Guidelines for programming assignment #1

INFO-0010-2/4

2018-2019

Context

- You will develop a client/server application in order to play Battleship.
- Java (1.8) Sockets.
- Console input/output (no fancy GUI).
- Imposed protocol.
- To be realized alone.
- **HARD deadline** : March, 24th, 2019

img src : http://www.youtube.com

Game rules

On game start the server will place 5 ships at random on the 10x10 play area.

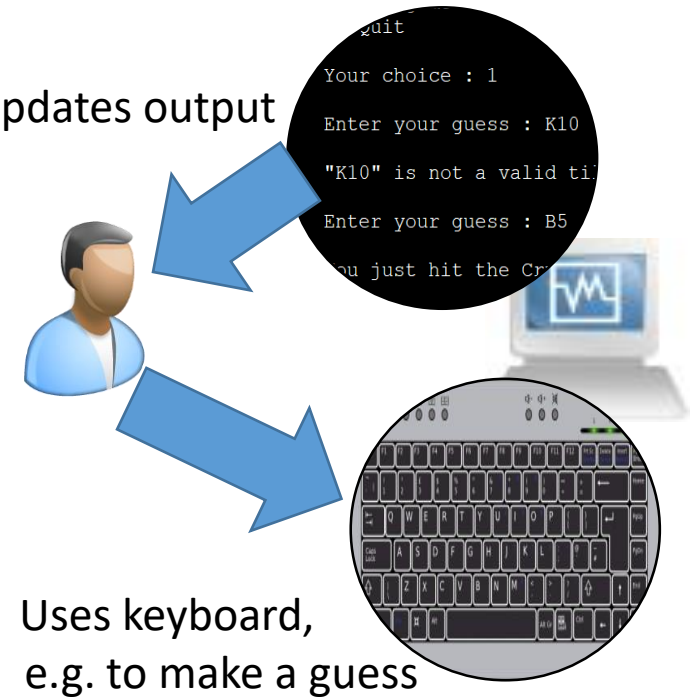
Each ship occupies a number of consecutive tiles on the grid, arranged either horizontally or vertically.

Ships are the following : Carrier (5 tiles), Battleship

(4 tiles), Cruiser (3 tiles), Submarine (3 tiles) and Destroyer (2 tiles).

1. The position of the 5 ships is selected at random.
2. User tries to guess the location of one ship, and provides the X and Y coordinate to be evaluated.
3. The response is a number corresponding to the ship that was hit, or 0 if no ship was present.
4. If the user destroyed the 5 ships or failed to do so in 70 tries, go to 5, otherwise go to 2.
5. Game over. User wins if (s)he destroyed all ship, (s)he loses otherwise. User wants a new game? Go to 1, otherwise, quit.

