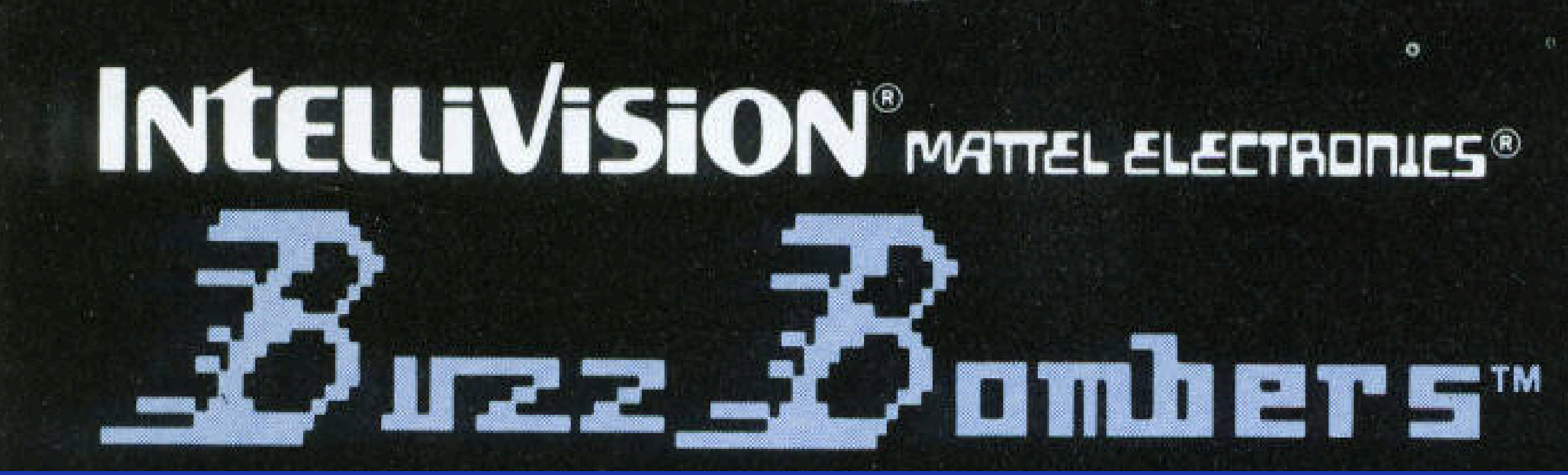
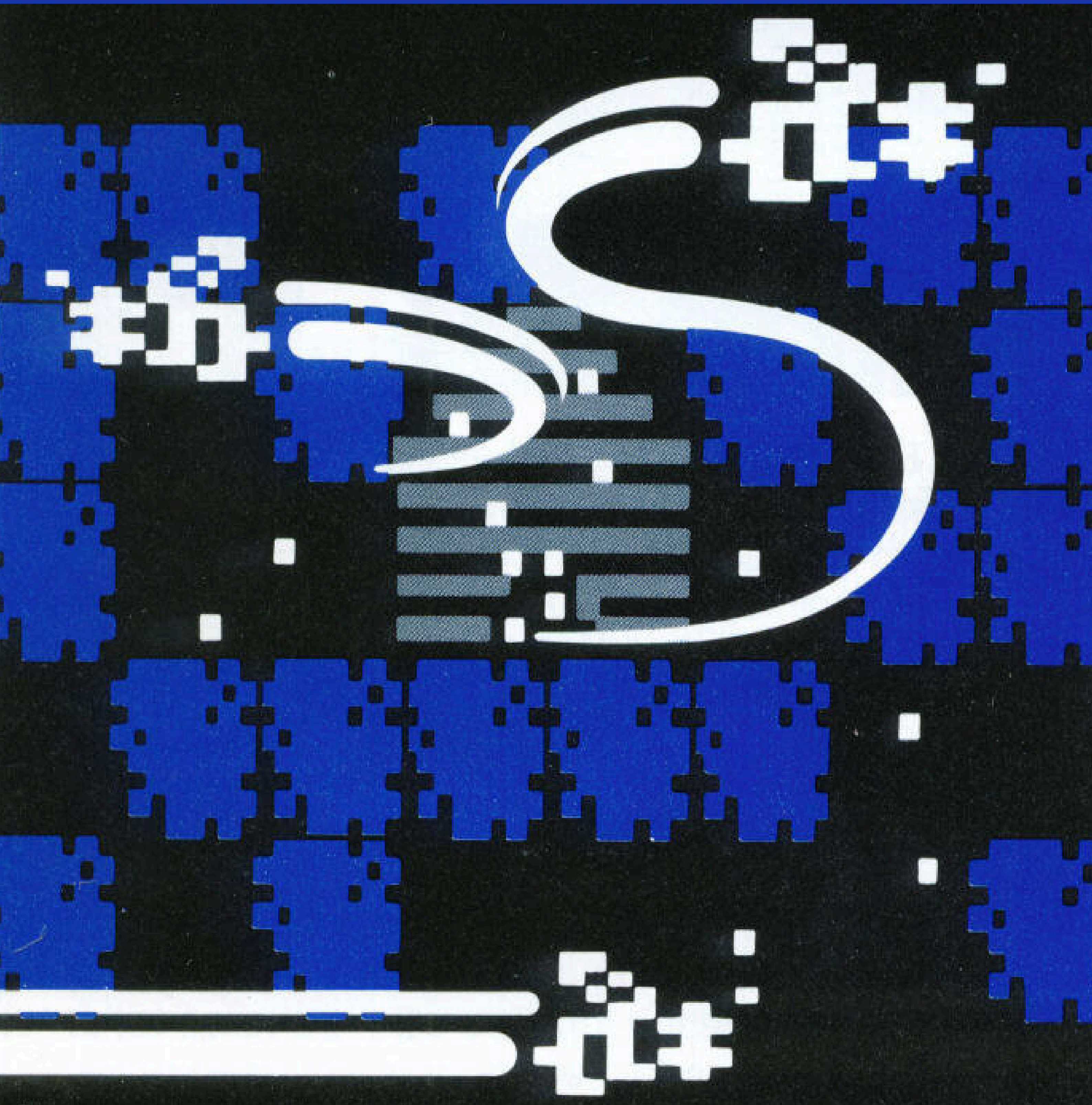


