

Programming in Graphical Environment

Lab 1 - WinApi - Memory Game

Example app

Task description

Your task is to create a simple memory game application using WinAPI's basic techniques.

Inside the main window, there is a grid $N \times N$ of square cells (which are also the windows). N can be between 3 and 10, and it is the only argument of the application provided from the command line (if not specified, use value 3).

The player's goal is to remember the sequence in which the cells are displayed and later repeat it. With every correctly repeated sequence its length is increased by 1 (the beginning remains the same).

The game tracks the best player score - the length of a correctly repeated sequence.

Functionality

- Main window: fixed size, based on board size (app argument), prevents a size change but allows to change the window position and to be minimized
- At the start, the main window appears in the middle of the screen, all cells are visible, and app waits for pressing ESC button
- Board cells are the square windows of color #7C0A02, the background of the app is #FFFDD0
- The cells are arranged in an $N \times N$ grid layout, the size of the board cell is 90x90px (with a margin of 5px, in total the grid field is 100x100px)
- Use *Timer* for animating the sequence, each cell is displayed for 1 sec
- After displaying the sequence, the player can click on board cells using the left mouse button.
- If pressed correctly, the last cell is displayed, and the player can guess the next cell. If not, game ends.
- If it was the last cell, it is displayed for 1 sec, new random cell is added to the sequence and the sequence is displayed once again.
- Display "Score: %d, " with "Press ESC to start!", "Memorize!", "Guess!", "Guess OK!" or "Wrong! ESC to restart!" as a window title based on the game state.

Note: In all doubtful and untold aspects, the application should behave like an example app.

Additional requirements

- There is only one window on the taskbar
- Combination Alt + F4 closes the application
- Show the system menu when you click Alt + Space or right-click on a window in the taskbar
- No flickering or blinking, and properly repainted windows after moving

Tips

- AdjustWindowRect, _wtoi, SetWindowText, GetSystemMetrics, SM_CXSCREEN and SM_CYSCREEN
- WS_CHILD, WS_CLIPCHILDREN, WS_VISIBLE, WS_SIZEBOX, WS_MAXIMIZEBOX
- SetTimer, KillTimer, WM_TIMER
- CreateSolidBrush, RGB
- WM_KEYDOWN, WM_LBUTTONDOWN, GET_X_LPARAM and GET_Y_LPARAM

Scoring

Note: It is not possible to obtain points for incomplete functionality.

- Correctly displaying the main window (title, color, size, and position) based on the given size argument: 2 points
- Displaying child windows in the grid (color, size, and position): 1 point
- Displaying a cell sequence using a Timer: 2 points
- Implemented guessing stage (mouse interaction): 2 points
- Fully implemented game logic: 1 point