COMSATS University Islamabad, Abbottabad Campus
Department of Computer Science
MIDTERM EXAMINATION SPRING 2023

Class: BSE-7A/7B
Subject: Game Development
Time Allowed: 90 Minutes
Instructor: Mr. Ibtisam Gul
Max Marks: 50

Instructions:

1. Clearly mention the question number and part number in your answer script.
2. Don't attempt extra questions, as only the first one will be marked.
3. Follow the NOTE given in each question.

Q.1 Fundamental concepts of Game Development.

(NOTE: Do any 1 from long questions and any 2 from short questions)
(Total Marks: 20)

Long Questions (Marks: 10)

A. C# scripting is widely used in Unity for game development. Explain the use of variables in methods and the significance of the [SerializeField] attribute. Compare the usage of [SerializeField] with public fields, highlighting their advantages and disadvantages.

B. Effectors in Unity allow for advanced physics interactions. Discuss the concept of effectors and their usage in Unity game development. Provide examples of scenarios where effectors can be applied to enhance gameplay mechanics.

C. Scriptable Objects are a powerful asset management tool in Unity. Explain the concept of Scriptable Objects and their usage in game development. Discuss the advantages and use cases of Scriptable Objects, providing examples to support your explanation.

Short Questions (Marks: 10)

A. Describe the concept of canvas in Unity’s UI system.
B. What is the purpose of Rigidbody2D in Unity?
C. Compare and contrast the concepts of screen space and world space in Unity's UI system.
D. How can sound effects be incorporated into Unity games?
E. Explain the role of SceneManager in Unity.
F. Discuss the significance of using the Print to Console function in Unity.

Q.2 Using different assets (game objects, components, scripts, and animations).

(NOTE: Do any 2 from long questions and any 4 from short questions)
(Total Marks: 40)

Long Questions (Marks: 20)

A. Implementing character movement is a fundamental aspect of game development. Explain how to achieve 2D game object movement using the transform.Rotate() and transform.Translate() functions in Unity. Provide a code snippet illustrating the implementation of these functions in a game scenario.

B. Collision detection plays a crucial role in game development. Discuss the implementation of collision detection in Unity, focusing on 2D colliders and triggers. Provide code examples to demonstrate the usage of colliders and triggers in a game scenario.

C. Tile Palette and Tilemap are powerful tools in Unity for designing game levels. Explain the concept of Tile Palette and how it can be used in conjunction with Tilemap to design and compose game levels. Provide step-by-step instructions and code snippets to demonstrate the usage of Tile Palette and Tilemap.

D. Buttons are commonly used for user interaction in games. Explain the concept of a button in Unity's UI system. Discuss the events and functionalities associated with buttons and provide code snippets to demonstrate their implementation.

E. Sprite Shape is a versatile game object in Unity. Explain the concept of Sprite Shape and how it can be utilized to create complex and dynamic 2D environments. Provide step-by-step instructions to demonstrate the use of Sprite Shape.

F. Rule Tile is a versatile feature in Unity for creating tile-based levels. Discuss the concept of Rule Tile and its usage in designing levels. Provide examples to illustrate the implementation of Rule Tile in a game scenario.

Short Questions (Marks: 20)

A. How can lists be used in C# for game development?
B. Describe the process of creating 2D animations using sprite sheets in Unity.
C. How can Rigidbody2D be used to apply different physics properties, such as torque and force, to game objects in Unity?
D. Discuss the concept of crash detection in Unity. How can crash detection be implemented to handle collisions between game objects?
E. Describe the process of creating and using particle effects in Unity.
F. How can we use Unity input system to get user input?
G. How can colliders be applied to a Tilemap in Unity?
H. How can framerate independence be achieved in Unity?

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Q 1. Understanding Fundamental Concepts of Game Development. (CLO-1, C2, 10 marks)
a. Discuss the purpose of the Update and FixedUpdate functions in Unity scripting.
b. Describe one method for implementing a scoring system in a Unity game.

Q 2. Creating Assets and Scenes for a Game Scenario. (CLO-2, C6, 10 marks)
a. Compose the steps involved in creating mountains and canyons landscape using Unity's Terrain system.
b. Analyze the concept of object hierarchies in Unity and provide an example of when they might be useful.

Q 3. Creating Animations for a Game Scenario. (CLO-3, C6, 10 marks)
a. Compose the steps involved in creating a basic animation using Timeline in Unity.
b. Visualize the concept of Cinemachine in Unity and how can it be used to create a follow camera?
