better on other systems, so picking the right tools can be important.	It is convenient and simple to use web applications on mobile devices, like phones and tablets. However, the way some web apps function on mobile devices can occasionally be impacted by their smaller screens and different features.

Development Tools	Because of its sophisticated design and potent hardware, Mac is a great platform for developers; however, in comparison to more popular systems, it might have fewer development tools and a smaller community.	Linux is a robust, free web software hosting platform with an abundance of tools and a supportive community. Those accustomed to Windows or Mac, however, might find it less familiar.	Because Windows is widely used and user-friendly, it is a good platform for hosting web applications. Although it has many tools, some may be more compatible with other operating systems, such as Linux.	Phones and tablets are great for using web apps because you can take them anywhere. However, developing apps for them can be challenging due to their small screens and disparate operating systems, such as Android and iPhone.

Recommendations

Analyze the characteristics of and techniques specific to various systems architectures and make a recommendation to The Gaming Room. Specifically, address the following:

1. **Operating Platform:** Select Ubuntu Server, a Linux distribution, for the game application. Linux provides a stable and affordable base upon which the game development requirements can be supported.

2. **Operating Systems Architectures**: Details: The monolithic kernel of Linux makes effective use of hardware resources to improve gaming performance. This simple architecture fits in nicely with Draw It or Lose It's requirements.

3. **Storage Management**: It is advised to use the open-source relational database PostgreSQL for structured data storage. It provides a strong basis for managing teams, games, and player data and integrates with Linux with ease.

4. **Memory Management**: Linux's demand paging and virtual memory techniques guarantee effective memory allocation and deallocation, enabling the best possible performance for the Draw It or Lose It program.

5. **Distributed Systems and Networks**: Establish a microservices framework utilizing RESTful APIs to facilitate smooth inter-platform communication. Tasks like user authentication, game logic, and team management can be handled independently with this design.

6. **Security**: Security precautions include implementing strong user authentication, encrypting sensitive data storage, and ensuring secure communication via HTTPS. The overall security of user data is improved by the active community support and built-in security features of Linux.