PIXELSHATTER

Team Members:

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INTRODUCTION

•Classic **Brick Breaker (Arkanoid-inspired)** game.

•Developed in **C++ with OpenGL (FreeGLUT)**.

•Provides a **retro arcade feel** with modern enhancements.

•Focus on **graphics, interaction, and gameplay logic**.

OBJECTIVES

•Build a **2D interactive game** from scratch.

•Practice **OpenGL rendering** (bricks, paddle, ball, animations).

•Implement **game states** (Menu, Playing, Paused, Game Over, Credits).

•Add **keyboard & mouse controls** for smooth gameplay.

•Enable **dynamic color customization** of paddle, ball, and bricks.

TECH STACK

- **Programming Language**: C++
- **Graphics Library**: OpenGL (FreeGLUT)
- **Development Environment**: MSYS2 / MinGW on Windows 10
- **Text Rendering**: GLUT bitmap fonts
- **Animation**: Sinusoidal functions (sin, cos) **for smooth effects**
- **Collision Detection**: Bounding box + trajectory adjustment

SUPPORTED DEVICES

- 💻 **Windows 10 / 11 (Desktop & Laptop)**

- 🖥️🎛️ Requires OpenGL-compatible GPU

- 🎮 🕹️ 👾 Runs on standard hardware (no high-end GPU required)

- ⚙️ Minimum Specs:
- Dual-core CPU
- 4GB RAM
- OpenGL 2.1+ support
- ⚡ Smooth gameplay at 60 FPS on tested devices

SYSTEM FEATURES

- 🎮 **Game States**:
- Main Menu
- Playing
- Paused
- Game Over
- Info / Credits

- 🎨 **Customization**: Right-click menu → Change **Ball / Paddle / Brick colors**.

- 🧱 **Dynamic Brick Layouts** reset each level.

- 💯 **Scoring system** with increasing difficulty.

CONTROLS

- **Mouse Move** → Move Paddle
- **Left Click / Spacebar** → Launch Ball
- **Right Click** → Open Color Customization Menu
- **P** → Pause / Resume
- **N** → New Game
- **C** → Credits
- **Q** → Quit Game
- **ESC** → Return to Menu

GAME MECHANICS

- Ball bounces off walls, paddle, and bricks.
- Paddle deflection adjusts ball’s trajectory.
- Bricks disappear on collision, increasing score.
- Level increases when all bricks are cleared.
- Game over when lives = 0.

GRAPHICS & ANIMATION

- **Gradient background** with smooth animation.
- **Dynamic colors** using OpenGL (glColor3f)
- **Menu animations** (**menuAnim sinusoidal effects**).
- Anti-aliased shapes using **OpenGL primitives**.

