Draw It or Lose It

CS 230 Project Software Design Template

Version 1.0

Table of Contents

Document Revision History

Version	Date	Author	Comments
1.0	03/19/2023	Jordan McNairy	Update
1.1	04/02/2023	Jordan McNairy	Updated Evaluation.
1.2	04/15/2023	Jordan McNairy	Update recommendations

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

The Gaming Room plans on developing a web-based game that can operate on a wide variety of devices. The game will be titled Draw It or Lose It and will be available solely on Android for the immediate future. The goal of this game is for numerous teams of several persons to go four rounds at a minute each. When a photo is chosen from a database, one team guesses till time runs out. In the event nobody responds, each opposing team member has 15 seconds to answer.

Requirements

Design Constraints

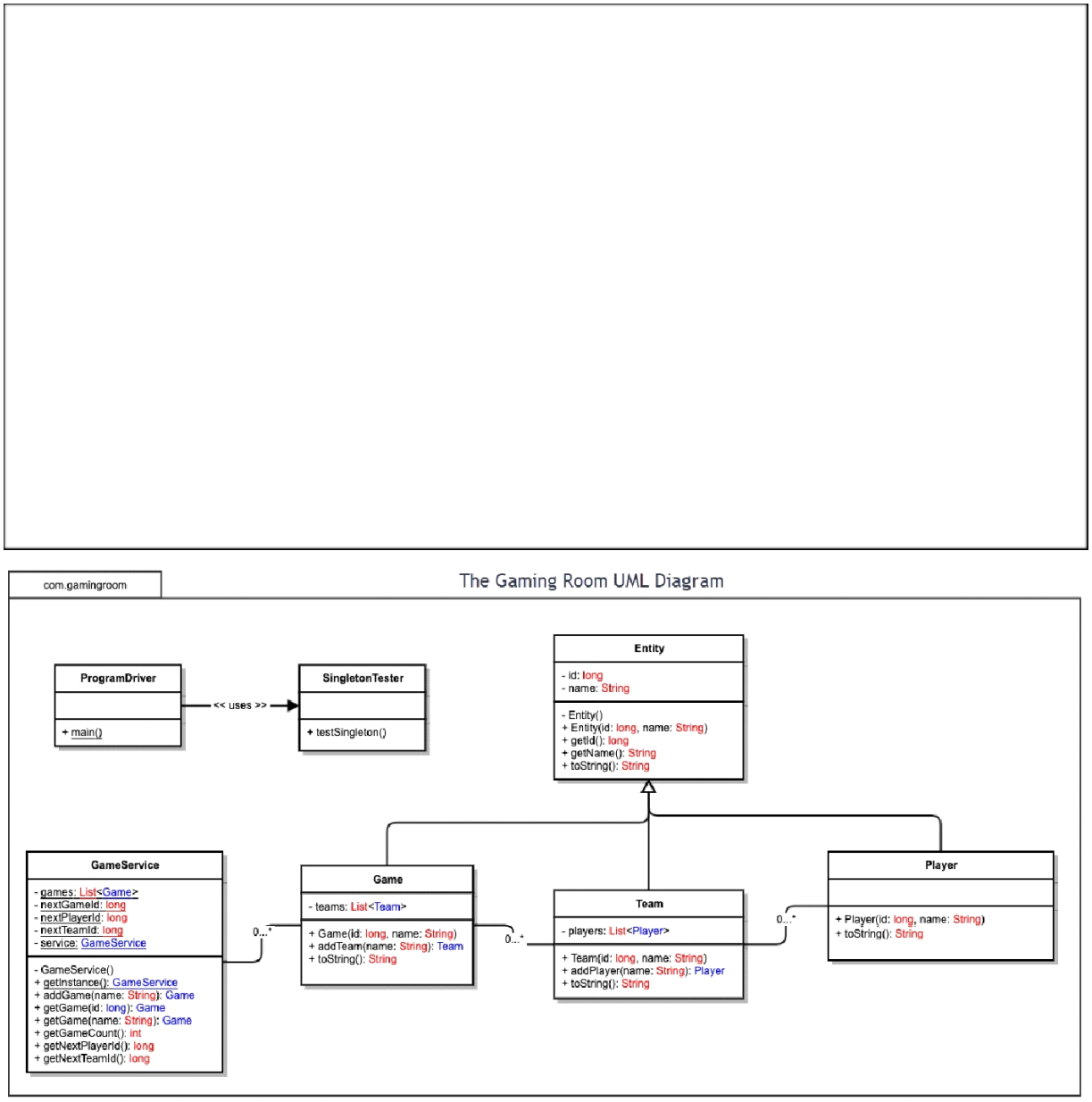
- Each team includes at least three members.
- Game and team names must be distinguishable in order for users to determine if the name is currently utilized or available.
- One or more teams are required to participate.
- There can only be one instance of the game running at any given moment.
- It must be able to run on a variety of platforms.

