COLOR SWITCH

CSE 201: Advanced Programming

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Implementation and Features:

1) **Main Menu:** Used to start new game, or load any saved game, to open game rules/instructions, to open leaderboard for highest score, and to select day/night mode.
2) On starting a new game, player is taken to the game screen, with different kind of multi-colored obstacles containing stars.
3) On loading a saved game, player is taken to the game screen with the player ball and obstacles at exact positions where game was left.
4) **Game screen:** Contains current score, stars collected, and highest score, obstacles and player ball.
5) **Star collection** : Each time the player collides with a star, it is added to the player's star count for that particular game, and score is incremented by 1.
6) Game screen has **3 levels with obstacles of increasing difficulty** based on player's score:
    a) **Scenes Easy - 6 obstacles** : Circle , Square , Rhombus , Vertical Lines , Horizontal Lines , Plus Sign
    b) **Scenes Medium - 6 Obstacles** : Concentric Circles (2) , Concentric Squares (2) , Concentric Rhombuses (2) , Vertical Lines , Horizontal Lines , Plus Sign
    c) **Scenes Difficult - 6 Obstacles** : Concentric Circles (3) , Concentric Squares (3) , Horizontal Lines (3) , Vertical Lines , Horizontal Lines (2 parallel lines) , Plus Sign
7) **Pause Menu:** Player can press 'P' to pause game at any time. Option available in pause menu are: resume game, restart game, to open game rules/instructions, and exit to main menu.
8) **Save Game and Restart Game options** : Player can save multiple game states. Player can also restart the same game at any point of time.
9) **Game End Alert Box:** On collision with an obstacle of color other than that of player, the game end alert box is thrown with following options: resurrect, restart game, open game rules/instructions, and exit to main menu.
10) **Resurrection**: Player can resurrect if number of starts collected >=10, and a new game with same score but 10 stars deducted would be started.
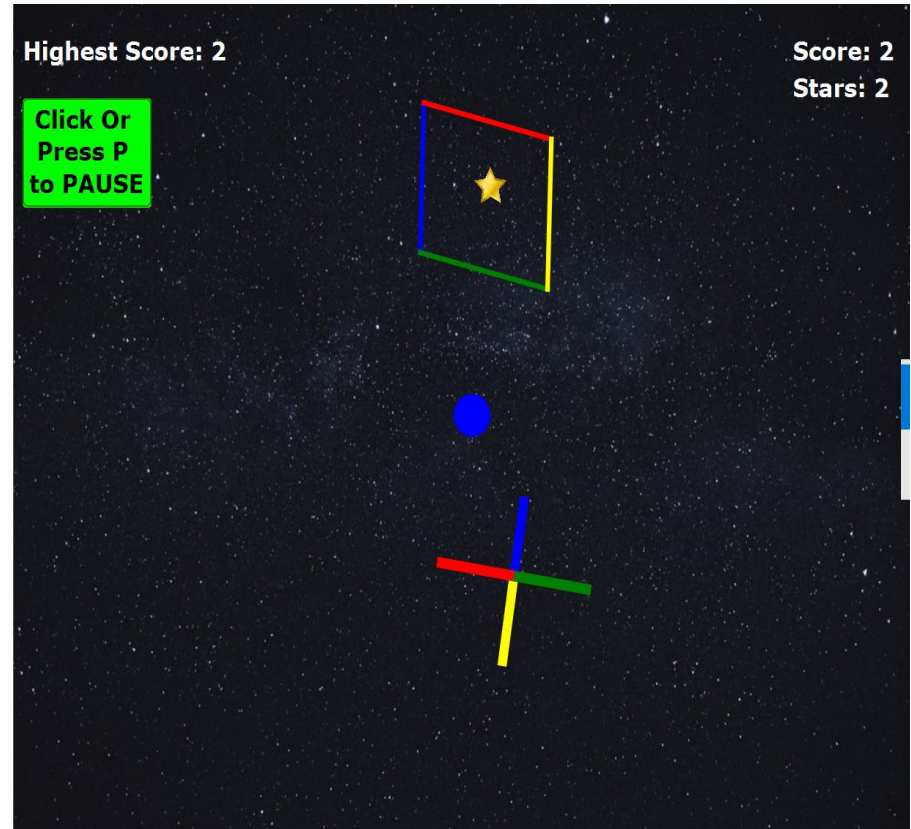
Design Patterns:

Design Patterns:

1) **Singleton-** For the database, as we need only one reference throughout the game.
2) **Iterator** - To ensure that collection of Stars and Obstacles are accessed in a synchronized way.
3) **Factory-** To create objects of Scenes class (ScenesEasy+ScenesMedium+ScenesDifficult).

Threading :
All the Animations are done using Animation Timer , each of which is an individual thread in a JVM.

Individual Contributions:

		Abhinav Gudipati	Shruti Jha
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2		2019227	2019274
3	UML + USE CASE DIAGRAM	Yes	Yes
4	All Menus (Pause Game + Start Game + End Game) - GUI	Yes	
5	All Menus (Pause Game + Start Game + End Game) - Event Handler		Yes
6	Scenes (Easy + Medium + Difficult) : 74 Scenes	Yes	
7	Sound		Yes
8	Obstacles	85% (11 Obstacles)	15% (2 Obstacles)
9	Stars		Yes
10	Save Game (Serialization and Deserialization)		Yes
11	Complete Game Logic		Yes
12	All Animations (Collision+ Star collection+Player movement+Obstacles Rotation)		Yes
13	Initialising Classes and their attributes	Yes	Yes

Bonus Component:

1) **SOUND**
   a) Background Sound
   b) Obstacle collision sound
   c) Star Collection Sound
2) **2 THEMES (Night and Day Mode)** - Incorporated a Night and Day theme/mode which player can select in main menu.
3) **SCENE DIFFICULTY** (**Difficult** + **Medium** + **Easy)** - Incorporated 74 different scenes with combinations of 13 different Obstacles for the sake of variety. The Easy Scenes can be maneuvered by the user, after reaching a certain score, we designed an algorithm where the player would be taken to a scene of higher difficulty.
4) **Infinite Flow** - Incorporated infinite vertical flow just like the original game.
5) **LeaderBoard** - Button in main menu to see highest score
6) **Game Rules** -Included game rules where the rookie user can refer to the same. Included in both pause-menu as well as start-game menu
7) Restart game option available in pause menu as well as game alert box.