IMPLEMENTATION DETAILS

•**Language**: C++

•**Graphics Library**: OpenGL with FreeGLUT

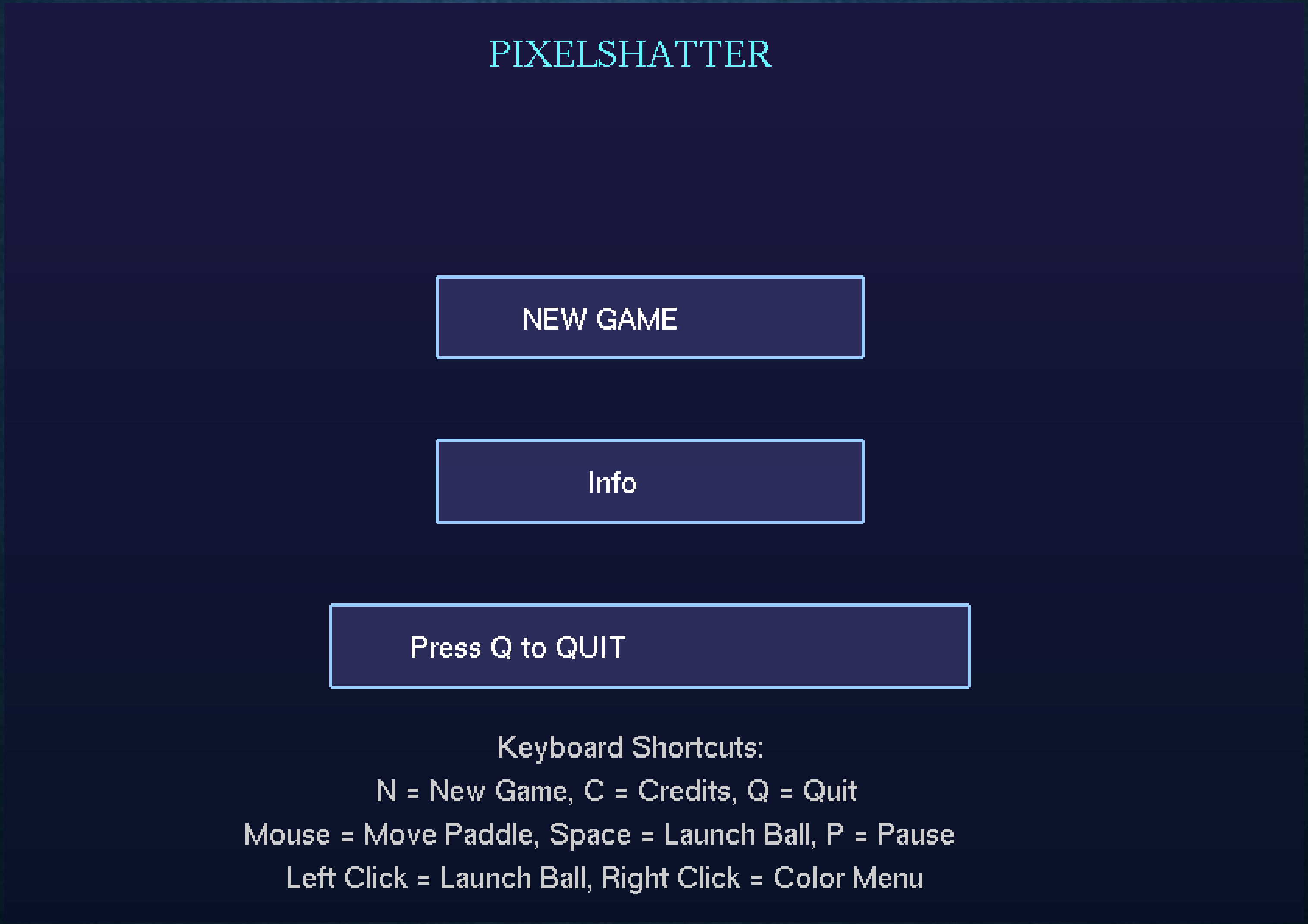
•**Window Size**: 1200 × 800

•**Game Objects**:
•Ball (triangle fan)
•Paddle (quad)
•Bricks (grid of quads)

•**Collision Detection**:
•Bounding-Box for paddle or pixel / brick
•Edge check for walls .

DEMO / SCREENSHOTS

- Main Menu :



Keyboard Shortcuts:

