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Blackjack Game Project Report



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Abstract

This project was about creating a Blackjack game which had the ability to both allow users to play as well as allowing them to enter a tutorial mode in which they could receive feedback on the best action to take at any point. The resulting game had to be fully functional while remaining fun to play.

Algorithms to calculate the probabilities of all hands were created for games with any number of decks and executed for single deck games. These were generalised into a strategy table allowing quick reference to what the best option is for any game situation.

The game incorporates these probabilities, alongside teaching of the Hi-Lo card counting system, into the tutorial mode to present the user with a complete picture of the game of Blackjack and how to play it to their advantage.

Finally, the game's graphical user interface was also very important. This was designed to be user friendly as well as in keeping with the look and feel of the game of Blackjack.

Keywords: Blackjack, probability, game, betting, card counting

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Introduction

The main aim of this project was to create a Blackjack game which allows players to both learn and improve their knowledge of the game and card counting while they play. This aim led to a project to create a game with a tutorial mode in which players can learn about the game and card counting as well as a game mode to allow several players to play together for fun. The game should allow learning of Blackjack and card counting such that players can use this information in computer and real-world games.

The main motivation behind this project was a personal interest in the game of Blackjack and other casino card games. A further motivation was the ability to develop a software tool which can be used to help others learn how to play in a way which was not based around simply reading rules and then guesswork.

In order to achieve this, it was decided that detailed feedback would be needed and that the best way to get this feedback would be to calculate the probabilities for the player's current hand. It was also important to consider the users who wanted to learn the game at a basic level without having to interpret a set of probabilities, so it was therefore important to also use these numbers to formulate a few sentences explaining what the advice actually meant. In this way the player can be presented both with an explanation of the best option for them to take in any given situation and also take note of the mathematics (in the form of the probabilities) if they wish.

It was also considered important that players had something general they could learn which would allow them to take the best option in any case. It was therefore decided that, in the course of the project, a strategy table for single deck games would be created based on the calculated probabilities.

It was also subsequently decided (during the project development) that card counting is important if players wish to play Blackjack like a professional. While this was not in the original specification, research showed both that it was important and also that there were not many games available which offered the full package incorporating both advice on how to play as well as information on card counting.

The report will start with an introduction to the game of Blackjack before looking to existing games and other information already available. Research findings will then be summarised and analysed before a list of requirements is presented. The design and implementation processes will be discussed leading into a description of the testing this software has been through. The user interface design will then be discussed before a summary of the project management issues. Finally, the project will be appraised and evaluated before coming to a conclusion on what the project has achieved and a discussion of any further developments that could be undertaken.