

<Draw It or Lose It>

# **CS 230 Project Software Design Template**

Version 1.0

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| Version | Date | Author | Comments |
| --- | --- | --- | --- |
| 1.0 | <01/26/yy> | Dhiraj Gurung | Project One: Iteration 1 |

**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](#_heading=h.35nkun2)

The client The Gaming Room is looking to develop a web-based application for game Draw It or Lose It. It is currently only available as an Android app but they are looking to make it available for other platforms like Mac, Linux, and Windows. The client is also requesting some key requirements that must be added to the game: the ability to have one or more teams, each team to have multiple players, unique game and team names, and to have only one instance of a game in memory at any given time.

## 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](#_heading=h.1ksv4uv)

1. **Creating a Cross-Compatible Application:** Since the app will be a web-based application there are some features that may be easier to implement in one browser over the other. For example, some requirements may be easier to implement for Chrome users than it is for Safari users. The implications of creating a cross-compatible application mean that more time and effort will be needed to ensure that a feature works for all of the platforms. Additionally, this also means that there will be an added financial cost as well because more time spent means more money spent paying for the development costs.
2. **Time and Budget:** Although not explicitly stated time and budget are always a constraint for development. Resources are finite and therefore the app development should be done in an efficient manner so as to not waste both time and money with redundant coding and testing. The higher the budget the more time and resources that can be spent trying to refine the app.
3. **Server Size and Long-Term Sustainability:** Since the game will be played by players in real-time across the web there needs to be adequate money spent on servers. This is done not only to host the games but also to handle the number of players playing at any given time without laggy or glitchy gameplay. The active player base is one factor in determining how big the server size is and how much money should be spent to maintain it.

## [System Architecture View](#_heading=h.44sinio)

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](#_heading=h.2jxsxqh)

**"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.**

The UML diagram above shows the classes that exist within the Draw It or Lose It app and how they interact with each other. One object-oriented principle that can be found within the diagram is inheritance because the Entity class serves as a base class for the Game, Team, and Player classes. This means that the Game, Team, and Player classes are derived classes and can access all the protected and public members of the Entity class. An example of run-time polymorphism within the derived classes is the toString function because each of the derived classes has its own version of the toString function which they are overriding from the Entity class.

The GameService class has an association relationship with the Game class and a zero-to-many multiplicity. The same relationship and multiplicity applies to the Game and Team Class as well as the Team and Player class.

The ProgramDriver class is the driver that starts off the program. It uses a singleton class design pattern ensuring that only one instance of the GameService class will be used throughout the whole application. The <<uses>> also indicates a dependency relationship with the SingletonTester class.

## [Evaluation](#_heading=h.z337ya)

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** | <Evaluate Mac for its characteristics, advantages, and weaknesses for hosting a web-based software application.> | <Evaluate Linux for its characteristics, advantages, and weaknesses for hosting a web-based software application.> | <Evaluate Windows for its characteristics, advantages, and weaknesses for hosting a web-based software application.> | <Evaluate Mobile Devices for their characteristics, advantages, and weaknesses for hosting a web-based software application.> |
| **Client Side** | <Determine the software development considerations (cost, time, expertise) that are necessary for supporting multiple types of clients as they pertain to Mac.> | <Determine the software development considerations (cost, time, expertise) that are necessary for supporting multiple types of clients as they pertain to Linux.> | <Determine the software development considerations (cost, time, expertise) that are necessary for supporting multiple types of clients as they pertain to Windows.> | <Determine the software development considerations (cost, time, expertise) that are necessary for supporting multiple types of clients as they pertain to Mobile Devices.> |
| **Development Tools** | <Identify the relevant programming languages and tools (IDEs and other tools) that are used to build this type of software for deploying on Mac.> | <Identify the relevant programming languages and tools (IDEs and other tools) that are used to build this type of software for deploying on Linux.> | <Identify the relevant programming languages and tools (IDEs and other tools) that are used to build this type of software for deploying on Windows.> | <Identify the relevant programming languages and tools (IDEs and other tools) that are used to build this type of software for deploying on Mobile Devices.> |

## 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**: <Recommend an appropriate operating platform that will allow The Gaming Room to expand Draw It or Lose It to other computing environments.>
2. **Operating Systems Architectures**: <Describe the details of the chosen operating platform architectures.>
3. **Storage Management**: <Identify an appropriate storage management system to be used with the recommended operating platform.>
4. **Memory Management**: <Explain how the recommended operating platform uses memory management techniques for the Draw It or Lose It software.>
5. **Distributed Systems and Networks**: <Knowing that the client would like Draw It or Lose It to communicate between various platforms, explain how this may be accomplished with distributed software and the network that connects the devices. Consider the dependencies between the components within the distributed systems and networks (connectivity, outages, and so on).>
6. **Security**: <Security is a must-have for the client. Explain how to protect user information on and between various platforms. Consider the user protection and security capabilities of the recommended operating platform.>