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

Entity creates a link between the Game, Team, and Player classes. This implies that they all inherit or get information from Entity. We can demonstrate this via inheritance in UML. As a result, common references such as "name" and "id" will be shared by each class. Entity becomes a superclass. When we look at their relationship, we can observe that Team and Player are of the "has a" variety. Game has a Team, whereas GameService has Games. Aggregation is what we term it in UML (HAS-A). It implies that it is an instance of one class and has a reference to another class's instance. Looking at this diagram, we can see that GameService has a reference to Games, Games has a reference to Tea, and Team has a reference to Player.



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.

Server side:
Each operating system provides a server-based deployment technique for hosting the website.
They can utilize an open source server based on Linux. As a result, it is free. Other tools, such as server side programming languages and scalability tools, are also free. This is general knowledge. In any event, there aren't many alternatives for servers other than Windows and Linux, as these two are the best and

have shown to be stable. Linux servers are open source, safe, free, cost effective, and require little support. Window server: private, more secure, paid, more expensive, and with greater support.
Client side:

Windows: Visual Studio Development Tool/IDE, Visual Basic Programming Language (default), It is quite difficult to create network-oriented programs in Visual Basic.
Yet it is still conceivable.

Mac: XCode Development Tool/IDE, Swift Programming Language (or Objective C), Linux Desktop Application, Development Tool/IDE – Eclipse is the most widely used. Swift (or Objective C).

Linux: Development Tool/IDE - Eclipse is the mose popular, Programming Language - C (default).
For web and mobile apps:

Web application: Run's on both the users broswer and server. Consists of HTML, CSS, JAVASCRIPT. The server side is PHP. Frameworks include: REACT , ANGULAR JS

Mobile:

Android: Android studio(default), programming languages include Java and Kotlin.

Ios: Xcode as the ide and swfit as the programming language.

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	Versatile terminal commands for configuring the server, gaining access, and making modifications. Characteristics: It is often used in web hosting. Advantages: It may be upgraded, and it includes a variety of alternatives for different web hosting needs. Disadvantages:	Linux has the same features as Mac, however it is less expensive. Characteristics: Very recommended, safe. Advantages: Because security problems are detected before they cause a problem, it is the most popular choice for web hosting services. Disadvantages:	There is more software available than on other operating systems. Characteristics: It leads the other platforms. Platform is enclosed. Advantages: High resource needs, short loading time, and excellent convenience Disadvantages: Easy virus vulnerability	It is preferable if the server is stationary and can be traced in a single location. Several devices have superior specifications. Characteristics More popular and accessible. Advantages: Having a greater reach, better interoperability, and lower costs Disadvantages: It is quite specific to many smart mobile devices.

	It is less commonly used for web hosting services. **Update:**	It is more challenging to discover programs that meet the criteria of web hosting.		Inferior security
Client Side	Moderate experience and time are necessary. The price is comparable to that of windows. What steps must be taken during the application development process to guarantee that the app is compatible with all web browser platforms and mobile devices?	Maximum expertise and time are required. Minimal cost. What should be done during the application development process to guarantee that the app is compatible with all web browser platforms and mobile devices?	Less expertise and time are required. The price is equivalent with that of a Mac. What steps must be taken during the software development process to guarantee that the app is compatible with all web browser platforms and mobile devices?	Allows clients or even developers to view updates from any location. Implementation is slightly more complicated than with other devices. -
Development Tools	Swift is the more common alternative for executing languages on Macs. It includes useful programs such as notepad++. All languages are supported by Macs. Languages include, but are not limited to, HTML/CSS/JavaScript, as well as libraries that support the frontend and general-purpose languages. Java, Python, PHP, and Ruby are examples.	Linux is compatible with Visual Studio, Eclipse, and Notepad++. Linux is capable of supporting a wide range of languages. For example, HTML/CSS/JavaScript while enabling libraries to handle both frontend and backend. They include Java, Python, PHP, and Ruby.	It is simpler to use than Linux yet can do the same functions. Most IDEs, such as Visual Studio and Eclipse, are available. Languages include, but are not limited to, HTML/CSS/JavaScript, as well as libraries that support the frontend and general-purpose languages. Java, Python, PHP, and Ruby are all available, much like Linux and Mac.	Using Android and Swift, you can develop a plethora of apps. All three devices can run both languages and applications. Languages include, but are not limited to, HTML/CSS/JavaScript, as well as libraries that support the frontend and general-purpose languages. Java, Python, PHP, and Ruby are examples.

