Term Project
Problem Statement

Ahmad Yazdankhah
ahmad.yazdankhah@sjsu.edu
CS 151: Object-Oriented Design

Team number	6	**Section**	3
Team Members	1. John Hoang 2. Isabel Pham 3. Ngan Luu 4. Anthony Nguyen		
Software Name	JINA Studios		

Software Description

1. The project is going to be an offline arcade program. The target audience for the application would be anyone who wants to play a collection of retro games. This program allows users access to interactive entertainment while their internet is down as well as providing several games to pick and choose from.

2. List of major features:
    a. Select and play a variety of retro arcade games (ie.)
        i. Snake
        ii. BlockBreaker
        iii. Pong
        iv. Tetris
    b. Customize functions/variables within the game
        i. Settings function
            1. Customize speed for enhanced difficulty and challenge
            2. Change colors for users with colorblindness
        ii. Pause the game while playing
        iii. Switch between games during pause
        iv. Challenge mode with preset settings
    c. Achieve high scores as well as store them for future attempts
    d. Point System Shop
        i. Points are accumulated through all runs in the game and only depletes when user buys an item in the point shop
        ii. Items help user or provide tradeoffs in their next run

Term Project
Functional Specification

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CS 151: Object-Oriented Design

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1. Problem Statement

The project is going to be an offline arcade program. The target audience for the application would be anyone who wants to play a collection of retro games.

2. Product Objective

This program allows users access to interactive entertainment while their internet is down as well as providing several games to pick and choose from. The target audience for the application would be anyone who wants to play a collection of retro games.

3. Functional Requirements

List of major features:

a. Select and play a variety of retro arcade games (ie.)
    i. Snake
    ii. BlockBreaker
    iii. Pong
    iv. Tetris
b. Customize functions/variables within the game
    i. Settings function
        1. Change colors for users with colorblindness
c. Achieve high scores as well as store them for future attempts
d. Point System Shop
    i. Points are accumulated through all runs in the game and only depletes when user buys an item in the point shop

ii. Items help user or provide tradeoffs in their next run

4. Use Cases

Use Case Name	Exchange points for item(s) in Item Shop

Goal

This use case describes how a user may purchase an item in the item shop

Participating Actors

User
System

Glossary

Define any complex concepts, abbreviations or acronyms

Item - an entity that provides a specific condition in a game to help users or provide tradeoffs in their next run/round. An item is equivalent to a fixed amount of scores that the user earns.

Primary Flow of Events

Trigger

User clicks on "Purchase" button

Steps	Action	System Response
1	User click “purchase” on item they want to select	System deduct the User’s accumulated points by the cost of the item. System enables the customization change.
2	User exit item shop	System returns back to Main Menu
3		
4		
5		

Alternate Flow of Events

Alternate Trigger

In Step 2, user does not have enough points to purchase the selected item

Steps	Action	System Response
1	User are unable to click on buttons	System shows buttons but are unclickable depending on how many points the user has.
2	User exit item shop	Proceed with Step 3: Return back to Main Menu
3		

Use Case Name	Playing the game: Snake

Goal

User wants to play Snake on JINA Studios
This use case describes how a user interacts with the game Snake and quits Snake

Participating Actors

User and System

Glossary

The player in the game Snake move up, down, left, right to eat the food to grow longer

Primary Flow of Events

Trigger

User clicks on "Snake" on games menu

Steps	Action	System Response
1	User presses the up arrow key	Snake moves vertically upwards
2	User presses the down arrow key	Snake moves vertically downward
3	User presses the left arrow key	Snake moves horizontally left
4	User presses the right arrow key	Snake moves horizontally right

Alternate Flow of Events

Alternate Trigger

User clicks on “Save Points” button

Steps	Action	System Response
1	User click on “Save Points”	System redirect to a tiny menu showing points earned from the in-game round as well as the cumulative points. Then, it redirects to Game Menu.

Alternate Flow of Events

Alternate Trigger

User clicks on “Exit Game” button

Steps	Action	System Response
1	User click on “Exit Game”	System redirect to Game Menu without saving or adding the in-game score.

