

INTRODUCTION TO COMPUTER SCIENCE

FINAL PROJECT PROPOSAL

GROUP MEMBERS:

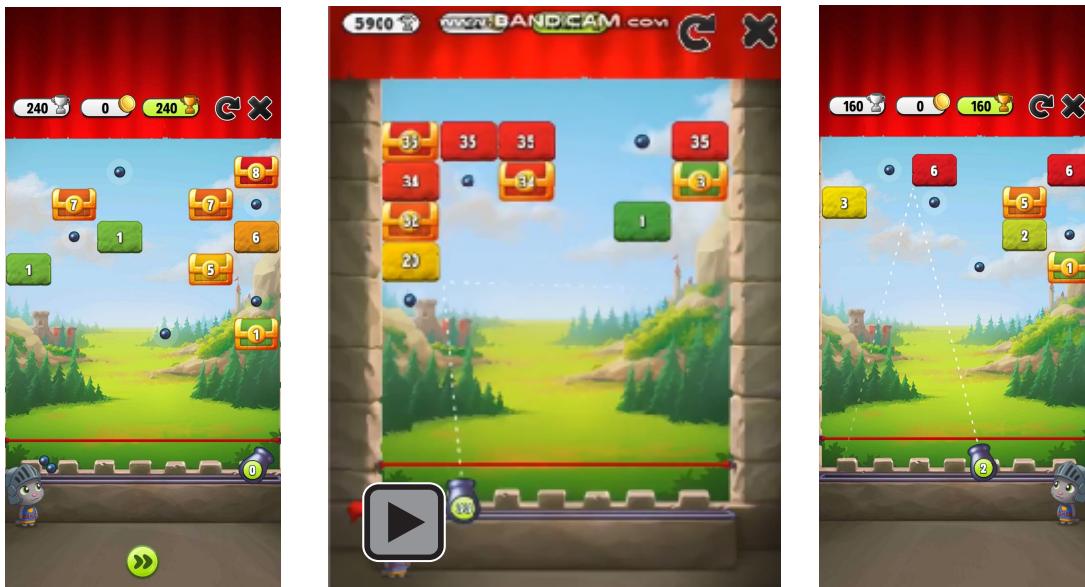
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PROJECT SUMMARY:

Our project is a derivative of the “Brick Blast” minigame present in the popular children’s mobile game “My Talking Tom”. In the minigame, the player has to skillfully aim a cannon (placed at the bottom of the screen) at blocks of different durabilities (the quantity of cannonballs required to destroy each block) and destroy them. With each cannonball that hits them, the durability of the blocks decreases correspondingly. For example, a block of durability “9” will require 9 cannonballs to destroy it. The cannonballs of each shot will “bounce” (reflect) from the walls (edges of the screen) and/or the blocks as they move across the screen. Before the next turn, the cannon will move to the landing position of the final “active” cannonball of the turn. The blocks themselves will make their way downwards from the top of the screen one row at a time with each shot/turn. The durability of the blocks and the cannonballs available to the player for each shot/turn will increase progressively, so as to make the game more interesting. The infinite game ends when one of the blocks manages to make it to the demarcated level. The goal is to get your score as high as possible for bragging rights among faculty, peers and the larger NYUAD community.

BRICK BLAST — SCREENSHOTS AND VIDEO*:

<https://drive.google.com/open?id=1sbB7dc931jYy7RNaaNMUBxDuzWOb6dx>



* Video viewable with Adobe Acrobat and available on given Google Drive folder

KEY FEATURES:

- Suitable for all ages (no prerequisites for the enjoyment of the game, simple and colorful user interface, natural user controls)
- Intuitive gameplay mechanics which enable immediate gratification yet leave room for mastery
- Infinite gameplay with procedurally generated level spaces (arrangement of blocks, durability of blocks)
- Reflections of cannonballs based on perfectly elastic collisions and the physics model of light
- Soothing experience (agreeable gameplay with accompaniment of calming music)

TASK ALLOCATION:

- Research on Circle-Rectangle Collision (Abdullah), Mathematics and Physics of Light Reflection (Abdullah), Garbage Collection (Shehryar), and Procedural Level Generation (Shehryar):
 - In class, we have only covered circle-circle collisions and one-dimensional circle-rectangular collisions (one-directional movement of a circle and one edge of a rectangle). Accordingly, for our project, we will first have to research how to detect collisions involving multiple points of a circle and multiple edges of rectangles.
 - Research material will be used to implement cannonball-wall and cannonball-block collisions.
 - Given the large number of objects that will be utilized, we will have to delete them as they become irrelevant to the game, to prompt ease and save PC memory.
 - For the infinite gameplay, we must learn to generate the level as gameplay proceeds.
- Reflection (Abdullah):
 - Upon collisions with the walls and the blocks, reflections will occur until the cannonballs reach the demarcated level where they despawn.
- Asset-Collection (Abdullah and Shehryar):
 - Images for objects and background, sound effects, and background music are needed.
- Level Generation (Shehryar):
 - The durability, locations and quantity of blocks will be randomly generated, with the current game-state (i.e. number of cannonballs) as a parameter.
- Rotation of cannon when aiming and its movement after each shot/turn (Abdullah and Shehryar):
 - The rotating cannon will be aimed using the mouse and will move after each turn to where the last "active" cannonball landed
- Shooting with aim (Shehryar):
 - Multiple "trailing" cannonballs will be fired with each shot. Their initial direction (from the cannon) will be towards the point where the cursor is when the mouse is clicked.
- Scoring and Display (Abdullah):
 - The total sum of the durabilities of the destroyed blocks will be displayed.
- Soothing Background Display that suits our desired User Experience (Shehryar)
- Final Integration of Components, Display, and Restart Mechanic (Abdullah and Shehryar)
- Testing with Peers and Incorporation of Associated Feedback (Abdullah and Shehryar)
- Public Repository on Github with research, comments and notes for open access (Abdullah)