Texas Hold 'Em Poker User Manual

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1 Introduction

The Texas Hold 'Em Poker application lets you play poker against the computer. You have the opportunity to play poker against three artificial intelligence opponents who will react to the decisions you make. This application is appropriate for the beginner and for the advanced user since you can change the difficulty of the opponents. Lastly, this application lets you track your progress over time so you can see how you develop!

This document will provide the following implementation about how to use the Texas Hold 'Em Poker application:

- A how-to installation guide
- A how-to guide for all major functionality of the application
- A guide for handling errors which may occur while using the application.

This manual assumes that you are familiar with all of the rules of Texas Hold 'em poker.

2 Installation

2.1 System requirements

The system has be designed to be run only on the computers at The Henley College. The system has therefore only been tested on computers at the college. As such, the following requirements must be met for optimum performance:

RAM The computer must have at least 3GB of usable RAM.

Operating system The computer must have at least Windows 7.

Processor The computer must have at least a 3.10GHz processor.

2.2 Prerequisites

There are the following prerequisites to get the system to run:

Memory stick You must have a memory stick with at least 350MB of free space.

.NET Framerwork You have the .NET framework (at least version 4.5.1) installed on the computer.

EasyPHP DevServer You must have at least EasyPHP DevServer 14.1.[1]

[1]This can be downloaded from http://www.easyphp.org/easyphp-devserver.php

2.3 Setting up the application

The following steps will guide you through the process of setting up the application:

1. Copy the EasyPHP-Devserver setup file (.exe file) to your memory stick, into a folder of your choice
2. Run the setup file from the memory stick and install the software onto the memory stick using the setup wizard
3. Obtain a copy of the Texas Hold 'Em file (.zip file) from your teacher
4. Copy the Texas Hold 'Em file onto your memory stick
5. Extract the contents of the .zip file on your memory stick.

The following images will demonstrate the above steps:

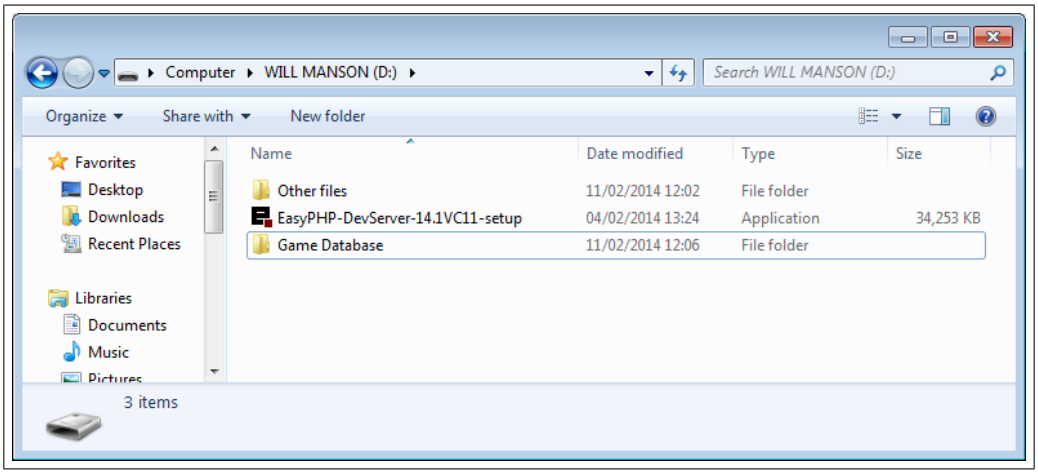

Figure 1: Put the DevServer setup file on the memory stick

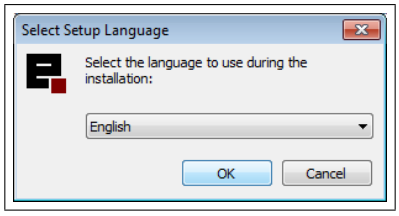

Figure 2: Open the setup application and choose "OK" for English as the installation language

Figure 3: Click "Next" to proceed

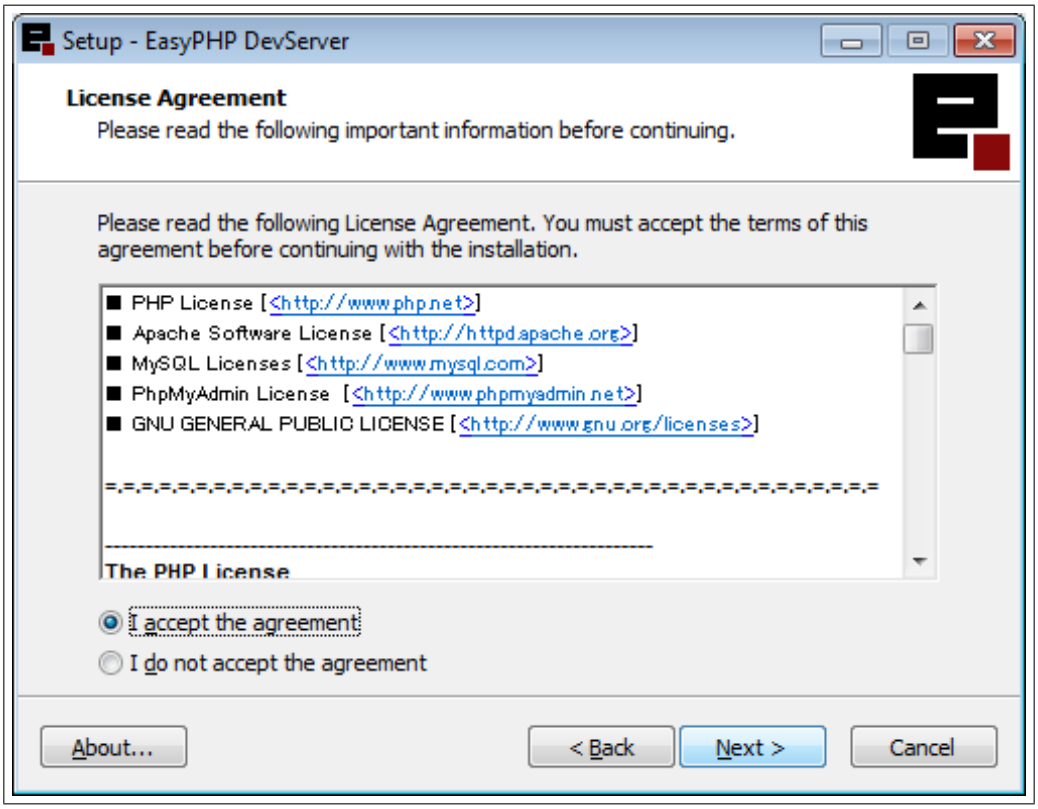

Figure 4: Accept the license agreement

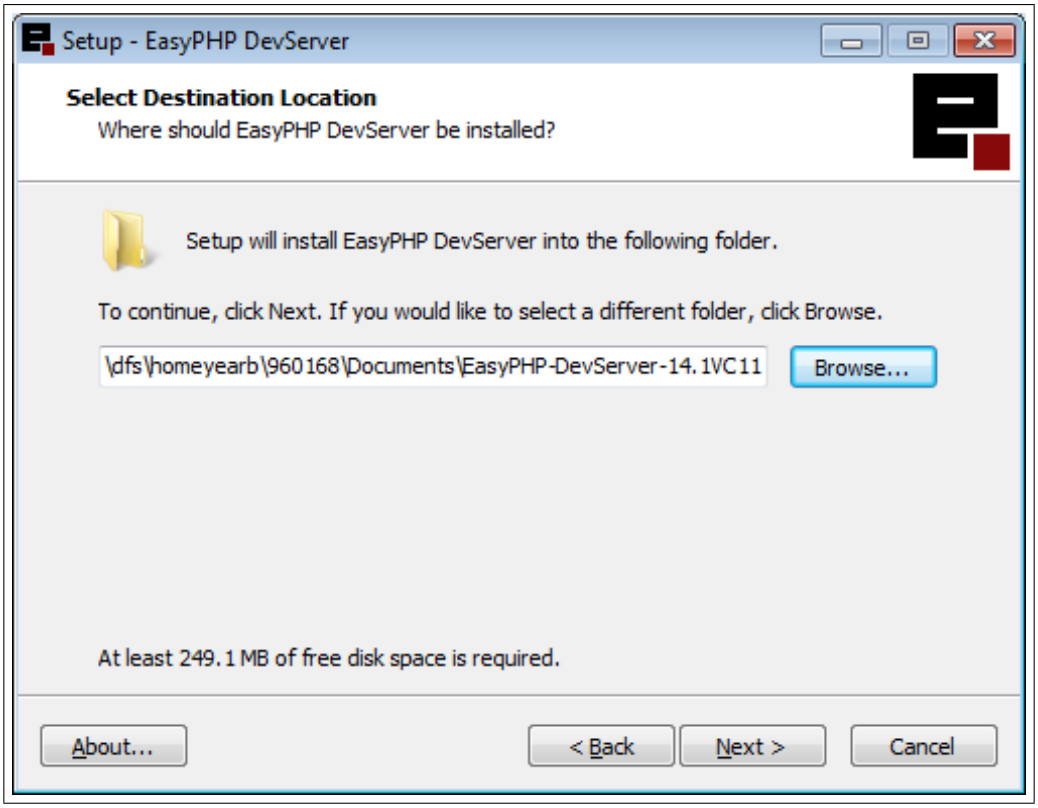

Figure 5: Click browse to select the folder to which you will install this program

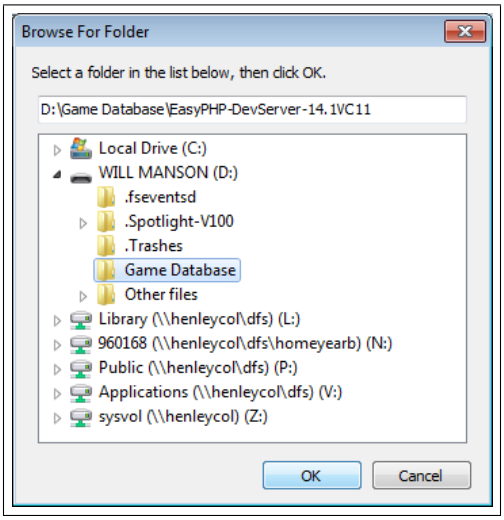

Figure 6: Choose a folder on the memory stick to which you wish to install the program

