**BLACK JACK**

**GROUP NAME: EASY TEAM**

**21 ACES**

Blackjack is a game played by a full on deck of 52 playing cards with the Joker cards excluded. Blackjack is an invention by the Romans that requires least amount of mathematical and logical skills. As any card game, luck also plays a role in the play of the game. One may be lucky to get certain cards but not so lucky if they’re not using their cards sensibly. This version of Blackjack will be a one-one-one play where the player plays against the computer. It is a fairly simple card game. To play a good Blackjack, is about strategically considering all the possibilities. You do not have to super skilled to understand the basics. You play against the dealer (computer) and in every round there is an equal chance of winning or losing. To be more specific it is an equal probabilistic game. Choose your moves carefully then statistically the dealer will have no chance against. To play Blackjack, make sure you know a bit of arithmetic. Blackjack has a few basic rules. The goal of the game is to get card numbers that are closest to but also not exceeding 21 and beat the dealer total. If you get card values that add up to a number exceeding 21 then you are considered to have busted and will forfeit your bet immediately regardless of the dealer’s hand. In other words, you lose immediately. Same rules apply to the dealer if his/her hand exceeds 21. Card values are also fundamental to the game itself. Kings, Queens and Jacks also known as face cards and are worth 10 points each. Cards that have numbers on their faces (that is cards that start from 2 to 10), retain their face values. Aces however can either be 1 point or 11 points, depending on which value advantages the player. Each player has two choices after receiving his/her first pair of cards, “HIT” or “STAND”. “HIT” means you request another card from the dealer and you can hit multiple times before you stand. “STAND” means you want to play your hand against the dealer. If your first two cards add up to 21 that means you hit the blackjack (you won). These are the fundamental rules.

Blackjack has other rules or rather ‘plays’ that can be arbitrary to ensure the players winnings. Blackjack is also considered to have medium level of complexity. Irregardless, our aim is to increase it’s complexity. Although there are two basic choices, we want to make the game interesting by including a bank balance variable. Here the human player will be given a certain amount of money and in order for the player to pay he/she has to bet with a certain amount of money. In this way player will earn double the amount if they win and if not, the player loses the money they bet with. We are aiming to include all of this in order to increase complexity. These choices can be difficult to code and sometimes slow down the gameplay. However, these extra choices are meant to keep players on the table. The ultimate problem will be coding the graphic user interface of the game.

The game was coded in Java. Many steps were involved in the ensuring that the game works perfectly. The following milestones: “make deck”, “shuffle deck” and “Gameplay” are the key parts of the project. The first two milestones are data structures. The gameplay is the key part of the project with multiple states and it covers approximately 70% of the project, both time the invested and the code itself. The dealer will always be the computer and there are optimization processes (choice that the dealer makes) to secure the dealer’s profits. It is also important to keep track of states of the game like money and therefore there are more functions included to store and update such data during gameplay. Game designs were also essential for presentation and appearance of the game.

“Make Deck” and “Shuffle Deck” data structures took less than to implement a week to implement and are highly effective since the entropy calculations range between 2,8 to 3,4. Note that in a game of blackjack, there is no difference between ‘Ace of hearts’ and ‘Ace of spades’ or rather there are only 12 different card values and so the maximum possible entropy is 3,6.

“Gameplay”- The actual gameplay took the majority of the time. Since there are many standard rules that are involved in Black Jack, many of them have their own time frames. The card class and the CPU logic took a week to implement. And since the rules of the game are part of this state and thus extending the time frame for gameplay for another 2 weeks.

“Graphics and Testing” – The functionality of the game and presentation were the last key parts of the game/project that were also time consuming. As each piece of code was tested, there is no actual time frame for testing. The graphics took a week to implement.