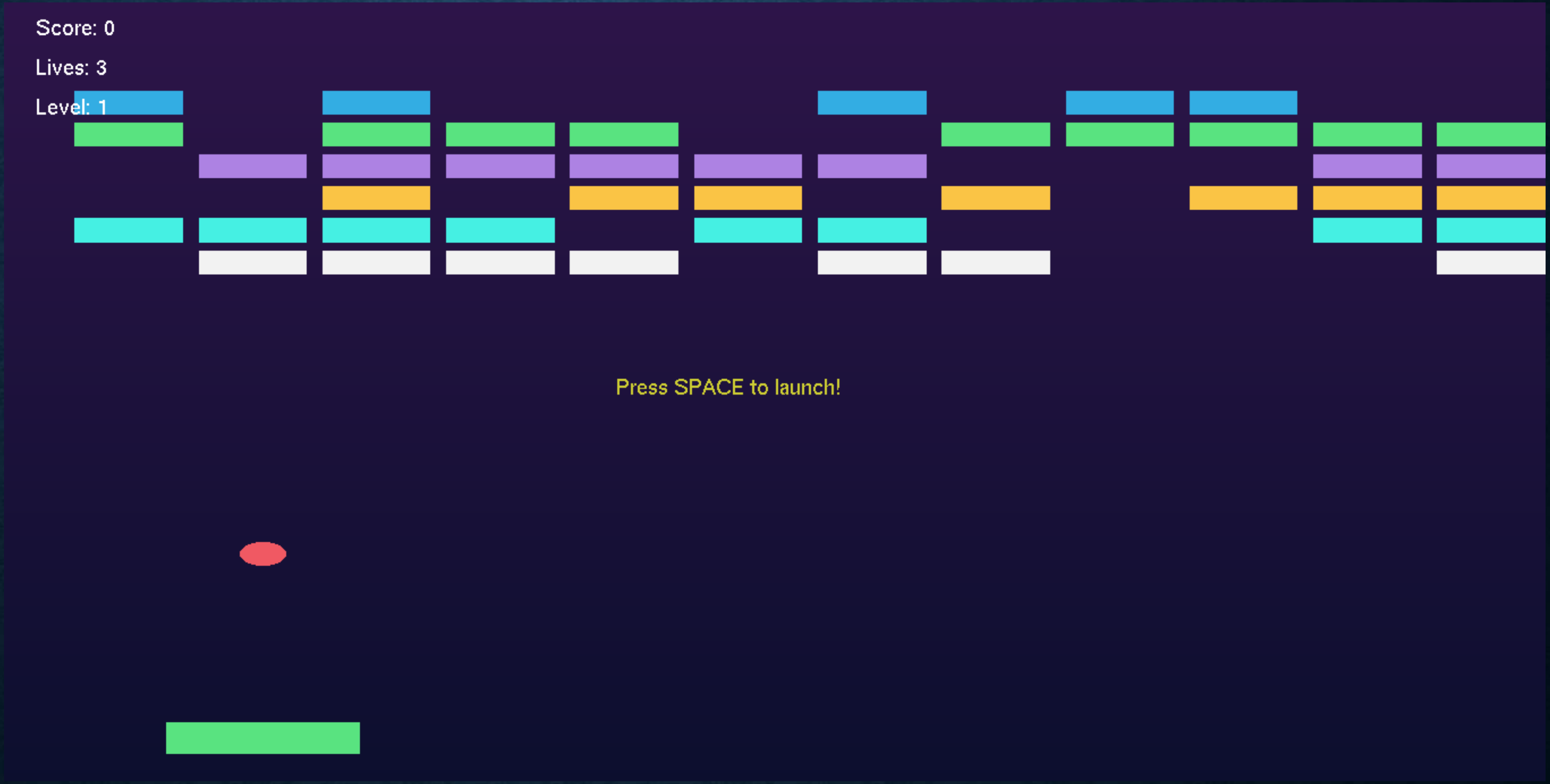
N = New Game, C = Credits, Q = Quit

Mouse = Move Paddle, Space = Launch Ball, P = Pause

Left Click = Launch Ball, Right Click = Color Menu

DEMO / SCREENSHOTS

- Game Playing
- Screen



Score: 0

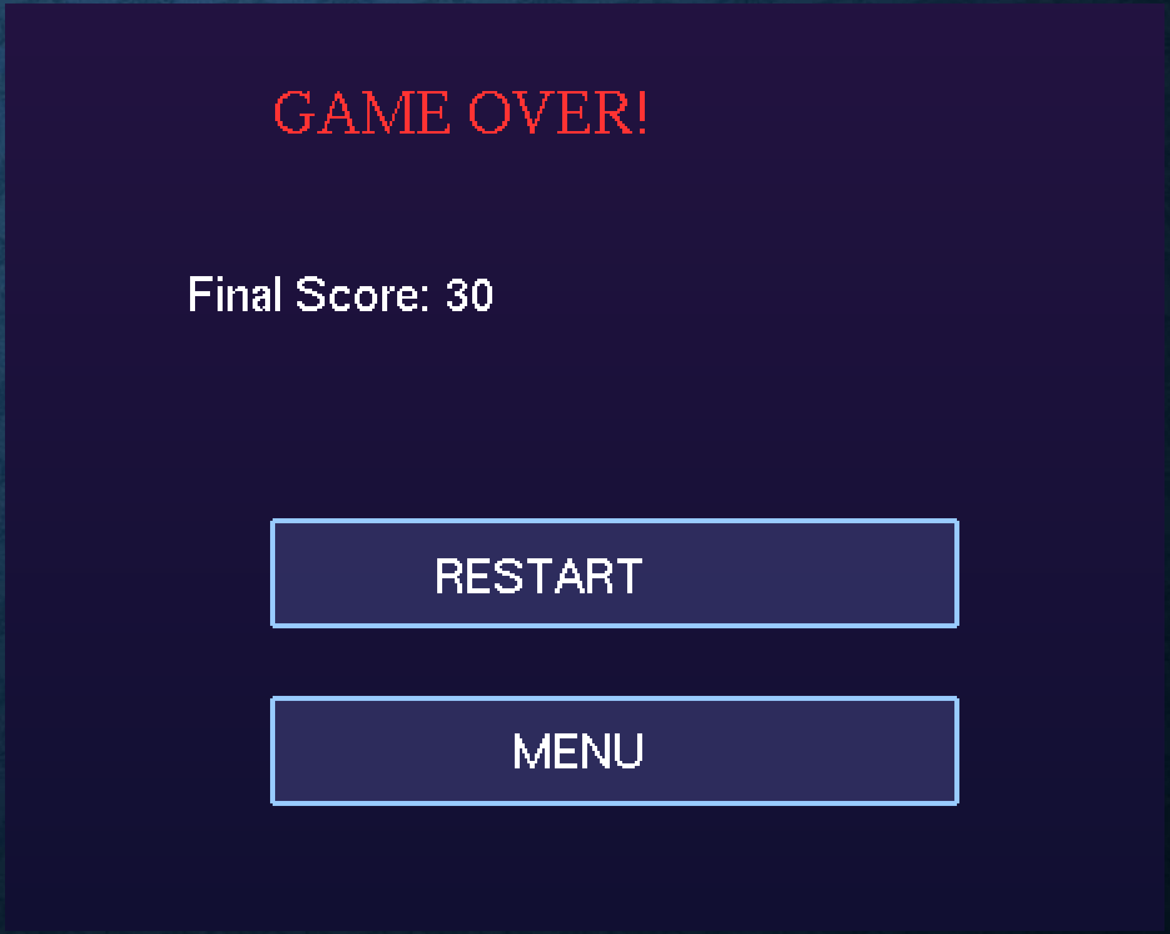
Lives: 3

Level: 1

Press SPACE to launch!

