

Draw It or Lose It

# **CS 230 Project Software Design Template**

Version 1.0

## Table of Contents

[**CS 230 Project Software Design Template** 1](#_Toc115077317)

[**Table of Contents 2**](#_Toc115077318)

[**Document Revision History 2**](#_Toc115077319)

[**Executive Summary 3**](#_Toc115077320)

[**Requirements 3**](#_Toc115077321)

[**Design Constraints 3**](#_Toc115077322)

[**System Architecture View 3**](#_Toc115077323)

[**Domain Model 3**](#_Toc115077324)

[**Evaluation 4**](#_Toc115077325)

[**Recommendations 5**](#_Toc115077326)

## [Document Revision History](#_grjogdjh5fi8)

| Version | Date | Author | Comments |
| --- | --- | --- | --- |
| 1.0 | 11/17/2024 | Kieran Brennan | Summary and identification of design constraints |
| 2.0 | 12/1/2024 | Kieran Brennan | Server side and client side |

**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](#_sbfa50wo7nsh)

The main objective of the game Draw It or Lose It is to generate random images from a pre-defined library that render at a steady rate over 30 seconds. The players guess what the image is before the 30 second mark, but if they are not able to guess correctly the opposing team will have 15 seconds to guess for themselves. The must be the ability to have more than one team and the players will name the teams themselves. The game will last for four rounds.

## Requirements

The requirements are:

1. One or more teams.

2. Library of images that are selected at random.

3. Ability to load over 30 seconds and end the round if guessed correctly.

4. Second team gets to guess if the 30 seconds is up.

5. 4 rounds with images for both teams being one round.

6. Team names will be created by the players.

## [Design Constraints](#_2et92p0)

Some design constraints with web-based applications are compatibility, security, experience, internet dependency, and restricted functionality. Web-based applications have to be compatible with multiple browsers that players might use. Often times they are less secure than local games. The experience of a web-based games is at a disadvantage compared to a local game. The experience is what keeps players coming back to play. Players are dependent on the internet to access the game with a web-based app. This is a disadvantage compared to locally stored games that can be played anywhere. There is a restricted functionality of web-based applications compared to local games. They must connect to an off site server that can slow speeds.

## [System Architecture View](#_ilbxbyevv6b6)

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](#_8h2ehzxfam4o)

<Describe the UML class diagram provided below. Explain how the classes relate to each other. Identify any object-oriented programming principles that are demonstrated in the diagram and how they are used to fulfill the software requirements efficiently.>

**"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)

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** | MacOS is a proprietary OS that is made to only run on Mac products. Its advantages are consistent software that works for Mac like Apache, Adobe, other programs made for mac. It also has good security. Its disadvantages are high cost, and limited choices for as a lot of programs do not run on mac. | Linux is a open source OS that is free in most cases. Its advantages are that it can run on any machine, low cost and has a wide variety of development options. Its disadvantages are that it is less used than windows or Mac and can be more complex to manage. | Windows is a proprietary software that is the most common. It is widely available on most machines and is in the middle cost wise. Its advantages are it has a lot of tools for development. Disadvantages are based on cost the fact that it is a proprietary OS. | Will have to use one of the following OS to host the server for mobile devices. Have to decide how to host for Andoid and iOS. |
| **Client Side** | The cost for development for Mac can be more than other OS. There are specific programs that you use to develop on Mac and if you are not an expert it could take more time. It is less likely to find experts on Mac than other OS. | The cost for linux is low compared to other OS. The time to develop is similar to the other OS but it can be more complex and might require someone who is an expert in Linux. | Cost for windows can be relatively high. Time constraints are less common due to the most experts. Experts in .net framework would be beneficial. | Cost for development can be high because you need different languages for different mobile OS (android, iOS). Swift is the language for iOS and kotlin for android. |
| **Development Tools** | Program tools on Mac are Objective-C, C++, and Swift. The IDE on Mac is XCode. | Programming languages in Linux are almost all of them. Including C++, python, java, etc... This makes it a popular choice. The IDE available are IntelliJ IDEA, Eclipse, visual studio... | Programming languages are C++,C# , java, python, etc. Most common choices for IDE is Visual studio. | For Android they use android studio with kotlin and java. For iOS they use xcode and swift and objective-C is most common. |

## 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**: Based on my research I would recommend the windows operating platform. It has a medium price point and has a significant number of tools to achieve our goal. It is also the most common OS, which will help integration.
2. **Operating Systems Architectures**: The Windows operating architecture is made up of the user mode and kernel mode. User mode has limited access to memory and storage while kernel mode has access to everything. Windows uses three subsystems to integrate between kernel and user mode called Win32, OS/2, and POSIX.
3. **Storage Management**: We would recommend Microsoft Azure, it is the most common management tool for fortune 500 companies and provides Storage Management as a tool. Azure provides Blob storage which is a scalable object storage and Archive storage which is a secure cloud-based storage that is low cost, durable and highly available.
4. **Memory Management**: Windows Hyper-V and VMs that come with a windows server have support up to 248GB of RAM. This is considerably more than would be needed for Draw It or Lose It.
5. **Distributed Systems and Networks**: Using a cloud-based architecture like Windows Server 2025 ensures that the game will always be available as Windows will provide redundancy.
6. **Security**: Security in Windows Server 2025 is managed with Windows Local Administrator Password Solution, Security Baseline - By implementing a customized security baseline, you can establish security measures right from the beginning for your device or VM role based on the recommended security posture, Secure certificate management.