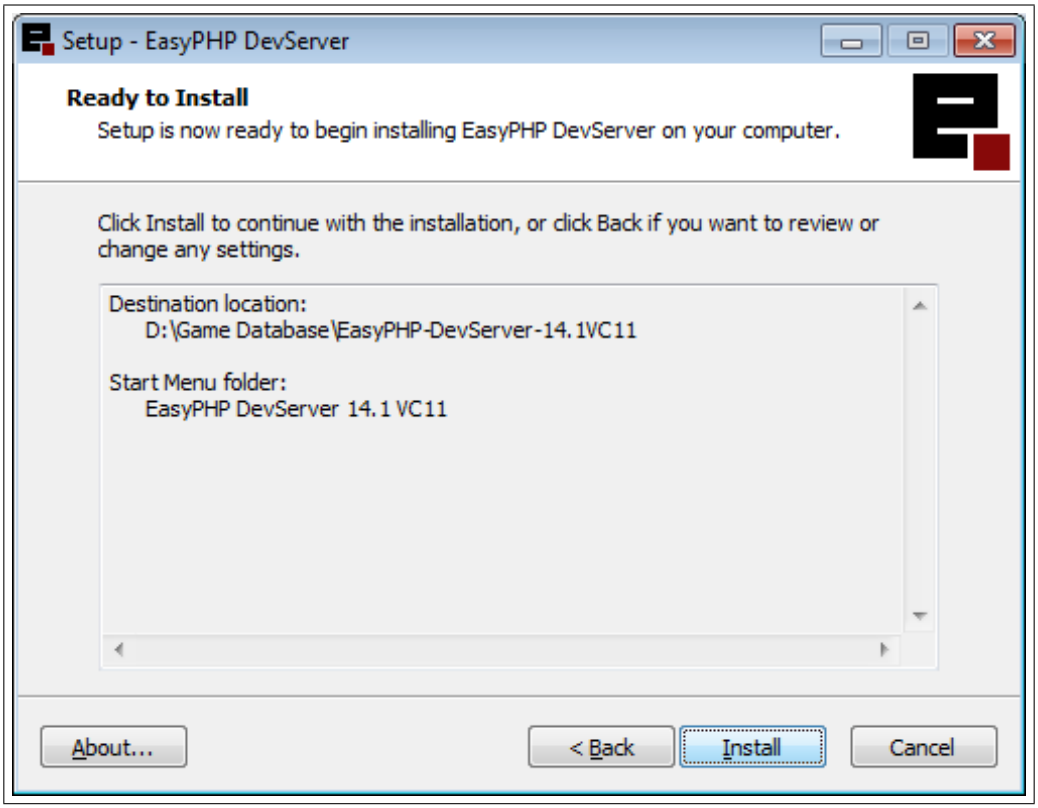

Figure 7: Click "Next" twice to proceed and then click "Install" on this menu to confirm installation

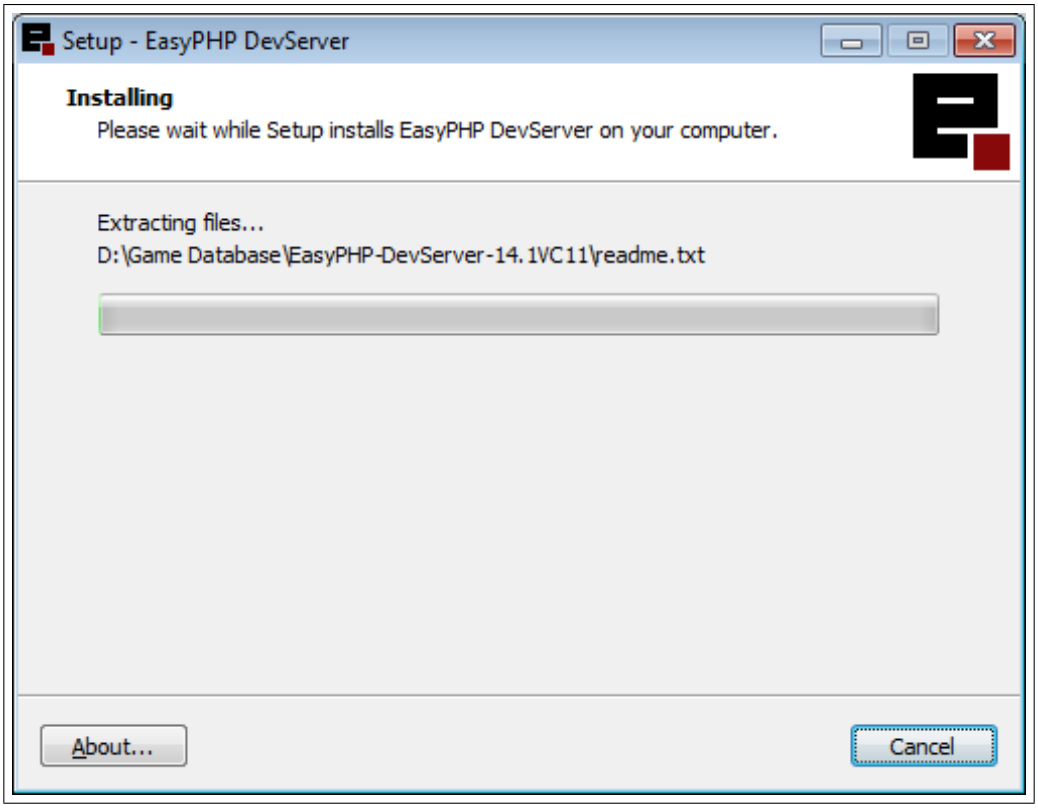

Figure 8: The program will install

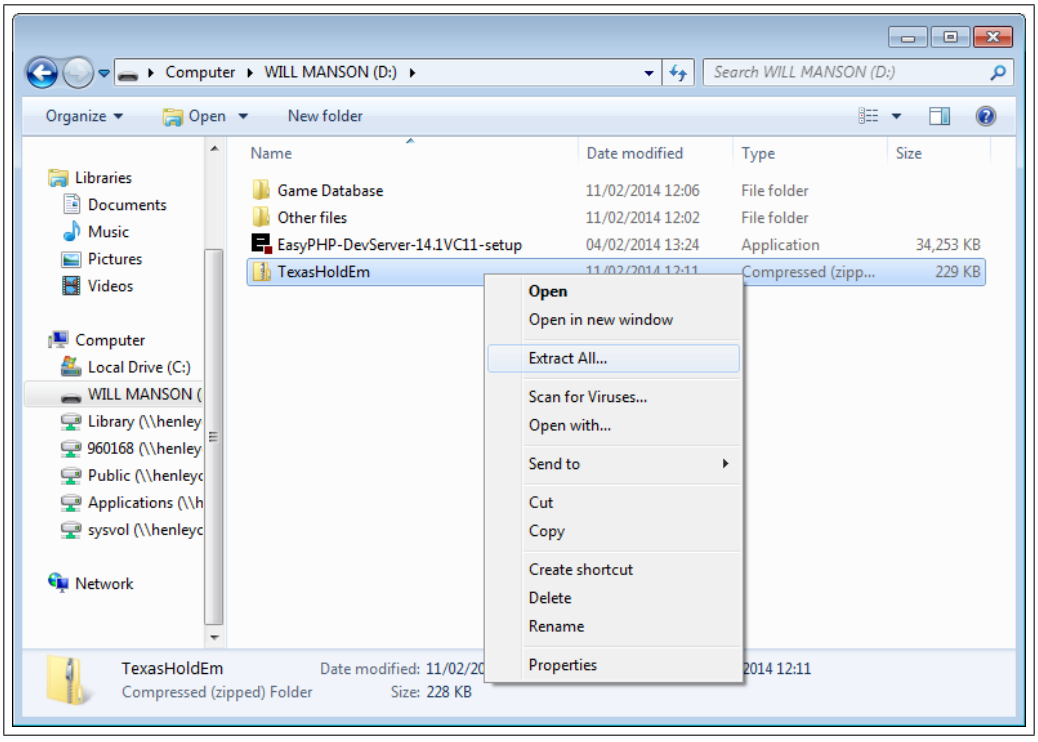

Figure 9: After the installation has completed, copy the Texas Hold 'Em file (obtained from your teacher) onto the memory stick and then extract the file

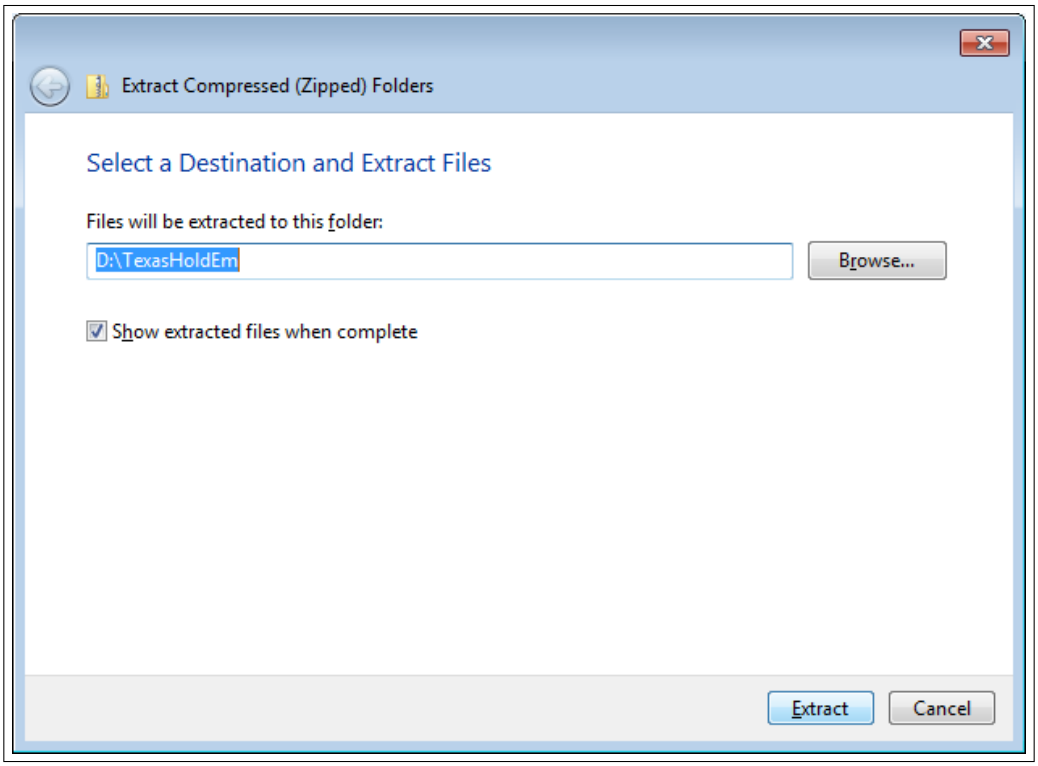

Figure 10: Choose the folder on the memory stick to which you wish to extract the file

2.4 Running the application

Before running the application, you must always first run the DevServer software. To do this, go to the folder to which you installed the software on the memory stick and run the file.

