

## Project Battleship

Battleship is a guessing game for two players. It is played on ruled grids (paper or board) on which the players' fleets of ships (including battleships) are marked. The locations of the fleet are concealed from the other player. Players alternate turns calling "shots" at the other player's ships, and the objective of the game is to destroy the opposing player's fleet.

### 1. Project description

The goal of this project is to implement a Battleship game following the description bellow:

- Each player has two boards 10x10 - one to set up his ships (**main board**) and another to mark the places where he fires (**mark board**);
- The game uses 5 types of ships:

Amount	Ships	Size	Not hit	Hit
1	Carrier	5	C	c
2	Battleships	4	B	b
3	Submarines	3	S	s
4	Destroyers	2	D	d

- Ships must be set up on main board for the game begin. Each player can choose where he puts each ship on the main board at the beginning. Ships can be placed on vertical and horizontal, never on diagonal;
- The game must request the opponent's address to connect with him;
- Use the letters on the table to represent the ships on your main board. The size of each ship represents the number of cells it uses on the board. For instance, a carrier need 5 cells to be set up on main board.
- Mark places where you fire using X. Use capital letters to represent places not hitten and lowercase for hitten places. See example show bellow;
- For each round, the game must request for player's move. Each player enters his move using a letter and a number, for example, 'A1'. Letters represent columns and numbers represent lines. After one player entering his move, the game should mark it on opponent's main board and his mark board;
- The game ends when one player has no more ships.

### 2. Requirements

For this project you must meet the following requirements:

- Use C and only C, not C++;

- Use inter-process communication mechanisms, like socket, thread, semaphore, etc.;
- **Maximum two people per group.**

### **3. Delivery**

Each group should deliver:

- The code in C;
- The readme file, explaining how to run your code (if we cannot run your code, we will consider it is not working);
- The technical report, where you explain your code, your architecture and other features you think are important to better evaluate your project;

### **4. Presentation**

- You need to prepare a presentation (soutenance);
- The presentation will take place on last project class.
- You have 20 minutes to show your work;
- Both members should be able to explain the project and know how to answer all questions.

**Example:** This example is just to illustrate how to build the boards, how to set up the ships on it and how to use capital and lowercase letters. This example shows what each player can see during the match. However this example does not contain all ships, but on your project, you SHOULD use all ships.

Main board											Mark board										
1	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	-	C	-	-	-	S	S	S	-	-	-	-	-	-	-	-	-	-	-	-	
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	-	-	-	D	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	A	B	C	D	E	F	G	H	I	J	A	B	C	D	E	F	G	H	I	J	

Board with player ships

Move: A1

Player fires on A1

Main board											Mark board										
1	-	C	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	
2	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	-	C	-	-	-	S	S	S	-	-	-	-	-	-	-	-	-	-	-	-	
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	-	-	-	D	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	A	B	C	D	E	F	G	H	I	J	A	B	C	D	E	F	G	H	I	J	

Board to mark where player fires.  
A1 is marked here. This player fired on whater, so X is uppercase

Enemy move: B1

Enemy fires at B1

Main board											Mark board										
1	-	c	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	
2	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	-	C	-	-	-	S	S	S	-	-	-	-	-	-	-	-	-	-	-	-	
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	-	-	-	D	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	A	B	C	D	E	F	G	H	I	J	A	B	C	D	E	F	G	H	I	J	

Since this player have a ship on B1, this place is now marked with a lowercase letter. To destroy this ship, the enemy must shoot all five places