Alternate Flow of Events

Alternate Trigger

User presses “r”

Steps	Action	System Response

1	User presses “r”	System reset in-game score and restarts a game round of Snake.
2		

Use Case Name	Playing the game: Pong

Goal

User wants to play Pong on JINA Studios

This use case describes how a user interacts with the game Pong and quits Pong

Participating Actors

User

System

Glossary

Pong Box is essentially the player in the game Pong where they move strictly up or down to hit a ball into the opponent’s goal while blocking the user’s own game

Primary Flow of Events

Trigger

User clicks on "Pong” on games menu

Steps	Action	System Response
1	User presses enter key	Pong game starts
2	User presses the up arrow key	User’s Pong paddle moves vertically upwards
3	User presses the down arrow key	User’s Pong paddle moves vertically downward
4		
5		

Alternate Flow of Events

Alternate Trigger

User clicks on “Save Points” button

Steps	Action	System Response
1	User click on “Save Points”	System redirect to a tiny menu showing points earned from the in-game round as well as the cumulative points. Then, it redirects to Game Menu.
2		

Alternate Flow of Events

Alternate Trigger

User clicks on “Exit Game” button		
Steps	**Action**	**System Response**
1	User click on “Exit Game”	System redirect to Game Menu without saving or adding the in-game score.
2		
3		

Use Case Name	Playing the game: Block Breaker

Goal

User wants to play Block Breaker on JINA Studios

This use case describes how a user interacts with the game Block Breaker and quits Block Breaker

Participating Actors

User

System

Glossary

Block Breaker box is essentially the player in the game Block Breaker where they move strictly left or right to hit a ball into the blocks near the top of the screen while keeping the ball bouncing without missing a hit

Primary Flow of Events

Trigger

User clicks on "Block Breaker” on games menu

Steps	**Action**	**System Response**
1	User presses the left arrow key	User’s Block Breaker box moves horizontally left
2	User presses the right arrow key	User’s Block Breaker box moves horizontally right
3		
4		
5		

Alternate Flow of Events

Alternate Trigger

User clicks on “Save Points” button

Steps	**Action**	**System Response**
1	User click on “Save Points”	System redirect to a tiny menu showing points earned from the in-game round as well as the cumulative points. Then, it redirects to Game Menu.

2		

Alternate Flow of Events

Alternate Trigger

User clicks on “Exit Game” button

Steps	Action	System Response
1	User click on “Exit Game”	System redirect to Game Menu without saving or adding the in-game score.
2		
3		

Use Case Name	Playing the game: Tetris

Goal

User wants to play Tetris on JINA Studios
This use case describes how a user interacts with the game Tetris and quits Tetris

Participating Actors

User
System

Glossary

Tetrimino is a geometric shape composed of four squares connected orthogonally.

Primary Flow of Events

Trigger

User clicks on "Tetris” on games menu

Steps	Action	System Response
1	User presses the left arrow key	User’s tetrimino moves one space to the left
2	User presses the right arrow key	User’s tetrimino moves one space to the right
3	User presses the down arrow key	User’s tetrimino moves one space downward
4	User presses the up arrow key	User’s tetrimino rotates 90 degrees clockwise
5	User presses the spacebar key for the first time	User’s current tetrimino is stored and the next tetrimino in queue is given to the player

Alternate Flow of Events

Alternate Trigger

User clicks on “Save Points” button

Steps	Action	System Response
1	User click on “Save Points”	System redirect to a tiny menu showing points earned from the in-game round as well as the cumulative points. Then, it redirects to Game Menu.
2		

Alternate Flow of Events

Alternate Trigger

User clicks on “Exit Game” button

Steps	Action	System Response
1	User click on “Exit Game”	System redirect to Game Menu without saving or adding the in-game score.
2		
3		

Alternate Flow of Events

Alternate Trigger

User clicks on “New Game” button or presses “N” key

Steps	Action	System Response
1	User clicks on “New Game” button or presses “N” key	System restarts Tetris game and refresh scores back to 0.
2		

Alternate Flow of Events

Alternate Trigger

User clicks on “Pause” button or pressed “P” key

Steps	Action	System Response
1	User clicks on “Pause” button or pressed “P” key	System put the Tetris game in standstill. Pause button changes text to “Resume”
2		
3		

Use Case Name	Change to colorblind mode from Settings page

Goal

User wants to switch to colorblind mode

This use case describes how a user can change to color blind mode from the settings page

Participating Actors

User

System

Glossary
User wants to change to colorblind mode to have a more visual interaction with the games if the user has colorblindness

Primary Flow of Events

Trigger

User clicks on the settings button on the main menu

Steps	Action	System Response
1	User presses the “Enable colorblind mode” button	System changes Block Breaker, Snake, and Tetris color schemes to a colorblind oriented palette
2		
3		
4		
5		

