Milestone 2

Team Number: 3
Team Name: King Pong
Team Members:
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Connor Adams
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Application Name: King Pong

I. Project Features List:

- **Account system:** to allow a user to log in such that they can save user score and identify themselves in tournament setting
- **Game I/O:**
- **Paddle Interaction:** the game I/O for the paddle movement and interaction with the ball
- **Shrinking/growing n-gon:** as each player is eliminated from the tournament, the n-gon of paddles shrinks by 1 edge/paddle
- **Ball subtraction and addition:** balls are added as the game stagnates and are taken away as number of people reduces in the tournament
- **Multiple instances of the game:** as this is an online multiplayer game, there will be the ability to have multiple, discrete instances of the game occurring simultaneously
- **Multiplayer:** in a single instance of game, multiple people should be able to play against one another with concurrent updates
- **Waiting Lobby:** there should be a lobby dedicated to holding players while waiting for the instance of the game to have enough players to begin
- **Global scoreboard:** there will exist a global scoreboard such that players across all instances of the game can be ranked against one another
- **Synchronize games:** client side feature that ensures the multiple people playing in a single instance of the game will experience events in a synchronized manner
- **Physics of balls:** the interaction of the balls with each other and with paddle will be demonstrated throughout the game by a bouncing-type physics
- **Different color paddle per player:** each player's paddle will be differently colored such that recognition of a player's paddle is easy

II. Requirements:

Source for Requirements Documentation Examples and Explanations: https://www.altexsoft.com/blog/business/functional-and-non-functional-requirements-specification-and-types/

A. Functional

1. Shrinking/growing n-gon

Shrinking/growing n-gon	
Purpose	This is the mechanism by which pong is made more heavily-multiplayer and provides for the physical mechanics of the tournament style aspect of the game.
Description	The user will be represented by a paddle forming an edge of an n-gon such that each time a player is eliminated from the tournament, the n-gon shrinks by one-edge, compressing inwards until there is a two-person classic game of pong.
Specific Requirements	There must be a player status of in-the game or lost/out of game such that they will be physically eliminated when they have lost. The n-gon must be adjusted and therefore redrawn during each elimination.
Actors and Interfaces	The actors involved are the players themselves. The interface is the collection of paddles that readjusts during each player elimination
Initial Status and Preconditions	Before shrinking, the player to be eliminated has just lost the game; however, they are not yet physically eliminated from the n-gon of paddles.
Basic Flow	
1. The user is determined to be eliminated and their status of in-game is adjusted 2. The dimensions of a (n-1)-gon are found 3. The (n-1)-gon is drawn with the out-of-game player excluded 4. Play continues	
Post Condition	

The game continues with the out-of-game player excluded and in an (n-1)-gon

2. Paddle Interaction

Paddle Interaction	
Purpose	This is the predominant mechanism by which the user can interact during game play.
Description	The user will be represented by a paddle forming an edge of an n-gon. They have a limited space in which they can move their paddle about and hit the balls.
Specific Requirements	There will be a mouse controlled paddle that reacts to movements from the user and can influence the ball.
Actors and Interfaces	The actors involved are the players themselves. The interface is the mouse controlling the movement of the paddle.
Initial Status and Preconditions	The paddle is in a specific position before the user prompts it to move.
Basic Flow	
1. The user makes a mouse movement. 2. The paddle move to a certain spot within the restrictions of the n-gon edge space.	
Post Condition	
The paddle reacts to the user's mouse movement by moving to their desired location such that the paddle stays within the restrictions of the "edge-space".	

3. Global Scoreboard

Global Scoreboard	
Purpose	This is how the players' gameplay can be ranked across all instances of the game.
Description	There will exist a scoreboard that ranks the performance of the top players across all instances of the game.
Specific Requirements	There must be a database that saves the scores of top players in each instance of the game and compares as each game concludes such that it is automatically updated.
Actors and Interfaces	The actors involved are the players themselves. The interface is the global scoreboard that will adjust based on player performance.
Initial Status and Preconditions	The global score board holds data according to an initial ranking of top players.
Basic Flow	
1. A game ends with some players having beaten some scores within the global scoreboard 2. The global database of top scores is compared to the new top scores. 3. The new top players are put in the database of top players 4. The global scoreboard is refreshed with the new data	
Post Condition	
The global scoreboard is updated with new rankings of the top players.	

B. NonFunctional

1. Synchronize games client side

Synchronize games

Purpose	A single instance of a game must be synchronized for all players
Description	There will be a client side synchronization that refers to a database of moves for that instance of the game and refreshes constant with updates, reading and writing as the game takes place such that all players have an updated version of the game.
Specific Requirements	There must exist a temporary database for each instance of the game that the player's clientside is constantly reading from and writing to
Actors and Interfaces	The actors involved are the players themselves. The interface is the client side that is updated with the players' moves and with ball positions etc.
Initial Status and Preconditions	A player for instance hits a ball with their paddle
Basic Flow	
1. The ball's changing position vector is updated to the database 2. Each player's client side reads from this database and updates the position of the ball accordingly	
Post Condition	
The updated positions of all game components is equivalent across all clientsides of the same instance of the game	

2. Multiple instances of game

Multiple Instances of Game	
Purpose	There will exist the ability to have multiple games occurring concurrently.

