

# **CS 230 Project Software Design Template**

Version 1.0

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## [Document Revision History](#_grjogdjh5fi8)

| Version | Date | Author | Comments |
| --- | --- | --- | --- |
| 1.0 | 05/22/23 | Londelle Sheehan |  |

## [Executive Summary](#_sbfa50wo7nsh)

The Gaming Room plans to create a web-based game that can be played on several devices. "Draw It or Lose It" is the title of the game, which is solely accessible on Android for now. This game's objective is to have numerous teams made up of several players go through four rounds at a minute each. One team makes estimates up until the timer goes off when a photo is selected from a library of images. If not, until the allotted 15 seconds have passed, each member of the opposing side may respond.

## Requirements

## [Design Constraints](#_2et92p0)

These are the specifications that must be adhered to when writing code and software. We still need to consider application development even though this is merely the game-related part. This needs to work on all platforms, according to The Gaming Room. This indicates that while we now have it on Android, we still need to integrate it into another mobile platform. together with devices running Linux, Windows, and Apple. In order to accomplish this, we will either need to rewrite the code in swift for (Apple devices) or discover a way to leverage existing code that can be run on other devices by inheriting other languages. similar to how we combine several computer languages to create stronger code.

## [System Architecture View](#_ilbxbyevv6b6)

## [Domain Model](#_8h2ehzxfam4o)

Entity establishes a connection between the classes of Game, Team, and Player. This implies that they all receive information from Entity or inherit it. We can demonstrate this using inheritance in UML. Therefore, common references like "name" and "id" will be shared by each class. creating a superclass for Entity. Team and Player are a "has a" type when we examine their relationship. GameService has Games, while Game has a Team. We refer to it as aggregation (HAS-A) while using UML. A user "has a" when I say that they have both an instance of one class and a reference to an instance of another class. This diagram shows that GameService has a reference to Games, Games has a reference to Tea, and Team has a reference to Players.

**"The Gaming Room UML diagram. The top of the diagram is labeled as com dot gamingroom. Test boxes are placed in two layers. The first layer has three text boxes and the second layer has four of them. In the first layer, the 'ProgramDriver' textbox points to 'SingletonTester' textbox. The 'ProgramDriver' textbox contains the text 'asterisk main round brackets.' The 'SingletonTester' textbox contains the text 'asterisk testSingleton round brackets.' The arrow between these two text boxes are labeled 'open two angle brackets uses close two angle brackets'. In the second layer, there are 'GameService', 'Game', 'Team', and 'Player' text boxes. The 'GameService' textbox has texts arranged in two layers. The first layer contains games colon List open angle bracket Game close angle bracket, nextGamesId colon long, nextPlayer Id colon long, nextTeamId colon long, and service colon GameService. The second layer contains GameService round brackets, getinstance round brackets colon GameService, addGame open parenthesis name colon String close parenthesis colon Game, getGame open parenthesis id colon long close open parenthesis colon Game, getGame open open parenthesis name colon String close open parenthesis colon Game, getGameCount round brackets colon int, getNextPlayerID round brackets colon long, and getNextTeamId round brackets colon long. The 'GameService' box is connected with the 'Game' textbox with a line labeled 'zero dot dt dot asterisk'.  The 'Game' textbox also contains text in two layers. The first layers contains the text teams colon List open angle bracket Team close angle bracket. The second layer has Game open round bracket id colon long comma name colon String close parenthesis, addTeam open parenthesis name colon String close parenthesis Team, toString round brackets colon String. The 'Game' textbox is connected with the 'Team' textbox with a line labeled 'zero dot dt dot asterisk'. The 'Team' textbox also contains text in two layers. The first layers contains the text players colon List open angle bracket Player close angle bracket. The second layer has Team open parenthesis id colon long comma name colon String close parenthesis, addPlayer open parenthesis name colon String close parenthesis colon Player, and toString round brackets colon String. The 'Team' textbox is connected with the 'Player' textbox with a line labeled 'zero dot dt dot asterisk'. It contains the text Player open parenthesis id colon long comma name colon String close parenthesis and toString round brackets colon String. The 'Game', the 'Team, and the 'Player' boxes point to the 'Entity' textbox in first layer. The 'Entity' textbox contains text in two layers. The first layer has the text id colon long and name colon String. The second layer has Entity round brackets, Entity open parenthesis id colon long comma name colon String close parenthesis, getId round brackets colon long, getName round brackets colon String, toString round brackets colon String.**