DEMO / SCREENSHOTS

- Game Over Screen

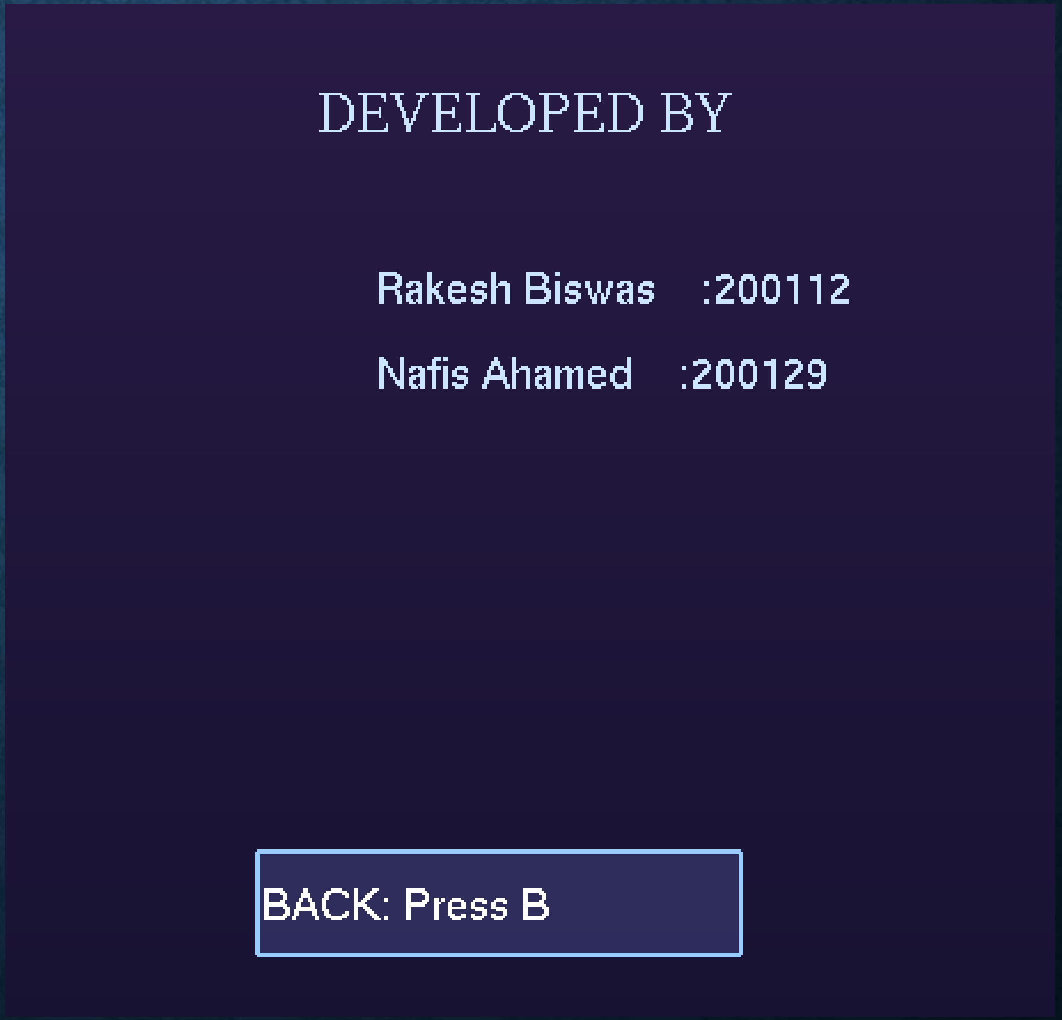


GAME OVER!

Final Score: 30

DEMO / SCREENSHOTS

- Info / Credits



DEVELOPED BY

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FUTURE IMPROVEMENTS

•Add **power-ups** (extra life, larger paddle, multi-ball).

•Add **sound effects** (bounce, brick break, game over).

•Implement **high score saving**.

•Add **multiplayer (2 paddles)** mode.

•Support for **mobile / web version** using OpenGL ES or WebGL

CONCLUSION

PixelShatter successfully:

•Implements a **classic arcade game** with modern visuals.

•Strengthens knowledge of **Computer Graphics & OpenGL**.

•Provides a foundation for further **game development projects**.

Thank you !

(Any questions?)