Hacettepe University
Department of Computer Science and Engineering

BIL342 Programming Laboratory
Experiment V

Subject:	Socket Programming with Unix and Java
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Submission Date:	05/05/2002
Deadline:	19/05/2002
Programming Language:	C or C++ and Java

AIM

The aim of this experiment is to give students the ability to code with the basic concepts of socket programming on Linux and java. Within this context you are asked to write a C program to serve java applets to play a multiplayer tank war game.

PROBLEM DESCRIPTION

In this experiment, you will implement a real-time multiplayer tank war game software which will include two components. The first one is the "server" writen in C under Unix/Linux environment. The second is the "client" writen as a Java Applet, with a GUI for the players.

At the beginning of the game the server will generate a map of cells on the screen. Each cell can contain only one symbol at a time: Wall, Tank (⇐⇒⇑⇓), Bullet (▯▯▯▯) or Blank. There are two types of walls: Bullet Proof (▯) or Destroyable (▯). A sample map generated by the server for two clients is shown below.

Tanks can do two different actions: moving and firing. A tank can rotate and move in 4 directions. Up, down, left and right. The arrow keys of the keyboard will rotate and move the tank and space bar will fire. Movements of tanks and bullets in the specified direction will be one cell at a time. The server will refresh the map every 200ms. In a period of 200ms (once the map is received) each client will be able to do only one action at a time (either move or fire). In other words only the first action of a player (if there is one) within the period will be taken into consideration (sent to the server as a command) by the client applet.

The server will be responsible of getting client's commands, updating the map accordingly and dispaching it to the clients every 200ms with an adaquate format. Drawing the map on the user screen will be handled by the client applet.

Possible Questions and Answers

Q: Can two tanks be in same cell?

A: No. Tanks cannot crossover each other. They simply hit each other. In this case both tanks will destoryed.

Q: What about bullet collisions?

A: As the tanks, two bullets cannot be in same cell. They simply hit each other and both bullets will destory.

Q: Where to I have to control the collisions? Server or Client?

A: It's up to you. Chose the simple one.

Q: Do I have to check created map for something?

A: Yes. There must not be a area which is isolated by bullet proof walls.

Q: If a player joins the game, where will be the starting point?

A: Your server will choose it. But it must be an empty cell.

Q: What is the speed rate between tanks and bullets?

A: Bullets are three times faster than tanks.

Q: Do I have to make any animations?

A: No.

Q: Is there a maximum for the player number?

A: No. There is no limit.

Q: What will be the parameters for server?

A: Server will take 2 parameters. First one is the dimensions of map and the second one is the port number to listen.

NOTES

1. Soft copy of this paper is in
   `ftp://ftp.cs.hacettepe.edu.tr/pub/dersler/bil342/2003/5`

2. You are asked to give your `Makefile` with your program.

3. You are asked to give your `HTML` file which will run your java applet.

4. You are asked to follow announcements made to "bil342 discussion list". If you are not subscribed yet, please subscribe to it by sending an e-mail to:

   `majordomo@cs.hacettepe.edu.tr`

   with a message body of
   "`subscribe bil342`".

5. Your report and programs must be submitted at the same time.

6. Your report must be printed.

7. Your programs and reports will also be posted with a floppy disc.

8. E-mail submissions are not accepted.

9. Late submission will not be accepted.

10. Office hours will be held on Wednesday afternoons. You can also send e-mails to
    `kerem@linux.org.tr` for your additional questions.

Good Luck