



# B2 - Unix System Programming

B-PSU-200

navy

You sunk my battleship!



2.0

# navy

binary name: navy  
repository name: PSU\_navy\_\$ACADEMICYEAR  
repository rights: ramassage-tek  
language: C  
compilation: via Makefile, including re, clean and fclean rules



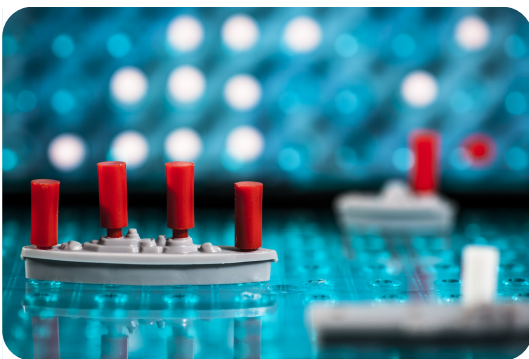
- The totality of your source files, except all useless files (binary, temp files, obj files,...), must be included in your delivery.
- All the bonus files (including a potential specific Makefile) should be in a directory named *bonus*.
- Error messages have to be written on the error output, and the program should then exit with the 84 error code (0 if there is no error).



**Authorized functions:** open, close, read, write, lseek, malloc, free, getpid, kill, signal, sigaction, sigemptyset, setcontext, getcontext, usleep, nanosleep, pause, getline, fopen, fclose



You are allowed to use one (and only one) global variable, if you can justify it.



You all know the very famous Battleship game. Well, I hope so.

You must code a terminal version of this game.

The two players are **ONLY** allowed to communicate using the signals *SIGUSER1* and *SIGUSER2*.

The map size is 8x8. On each turn, you must display your positions, and then your enemy's positions.

At the end of the game (when all the ships of a player have been hit), you must display whether "I won" (and return 0) or "Enemy won" (and return 1).



```
Terminal
~/B-PSU-200> ./navy -h
USAGE
    ./navy [first_player_pid] navy_positions
DESCRIPTION
    first_player_pid: only for the 2nd player. pid of the first player.
    navy_positions: file representing the positions of the ships.
```

The file passed as parameter must contain lines formatted the following way:

LENGTH : FIRST\_SQUARE : LAST\_SQUARE

where LENGTH is the length of the ship, FIRST\_SQUARE and LAST\_SQUARE its first and last positions.

In this file, you must have 4 ships (of lengths 2,3,4 and 5).

If the navy file is invalid, you have to quit the program and consider it as an error.

## EXAMPLE



The display must be EXACTLY the same as the one below.

Here is an example game.

The user inputs are written in *italic* font.

```
Terminal
~/B-PSU-200> cat pos1
2:C1:C2
3:D4:F4
4:B5:B8
5:D7:H7
```

```
Terminal
~/B-PSU-200> cat pos2
2:C4:D4
3:H1:H3
4:E6:H6
5:B1:F1
```



## CONNECTION

Player 1

```
Terminal
~/B-PSU-200> ./navy pos1
my_pid: 4242
waiting for enemy connection...

enemy connected
```

Player 2

```
Terminal
~/B-PSU-200> ./navy 4242 pos2
my_pid: 4250
successfully connected
```



## TURN #1

Player 1

```
Terminal
my positions:
|A B C D E F G H
+-----+
1|. . 2 . . . . .
2|. . 2 . . . . .
3|. . . . . . . .
4|. . . 3 3 3 . .
5|. 4 . . . . . .
6|. 4 . . . . . .
7|. 4 . 5 5 5 5 5
8|. 4 . . . . . .

enemy's positions:
|A B C D E F G H
+-----+
1|. . . . . . . .
2|. . . . . . . .
3|. . . . . . . .
4|. . . . . . . .
5|. . . . . . . .
6|. . . . . . . .
7|. . . . . . . .
8|. . . . . . . .

attack: Z0
wrong position
attack: B6
B6: missed
```



Player 2

```
Terminal
my positions:
|A B C D E F G H
+-----
1|. 5 5 5 5 5 . 3
2|. . . . . . 3
3|. . . . . . 3
4|. . 2 2 . . .
5|. . . . . .
6|. . . . 4 4 4 4
7|. . . . . .
8|. . . . . .

enemy's positions:
|A B C D E F G H
+-----
1|. . . . . .
2|. . . . . .
3|. . . . . .
4|. . . . . .
5|. . . . . .
6|. . . . . .
7|. . . . . .
8|. . . . . .

waiting for enemy's attack...
B6: missed

attack: 4
wrong position
attack: C1
C1: hit
```



## TURN #2

Player 1

```
Terminal
my positions:
|A B C D E F G H
-+-----
1|. . x . . . . .
2|. . 2 . . . . .
3|. . . . . . . .
4|. . . 3 3 3 . .
5|. 4 . . . . . .
6|. 4 . . . . . .
7|. 4 . 5 5 5 5 5
8|. 4 . . . . . .

enemy's positions:
|A B C D E F G H
-+-----
1|. . . . . . . .
2|. . . . . . . .
3|. . . . . . . .
4|. . . . . . . .
5|. . . . . . . .
6|. o . . . . . .
7|. . . . . . . .
8|. . . . . . . .

attack: C4
C4: hit

waiting for enemy's attack...
D1: missed
```



Player 2

```
Terminal
my positions:
|A B C D E F G H
+-----
1|. 5 5 5 5 5 . 3
2|. . . . . . 3
3|. . . . . . 3
4|. . . . . . .
5|. . 2 2 . . . .
6|. o . . 4 4 4 4
7|. . . . . . .
8|. . . . . . .

enemy's positions:
|A B C D E F G H
+-----
1|. . x . . . . .
2|. . . . . . .
3|. . . . . . .
4|. . . . . . .
5|. . . . . . .
6|. . . . . . .
7|. . . . . . .
8|. . . . . . .

waiting for enemy's attack...
C4: hit

attack: D1
D1: missed
```

Etc.





## LAST TURN

Player 1

```

▽ Terminal
attack: H6
H6: hit

my positions:
|A B C D E F G H
+-----+
1|o . x o . o . o
2|. . 2 . . o . .
3|. o . . o . . .
4|. . . x x x . .
5|. x o . . o o .
6|. x . . . . .
7|o x . x x x 5 5
8|. x . o . o . o

enemy's positions:
|A B C D E F G H
+-----+
1|. x x x x x . x
2|. . . o . o . x
3|. o . . . . o x
4|. . x x o . . o
5|. . . . . o . .
6|. o . . x x x x
7|. . o . . . o .
8|. . . . . o . .

I won
```



Player 2

```
Terminal
waiting for enemy's attack...
H6: hit

my positions:
|A B C D E F G H
+-----+
1|. x x x x x . x
2|. . . o . o . x
3|. o . . . . o x
4|. . x x o . . o
5|. . . . . o . .
6|. o . . x x x x
7|. . o . . . o .
8|. . . . . o . .

enemy's positions:
|A B C D E F G H
+-----+
1|o . x o . o . o
2|. . . . . o . .
3|. o . . o . . .
4|. . . x x x . .
5|. x o . . o o .
6|. x . . . . .
7|o x . x x x . .
8|. x . o . o . o

Enemy won
```

## BONUS

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You have to make the mandatory part before adding bonus!

Here are some example of bonus:

- play against an AI,
- a nice interface, music,
- multiplayer mode with more than 2 players,
- customize game,
- networking,
- and whatever you feel like.