Project 3: Vector Player

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The Back Story

It was so weird. You and some friends were having fun, playing your favorite board game (Vector) and listening to your favorite LP, when BAM! , you all magically find yourselves 40 years in the future in the year 2009. You have missed 38 years and are totally lost; your clothes are all out of fashion, and very few people know of Vector: essentially, nothing is the same. You and your friends console yourselves by traveling the world and playing Vector (although finding a copy took a very long time).

But then you get word of this Vector tournament being held in Rochester, NY, except with a twist: rather than human players, this tournament consists of *computer* players. You and your friends get all excited; it does not matter that you have to learn how to program: Vector is worth it.

You enter the tournament and are presented with all the necessities to get you started: the tech specs of the server system (cleverly named VSE for Vector Server Engine), the protocol, the rules, and even a very nice user and programming guide. Luckily, the rules are the same as in the original game, so you do not have to learn those.

However, you do have to learn a programming language, sockets and network connections. You are a bit restricted regarding the sockets and the network, but you can (theoretically) use any programming language you want, as long as it supports sockets. To help you out, the team who created the VSE also provided "dummy" players, in what they consider three of the languages most likely to be used: Python, Java and C. This team figures that these examples should help novice network programmers get acquainted with the system.

Some More Specifics

The team who created the VSE is actually a group of undergraduate students at the University of Rochester, and the Department of Computer Science has been so gracious to offer use of their lab machines to host the tournament. Thus, each player get his (or her) own CSUG Dell Machine; that is, each player is limited to the computing power of ONE CSUG Dell machine. You may not hijack other computers/resources. The VSE will run on a separate CSUG Dell Machine, and each player must connect to the server on that computer. However, as soon as the game begins, there must be NO communication between the players: the server handles any and all communication!

The preceding point is very important. There can be NO communication between players once the tournament begins! This includes players on the same team! Everyone is expected to be virtuous. It would be highly immoral to secretly communicate between players.

The tournament begins once all four players connect. At the start of the tournament, the server randomly assigns teams for all 13 games. Each game has 12 rounds (a round consists of every player picking a direction and a magnitude). For some added challenge, each player may have no more than 0.5 seconds to choose their direction and magnitude. If a player does not abide by this time-limit, that player and that player's team are disqualified from the current game. When a player is disqualified, the game ends and the tournament server moves on to the next game.

Following the protocol is very important: if a player gives malformed input, that player's *team* is disqualified from the game (see immediately above for what happens in a disqualification).

As mentioned before, the rules for the tournament are exactly those of the rules for the original Vector game. The winning team (of a game) receives 1 point, the losing team (of a game) receives 0 points, and in the event of a tie, everyone receives 0.5 points.

The user guide and protocol can be found as Appendices A and D, respectively, in this paper. The README can be found as an associated file submitted along with this paper.