

ENSC 251

Fall 2018

Lab 2

The sinking ship

Deadline: October 8th, 2018

Last revision: September 27, 2018



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1 A friendly game

I wonder who invented the game of battleship.

Two players take turns at guessing where the other person put their boats. The activity seems silly.

And yet, some people living in a fictional town somewhere in South-Western Canada have chosen the act of playing the battleship game to be the replacement for the judiciary and the parliament.

To major amazement, this actually improved the laws of the land and resulted in a very high conviction rate of almost 50%.

Let's learn more about this game and let's implement a very simple version.

2 The task at hand

Write a program in C++ which will print a battleship board.

The program, when run, must print an 8x8 board fully filled with ships.

3 The ships themselves...

- A battleship. Length 4. You have just one of those.
- A cruiser. Length 3. Two of those.
- A cargo ship. Length 2. Five of those.
- A submarine. Length 1. Ten of those.

In this version of the game your ships can only be placed vertically. Each ship has many segments. Each subsequent segment must be placed below the first.

For example: If you are placing a battleship at location $x=2$ $y=4$, then the segments end up occupying y locations 4 through 7, ends inclusive.

4 The place procedure

For every ship of your collection of ships do the following:

1. Generate random numbers x and y , between 0 and 7. (Use `rand() % 8`; from `<cstdlib>`)
2. Try placing the ship at those coordinates, making sure the ship won't stick out of the board and won't be placed over any neighbors that were already placed.
3. Either try the next ship or retry the current one, depending on if the random pair was a

good place to put the ship. I suggest you start the place process from the biggest ships.

5 Graphical outputs

Output 100 filled boards, each randomly generated.

Finally, for every point on the board, output B for battleship, C – cruiser, S – cargo ship, underscore for a submarine and nothing for open waters.