Description	There will be multiple instances of the game such that players can play against one another without interfering with other concurrent games that are occuring, each with their own temporary and smaller database for game stats.
Specific Requirements	There must exist an initialization process for each individual game, as well as a destruction process that ends the branched off instance of the game and updates the overall global databases
Actors and Interfaces	The actors involved are the players themselves. The interface is their particular game that is treated discretely and does not interfere with other concurrent instances of the game.
Initial Status and Preconditions	Two (or more) seperate games are started
Basic Flow	
1. Two instances of the game are instantiated. 2. The games proceed discretely 3. A game ends. 4. The global databses are adjusted if needed. 5. The ended game is terminated.	
Post Condition	
Two (or more) games end and global databases are updated as needed.	

3. Multiplayer in single instance of game

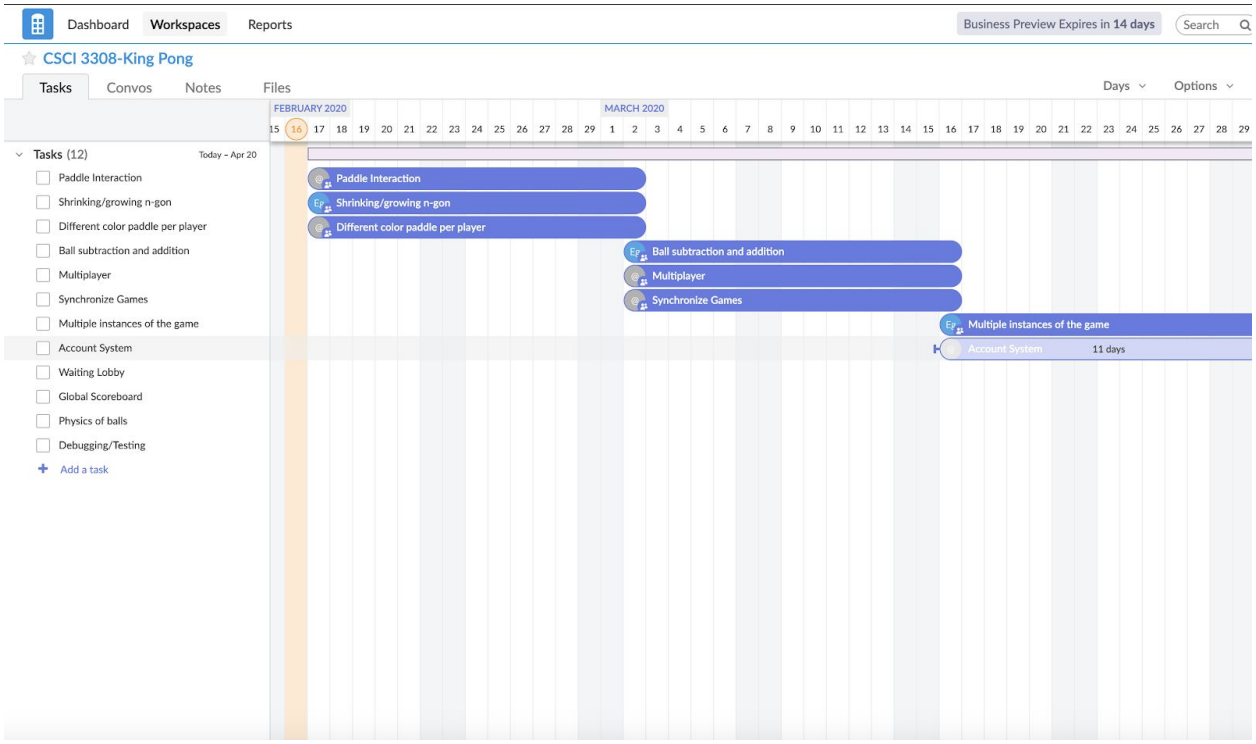
Multiplayer in Single Instance of Game	
Purpose	A single instance of a game must be playable for multiple people.
Description	A single instance of a game will be shared and interactable across

