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"NOVOSIBIRSK NATIONAL RESEARCH UNIVERSITY
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Focus (profile): Software Engineering and Computer Science

TERM PAPER

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"Arkanoid"

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TERMS OF REFERENCES

1. Team members

Anisimov Kirill, Lebedev Nikolay, Romankin Daniil

2. Project name

“Arkanoid”

3. Project resources

Logisim, Cdm-16 emulator for Logisim, Cdm-16 banked memory for Logisim, Cdm-16 debugger for Logisim

4. Logisim circuit

The Logisim scheme should display the playing field, properly process the removal of blocks and their rendering, transmit the x-coordinates of the bat, the restart signal and random speeds to the Cdm-16 processor, as well as read the x- and y-coordinates of the ball and the score from the necessary addresses.

5. Assembler program

The Cdm-16 assembler program performs several important functions, including calculating ball physics, storing game scores (at address *0xc000*), updating block states and handling collisions. It also resets the game when necessary (by sending a reset signal to address *0xa002*), reads bat coordinates (5-bit x-coordinate of the right pixel of the bat at address *0xbeef*) and random velocities from the Logisim circuit, which are stored at addresses *0xa000* and *0xa001*.

6. Game rules

In the game the player controls a platform, hitting a ball and destroying blocks on the screen. The goal is to clear all the blocks from the field without letting the ball fall. The game ends when a player reaches 72 points (win) or when the ball reaches the bottom of the screen (lose).

7. User manual

The player should use the joystick to control the movement of the bat to the right or left. In the event of a loss, the player can press the "reset" button for 1 second to restart the game. This will cause the game to start over from the beginning of the first level, with the score reset to zero.

8. Improvements

- Ball velocity randomizing
- Different ball bounce settings
- 3 levels
- Resetting function
- Win / lose notification