CS1002: Programming Fundamentals (Fall 2024)
PROJECT



Phase 2: (overview)

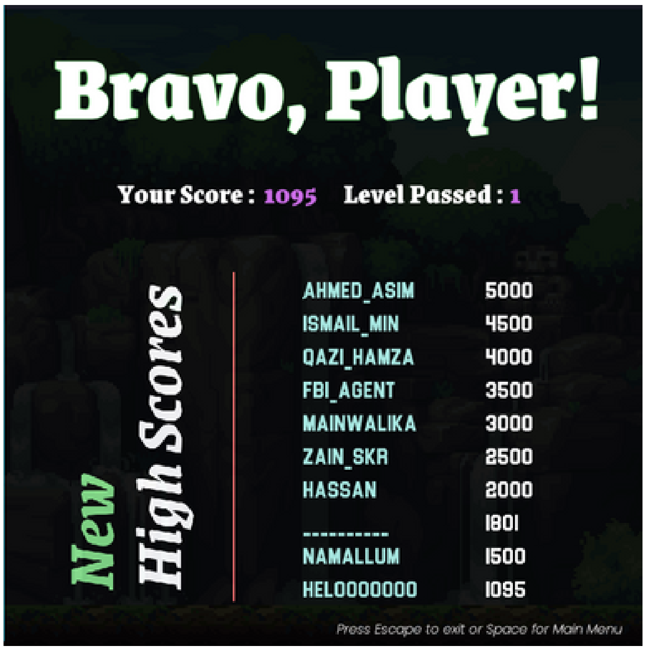
In this phase, students will enhance their game project by implementing two major features: a high-score tracking system and a new boss level. The high-score system will store the top 10 player scores along with their names in a file, utilizing concepts of file handling. This allows players to view their rankings across game sessions. Additionally, students will develop a boss level, which will serve as the 4th and final level of the game. This level should be accessible from the game menu and include new gameplay elements, such as a power-up for the player in the form of a spray can. Another exciting addition is the introduction of a dynamically created "infant bee" – a concept unique to this phase and not found in the original Buzz Bombers game. The infant bee will emerge from the hive after a set duration, adding complexity to the gameplay. Each of these features will be explained in greater detail in the subsequent sections of this document.

