Assignment 4

(due Friday, 4/15 at 11:59 pm)

CMSC 491 – Mobile Programming (iOS)
Spring 2017

In this assignment you will be building a game app called MazeMan using Sprite Kit. There will be two scenes: Main and Game Over scene.

A) Main Game Scene:

Assume the app will be run only in iPad and in landscape left and right modes only. You can further set the screen size to iPad Pro screen size of (1024, 1366).

Game will start with blocks (obstacles) only in bottom (one row) and top part (two rows). Button row will include two water blocks. As the game goes on, there will be a block added in every 1 second until 15 (maxBlockCount) blocks are added. Adding the blocks into the game scene

should not result overlapping items. To this extend, you can divide the screen into grids (64 x 64) and put blocks only to grids available (not occupied by food, star, player, or previous blocks).

Player:

Initial location of the player will be lower left corner, facing right. The facing direction of player will change either to left or right, depending on movement.
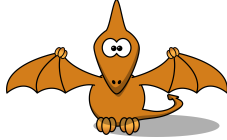
a) **Life**: Initially player will have 3 lives (hearts). Every time its energy becomes zero, it loses one heart.
b) **Energy**: 1 Life (heart) is 100 energy. Every second it loses energy. It can gain energy by eating the food (50 energy). It loses energy if contacts to enemies.
c) **Movement**: Movement of player will be achieved by swipe gesture recognizers. Swiping to any direction will result in player move in that direction until it hits an object or edge of screen.
d) **Shooting:** Player can kill the enemies by shooting. When user clicks a location, there will be a rock thrown towards the point user touched. Rock needs to travel until it goes out of screen, not until it comes to touch location. Moreover, the speed of all rocks thrown in any direction should be the same (use a unit vector). Rock can go through blocks. Initial rock count of player is set to 10. Every time it shoots, loses one rock. Only way of earning new rocks is by time (every 30 sec). Max rock count is set to 20, cannot earn more than this.
e) **Dying:** Player will die either when it loses all hearts and energy or drown in water (immediate die). No gravity will be effective initially but it will be enabled after every random time in range [40-60] seconds and will affect only the player. Gravity will be effective only 1 second. Player will drown if it falls into water.

Enemies:

One instance of each enemy type will be added to the game at the beginning.
Enemies can go through blocks. Their damage to player's health (energy) is different. They are killed by rocks thrown by player. A new instance of killed enemy type reappears (after dying) after randomly selected time in range [1-5] sec. Make all enemies moving slightly faster than player.

Enemy Type	Image	Damage to Player	Entry Point	Behavior
Dino1		60 energy (0.6 heart)	Randomly selected water block in the ground row.	Goes up and down, then waits randomly 1-3 sec after each up and down. Can go through blocks.
Dino2		80 energy (0.8 heart)	Any row from right	Goes left and right, waits randomly 1-3 second after each left and right. Facing direction (left or right) should change accordingly. Can go through blocks.

|		100 energy (1 heart)	Upper left corner, facing right.	Can go all directions. Selects a random direction and continue till it hits another object (including blocks), then reselects another direction. Facing direction (left, right, up, down) should change accordingly.
Dino3				
Dino4		No damage to player. Not affected by rocks (immortal)	Left most point of ceiling row.	It moves right and left at the ceiling of the game screen, and it can throw fire balls every randomly selected time in range [5-10] sec.
Fire		100 energy (1 heart)	From Dino4's position	Randomly created. It drops down and goes out of screen. Can go through blocks.

Scores and Panels:

Node type	Image	Who can contact?
Star		Every time player contacts a star, its score increases by 1 and star disappears (removed from parent). Star is not affected by enemies. Another star is added to screen immediately after the previous star (at a random location which is not occupied).
Food		Every time player contacts a food, its energy increases by 50 (half heart) – max 3 heart or 300 energy it can have - and food disappears (removed from parent). Player status panel should be updated accordingly. Food can also be eaten by enemy types dino1, dino2 or dino3, (not by fire coming from dino4). Another food is added to screen immediately after the previous food (if eaten by player). If an enemy has eaten the food, then new one will be added after 10 seconds.

Player Status panel will be updated with current counts of star (score), rock, heart and energy.
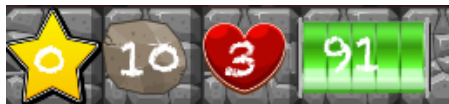
Game Status Panel will show messages to player regarding what is happening in the game.
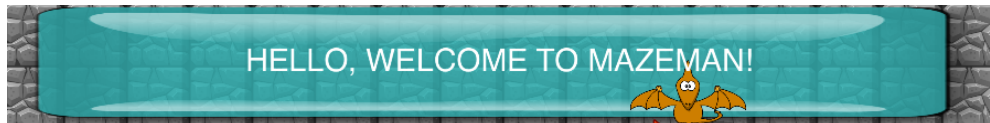
Some message examples could be the following. Please use your own.
1- Hello, Welcome to Mazeman!
2- Enemy (Dino1) killed
3- Bravo, you've got the star
4- Gravity time is very close! (maybe 3 seconds before it happens)

Music: Add music for 1) eating food, 2) scoring (contacting star), 3) shooting the rock, 4) when rock kills enemy, 5) when player dies, 6) when player contacts to enemy.

B) Game Over Scene:

It will show a text label with the score of current game.
It will also show 3 high scores achieved till now.
Clicking screen will restart the game.

Current Score is 3

High Scores 3, 0, 0

Begin New Game
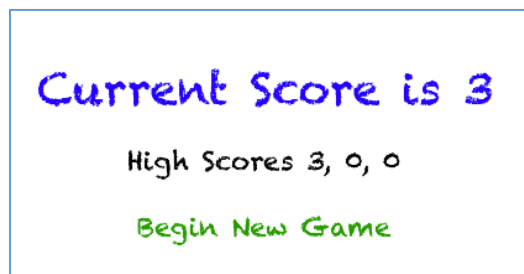
General Guidelines:

- Define your custom classes as needed.
- It is an iPad only app, and landscape only.
- Most image resources are provided (you may need to scale them), but you are encouraged to create/use your own.
- Do not make your images stretched. Use aspect fit or fill for the content mode of the image views.
- You can submit a README file if some changes are made (without affecting general structure).

Submission Guidelines:

- **Make sure your app is running before submitting. Also, make sure your submission includes all files.**
- Submissions should be made in Blackboard before midnight on 4/15. Up to 3 submissions are allowed.
- Up to 2 days late submissions only (1 day 20% penalty, 2 days 40% penalty).
- Make sure all your images and other resources used are inside the project folder. When copying an image inside the Assets folder, always make sure "copy" is checked and select the target as the project.

General Grading Criteria:
Appearance: (40%)
       a. Enemies, Player, Food, Star, Rock, Water, Blocks
       b. Game Over Screen, High Scores
       c. Player status panel
       d. Game status panel

Functionality: (60%)

     a. No overlapping of newly added nodes with current ones.
     b. Scoring (when contacted with star)
     c. Eating food (energy increase)
     d. Losing energy (every second and every time enemy damages)
     e. Movement of player by gesture recognizers until hitting a block
     f. Killing of enemies by throwing rock (dino4 cannot be killed, only its fires can be killed)
     g. Throwing of rock from player towards touch point with same speed until out of screen (Use your judgement for setting reasonable speeds to all sprites)
     h. Dying (by enemies, water)
     i. Applying gravity
     j. Game Status panel updates (messages)
     k. Player Status panel updates (rock, heart, energy and score updates)