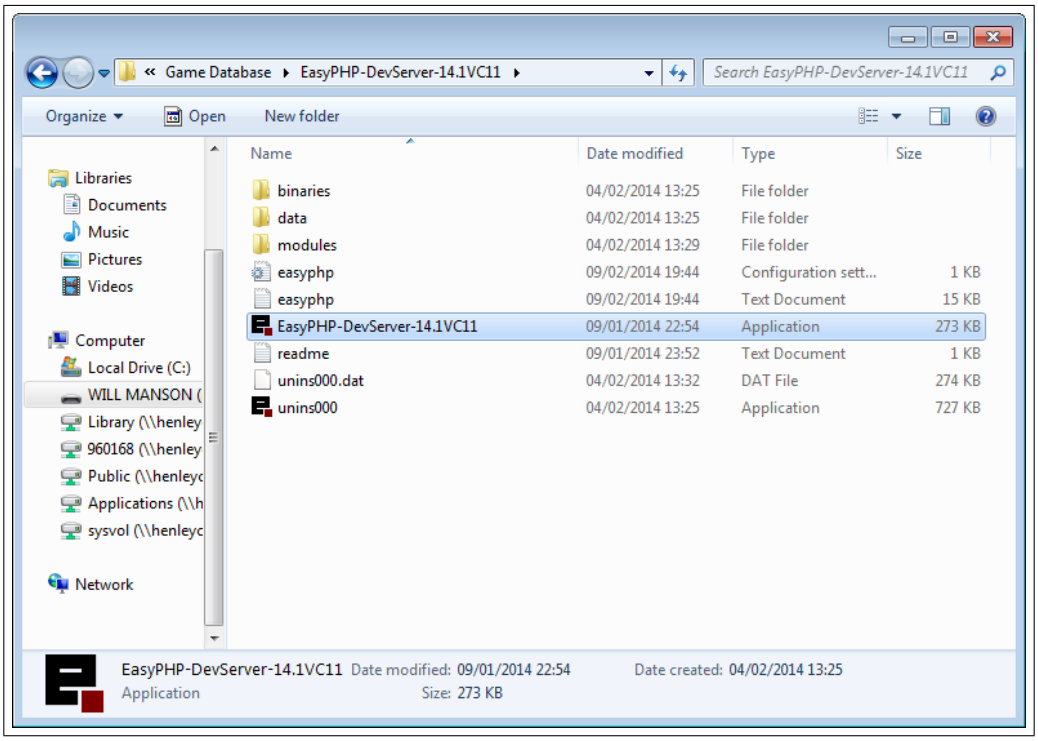

Figure 11: Browse to the folder on the memory stick to which you saved the DevServer file and run the file

You must now browse to the folder on the memory stick to which you extracted the Texas Hold 'Em files. From here, simply run the application.

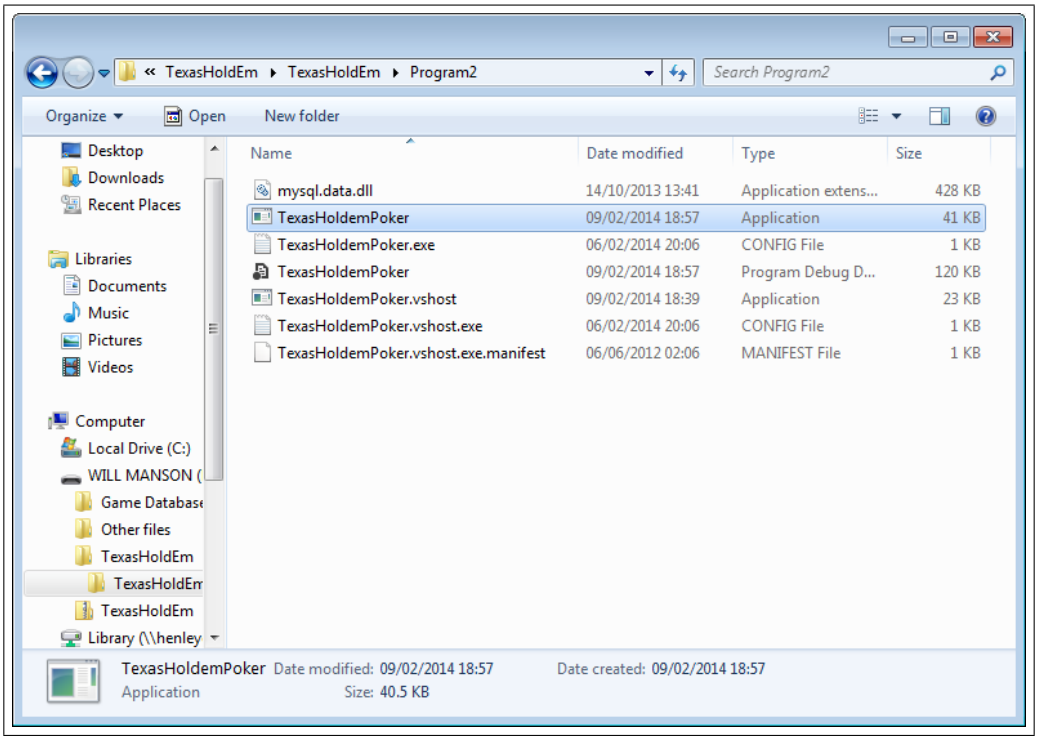

Figure 12: Browse to the folder on the memory stick to which you saved the Texas Hold 'Em files and run the "TexasHoldemPoker" application

3 How to use the software

3.1 Creating a password

On the first visit of the application, it will be necessary for you to create a password. The password must adhere to the following rules in order for it to be validly accepted by the system:

- The password must have at least eight characters
- The password must have at most twenty characters
- The password must consist only of letters and numbers (it cannot have any symbols etc.)
- The password must have at least one number.

Figure 13: When visiting the application for the first time, you must create a valid password

Figure 14: The application will tell you that you have created a valid password, provided that you have indeed done so

Figure 15: Access to the main menu will be provided after having created a valid password

3.2 Interacting with the main menu

After gaining access to the main menu, you will be asked to choose a menu option.

Figure 16: The main menu of the application

You must choose a menu option. If you enter a character not appearing on the list of options, you must try again to input a character on the new line.

Figure 17: If the input is not valid (i.e. it does not appear on the list of options), you must try again to choose an option on the new line

Figure 18: On the new line, you can try again at choosing a menu option

3.3 Creating a new game

To create a new game, you must choose "N" from the main menu. You must then choose the difficulty of the opponents in the game. Here are the available options:

0: Easy Easy opponents are perfect for beginners as they will make fairly poor calculations and will make regular mistakes. Easy opponents also make decisions very quickly (within about a tenth of a second)

1: Medium Medium opponents are perfect for experienced players as they will make fairly good calculations and will make fewer mistakes than easy opponents. Medium opponents make decisions quite quickly (within about one second)

2: Hard Hard opponents are perfect for very strong players as they will make very accurate calculations and will make very few mistakes. Hard opponents take quite a lot of time to make decisions (about nine seconds).

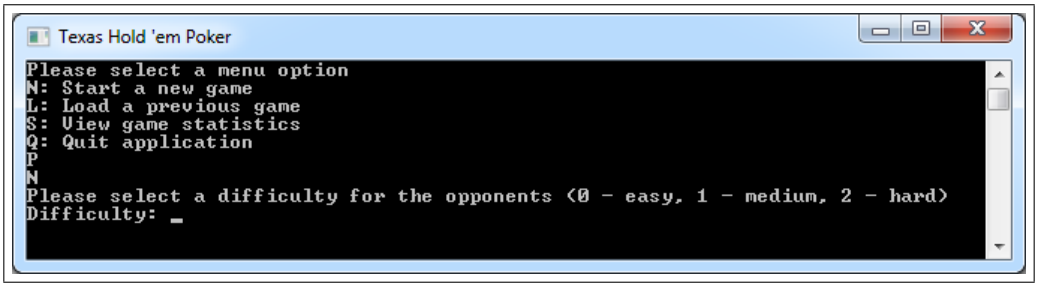

Figure 19: Attempting to create a new game and choosing the difficulty of the opponents

After having chosen the difficulty of the opponents, you will be asked to choose the number of hands that you wish to play. This can be 5, 10, 15 or 20.

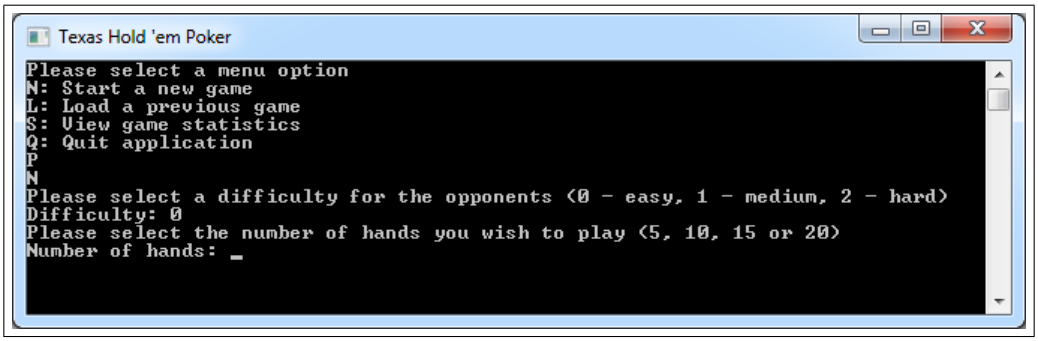

Figure 20: Choosing the number of hands to play

If you make an invalid choice by accident, the application will require you to reattempt input on a new line.

