Sultan's Gems

Sultan's Gems is a simple Match 3 game in which the player tries to achieve a high score within a certain number of moves by matching similar pieces. The project was created for educational purposes as part of James' **#GameInAWeek** challenge and is released freely under an MIT license. It may be of interest to those looking for a starting point in creating a Match 3 game in Unity for mobile. Bugs and feedback welcomed! @defuncart

Game Mechanics

Each ***level*** contains a goal that the player must complete within a certain limited number of moves. Every successful match costs a ***move***. A ***match*** is deemed successful if three or more stones of the same type (i.e. color) are matched horizontally and/or vertically. The ***game ends*** when all moves are used.

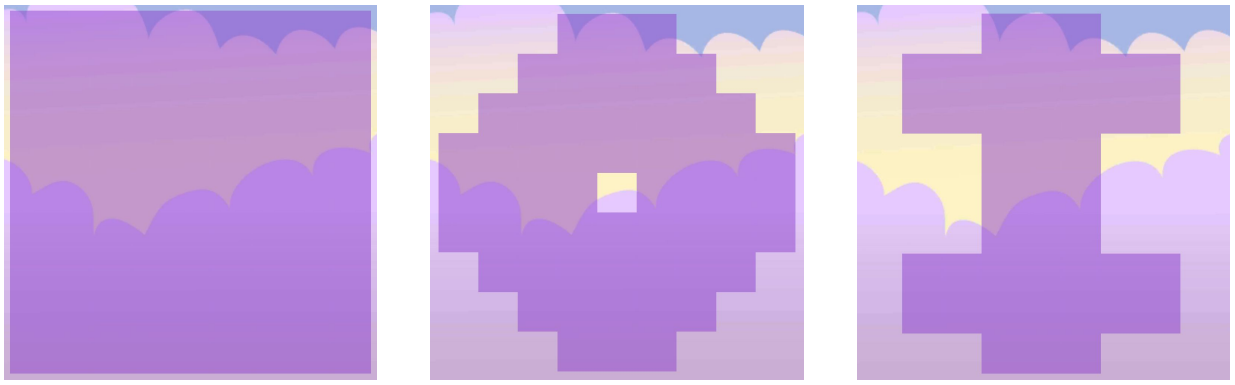
Game Board

The game board consists of two layers:

1. Board cells
2. Board pieces

Board cells

A game board consists of 9x9 board cells which may or may not be active. Active board cells are rendered with a graphic, while inactive cells are invisible. The ability to remove cells from the 9x9 square results in various game board shape configurations which is vital to designing interesting and challenging levels.



Board Pieces

A board piece is a game element which can be placed on an active board cell. *Sultan's Gems* contains only one type of board piece, the *Stone* which can be matched to score points. There are six types of stones available:

Level

Each level contains the following variables:

Variable	Description
maximumNumberMoves	The maximum number of moves allowed.
scoreToAchieve1Star	The score required to obtain a 1-star rating.
scoreToAchieve2Star	The score required to obtain a 2-star rating.
scoreToAchieve3Star	The score required to obtain a 3-star rating.
stonesDistribution	A probability distribution for the stones. Here one could set, for instance, green to be absent from the level or red to occur twice as frequently as blue. This distribution needs to sum to one.
stonesPoints	The points award per stone for each match.
initalGameboard	The initial gameboard. Here cells can be omitted or stones can be initially placed to aid the player.

Implementation

Sultan's Gems is written in C# using Unity 2017.3. The project utilizes a number of principles explained in more detail in various **#50-Unity-Tips** articles (Leahy 2017-2018). These include, but are not limited to, Binary Serialization, JSON Serialization, Singletons, LocalizationManager, iOS Launch Screen, Custom Popups etc. For more info see README.md.

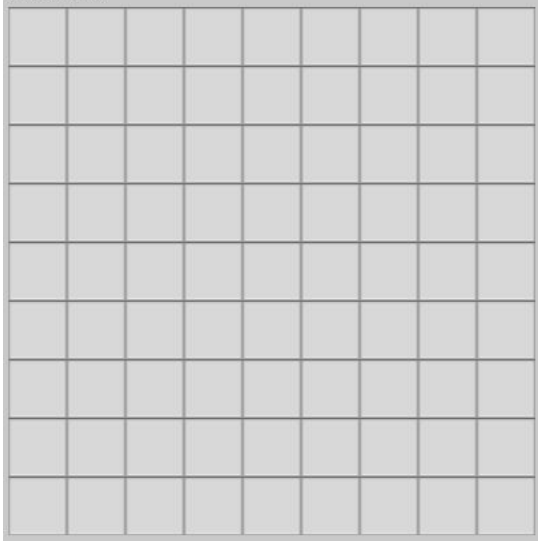
Game Design

Due to the time constraints of developing *Sultan's Gems* within a week, there is no game balancing. The four levels are simple examples of what one could do, for instance assigning higher points per stones, changing initial board configuration, setting custom boards, allowing only a few stones in the level etc.