Architecture



5. Updates output

4. Sends response,
e.g.: "1 2 2 "

3. Evaluates combination

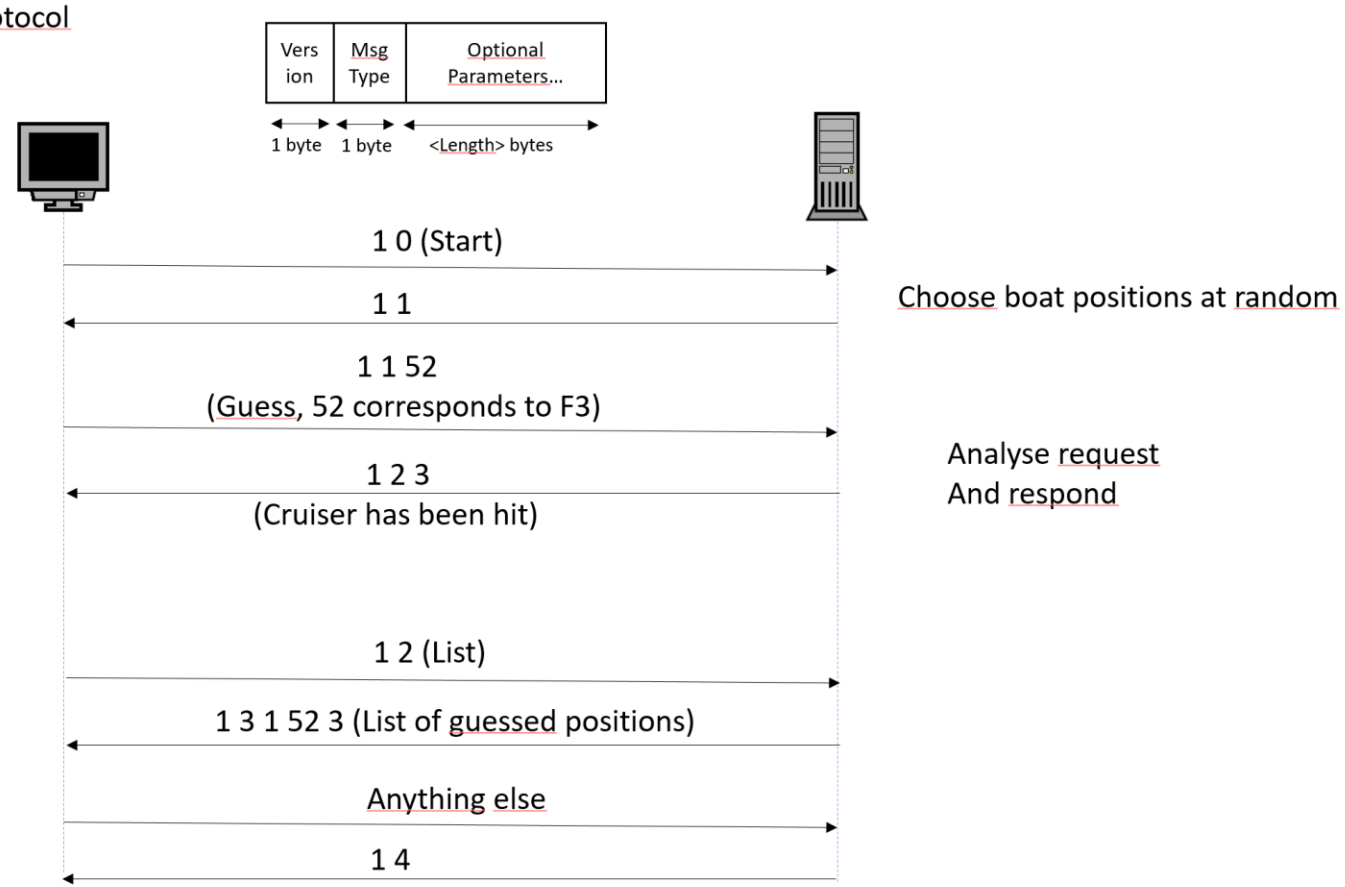
1. Uses keyboard,
e.g. to make a guess

2. Sends request,
e.g.: "1 1 25"
(each value is a byte)
(25 means 3rd row, 6th column)

Img src for Host and server from GNS3.

BattleshipProtocol (BP)

Battleship protocol



(Un)intentional malevolence

- What happens if I send "1 3", or "2 0"?
  - Good behaviour : Send "1 4".
  - Bad behaviour : Trigger exception.
  - Never expect, always check!

- What happens if I send "1 1"?
  - Server waits for the rest of the request, that never comes.
  - If single-threaded, cannot handle new connections.
  - One thread for new connections, then one thread per connection.
  - Use Socket time-outs, close connection if too long.

Extra guidelines

- Port number : *2xxx*, where *xxx* = last 3 digits of ULiege ID
- Class named « BattleshipClient" and « BattleshipServer".
- The server console should display the position of the ships.
- No "package" instruction, no shutdown hooks, limited libraries for import, no file manipulation.
- Fully operational on student machines (ms8**.montefiore.ulg.ac.be).
- Short report.
- Send submission to Montefiore Submission Platform (submit.run.montefiore.ulg.ac.be) before March, 24th 2019!