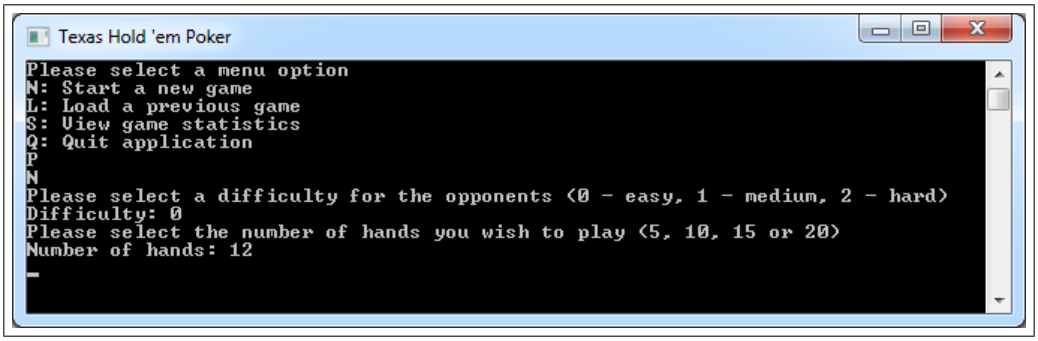

Figure 21: If you make an invalid choice, you must reattempt input on a new line

3.4 Understanding the game interface

This section will give a brief explanation of how to interpret the game interface. The following image is a typical interface that one can expect to see during gameplay.

Figure 22: A typical in-game interface

Here is a list explaining the various visible onscreen details:

Current player This piece of information tells you whose turn it is to make a gameplay decision

Hand This piece of information tells you what the current hand number and the target hand number are. In the case of the example image, this is the first hand of a total of five hands

Player X There are a few pieces of information about each player:

- **Chips** This tells you the number of chips in the stash of a given player
- **Bet** This tells you the amount of chips that the player has bet. Note that when a player makes a bet, this is not deducted from the "chips" stack until the bets are collected (at the end of the betting round)
- **Folded, etc.** Information after the player ("You", "Folded", "Small blind", "Big blind", "Dealer") tell you additional information about each player. All of these additional pieces of information correspond exactly to typical poker play

Pot This tells you the amount of money that is currently in the pot. Note that this does not take into account the bets of the current betting round: bets are moved from the stashes of the players to the pot at the end of each betting round

Current community cards This tells you the cards that are available to all players at the table. This consists of, if they have yet been dealt, the three cards of the flop, the turn and the river

Player cards This tells you the cards that you possess in your hand

The remaining list beneath the display of “player cards” shows you the available options for gameplay decisions. This is discussed in the next how-to section, “Interacting with the game”.

3.5 Interacting with the game

Throughout gameplay, a number of different options will be available to you. However, not all options will be available at all times (for example, as per the rules of poker, you cannot check if you do not match one of your opponent's bets).

Below is a list of the various options that you may see during gameplay. This should be fairly intuitive if you are familiar with the rules of poker.

C: Call Calling the bet may be performed only if your current bet is less than that of one of the opponents

Z: Check Checking may be performed only if your current bet is equal to or greater than that of the bet of every opponent

F: Fold Folding may be performed only if your current bet is less than that of one of the opponents

B: Bet Betting may be performed only if no bet has yet been placed in a given betting round

R: Raise Raising may be performed only if a bet has already been placed in a given betting round

P: Probabilities This option may be chosen at any point during gameplay. Choosing this option will present you with the probabilities of getting various different hands based on the current cards (your "player cards" and the "community cards", if appropriate). Choosing this option will require you to wait for about ten seconds while the program computes the probabilities. After having looked at the list of probabilities, you may make another gameplay choice

Q: Quit and save This option may be chosen at any point during gameplay. This option will save the game and return you to the main menu, thereby allowing you to later load up the game save at a date and time of your convenience. Whenever leaving a game, you should pick this option as opposed to directly closing the application window.

If you make an invalid input (i.e. you choose an option not appearing on the list), you must reattempt input on a new line.

At the end of each betting round, the chips of the players will be moved from their stashes to the pot. The next community card or set of community cards will be revealed, as per the rules of poker.

Choosing to bet will present you with the range of possible bets that you can make.

After having chosen a valid bet (in this case 30 chips), the opponent will make a decision on how to react.

After pressing enter when the probabilities have been displayed, you will be able to make a gameplay decision.

After the final betting round (the betting round that follows the reveal of the river - the 5th community card), the hands of the active (unfolded) players are outputted and, underneath, a list of the winner(s) with their respective shares of the pot.

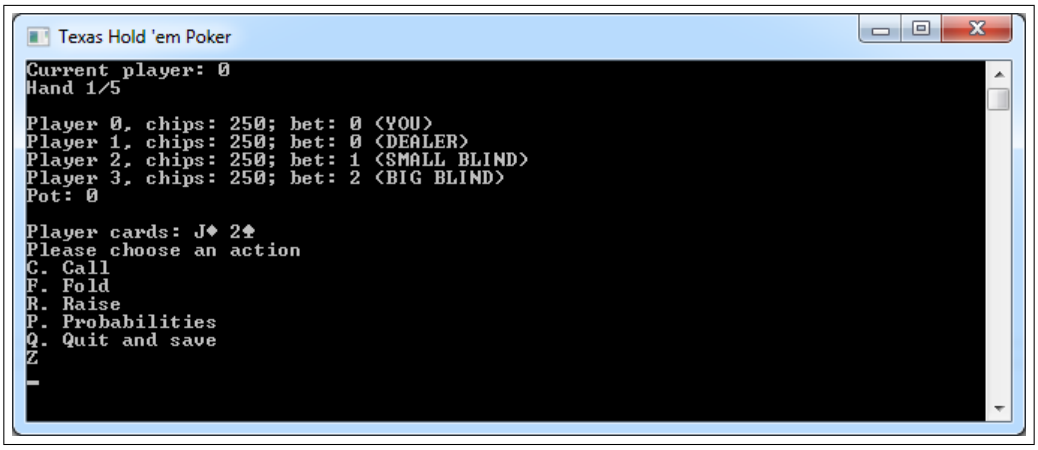

Figure 23: If you make an invalid choice, you must reattempt input on a new line

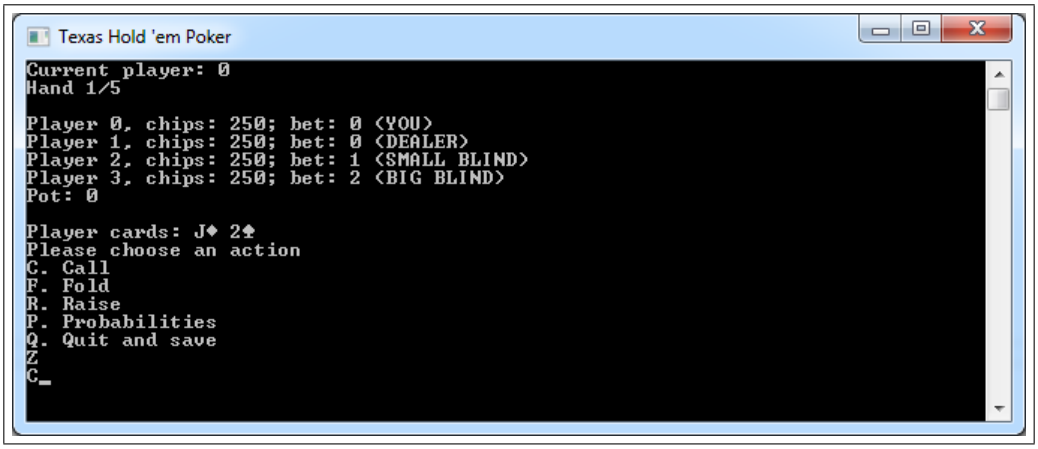

Figure 24: Calling a bet

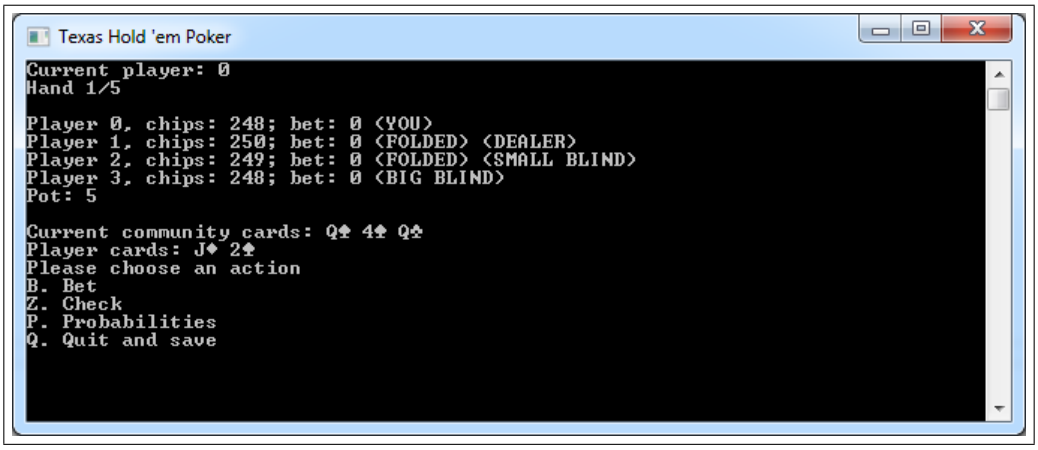

Figure 25: After each player has either agreed on the bet or folded, the next community card(s) will be revealed and the bet will be moved to the pot

Figure 26: Choosing to bet

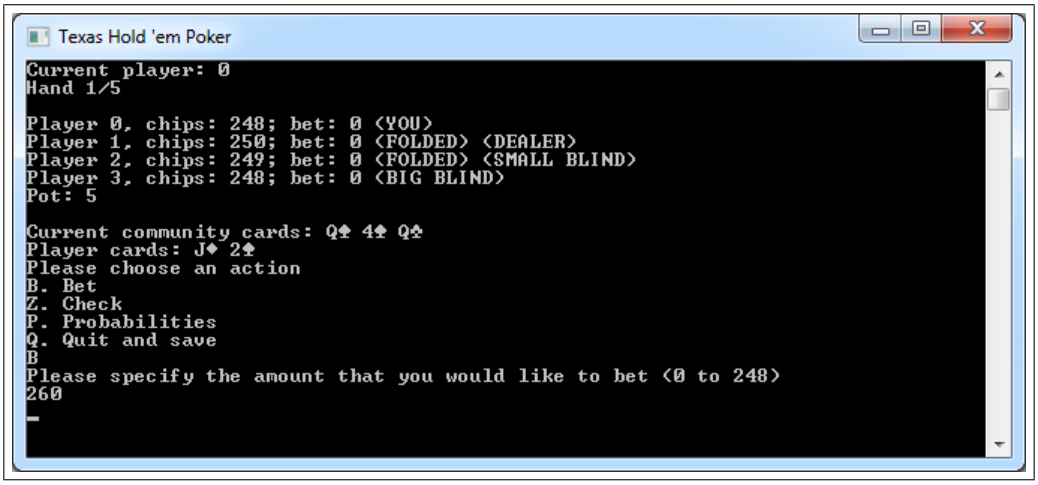

Figure 27: If you make an invalid choice, you must reattempt input on a new line

Figure 28: After having made a bet of 30 chips, the remaining opponent has called the bet and the next community card has been shown

