

HSE CPP course

Final course project

Description

Implement basic class Shape, and subclasses: Rectangle, Triangle, Circle. Implement Matrix::draw(Shape&) method, which fill matrix by shape's pixels. if pixel is out of the matrix bound, this pixel is skipping while drawing shape at matrix.

Requirements

- compiler with C++17 features
- cmake
- OpenCV

Building

```
$ mkdir build && cd build
$ cmake ..
$ make -j4
```

Project structure

- `include` - contains classes definitions.
- `images` - contains sample HSE logo images.
- `src` - contains classes implementations.
- `main.cpp` - contains main function

Run the programs

Program runs without any attributes. Program draws tree pictures: bw mashroom, bw house, color house and color car. Press any button to draw next picture. Drawn pictures can be stretched.

Example of execution program with command line:

```
./build/bin/runner
```

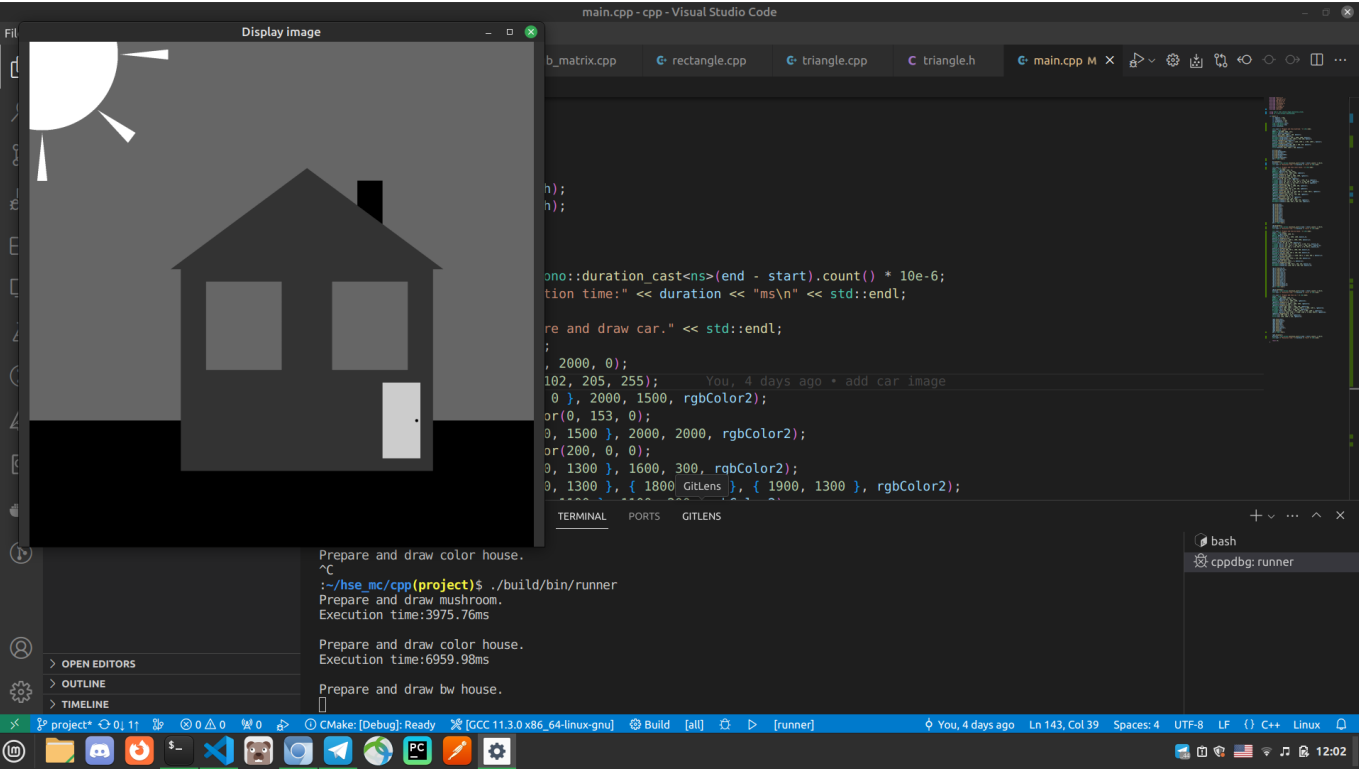
Program writes performance time to terminal.