Alternate Flow of Events

Alternate Trigger

User clicks on “Disable colorblind mode” button

Steps	Action	System Response
1	User click on “Disable colorblind mode” button	System changes Block Breaker, Snake, and Tetris color schemes to their original color palette
2		

Alternate Flow of Events

Alternate Trigger

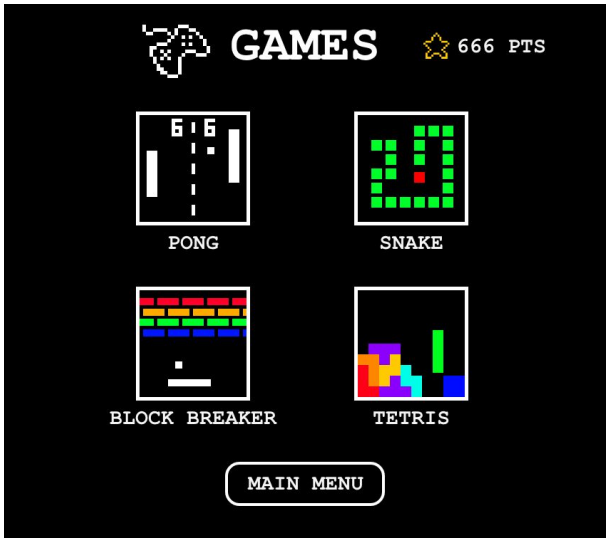
User clicks on “Exit to Main Menu” button

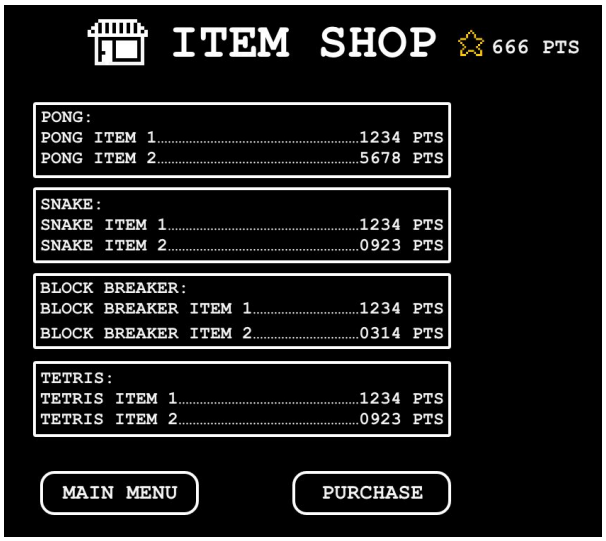
Steps	Action	System Response
1	User click on “Exit to Main Menu”	System redirect to Main Menu
2		
3		

5. Mockup

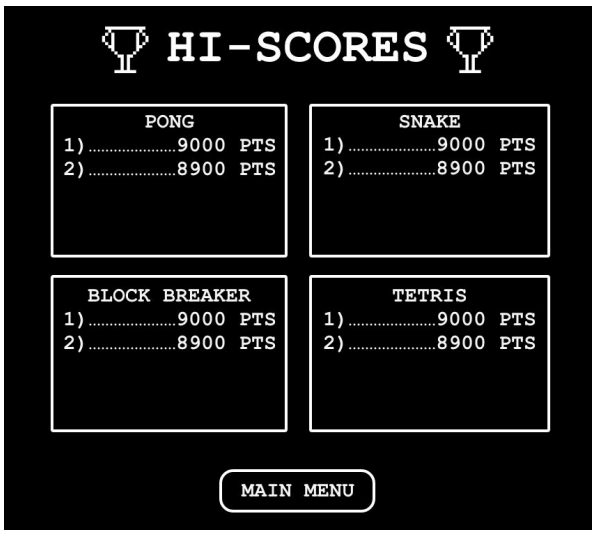
Note: “Game Block” is a section reserved for the game


JINA Studios
MAIN MENU
GAMES
ITEM SHOP
SETTINGS
HI-SCORES


GAMES
666 PTS
PONG
SNAKE
BLOCK BREAKER
TETRIS
MAIN MENU


ITEM SHOP
666 PTS
PONG:
PONG ITEM 1.....1234 PTS
PONG ITEM 2.....5678 PTS
SNAKE:
SNAKE ITEM 1.....1234 PTS
SNAKE ITEM 2.....0923 PTS
BLOCK BREAKER:
BLOCK BREAKER ITEM 1.....1234 PTS
BLOCK BREAKER ITEM 2.....0314 PTS
TETRIS:
TETRIS ITEM 1.....1234 PTS
TETRIS ITEM 2.....0923 PTS
MAIN MENU
PURCHASE