Recommendations

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

- **Operating Platform**: For the Gaming Room's "Draw It or Lose It" application's growth and optimum performance, the Windows server operating system is recommended. Windows server OS enhances computer stability with a protected and supervisor mode. This assists in serving the client's specific demands of computers running on that network. This function guarantees that computers and users work optimally. The Windows server operating system also allows for a broad variety of server roles, such as web server, file server, application server, mail server, database server, network storage, and others. Windows server OS is designed to run on server hardware. Windows offers system administrators with an easy-to-use and familiar interface, and it is well-known for its stability and scalability. It also features a strong developer community and a diverse set of third-party apps that can be connected with the platform. Windows also includes a range of features and tools to help with administration, such as the Active Directory for managing users, computers, and resources.

- **Operating Systems Architectures**: Windows server operating system architectures include memory and file management concepts, allowing the user to control and coordinate the computer's memory to best suit their specific needs, such as allocating bits of memory to different programs and/or freeing the space when it is no longer needed for later use. Windows server provides optimal application performance on systems with many processors when multi-processor scheduling is used. Windows offers services that are utilized by all Windows-based applications. These services allow apps to display a Graphical User Interface (GUI) while accessing system resources, among other things. Graphics and multimedia, chat, and online services are additional examples of applications. These services can be accessed via a user account or a server. Additionally, Windows has the ability to support multiple processor architectures is also important as it allows for the application to run on a wide range of hardware devices. This allows the client to easily expand the program to new computing environments. It is also designed with security in mind. Windows system components are kept separate from user-mode functions, which helps prevent unwanted access to system resources. Finally, Windows has a variety of security measures that assist guard against malware and other security risks, such as Data Execution Prevention (DEP), Address Space Layout Randomization (ASLR), and User Account Control (UAC).

- **Storage Management**: Storage sense is a useful feature in Windows 10. This lets you examine and manage files on your hard disk, as well as how much space they use. Additional benefits involve the capacity to store app locations to make them simpler to find. Moreover, like with previous ways, you may store data to the cloud. The built-in storage system makes it simple to create and put files for huge projects, preventing them from being lost or accidentally destroyed. This guarantees that the machines have enough storage capacity to make changes and store data to the system without running out of space. Additionally, Windows offers DFS for storage. DFS improves data access for end users and enables administrators to manage data storage more efficiently. This is especially true for a growing application like Draw It or Lose It, which would

require a scalable and readily manageable storage solution. DFS also supports Active Directory connection, allowing for centralized access control and permission management. This guarantees that only authorized individuals have access to the data, which increases data security and compliance.

- **Memory Management**: Memory management options provided by Windows server OS include random access memory, physical and virtual address space, and memory capacities ranging from two to four gigabytes. The supported pagefile allows the system to shift virtual address space pages to the system's hard drive, freeing up the random-access memory frame for other needs/uses. You will need to construct a database or library with a large number of images while developing this game. The RAM allocation enables convenient archiving of photographs outside of the normal picture folder. Additionally, Windows utilizes demand paging, which loads only the needed bits of an application into memory rather than the complete application. This helps to minimize the system's memory footprint and allows more apps to run simultaneously. Additionally, Windows provides dynamic memory allocation, which allows programs to request extra memory as needed, in addition to memory-mapped files, which enable applications to access data stored in files directly as if it were part of their memory. These techniques contribute to ensuring that memory is used efficiently and that the system responds swiftly to the demands of the programs that operate on it.

- **Distributed Systems and Networks**: Since each operating system is different, I researched various methods to publish the game so that it would work on all platforms. Unity, allows for the building of cross-platform games. It's a game engine that can work on any device. Once the game is finished, just export the game file to the web, iOS, Android, and a variety of other platforms that support cross-play. This will aid in the management of dependencies. To avoid additional issues such as outages or connection, the corporation must ensure that its servers are efficient enough to sustain big player volumes, as well as backup power for power outages. Additionally, it is critical that the servers used to host the game be efficient and scalable enough to manage huge numbers of players. As previously indicated, load balancers and containerization technologies such as Docker or Kubernetes can be used to do this. Also consider distributing game assets to players using a content delivery network (CDN). A CDN can improve game speed by storing material closer to the players and decreasing latency. Finally, installing an entire monitoring and alerting system could assist in quick detection and resolution of issues, limiting downtime and maintaining seamless gaming for all participants.

- **Security**: Nevertheless, using another source to safeguard user data and information is encouraged. But, when it comes to what is on the laptop, Windows comes pre-installed with protection. This system does a malware, virus, and security threat scan. Everything happens in real time, and because threats change, the system automatically adapts to keep the system and user data safe. Additionally, we advocate implementing a Security Information and Event Management (SIEM) system to monitor network activities and detect possible security risks in real-time. This can be enhanced by a Security Operations Center (SOC) to offer 24 hours a day, seven days a week monitoring and reaction to safety concerns. Finally, it is critical to perform frequent security assessments and penetration testing to detect and repair system vulnerabilities before they are exploited by cybercriminals. This could help in ensuring that The Gaming Room's Draw It or Lose It game is secure and safe from possible threats.