Examples

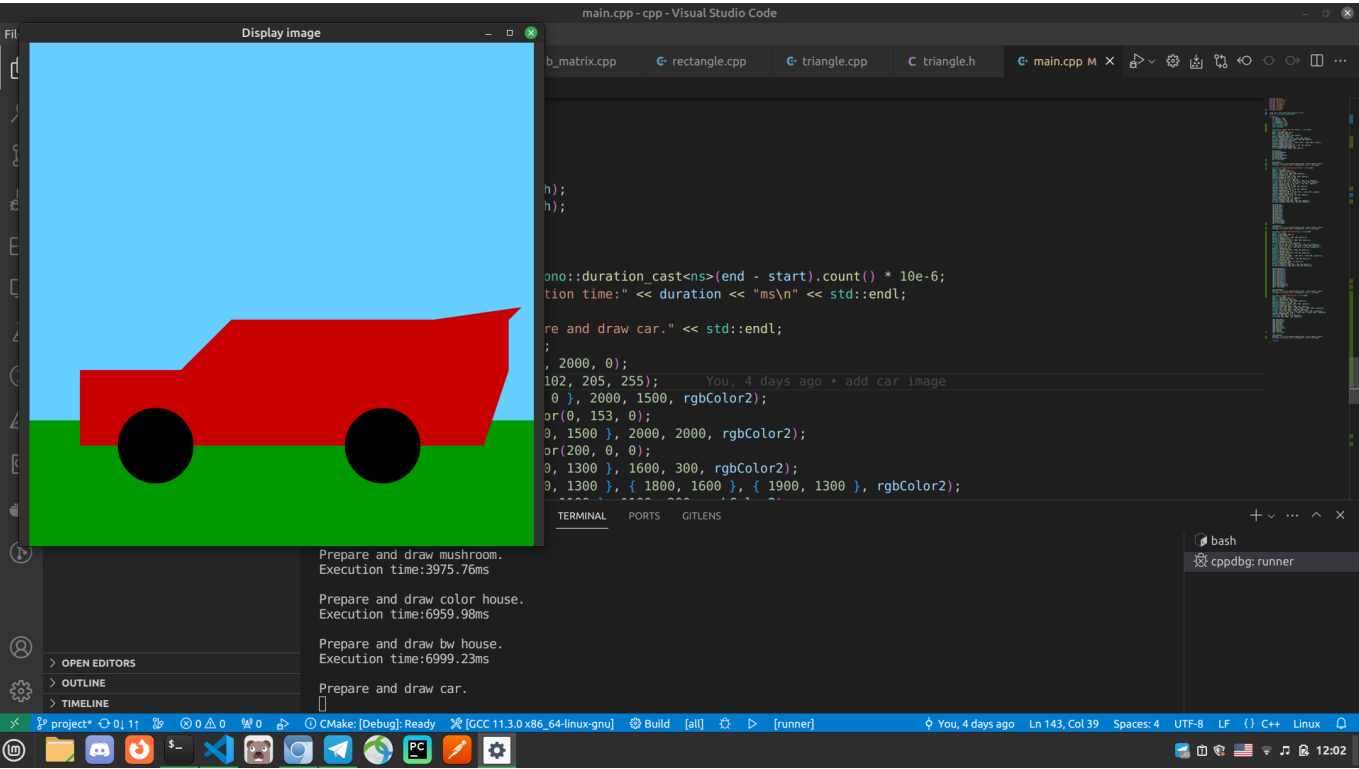
The image is a screenshot of the Visual Studio Code editor interface. The top bar shows the file explorer on the left and the editor tabs on the right, including 'main.cpp - M', 'b_matrix.cpp', 'rectangle.cpp', 'triangle.cpp', and 'triangle.h'. The main editor area displays a C++ program that uses the `SDL2` library to draw a house and a mushroom. The code includes headers for `SDL.h`, `SDL_image.h`, and `SDL_ttf.h`, and defines constants for window size and colors. It initializes an SDL window and renderer, loads a house image from 'house.png' and a mushroom image from 'mushroom.png', and then draws them onto the screen. The terminal window at the bottom shows the execution of the program, displaying the output 'Prepare and draw color house.' and 'Prepare and draw mushroom.' along with execution times. The status bar at the very bottom indicates the current file is 'main.cpp' at line 143, column 39, and the active language is C++.

The image shows a Visual Studio Code editor window titled "main.cpp - cpp - Visual Studio Code". The editor displays a C++ program that uses the SDL library to draw a scene. The scene includes a sun, a house, a car, and a mushroom. The program is divided into functions for drawing each element. The output window shows the execution results, including the drawing of a mushroom, a color house, and a car. The interface includes a file explorer, a terminal, and a status bar at the bottom.

Press any button and see next picture:



Press any button and see next picture:



Then you can see performance in the terminal:

```
:~/hse_mc/cpp(project)$ ./build/bin/runner  
Prepare and draw mushroom.  
Execution time:3975.76ms  
  
Prepare and draw color house.  
Execution time:6959.98ms  
  
Prepare and draw bw house.  
Execution time:6999.23ms  
  
Prepare and draw car.  
Execution time:6070.58ms
```