

Lab 5

Battleship

Objective

To use a two-dimensional array with the vector class, requiring flexible processing.

Assignment

In a simplified game of battleship, the computer places a single 4-unit-long ship at a random location in an 8 x 8 playing field, oriented either vertically or horizontally. The player is given 15 torpedoes to fire at the field. After a torpedo is fired, the map of the field is updated to show whether it was a hit or a miss. The game continues until the player sinks the ship or runs out of torpedoes.

Write a program using a vector of vectors of ints, and at least three functions to play this game.

Sample Run

```
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
```

```
15 torpedoes remain.  Fire where? 3 4
Hit!
```

```
. . . . . . . .
. . . . . . . .
. . . X . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
. . . . . . . .
```

```
14 torpedoes remain.  Fire where? 8 6
Miss!
```

Hint

Use a two-dimensional array to represent the playing field, with different integers representing different states (0 = empty, no fire; 1 = contains ship, no fire; 2 = empty, fired upon; 3 = contains ship, fired upon). Think about what you need to do to prevent the computer from placing parts of its ship outside the bounds of the playing field.