B2- Unix System Programmation

B-PSU-155

navy

You sunk my battleship!

navy

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|	
binary name:	navy
repository name:	PSU_$YEAR_navy
repository rights:	ramassage-tek
language:	C
group size:	2
compilation:	via Makefile, including re, clean and fclean rules

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- Your repository must contain the totality of your source files, but no useless files (binary, temp files, obj files,…).

- 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

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You are allowed to use one (and only one) global variable, if you can justify it.
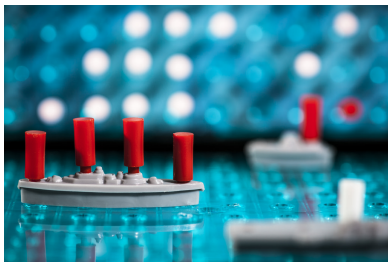
You all know the very famous `Battleship` game. Well, I hope so.

You must code a terminal version of this game.

The two players are ONLY allowed to comunicate 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).

```
~/B-PSU-155> ./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 (both players terminals in parallel).
The user inputs are written in *italic* font.

```
▽                Terminal            −  +  X
~/B-PSU-155> cat pos1
2:C1:C2
3:D4:F4
4:B5:B8
5:D7:H7
```

```
▽                Terminal            −  +  X
~/B-PSU-155> cat pos2
2:C4:D4
3:H1:H3
4:E6:H6
5:B1:F1
```

```
~/B-PSU-155> ./navy pos1
my_pid:  4242
waiting for enemy connexion...
enemy connected

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

waiting for enemy's attack...
C1:  hit

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 . . . . . .
```

```
~/B-PSU-155> ./navy 4242 pos2
my_pid:  4250
successfully connected

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

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|. . . . . . . .
```

```
┌▽──────────── Terminal ──────────── ─ + x ┐
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

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

[…]

```
┌▽──────────── Terminal ──────────── ─ + x ┐
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

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

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

[…]

```
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 . . .
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
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
```

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

my positions:
 |A B C D E F G H
-+---------------
1|. 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

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.