



<Draw It or Lose It>  
**CS 230 Project Software Design Template**  
Version 1.0

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## Document Revision History

Version	Date	Author	Comments
1.0	<10/17/2024>	<Vinita Ravivarma>	<Brief description of changes in this revision>

## 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

<Write a summary to introduce the software design problem and present a solution. Be sure to provide the client with any critical information they must know in order to proceed with the process you are proposing.>

## 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

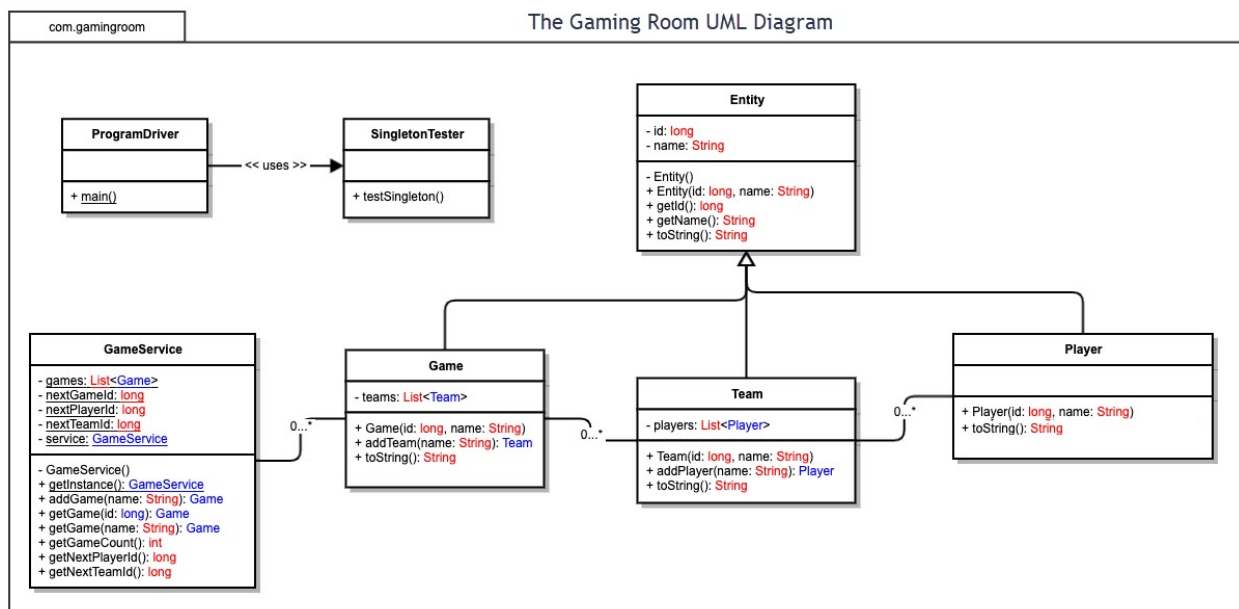
<Identify the design constraints for developing the game application in a web-based distributed environment and explain the implications of the design constraints on application development.>

## 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

<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.>



## 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.

In each cell, remove the bracketed prompt and write your own paragraph response covering the indicated information.

<b>Development Requirements</b>	<b>Mac</b>	<b>Linux</b>	<b>Windows</b>	<b>Mobile Devices</b>
<b>Server Side</b>	<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.>
<b>Client Side</b>	<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.>
<b>Development Tools</b>	<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.> It's recommended that The Gaming Room must utilize cloud-based server platforms for expanding Draw It or Lose It to other computing environments after a thorough analysis. Specifically, Amazon Web Services (AWS) is also recommended based on its robust infrastructure, global presence, and an extensive set of services altered for scaling and hosting applications.
2. **Operating Systems Architectures:** <Describe the details of the chosen operating platform architectures.> The AWS infrastructure provides a range of operating systems options for virtual machines, especially for Ubuntu, Amazon Linux, Windows Server, and more. In addition, AWS offers some container-based services such as Amazon ECS and maintainable Kubernetes services, allowing for containerized applications to run on multiple operating systems. Furthermore, AWS Lambda also supports serverless computing, removing the need for handling underlying operating systems.
3. **Storage Management:** <Identify an appropriate storage management system to be used with the recommended operating platform.> AWS offers a comprehensive set of storage solutions that may cater to different needs which are Amazon S3, Amazon EBS, and Amazon RDS for an effective storage management. In general, Amazon S3 (Simple Storage Service) that can be utilized for scalable object storage, making it a good idea for storing game assets, images, and other binary data. On the other hand, Amazon EBS (Elastic Block Store) distributes persistent block-level storage for EC2 instances, which are suitable for hosting the databases and game application. Amazon RDS (Relational Database Service) offers some manageable solutions for databases, establishing efficient data management and reliability.
4. **Memory Management:** <Explain how the recommended operating platform uses memory management techniques for the Draw It or Lose It software.> AWS provides automatic memory management for its main services. EC2 instances can be chosen based on memory requirements, and users may also select different instance types that are optimized for memory-intensive workloads. AWS Lambda automatically handles memory management for serverless functions, allowing developers specify the amount of memory required.
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).> In order to enable communication between various platforms, AWS offers a range of networking solutions which are Amazon VPC, Amazon Direct Connect, and Amazon Global Accelerator. Amazon VPC means virtual private cloud that allows individuals to create isolated network environments, establishing secure communication between the application's different components. Basically, AWS direct connect provides a dedicated network connection between AWS and on-premises infrastructure, making sure it has high-throughput communication and low-latency. Furthermore, AWS Global Accelerator optimizes the routing of traffic over the AWS global network, strengthening the performance/availability of the application. Overall, consideration must be given to the dependencies between components. Load balancing,

implementing redundancy, and failover mechanisms are the most critical stuff to mitigate outages or connectivity problems.

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.> Security is the most important part for clients and servers. However, AWS offers a range of security features and services like AWS IAM (Identity and Access Management), AWS WAF (Web Application Firewall), and AWS Key Management Service (KMS). AWS IAM (Identity and Access Management) permits for fine-grained control over user authorizations and access to resources. According to the situation, AWS WAF (Web Application Firewall) and AWS shield provides secure protection against DDoS attacks and other similar web application vulnerabilities. AWS Key Management Service (KMS) allows the encryption of sensitive data at rest. Additionally, daily security audits, monitoring, and incident response procedures must be established to make sure user information is continuously protected. The Gaming Room may create protective, scalable, and reliable infrastructures to expand Draw It or Lose It across multiple computing environments by leveraging the AWS capabilities.