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2803ICT Assignment 2

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# Problem Statement

This assignment requires the construction of code which can produce 2 separate programs, a server and client. The server should be able to facilitate the connection and communication with multiple clients and through the use of a pre-determined set of protocols and rules set by the task sheet. The sever should also be able to use the aforementioned rules as a way for the client to interact with a game known as numbers which the server will run, the client in turn will be a way in which the average end user would be able to interact with the server and furthermore the game in question.

# User Requirements

# Software Requirements

# Requirement Acceptance Tests

# Software Testing

# User Instructions

Below will be a list of instructions that are necessary to run the project which was created for this assignment:

## Preparations

This application is designed to solely work on Linux based operating systems and as such is inoperable on windows without the use of bash emulation software such as Cygwin; such running conditions must be obtained. Furthermore, if the intention is to run this with clients connecting from different networks on the internet, some extra steps will have to be taken to forward the port from your router to the computer running the server; in such a situation the server runner should forward the desired port and the clients should instead use the public IP of the network rather than the local IP of the server computer on its network.

## Server

In order to run the server, you should open the system terminal (or Cygwin terminal on windows), navigate to the directory of the server program and run it with a line similar to the one shown below, filling in the angle bracketed sections with relevant variables:

./game\_server.exe <port number> <game type> <game arguments>

Port number – is the number of the port on which the server is listen to for incoming users, in instance where this game is being played over the internet, this will also be the port which will have been forwarded from the router to the computer running the server.

Game type – this is the name of the game which will be played, currently numbers is the only game which has been developed and as such it is the only acceptable input.

Game arguments – this is a section for arguments and variables required to inform the game on how it should run. For numbers this is used to dictate the number of players the following game will hold.

## Client

In order to run the client, you should open the system terminal (or Cygwin terminal on windows), navigate to the directory of the server program and run it with a line similar to the one shown below, filling in the angle bracketed sections with relevant variables:

./game\_client.exe <game type> <server IP> <port number>

Game type – this is the name of the game which will be played, currently numbers is the only game which has been developed and as such it is the only acceptable input.

Server IP – this is the IP of the computer running the server, if being played on the same network the local IPV4 should be used. If the game is instead being played over the internet, then the public IP address of the network should be used.

Port number – is the number of the port on which the server is listen to for incoming users, in instance where this game is being played over the internet, this will also be the port which will have been forwarded from the router to the computer running the server.

## Game rules

### Phases

The game is split up into 2 sections: the joining phase, and the game phase. In the Joining phase all the clients should connect to the server until the specified number of players have joined the game, at this point the game phase will begin.

### Controls

During the game phase the server will call on the users one at a time, in the order in which they joined the game, when called upon to ‘please take you turn’ the user running the client has 30 seconds (if exceeded with no response the user will be removed from the game) to use one of two commands: the user can choose to QUIT which will remove them from the game, or they can choose to MOVE which should be followed by a number; in addition to that a user can also simply input a number which the client will interpreted as a MOVE command and the prefix automatically; furthermore the number sent has to be within a given range, if a players sends off a number outside the given range (which is currently between 1-9) the server will give the player 5 additional chances to send a valid input before they are removed from the game. Any command other than the commands mentioned will result in a server error which will result in that client’s removal from the game.

### Win conditions

For each turn the players will use the move command you send a number to the server which will be added to a running total which will be displayed to the users at the end of each turn, the aim of the game is to make the total reach 30 on your turn at which point you will win and the game will be over.