Level 1

Maximum Number Moves	5
Score To Achieve 1 Star	175
Score To Achieve 2 Star	250
Score To Achieve 3 Star	300

Initial Board

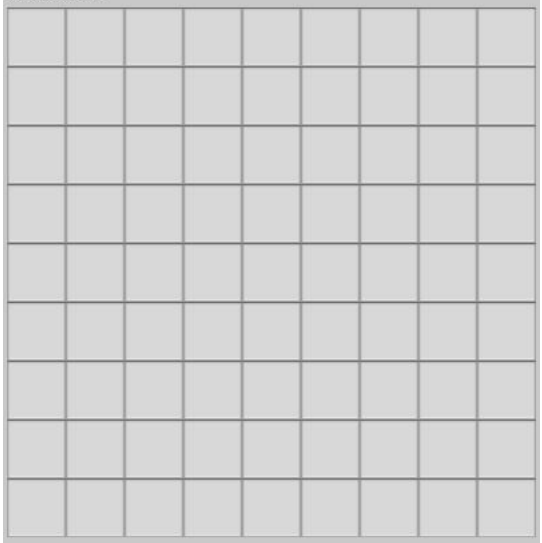


Stones	Points	Probability
0	10	0.25
1	10	0.25
2	15	0.2
3	5	0.3
4	0	0
5	0	0

Level 2

Maximum Number Moves	10
Score To Achieve 1 Star	400
Score To Achieve 2 Star	500
Score To Achieve 3 Star	600

Initial Board

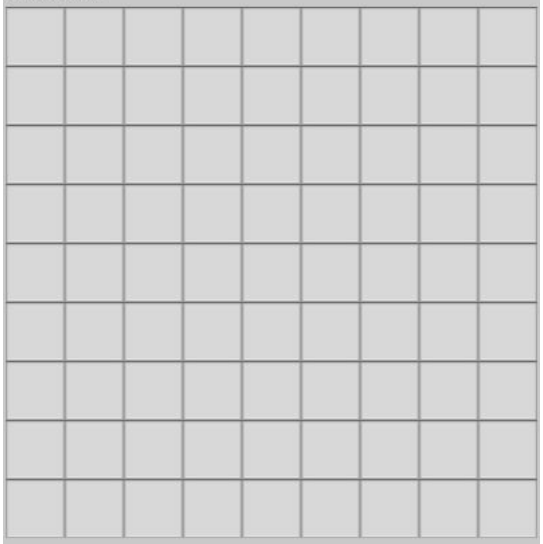


Stones	Points	Probability
0	0	0
1	10	0.2
2	10	0.2
3	10	0.2
4	10	0.2
5	10	0.2

Level 3

Maximum Number Moves	8
Score To Achieve 1 Star	325
Score To Achieve 2 Star	450
Score To Achieve 3 Star	550

Initial Board

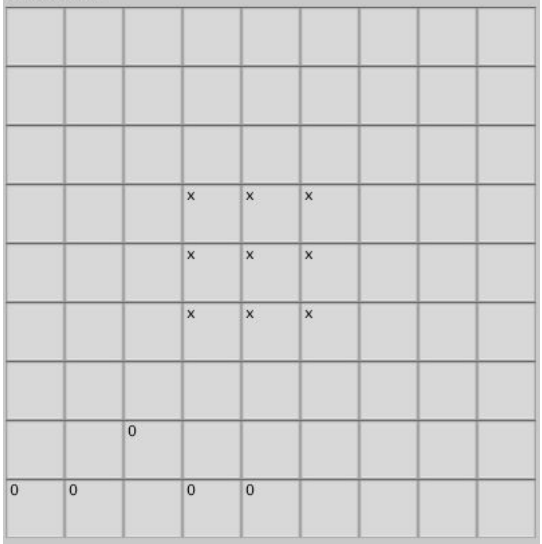


Stones	Points	Probability
0	10	0.1666667
1	10	0.1666667
2	10	0.1666667
3	10	0.1666667
4	10	0.1666667
5	10	0.1666667

Level 4

Maximum Number Moves	5
Score To Achieve 1 Star	100
Score To Achieve 2 Star	200
Score To Achieve 3 Star	300

Initial Board



Stones	Points	Probability
0	15	0.2
1	0	0
2	10	0.3
3	0	0
4	5	0.4
5	20	0.1

References

Leahy, J. (2017-2018) *50 Unity Tips* [ONLINE] Available at: https://github.com/defuncart/50-unity-tips [Accessed 8 January 2018]