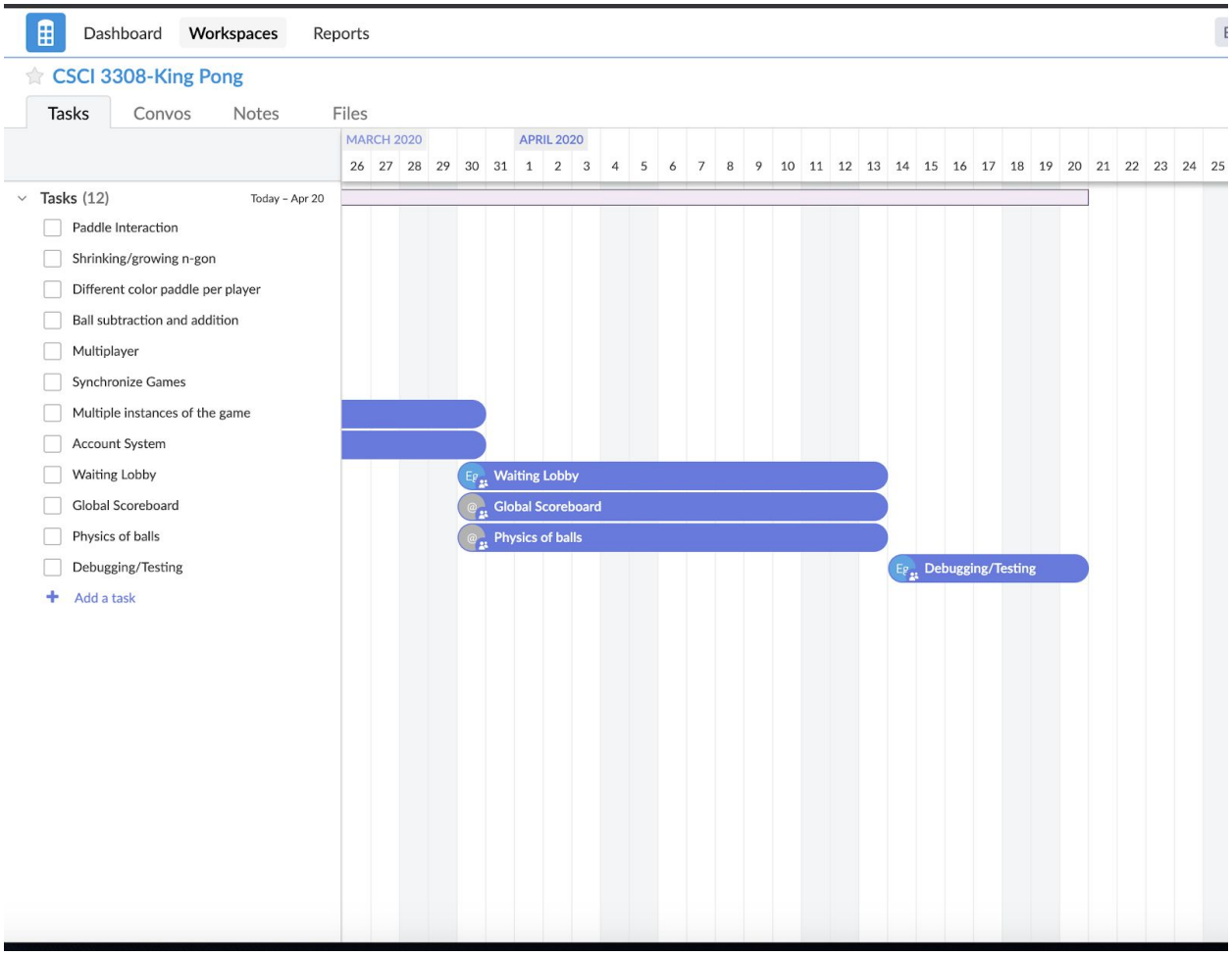
	multiple machines by way of a shared database and a series of local copies of the game.
Specific Requirements	There must exist game synchronization as described above and a constantly updated “local copy” of the game
Actors and Interfaces	The actors involved are the players themselves. The interface is their own local copy of the game.
Initial Status and Preconditions	A group of players begins a single instance of the game.
Basic Flow	
1. A local copy of the game is accessed by each player. 2. The user interacts with this copy 3. The shared database is updated with the game statuses 4. This info updates the users local copy of the game	
Post Condition	
Each player plays an updated and equivalent form of the game.	

III. Project Plan:

GANTT chart using RedBooth:

Our Sprints are two weeks with design, development, testing, and integration occurring for each task within that two week period. There is a shortened sprint towards the deadline dedicated to cleaning up the game in general. Each feature is assigned to people in the group to complete. Screenshots of this GANTT chart are below:


Dashboard
Workspaces
Reports
Business Preview Expires in 14 days
Search
CSCI 3308-King Pong
Tasks
Convos
Notes
Files
Days
Options
FEBRUARY 2020
MARCH 2020
Tasks (12)
Today – Apr 20
Paddle Interaction
Shrinking/growing n-gon
Different color paddle per player
Ball subtraction and addition
Multiplayer
Synchronize Games
Multiple instances of the game
Account System
Waiting Lobby
Global Scoreboard
Physics of balls
Debugging/Testing
Add a task
11 days


Dashboard
Workspaces
Reports
CSCI 3308-King Pong
Tasks
Convos
Notes
Files
MARCH 2020
APRIL 2020
26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
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