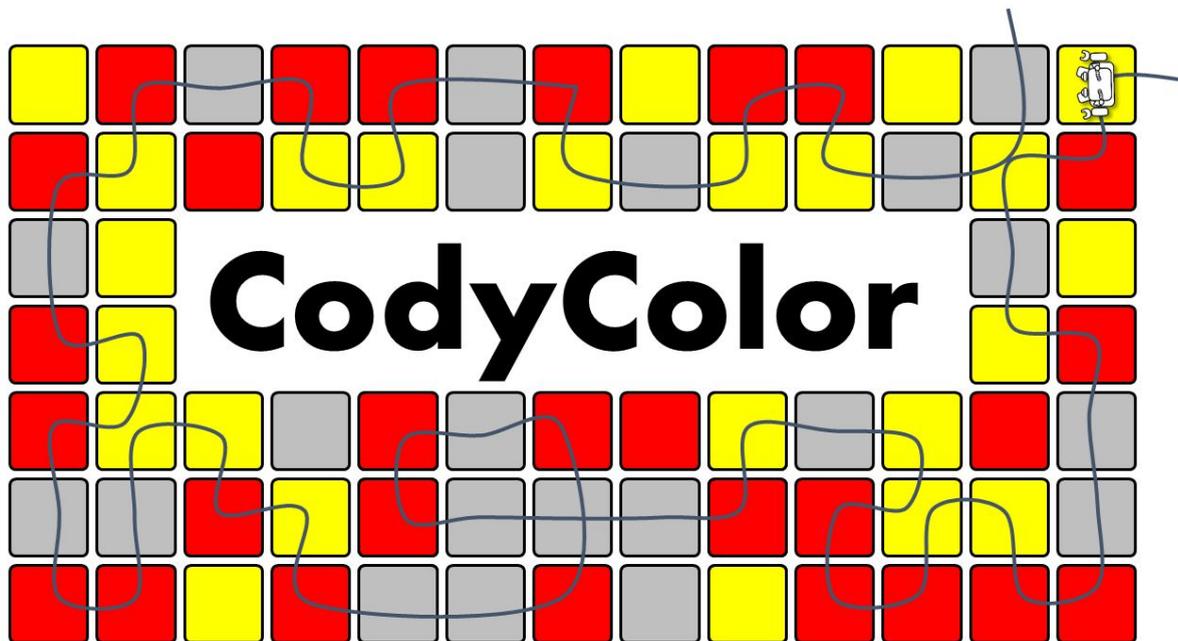


CodyColor is an online multiplayer game that will be used during Europe CodeWeek 2019 to organize pan-European coding activities.



What is CodyColor?

The CodyColor game is based on a **reduced set of coding instructions**, limited to two color-coded blocks: a *red block* is used to indicate a right turn while a *yellow block* indicates a left turn. The absence of color (i.e., a *neutral gray block*) is interpreted as a “NOOP” no-operation command. Players of the game (impersonating the Roby robot, thus acting as simple **code interpreters** and **executors**) start at a given starting position and perform indicated actions as they reach a new block. Forward movement (i.e., the “advance” action) is implicit and is always performed after reaching a block and executing the block’s action.

CodyColor was originally conceived, in 2018, as an “**unplugged**” **coding method**: that is, a coding activity that does not require any computer or other electronic devices. In the unplugged version of the game, the three kinds of instructions are represented as **large colored tiles** that can be placed on the floor. Actions can be put in a sequence, allowing programmers to represent a movement path both graphically (through the physical arrangement of blocks) and algorithmically (through the concatenation of movement actions).

At the start of the CodyColor game, a set of random blocks is arranged into a chessboard. Players choose the block from which they start and their initial orientation: from their starting block, players start executing the actions of the blocks

they stand on and moving across the grid. Players continue interpreting action blocks until they move outside of the chessboard.

Mentally **interpreting the color blocks** and **projecting the path** determined by the starting point can be a tricky exercise even for adult players. Several game schemes for single or multiple players have been designed based on this mechanic, such as finding longest paths, determining the exit point based on the starting point, finding infinite loops (if any), and so on.

Since its initial release, CodyColor has been successfully used in schools, both in its unplugged and in its online embodiments. The reduced abstraction between instructions and their representation, if compared to other methods based on cards or code blocks, has been appraised as particularly effective.

See <http://codemooc.org/codycolor/> for more information (in Italian).

The CodyColor online game?

The CodyColor concept has been adapted as an online multiplayer game, playable directly within any Web browser.

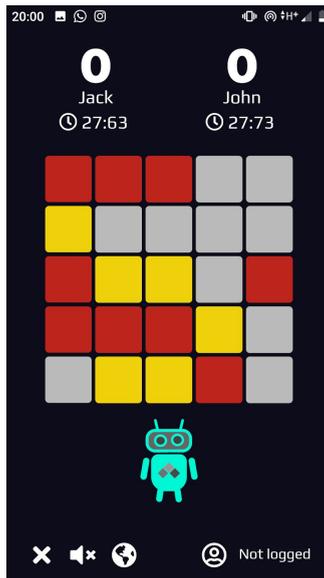
Anybody with access to the Internet and a Web browser (on a computer or on any mobile device) can easily participate and join a game of CodyColor: open a Web browser at <https://codycolor.codemooc.net/> and that's it.

Gameplay

The online game shows a **5 X 5 chessboard**, randomly populated with **colored tiles**, and shows the Roby robot that can be dragged to a starting position along the chessboard's borders.

As soon as the robot is dropped, it **enters the chessboard from the selected point** and starts **executing actions** corresponding to the underlying tile's color. The game is over when the robot **exits the chessboard**.

The purpose of the game is to **find the starting position** leading to the **longest path** across the chessboard. The path of the robot (and its length) is uniquely determined by the robot's entry point. Scores are determined by the **number of steps** the robot makes and the **speed** with which the player picks the starting position. Success in the game depends on the initial choices of the players and how quick they are at picking.



CodyColor offers 4 game modes:

- **Boot camp (1 player):** a single-player room is provided, that allows the player to experiment on random chessboards either without competing players or against an opponent moved by “artificial intelligence”.
- **Random match (2 players):** a game room is generated and assigned to two randomly picked players among those that are online at the moment.
- **Custom match (2 players):** a game room is generated by one player, who obtains a unique *match code*, to be used to invite an opponent of choice (through messaging or other external channels). The first player using the code is added to the room and starts competing on the same chessboard.
- **Battle royale (2+ players):** a game room for multiple players is generated (they can join by picking available game lobbies or using invitation codes, as above). The game allows all the players to make their choices independently in a given amount of time (e.g., 30 seconds). When the decision time elapses, all the robots placed by players start moving around according to the tiles they encounter. All the robots are displayed on the same chessboard to determine the longest path (i.e., the winner). A sequence of matches is played: at the end of each match, players are ranked on a leaderboard and gain points according to their performance. Points are accumulated until all the players decide to drop out of the game, terminating the game session and determining the final winner.

After each match, players can decide to keep playing inside the same game room. In this case new chessboards are randomly generated for the same players. Scores are cumulated and an updated leaderboard is shown after each match.