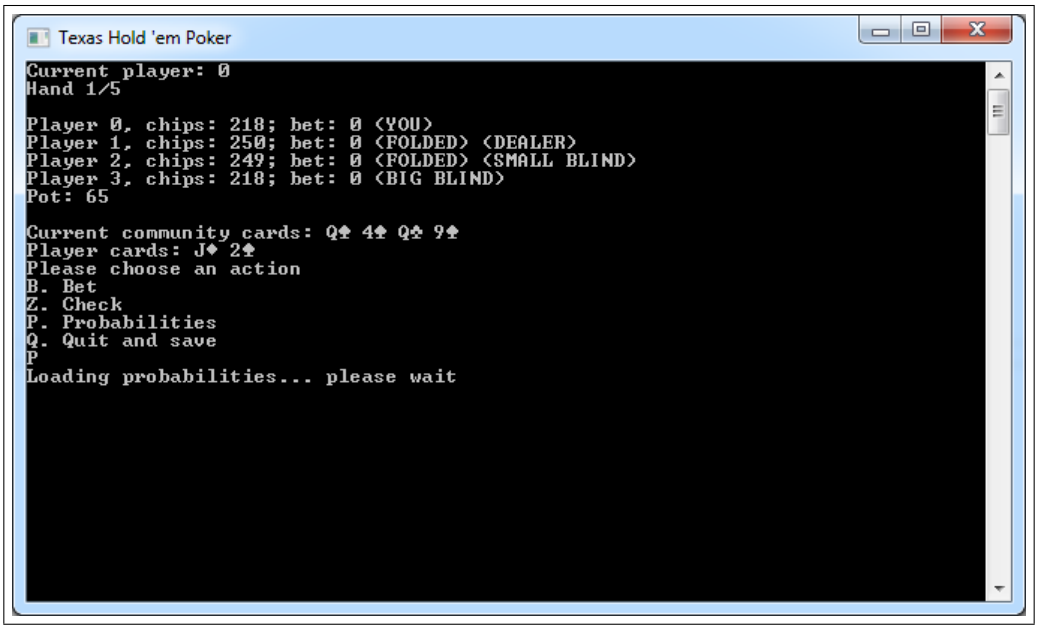

Figure 29: It takes about 10 seconds to request to see the list of probabilities

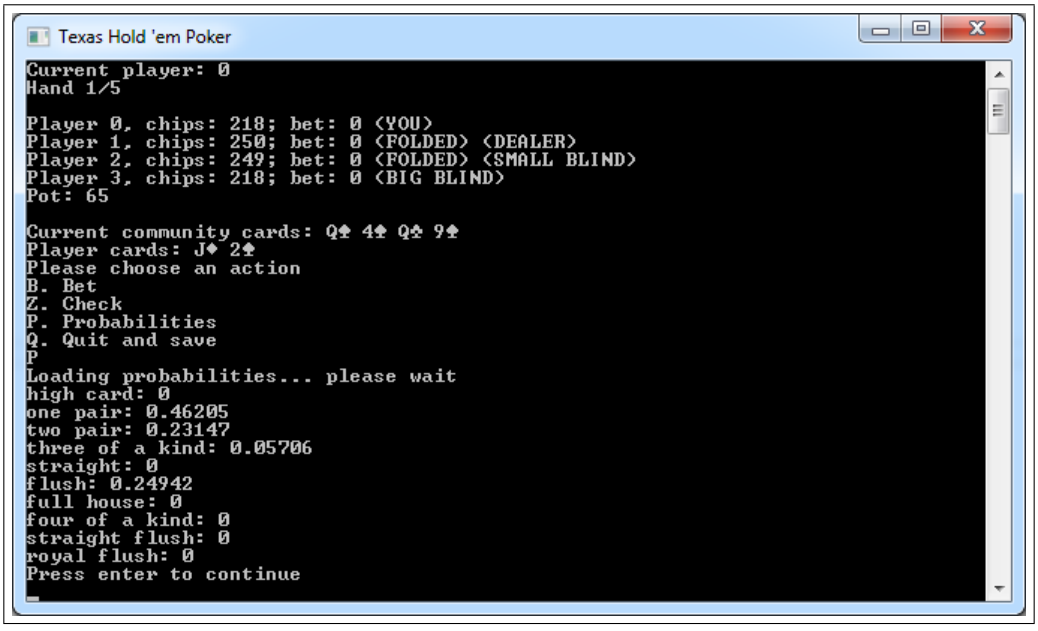

Figure 30: The list of probabilities is outputted

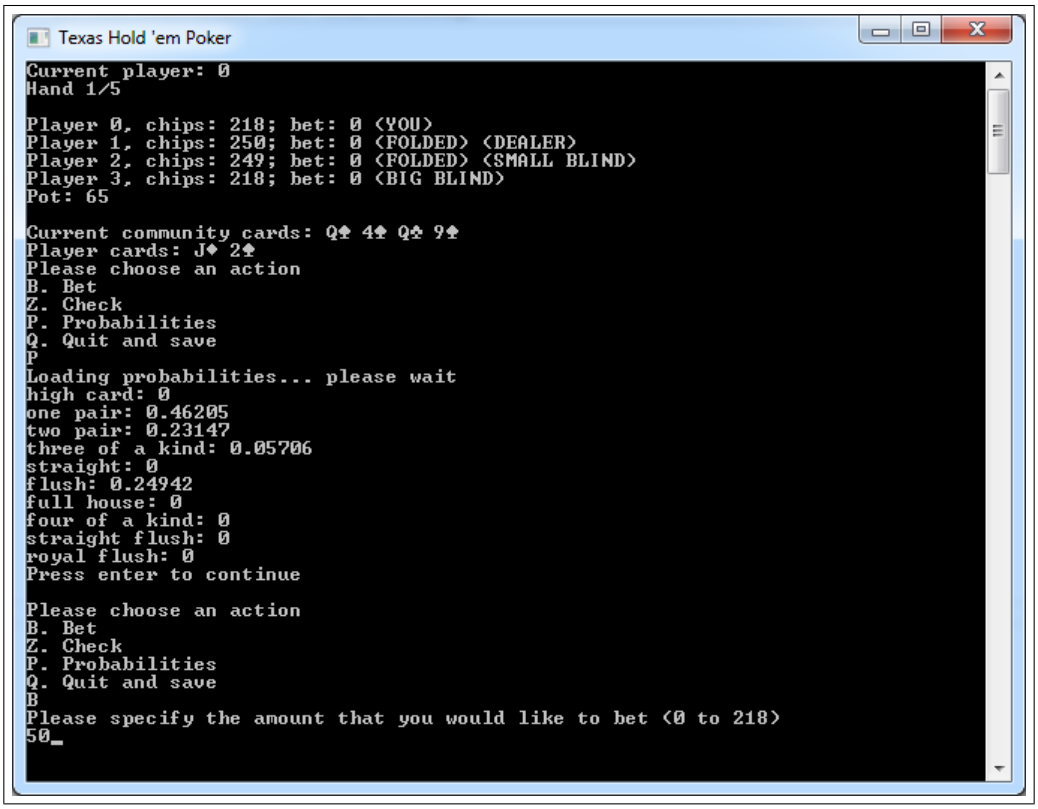

Figure 31: Underneath the probabilities display, you may make your gameplay decision

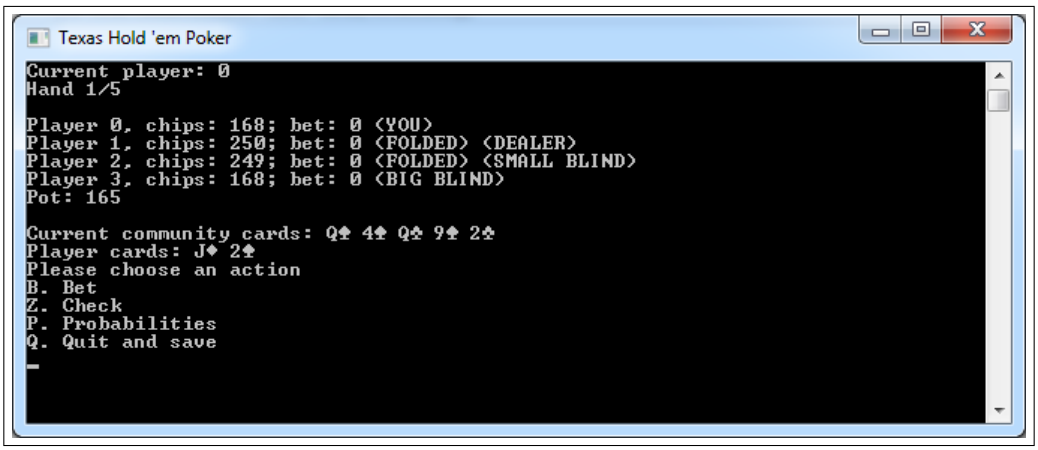

Figure 32: Gameplay continues as usual

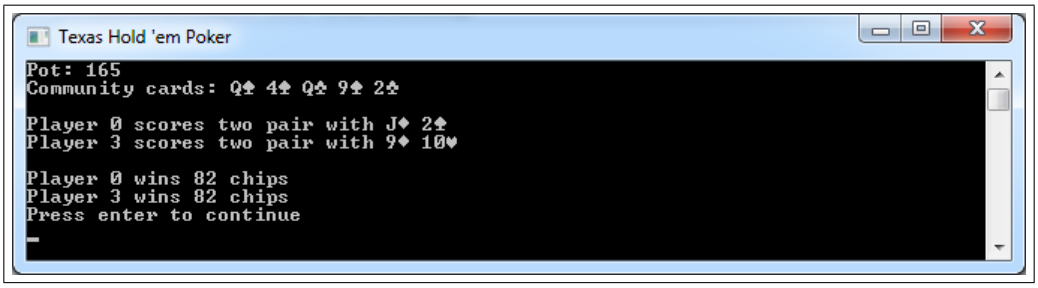

Figure 33: The pot is distributed amongst the winner(s)

Raising may be done using the input "R". This raise amount is added on to the existing amount.