## [Evaluation](#_2o15spng8stw)

| **Development Requirements** | **Mac** | **Linux** | **Windows** | **Mobile Devices** |
| --- | --- | --- | --- | --- |
| **Server Side** | Flexible terminal commands to access, modify, or configure the server.  -Features: It is well-liked in web hosting  -Benefits include upgradeability and a range of solutions for diverse web hosting needs.  -It is less popular for web hosting services, which is a drawback. | Characteristics: most recommended, safe.  Advantages: The best option for web hosting services since security problems are discovered before they cause a problem  Disadvantages: Finding programs to meet the needs of web hosting is more challenging. | Compared to other OSs, there is more software available.  Characteristics: Compared to other platforms, it is dominant. compact platform  Advantages: High comfortability, low loading times, and resource needs  Disadvantages: simple malware vulnerability, inadequate tech support | It is preferable if the server is immobile and can be tracked in a single place.  Other devices have superior specifications.  Characteristics: More widespread and highly portable.  Advantages: must be more widespread, compatible, and economical  Disadvantages: It is really picky when it comes to different smart mobile devices. Lack of security |
| **Client Side** | Moderate expertise and time required. Cost similar to windows. What is required of the application development process to ensure the application is compatible with all web browser platforms and mobile devices? | Maximum skill and effort are needed. Minimum price. What steps must be taken during the application development process to guarantee that the app is compatible with all mobile and web browser platforms? | Minimum expertise and time required. Cost similar to mac. What is required of the application development process to ensure the application is compatible with all web browser platforms and mobile devices? | What steps must be taken during the application development process to guarantee that the app is compatible with all mobile and web browser platforms? Allows clients or even developers the flexibility to access updates wherever they are. a little more challenging to use than other gadgets. |
| **Development Tools** | Swift is the more preferred option for executing languages on a Mac. while incorporating pleasant tools like notepad++. Although all languages can be run on Macs. Languages supported by libraries for frontend and general-purpose languages include but are not limited to HTML, CSS, and JavaScript. These include Ruby, PHP, Python, and Java. | Linux users can use notepad++, eclipse, and visual studio to create a good and user-friendly program. together with numerous additional tools and languages. Languages supported by libraries for frontend and general-purpose languages include but are not limited to HTML, CSS, and JavaScript. These include Ruby, PHP, Python, and Java. | Though easier to use than Linux, it can perform similarly. Eclipse and Visual Studio are just two examples of the numerous languages. Additionally, notepad++ is a tool that is easy to use and has many tools. Languages include, but are not limited to, HTML, CSS, and JavaScript, and libraries are available to support both front-end and general-purpose languages. Ruby, PHP, Python, and Java are some examples. | Numerous apps may be made utilizing swift and android. On all three devices, it is possible to run software and languages. Languages supported by libraries for frontend and general-purpose languages include but are not limited to HTML, CSS, and JavaScript. These include Ruby, PHP, Python, and Java. |

## 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** Operating Platform: I advise using a cloud-based operating platform to expand Draw It or Lose It to various computer environments. Scalability, flexibility, and the ability to deploy the game across numerous operating systems and architectures without any hassle are all provided by cloud platforms. Amazon Web Services (AWS) is a good choice since it provides a stable and feature-rich environment for hosting and administering applications.
2. **Operating Systems Architectures**: The intended audience, performance requirements, and compatibility with the game's technology stack all influence the choice of operating system architecture. I advise using Linux-based architectures for a game like Draw It or Lose It, which needs to work with several operating systems. Due to their widespread usage, community support, and interoperability with well-liked game development technologies, Ubuntu or Amazon Linux, delivered by AWS, are ideal options.
3. **Storage management:** I advise utilizing AWS storage solutions, particularly Amazon S3 (Simple Storage Service), to handle data storage effectively. Amazon S3 provides scalable, dependable, and always accessible object storage making it ideal for managing game-related data, user information, and assets.
4. **Memory Management:** The suggested operating system incorporates its Linux- or MacOS-specific memory management techniques. In order to manage and allocate memory resources as efficiently as possible, Linux uses paging and virtual memory management techniques, whereas automatic reference counting (ARC), virtual memory, and memory mapping techniques, similar to those employed by Windows, are used by macOS. The Draw It or Lose It software can improve system resource usage and guarantee fluid gameplay by making use of these built-in memory management capabilities.
5. **Distributed Systems and Networks:** To enable the game’s communication between platforms, I recommend using a distributed software architecture that makes use of APIs or a client-server strategy. Common protocols like HTTP or WebSocket can make it easier to communicate online. I will also make that the appropriate levels of fault tolerance and error handling are in place to handle connectivity issues and outages.
6. **Security:** I recommend the game to have strong security measures in place to protect user information. By using virtual private clouds (VPC), firewalls, access control options, and encryption services and using secure coding practices, we can ensure the confidentiality, integrity, and availability of game’s user information.