High-Score Tracking system

You are required to implement a high-score tracking system using file handling. The system must store the top 10 player scores along with their names in ascending order in a file.
This high-score feature will be displayed in the game on two occasions:

1. **Accessible from the Main Menu:** Players can view the current top 10 scores and their rankings.
2. **Displayed After the Game Ends:** The high-score table will appear when the game finishes or the player loses. If the player's current score qualifies for the top 10, it should be added to the list, replacing the lowest score if necessary.

To add a new score, the system will prompt the player to enter their name when the game ends.



Bravo, Player!

Your Score : 1095   Level Passed : 1

New High Scores

AHMED_ASIM	5000
ISMAIL_MIN	4500
QAZI_HAMZA	4000
FBI_AGENT	3500
MAINWALIKA	3000
ZAIN_SKR	2500
HASSAN	2000
----------	1801
NAMALLUM	1500
HELOOOOOOO	1095

Press Escape to exit or Space for Main Menu

*An example inspired by the Centipede game project from last year, showcasing an ending screen with updated high scores.

Boss Level

You are required to create a new level, designated as the 4th level of the game, referred to as the "Boss Level." This level should be accessible from the game's main menu and will introduce two exciting new features: Power-Ups and the Infant Bee Mechanic. At this level, there will be 20 regular bees, 15 fast bees, 15 pre-generated honeycombs, and 5 pre-generated hives (which should be randomly placed). If you are implementing the view bonus, all of these elements will be doubled.

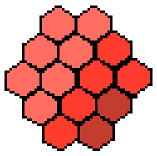
Power-Ups

In the Boss Level, there are 4 types of power-ups that exclusively affect the player's spray can:

1. Speed Increase
2. Speed Decrease
3. Height Increase
4. Height Decrease

These power-ups must create noticeable changes while keeping the game playable. Power-ups will drop under two conditions:

- When the hummingbird eats a honeycomb.
- When the spray can shoot red honeycombs that appear after hitting hunter bees.



Once dropped, power-ups will remain on the ground for a limited time. The spray can automatically pick up a power-up upon contact, instantly applying its effect. The effects of each power-up will last for a set duration, represented by a timer bar that gradually decreases. When the timer bar depletes, the power-up effect ends. If a player picks up the same power-up again while it is active, the timer bar resets, extending the effect duration. However, if a player picks up an opposite power-up (e.g., speed increase followed by speed decrease), the effects will cancel each other out immediately, and the power-up ends.

Infant Bee Mechanic

The Infant Bee introduces a completely new concept to the game. This bee will dynamically spawn from the top of the bee hive. Important: The Infant Bee must be created dynamically; no marks will be awarded if it is implemented statically. If the top of the hive is obstructed, the Infant Bee will not spawn.

Since it is a young bee, the Infant Bee cannot fly like an adult. It will attempt to fly upward. If an obstacle (such as a honeycomb) blocks its path, the bee will move left or right depending on available space. If it becomes completely trapped (no path upward, left, or right), it will transform into a new bee hive at its location.

When the Infant Bee successfully reaches the top, it matures into a Hunter Bee and will behave accordingly, flying downward as a threat to the player.