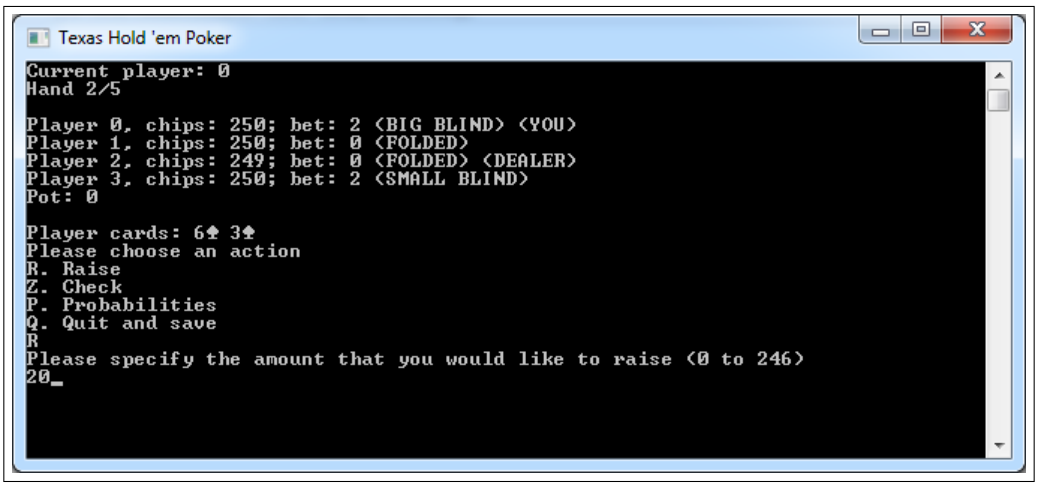

Figure 34: The player can raise an amount that has already been bet

If three players fold, the remaining player wins the whole pot.

Figure 35: Player 0 wins the whole pot since all of the other players have folded

3.6 Beating opponents

If a player bets all of its money and loses the hand, it is described as "out". In the example below, players 1, 2 and 3 have all bet their entire stashes.

Figure 36: Player 1, player 2 and player 3 have all bet their entire stashes

On completion of the hand, in this example, only player 0 (you) and player 2 win money.

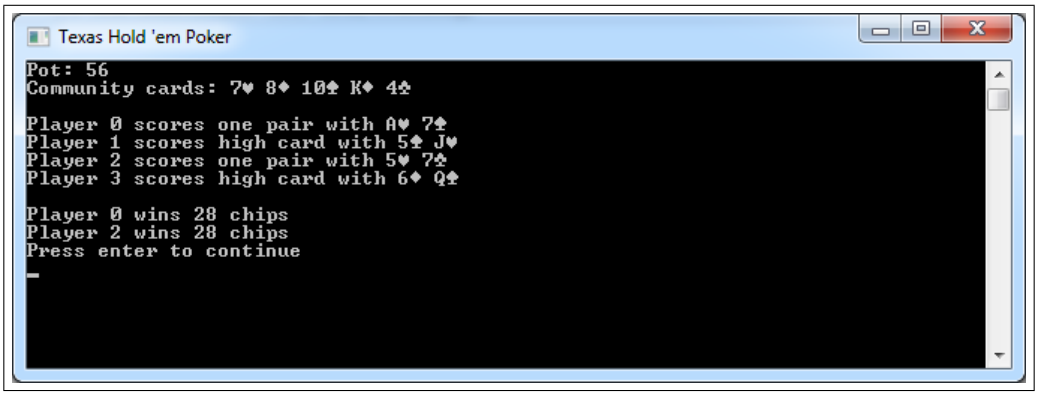

Figure 37: Only player 0 (you) and player 2 win money

Since player 1 and player 3 now have no chips remaining, they are declared as "out" and can no longer participate in gameplay.

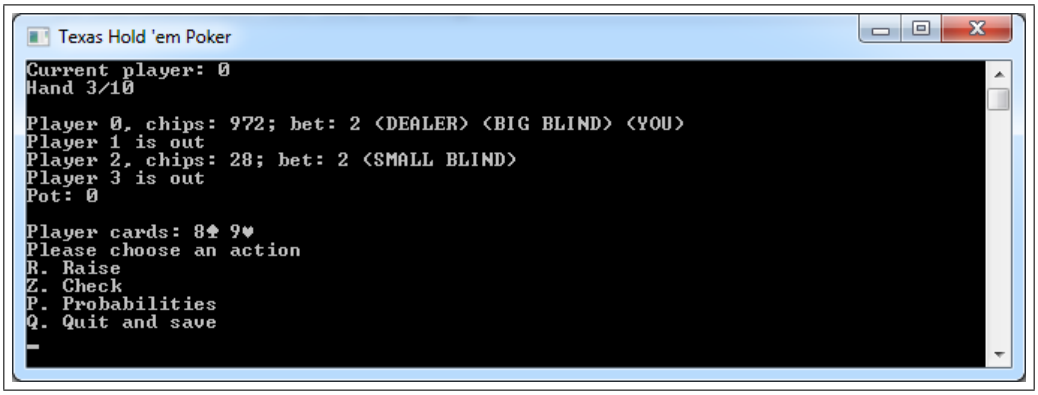

Figure 38: Players 1 and 3 are declared as "out"

3.7 Termination of gameplay

Gameplay terminates as soon as any one of the following conditions has been met:

- The total number of desired hands has been met (e.g. if you asked to play 5 hands and 5 hands have been completed)
- You beat all of the opponents (i.e. players 1, 2 and 3 are declared as "out" as a result of losing all of their chips)
- You lose all of your chips.

The following example shows what happens when you complete all of the hands that you set you out to complete (i.e. condition one, above).

The final betting round of the final hand of a game (as one can see by the "Hand 5/5" at the top of the image) is coming to an end.

Figure 39: The final betting round of the final hand

The following screen shows, as expected, the winners of the hand as well as the pot distribution.

Below this display is a message showing how well you performed over the course of the game. This information is then stored in a database: you can view statistics about previous games using the main menu option "S".

Figure 40: The pot is distributed amongst the winners of the hand and you are informed of how you performed over the course of the game

3.8 Quitting and loading

You can quit from a game at any point using the character "Q". Quitting using this input automatically saves the game.

Figure 41: Quitting can be done at any point

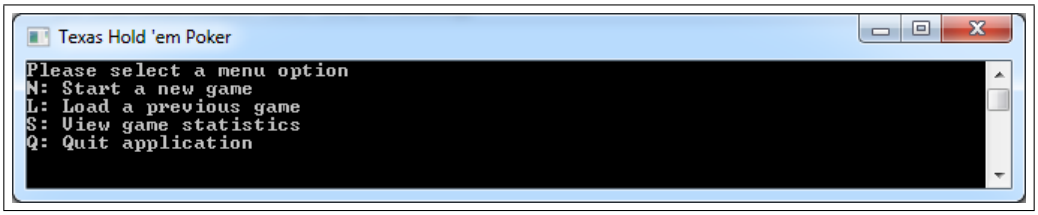

Figure 42: Quitting causes you to be redirected to the main menu.

Loading is done using the menu option "L".

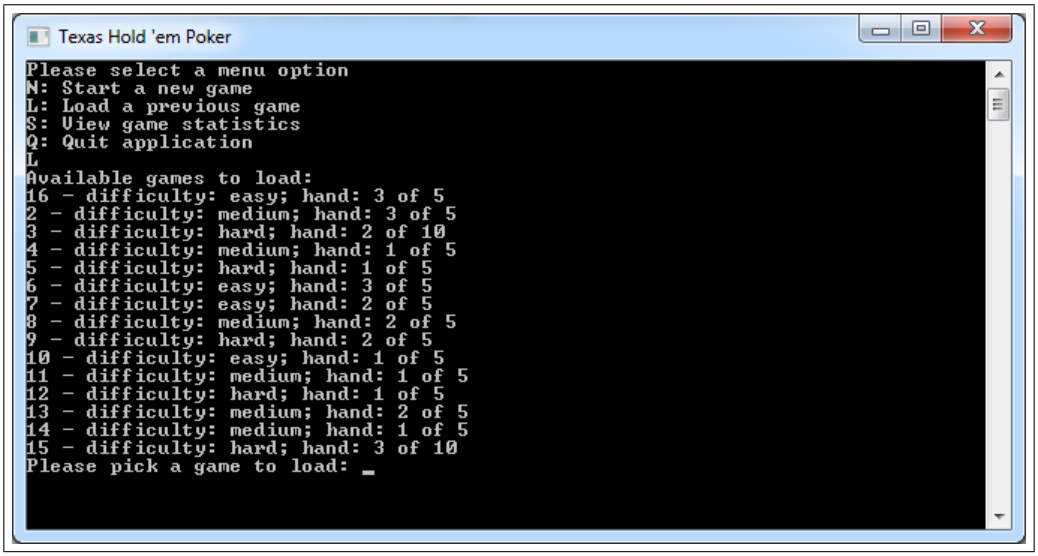

Figure 43: Use the option "L" to load a game

To load a given game, find the game ID in the list and enter it.