SETTINGS
COLORS:
LEVELS/SOMETHING ELSE HERE:
MAIN MENU


HI-SCORES
PONG
1).....9000 PTS
2).....8900 PTS
SNAKE
1).....9000 PTS
2).....8900 PTS
BLOCK BREAKER
1).....9000 PTS
2).....8900 PTS
TETRIS
1).....9000 PTS
2).....8900 PTS
MAIN MENU


PONG
666 PTS
Game Block
EXIT GAME
| |

6. Glossary

Item	an entity that provide a specific condition in a game to help user or provide tradeoffs in their next run/round
Hi-Score	Hi-Score means “High Score”

Term Project
Technical Specification

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1. Introduction

1.1. Objective [5 Points]

The Technical Specification Document provides the design description (classes, behavior, and relationships of classes) of JINA Studios. JINA Studios is a desktop application that allows users access to interactive entertainment offline with several games to pick and choose from. The target audience for this product would be anyone who wants to play a collection of retro games. A basic understanding of video games would be required to understand general video game functions, objectives, and controls.

1.2. References [5 Points]
https://stackoverflow.blog/2020/04/06/a-practical-guide-to-writing-technical-specs/

1.3. Acronyms, and abbreviations [5 Points]

Item	an entity that provide a specific condition in a game to help user or provide tradeoffs in their next run/round
Hi-Score	Hi-Score means “High Score”

2. Software overview

2.1 Problem statement [5 Points]

The video games arcade had its root in 1971. Although it is not as popular as its golden time, with the development of gaming technology, arcade games have survived in several forms. Thus, our software will provide an offline arcade program. It is an interactive platform that allows users to not only entertain themselves with several

retro games available but also to customize the environment by adding some extra features such as color setting and point trades.

Our application allows users to choose and play 4 retro games: Pong, Snake, Tetris and Block Breaker. For every round, users earn points. The highest point can be saved and sorted in order to create a competitive environment for users. With the corresponding amount of points, users can trade for items in the item shop which provide users the new and different experience to our application.

2.2 Scope [5 Points]

JINA Studios application targets users who are interested in playing retro games on their computers offline. Targeted users would be those who have an interest in offline games and users' age would be any age older than 6. Since the application is written in English, users' understood language would be English.

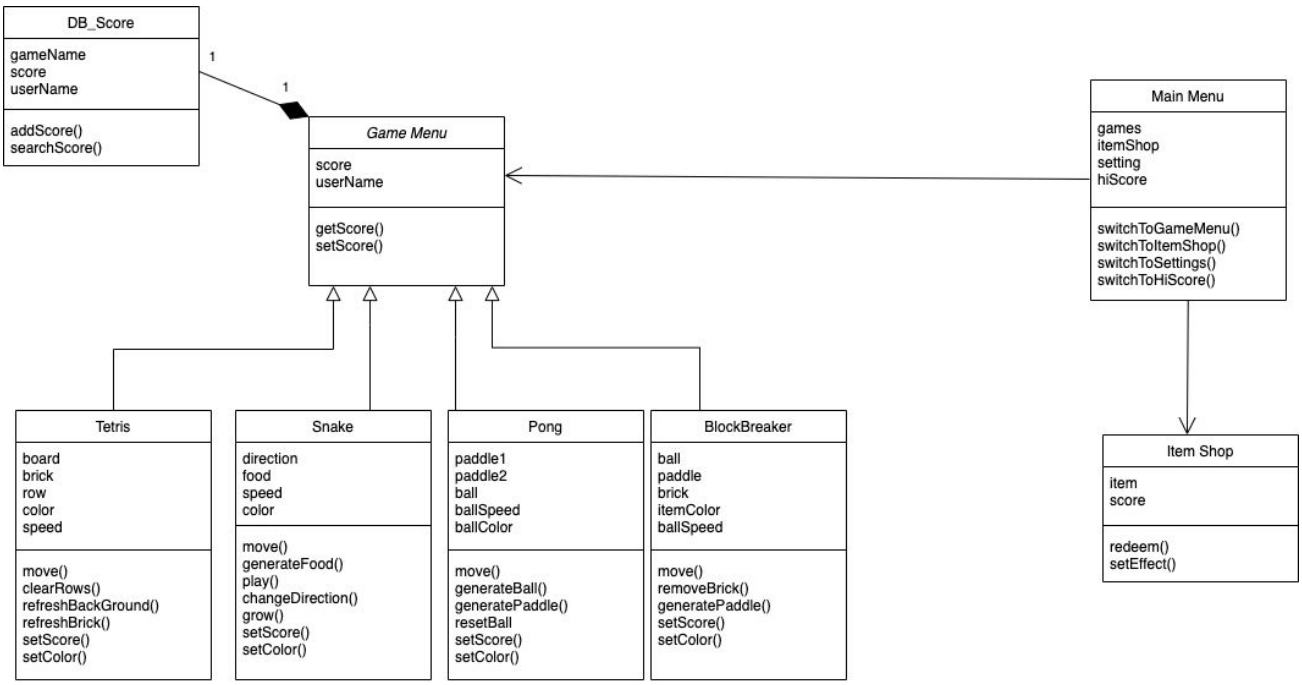
The key feature of our application is the option for games selection. With 4 games, our application will allow users to play 1 game at a time and save their score when they exit the game.

