

**Gebze Technical University**  
**Department of Computer Engineering**  
**CSE 241/501**  
**Object Oriented Programming / Programming**  
**Fall 2022**  
**Homework # 2**  
**Composition**  
**Due date Nov 5<sup>th</sup> 2022**

You will continue developing our Tetris game in this homework. You already have the Tetromino class from HW1. If you don't have one working, we will provide one on Oct 30<sup>th</sup>.

Your new class will be named Tetris. It will have at least the following functions

- Constructors to take the rectangular size of the Tetris board.
- Add function to add a Tetromino to the board. The new Tetromino will be added at the top row in the middle.
- Fit function to rotate and move the added Tetromino so that when it is dropped to the bottom it will produce the best fit.
- Draw function to draw the Tetris board. It will optionally start the drawing from the top. See how to move your cursor to the top of your screen on a UNIX terminal at [https://en.wikipedia.org/wiki/ANSI\\_escape\\_code#CSI\\_sequences](https://en.wikipedia.org/wiki/ANSI_escape_code#CSI_sequences). Note that your code will not be portable because it will work only on certain consoles.
- Animate function to animate the added tetromino dropping to the bottom of the board. The animation will be repetition of four steps:
  1. Draw the board with Tetromino at the top
  2. Rotate and move the Tetromino to its optimal position at the top
  3. Draw the board again
  4. Sleep 50 milliseconds
  5. Lower the Tetromino one level and go to step 3 until it hits the bottom.

Make modifications to the Tetromino class as needed. Do not forget about “the principle of least privilege”

You will submit two driver source files; each will include a main function. Your first driver code will test each member function of both classes (Tetris and Tetromino) and print (or show) the result on the screen.

Your second driver code will do the following

1. Ask the user the size of the Tetris board
2. Ask the Tetromino type (I, O, T, J, L, S, Z). User may enter R for random Tetromino, Q for quit.
3. Add the asked Tetromino to the board and animate
4. Go to 2

Notes:

- You will submit 2 header and 2 CPP files for two classes. You should also submit 2 driver CPP files named driver1.cpp and driver2.cpp
- **Create and submit only one makefile for this project that compiles and runs the whole project.**
- Do not use any functions from the standard C library (like `printf`), do not use C arrays. For math functions you may use standard C functions.
- Your program should have header file and implementation files
- Use all the OOP techniques that we have learned in the lectures such as `const`s, C++11 features (range for loops, strong enums, `auto` keyword, `decltype` keyword, etc.)
- Do not forget to indent your code and provide meaningful comments.
- Check the validity of the user input.
- **Test your programs very carefully at least with 5 different runs. For some runs use trivial cases such as 3 O tetriminos.**
- You should submit your work to the Teams page using the instructions from the TAs.