NM2207 Final Write Up (Ref) **Introduction**

I designed a game off the core concepts that were taught from NM2207, mainly working with Rahapel.js. I had the idea to use the "ball" bouncing off the wall as a based idea that was introduced to us in challenge 7 back in week 8, where we were taught "timer animation". I wanted to have a "bouncing ball" as the main concept and the idea struck me to create a game that uses the "bouncing ball" to hit off bricks, pretty nostalgic as I believe most of us may have came across a similar game in the early days of the Internet.

**Challenges**

Most of the concepts were "ripped & mashed" from previous codes used in class such as having the balls bounce of the walls. I would say figuring out how to create the bricks were the most challenging for me in the beginning. I knew I had to use an array to draw and display the bricks. I created two variables to represent the number of bricks in rows and columns, "brickRowTotal" & "brickColumTotal" so it will be easy for me to test my codes along the way by changing the number of bricks to a smaller number while I test the game. I made use of the array to determine which brick is being "hit" and to remove them with .remove once they are being "hit" by the ball. I've learned about ternary operations as well and used the logic to implement in my codes to determine if a brick is "hit" then being removed.  
  
As I wanted my final project to look well aesthetically as well, I went on to [GIPHY](https://giphy.com/), to find a GIF for my background and to fit it within my canvas size of 800px x 600px. One criteria was to use the grid layout that was taught in the module, however I wanted my page to have a clean look without forgoing the criteria of the grid layout. I went on to [W3Schools](https://www.w3schools.com/) to learn more about CSS and HTML, where I then "ripped and mashed" the CSS file again to fit my needs.I decided to sketch out how I want my bricks to layout on the canvas to determine the size each bricks is going to be. I've attached a sketch of how I determine the padding of each bricks to be, figuring out the X & Y co-ordinates.

Diagram

Description automatically generated

While working on this project, I realized the beauty of a named function, simply because there were many instances while testing out and working the codes, I realized I have to call certain "actions" multiple times, thats when I decided to put all key "actions" in named functions so I could just call them as I needed to.  
  
In all our challenges and homeworks, most of the eventlisteners that we were exposed to were just limited to mouse actions. I wanted to do a little more and went on to research about keyboard actions which work similarly to the mouse just that every key on the keyboard has an ID that is tagged to it. I managed to create the paddle to be controlled with the left and right arrow keys. Initially, I run into some issues where the paddle was not animating smoothly as I used object.animate and to have them shift left or right by X number of pixels. After consulting my tutor on it, I realized I had to use a timer animation for it to run smoothly and fixed it with a couple of tweaks in the code. I also created a math function to return a random number, to aid in giving a random number to the xrate of the ball once it bounces off the paddle. Without this random number adding into the xrate, the ball will just keep going left and right at the same angle and speed.  
  
Mostly with the knowledge that was taught in this module, I added a score and lives system as well with if/else statements. I decided to add a timer as well so one will know how long it takes for them to complete the game. I got the sound clips in my game from [FreeSound](http://freesound.org/" \t "_blank).

**Self Reflection**

If given more time, I'd like to create a scoreboard where players can input their initials along with their final score/game time. I've read up a little about it, and I would believe I'd need to use a local storage function to store the data for that. I'd probably like to create a "Game Master" page where one can input the number of rows and columns of bricks as well as determine the size of the ball along with the speed of the game. This shouldn't be tough as the concepts have been taught throughout this course. Nonetheless, I am happy that I managed to create a simple game like this with the knowledge that I have absorbed from the course.

# Final Project Weekly Diary (Ref)

Week 1 - 22 March, 2020  
I'm thinking of creating a simple game where you have a platform where ball bounces off to hit blocks that are falling down. With the skillset that I have been thought in class the past few weeks I believe it is very feasible. However, instead of using a mouse control, I would explore the option if the game could be play with the keyboard.  
  
Once I have thae basic of the game coded, I with to explore different options where I could allow users to upgrade their "base" or "balls" to level up during the game to clear falling blocks at a faster rate. Of course as the game progresses with time, the rate of falling blocks should increase as well. I believe this can be achieved with a timer and while loop, with a counter increasing after every "phase". Perhaps I can explore the option to have a saved data, where users can resume from where they left off.

Week 2 - 29 March, 2020  
After learning about how we can use sockets to send information across the server. I was wondering if I am able to make this game interactive. Perhaps, it will be a 2 players competing against each other. However, I have to figure out how can I ensure that when two players are "online", then the game will commence.  
  
I have been reading up on keypress code for the eventlisteners to have keyboard controls instead of mouse controls which we learned during this course. It is interesting to know that every character, be it lower or upper case has a specific keycode to it. To quickly find the code for every key, I found a website that will come in handy in the future, I'd just tag it here for now.  
  
[Keycode.info](https://keycode.info/)

Week 3 - 8 April, 2020  
I was building my game, I managed to get simple stuff we've learned from past challenges to work such as having the balls bounce off walls as well as having it to bounce off the paddle that is used to hit the ball. Currently, I am using the "mousemove" control to change the x position of the paddle so it moves with my mouse.  
I tried using the keydown function but it seems to be abit buggy having the paddle set to element.animate. I'm still researching for a better solution to have the animation be smoother.

Week 4 - 15 April, 2020  
As I was fine tuning the game, I realised I had to work out some math for the bricks to align nicely on my canvas. It was also helpful for me to sketch out the X & Y coordinates on a piece of paper to better viusalise the logic of the game on how the X & Y poisiton of the ball will hit the bricks to create the logic on when will the bricks will detect if it's being hit.  
I've also consulted a friend of mine who taught me some tips and tricks such as organizing my codes well. I've also learnt about ternary operations,

< condition > ? < do this if true > : < do this if false >

I realised it was a lot easier to create a function for certain logics as I may use these logics more than once throughout the code. With functions created, I'd just need to call these functions whenever I need them to perform the set of codes within the functions.