

COMP450 Artificial Intelligence

Term Project 1

Rock-Paper-Scissors Game

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Game rule, rock beats scissors, scissors beats paper, paper beats rock. First of all, we have 5 options to play this game. First one is human vs human. Two players choose what they do from rock, paper, and scissors. The user who reaches 3 points first wins. Second is user vs computer. The user choose what her / him do and computer choose randomly from these options. The computer does not have any rules when selecting one of these options, it chooses randomly. Anybody who reaches 3 points first wins. Third is user vs computer. Unlike in the second case, the computer selects decision from the options related to some rules that are identified by us. Fourth is statistical rule learner design. The computer decides between the rules with respect to data. Last one is We ask the user to select which player base he / she wants to play on.

Player 1

First of all, we initialize two user's counter for their score. We then print the options for both users. The options are rock-paper-scissors. In a loop, we learn about the decisions of both users. We get these information with input. We've assigned all the options to different numbers (0-rock, 1-paper, 2-scissors). If one of the two users is entering a number greater than 2, an undefined number, we will print the error message and ask them to decide again. If both users make the same decision, both of their score do not increase, we print the tie message on the screen. Whichever user wins in a hand, the user's score increases by one. The user who reaches 3 points first wins the game. Each time users' scores and who wins are printed on the screen.

Player 2

We initialize computer's and user's counter for their score. We print the options for user to decide. In a while loop, we take user's decision with input. Computer decide randomly its decision. We use randint function between 0 and 1000 numbers. If the number is between 0 and 333, computer selects paper. If the number is between 334 and 666, computer selects scissors. If the number is between 667 and 1000, computer selects rock. If decisions are same, we print tie message and do not increase their score. If decisions are different, whoever wins the point increases by one. Whoever reaches 3 points first wins the game.

Player 3

There are some rules. First hand or in tie, computer selects decision randomly. Second is that if user win hand, computer change its decision. The last one is that if computer win, keeps the decision. We initialize a flag named detect that is false at the beginning for computer decide its choice randomly. If user or computer wins, detect will be true. Thus, computer will not decide its choice randomly. So, computer will decide the choice related to rules. We keep user and computer counters for their scores. Also, we initialize first_user_count and first_computer_count in order to compare user and computer count to user or computer wins or lose. In a while loop, user make a decision. To determine who wins, we assign user_count and computer_count to first_computer_count and first_user_count. If the user wins, the computer will decide that the user will make the same move and make the decision to beat

that move. For example, if user wins with rock, computer thinks that the user decide same move. So next hand, computer choose paper move. If the user lose, the computer will decide that user will make the different move and make the decision to beat that move. Computer thinks that user will decide the move which is to beat computers' move. For instance, the user lose with rock, computer thinks that user will decide scissors. So next hand, computer choose rock.

Player 4

This algorithm creates a statistic by using the data entered. The main purpose of the algorithm is to obtain a certain probability value by comparing the total number of scissors / paper / stones entered to the total number of moves. After obtaining these possibilities, we check the cases with using if condition. These commands compare the possibilities of rock, scissors, or paper and try to obtain a result. If all the possibilities are equal then the program will change detect value as false then the probability values are used from the general statics. If the probability of two situations is equal, then it randomly selects one of the two options.

Player 5

This algorithm starts the first process with the random value and using probability values that we extracted in general statistics as in the 4th algorithm. Player 5 does not compare the probabilities as in the Player 4. The difference of Player 5, it directly uses the probability values with defining it by the range of number. We multiplied the probability values by 1000 to define the number ranges. Thus, after defining the first probability value, we were able to define the remaining intervals by adding the others. If the probability of rock is $1000X$ and the probability of paper is $1000Y$ then the rock interval will be $0-1000X$ and paper interval will be $1000X-(1000X+1000Y)$.