Gameplay Mechanics for the Infant Bee

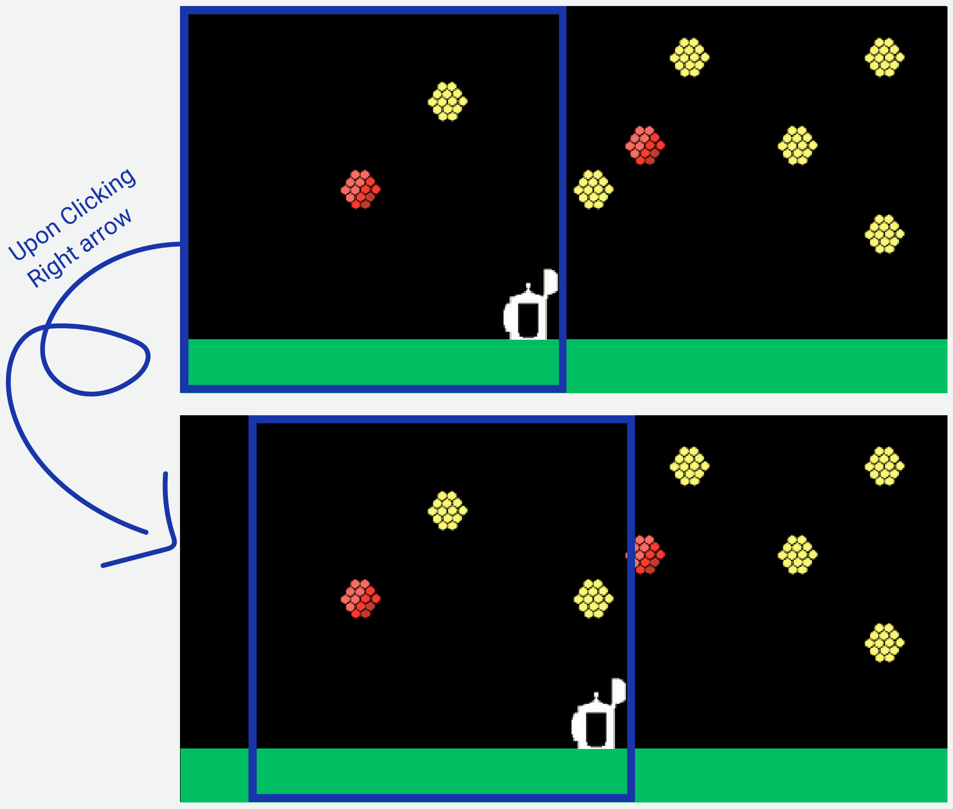
- Scoring:
  - Killing the Infant Bee in its child form results in a 500-point penalty because harming a child is not considered good.
  - Once it becomes a Hunter Bee, normal scoring and rules for Hunter Bees apply.
- Spawning:
  - The Infant Bee will spawn after a fixed interval. Ensure the interval is balanced:
    - Long enough to allow the player to clear all other bees and potentially win the game.
    - Short enough to maintain a steady challenge without excessive downtime.

BONUS (Bonus points will only be awarded to students who have successfully implemented the entire game)

View

This bonus is exclusive to the Boss Level. Students will create a game grid with double the number of columns compared to the current grid size. However, the visible area on the screen will remain the same as the existing view.

When the spray can reaches the edge of the visible screen (but not the boundary of the game grid), pressing the arrow key in that direction will shift the view to display the corresponding part of the game grid.



In this example, the blue square represents the area visible on the screen.

If students are using a background, they may utilize the sf::View function in SFML to dynamically adjust the background based on the spray can's position within the grid.

Additionally, the **bee** and **hummingbird** will move across the **entire game grid** (which is double the current size). This larger grid **cannot** be made global; instead, the grid must be **passed** to all functions that require access to it.

Animating the Infant Bee

You can earn a bonus by animating the Infant Bee using a sprite sheet. Proper use of the sprite sheet to create smooth, visually appealing animations will be rewarded.

Uploading Code on github

An additional bonus will be awarded to students who upload their complete project code to GitHub. The repository must include a properly written README.md file, clearly explaining the code, game mechanics, features, and instructions for running the game. Proper version control practices and repository organization will also be considered.