2.3 Technological Requirements [10 Points]

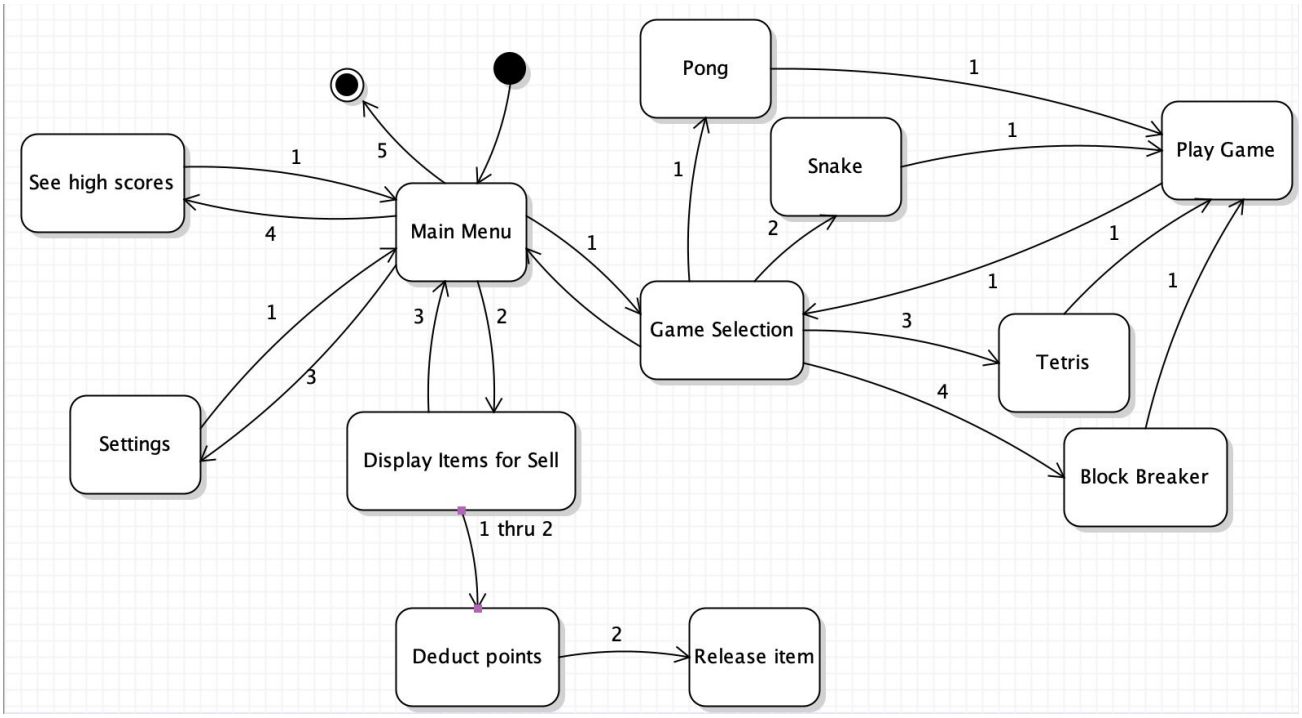
- Java for implementation of classes, interfaces, etc.
- JavaFX for user interface.
- Technology required:
    - Java 8
    - JavaFX
    - Computer devices
    - Windows 10 / Mac OS
    - Eclipse

