

Draw It or Lose It

# **CS 230 Project Software Design Template**

Version 1.0

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## [Document Revision History](#_grjogdjh5fi8)

| Version | Date | Author | Comments |
| --- | --- | --- | --- |
| 1.0 | 11/12/22 | Vincent Messina | Updated Executive Summary, Design Constraints, and Domain Mode |
| 2.0 | 11/27/22 | Vincent Messina | Updated Development Requirements under Evaluation |
| 3.0 | 12/11/22 | Vincent Messina | Updated Recommendations |

## [Executive Summary](#_sbfa50wo7nsh)

The Gaming Room wants to develop a web-based game that serves multiple platforms based on their current game, Draw It or Lose It, which is currently available in an Android app only. The Gaming Room needs help setting up the environment. The game consists of multiple teams with several players going four rounds at a minute each. Drawings are rendered at a steady rate and are complete at the 30-second mark. If the team does not guess the puzzle before time expires, the remaining teams have an opportunity to offer one guess each to solve the puzzle with a 15 second time limit.

## [Design Constraints](#_2et92p0)

1. The game must have the ability to have one or more teams involved.
2. Each team needs to have multiple players assigned to it.
3. Game and team names must be unique.
4. The users must be able to check whether a name is in use when choosing a team name.
5. Only one instance of the game can exist in memory at any given time.
6. The game needs to run on multiple platforms.

## [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)

Entity creates a relationship between the game, team, and player classes. They all inherit information from Entity. Each class share common references such as “name” and “id”. Therefore, Entity is a super class. The Team and Player classes have a “has a” relationship. This is called aggregation. It means they have an instance of one class and a reference to an instance to another class.

**"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** | Mac has many terminal commands to configure and access the server. An advantage of Mac is it has many different options for web hosting requirements. A weakness of Mac is that it is least used for web hosting. | Linux has many terminal commands to configure and access the server. Linux is also cost effective. Linux offers the best security and is an open-source OS. An advantage of Linux is security breaches are caught before they become an issue. Linux is the best OS when it comes to security. A disadvantage of Linux is that it is complicated to use. It is difficult to find the right applications to support web hosting. | Windows is the most used out of the three. It is user friendly and has much more available software compared to Mac and Linux. An advantage of Windows is its fast-loading time. Window is also user friendly. A disadvantage of Windows is its security. Windows is easily susceptible to viruses. | Mobile devices are the most popular and are highly portable. An advantage of mobile devices is that they are cost-effective. Mobile devices also are very popular and are compatible. A disadvantage of mobile devices is that they have poor security. Another is there are many different kinds of mobile devices each with their own OS. |
| **Client Side** | Mac requires moderate expertise to consider for software development. The cost of development on Mac is generally average and is similar to cost on Windows. The time for software development can range based on how large the app is and many other requirements. If it can be built under 700 hours, the cost can be in the lower price range. | Linux requires maximum expertise to consider for software development because of its difficulty. The cost of development on Linux is generally very low. The time for software development can range based on the size of the team and many other requirements. | Windows requires minimum expertise to consider for software development. The cost of development on Windows is generally average and is similar to cost on Mac. The time for software development can range based on the size of the project and many other requirements. If it can be built in under 700 hours, the cost can be in the lower price range. | Mobile devices require moderate expertise to consider for software development. The cost of development on mobile devices is generally high because of the many different smart devices and OS it needs to be built on. The time for software development can range but generally takes longer for mobile devices. |
| **Development Tools** | Mac’s most relevant programming language is Objective C. Some other relevant languages are C, C++, Swift, and Assembly. Some IDEs and tools are Atom, Apple Developer Tools, Xcode, NetBeans, Komodo IDE, and Eclipse. | Some of Linux’s relevant languages are C, C++, Java, Python, JavaScript, and Swift. Some IDEs and tools are Eclipse, NetBeans, CodeLite, Geany, KDevelop, Atom, IntelliJ IDEA, and Komodo Edit. | Window’s most relevant programming language is C. Some other relevant languages are JavaScript, Python, Java, Kotlin, PHP, C#, Swift, and C++. Some IDEs and tools are Visual Studio, Code::Blocks, PyCharm, Eclipse, IntelliJ IDEA, Visual Studio. | Some relevant programming languages for mobile devices are Java, Python, C++, Kotlin, and Rust. Some IDEs and tools are Android Studio, Qt, Xcode, Eclipse, JetBrains Rider, Visual Studio, DroidScript. |

## 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**: Windows is an excellent OS for The Gaming Room. Windows computers dominate in the US with over 76% of computers running the Windows OS alone. Using Windows will expand Draw It or Lose It to other computing environments.
2. **Operating Systems Architectures**: The Windows Architecture consists of two main components, user mode and kernel mode. User mode is made up of different DLLs and system defined processes. There are three main subsystems in User mode: Win32, OS/2, and POSIX. Kernel mode has full access to the hardware and system resources of the computer. Kernel mode also runs code in a protected memory area.
3. **Storage Management**: Windows uses Windows Storage Management Provider to manage storage configurations. It can be used with single disk desktops and even external storage.
4. **Memory Management**: Windows uses memory compression as a memory management technique. Memory compression is a memory management technique that reduces the size of inactive data in the RAM to free up unused space and allow more programs to run at once.
5. **Distributed Systems and Networks**: Windows uses Windows SoftwareDistrution to preload updates and hotfixes before installing them. This can also be used to distribute other software and applications to all end users within a network across all different operating systems without user intervention. These system and network components allow Draw It or Lose It to communicate between various platforms.
6. **Security**: Windows security provides many tools to protect user computers and data. It has virus and threat protection, account protection, firewall and network protection, app and browser control, device security, device performance and health, and family options.