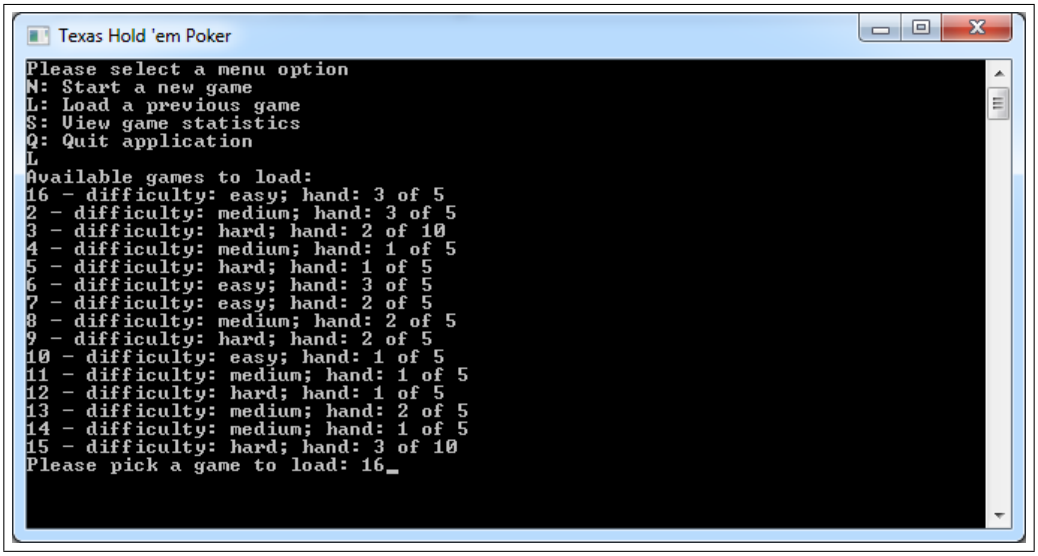

Figure 44: To load a game, input the game ID

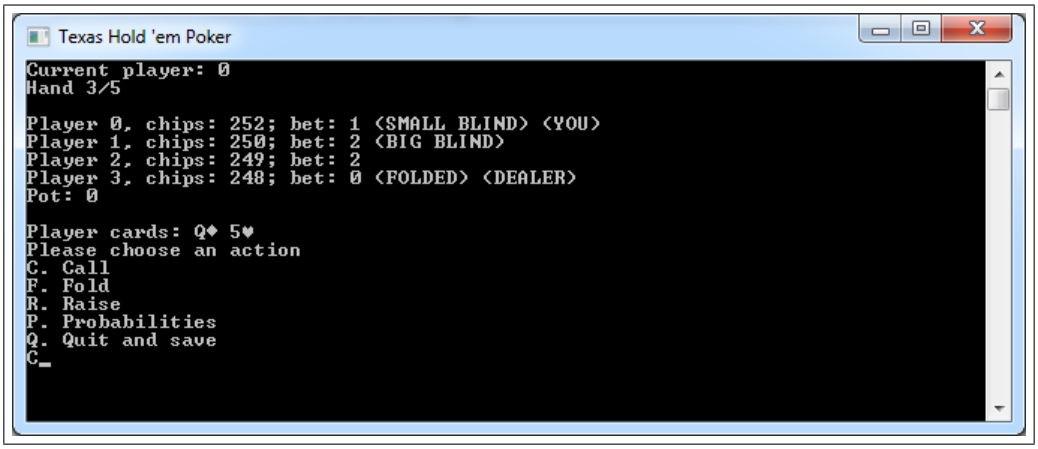

Figure 45: The game loads up at the exact point from which you previously saved

3.9 Viewing statistics

If you wish to view statistics about past games, use the option "S" on the main menu.

You will be asked to respond "Y" (yes) or "N" (no) to seven questions to specify the search that you would like to perform on the data about previous games.

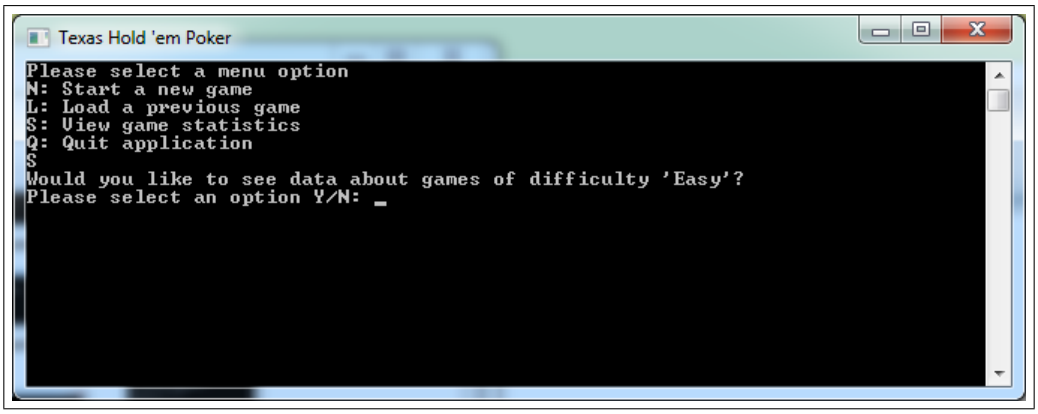

Figure 46: You will be asked 7 yes/no questions to specify the data about which you would like to view statistics

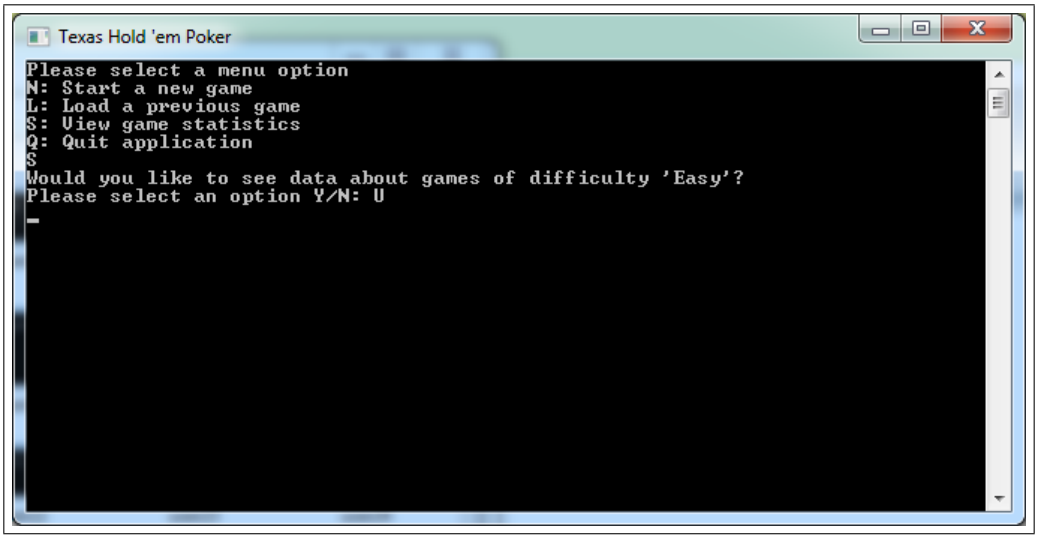

Figure 47: If you make invalid input, you must reattempt input on a new line

After responding yes or no to all 7 questions, you are presented with an output string beginning with the words "linear fit", followed by a number of curly-braced data points. In the example given here, you are requesting data about easy or medium games which consisted of either 5 or 10 hands. You may use this output string to obtain the graph. For convenience, this output string is copied directly onto your clipboard.

To view the results, load up an internet browser of your choice and go to the website "www.wolframampha.com". WolframAlpha is a free only computational knowledge engine.

Paste the output string into the search box on the webpage.

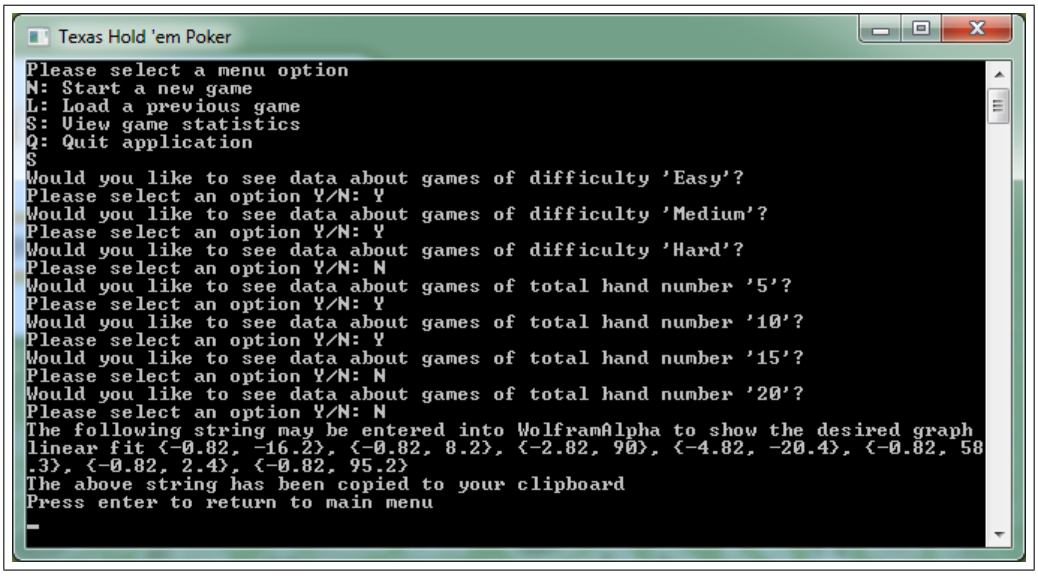

Figure 48: After responding yes/no to the questions, you are given an output string

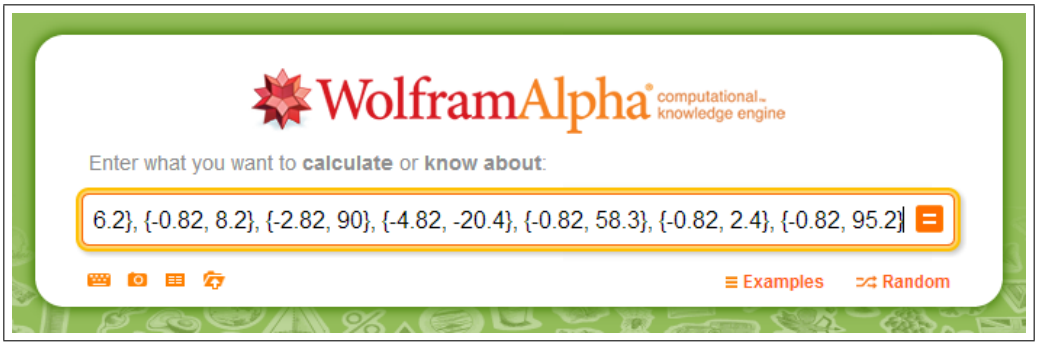

Figure 49: Paste the output string into the WolframAlpha search box

After submitting the results, you are presented with results about the data that you submitted. Here is an explanation of the results:

- Data points are given in two parts. The x-axis represents "time" with negative values showing days since the game. For example, an x-coordinate of "-3" means that 3 days have passed since the game took place

  The y-axis represents "average profit per hand". This value can, of course, be negative since it is possible to have lost money by the end of a game

- The graph entitled "Plot of the least-squares fit" shows the plotted data points (as a scattergraph) and a line of fit calculated by the least-squares regression line

- The graph entitled "Plot of the residuals" shows how far each data point deviates from the line of best fit. The order of the residuals is determined by the order of input

Figure 50: You are presented with results about the data that you submitted

4 Errors and error recovery procedures

4.1 "Unable to connect to any of the specified MySQL hosts"

When opening the application, you may be greeted with the error "Unable to connect to any of the specified MySQL hosts". The below image shows an example of this

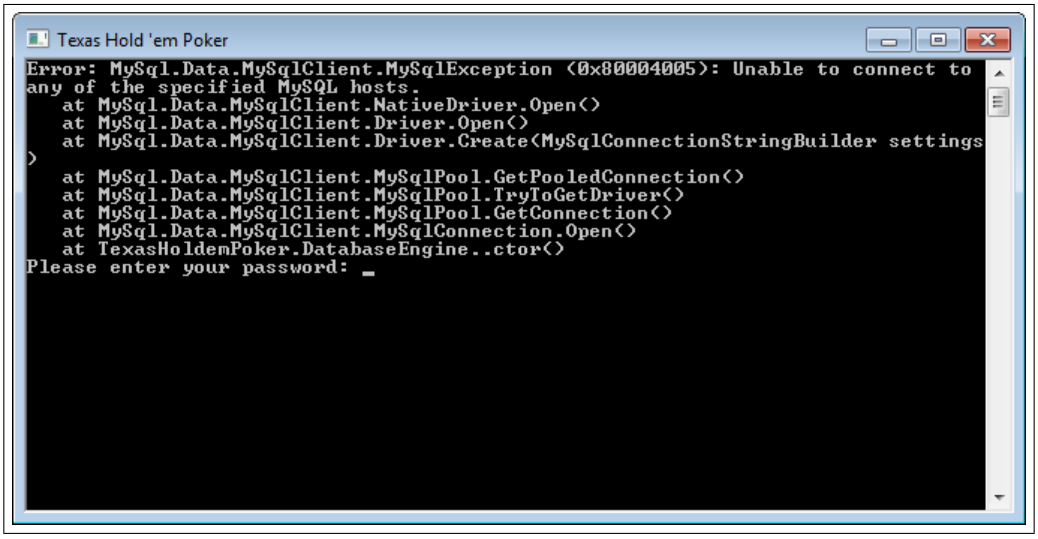

Figure 51: An example of the "Unable to connect to any of the specified MySQL hosts" error when opening the application

To resolve this error, you should check the icons tray of the windows bar to check for an EasyPHP icon.

- If the icon is not there, return to the "Running the application" part of the "Installation" section. This error has occurred as a result of not running the DevServer application
- If the icon is there, right-click on it and click "Start".

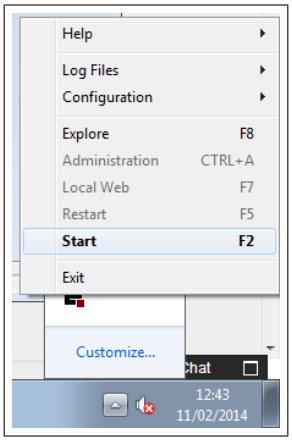

Figure 52: If the EasyPHP icon is present in the icons tray, right-click on it and click “Start”

4.2 "Fatal error encountered during command execution"

When interacting with the application, you may meet the error "Fatal error encountered during command execution". This error occurs when the connection to the database is lost. The below image shows an example of such an error

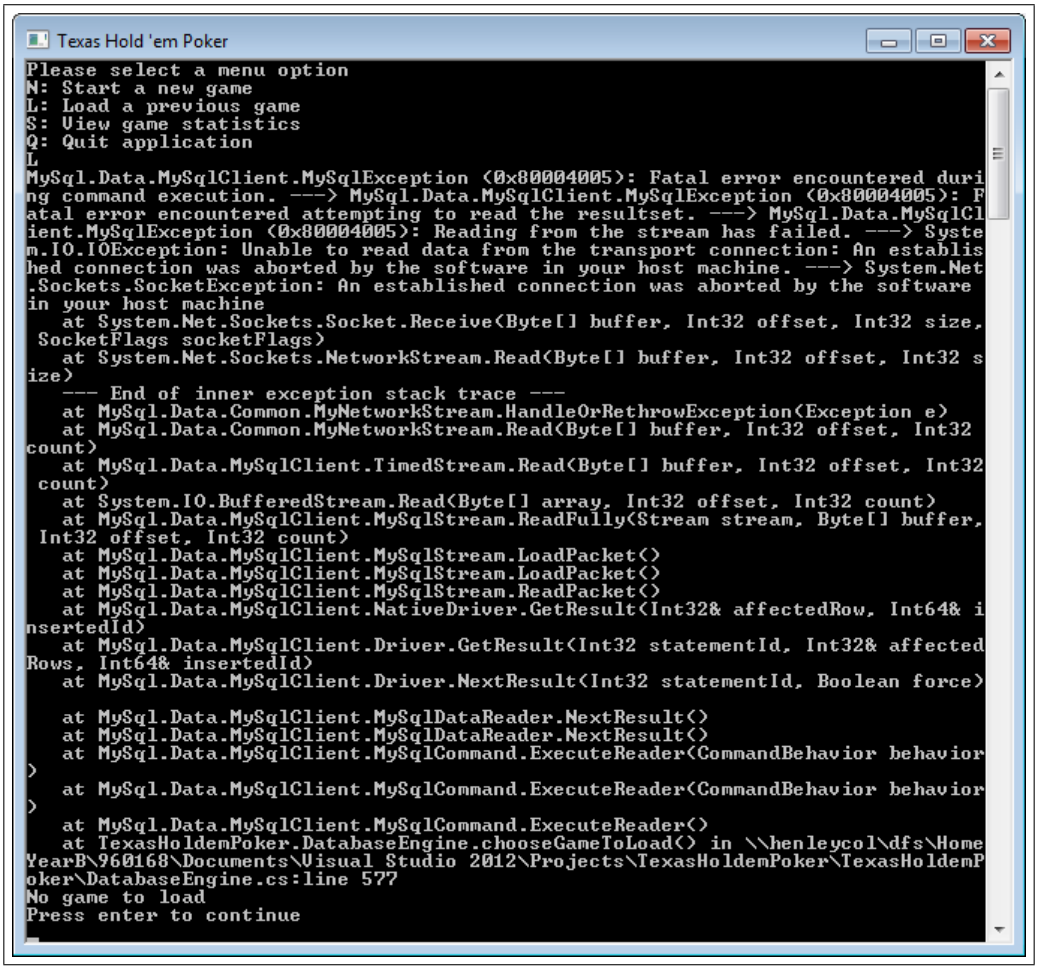

Figure 53: An example of the "Fatal error encountered during command execution" error

To resolve this issue, first close the application. Then perform the following procedure:

- If the memory stick has been removed, reinsert it and return to the "Running the application" part of the "Installation" section
- If the memory stick is still inserted, check for an EasyPHP icon in the icons tray of the Windows bar
  - If the icon is not there, return to the "Running the application" part of the "Installation" section. This error has occurred as a result of not running the DevServer application
  - If the icon is there, right-click on it and click "Start".

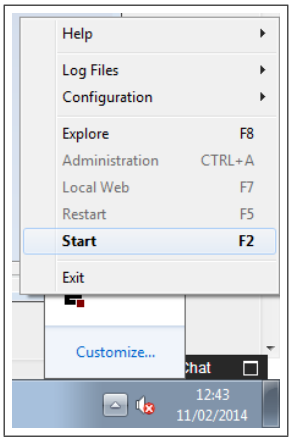

Figure 54: If the EasyPHP icon is present in the icons tray, right-click on it and click "Start"

4.3 "Could not find a part of the path..."

When creating a new password, you may meet the error "Could not find a part of the path 'N:\pokerdata"'. The following shows an example of this:

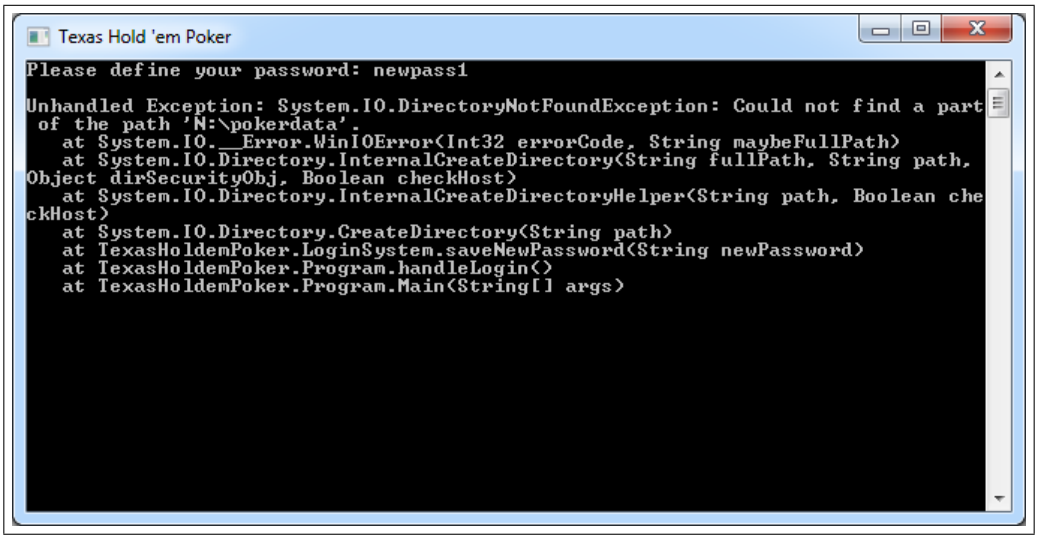

Figure 55: An example of the "Could not find a part of the path..." error

This error occurs when you are using a computer without an N: drive. All computers at The Henley College, for which the system was designed, have access to N: drives for the use of the students. It is for this reason that the N: drive was chosen.

This error is likely to occur if you attempt to use the software on a computer not at the college.

To resolve this problem, you must safely remove your memory stick from the computer and use a computer which has access to the N: drive.