3. Detailed Design

3.1 UML Class diagrams (for all classes) [20 Points]



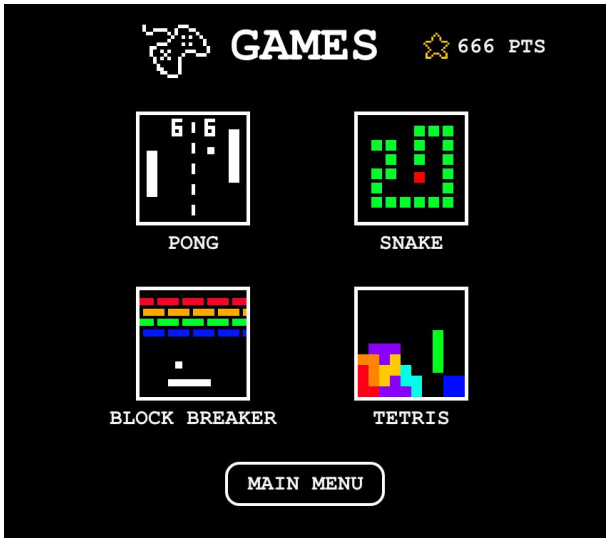
3.2 UML Sequence and/or state diagrams (at least one) [10 Points]



3.3 User Interface [15 Points]

Note: "Game Block" is a section reserved for the game


JINA Studios
MAIN MENU
GAMES
ITEM SHOP
SETTINGS
HI-SCORES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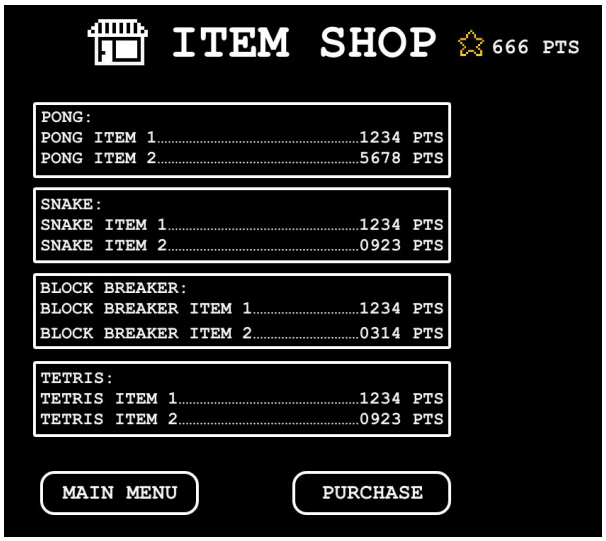
666 PTS
PONG
SNAKE
BLOCK BREAKER
TETRIS
MAIN MENU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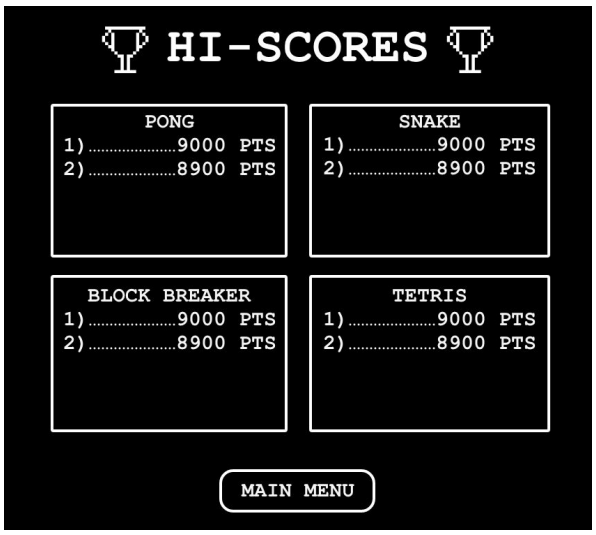
MAIN MENU
PURCHASE


SETTINGS
COLORS:
LEVELS/SOMETHING ELSE HERE:
MAIN MENU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2).....8900 PTS
MAIN MENU


PONG
666 PTS
Game Block
EXIT GAME
| |


SNAKE
666 PTS
Game Block
EXIT GAME
| |


BLOCK BREAKER
666 PTS
Game Block
EXIT GAME
| |


TETRIS
666 PTS
Game Block
EXIT GAME
| |