

ECE 332:202, Discrete Mathematics
Computer Project 1
Spring 2007
Due Date: March 20, 2007

In this assignment, you and your team are to program a simple game of Poker in MATLAB¹. Here are the guidelines:

- **Team:** Your team may consist of no more than 3 students. Please be advised that it is up to you to make certain that all team members contribute– I will not make teams or resolve team ‘disputes’.
- **Project Overview:** In order to implement the game of poker, you will need to implement several basic algorithms, ranging from shuffle to sorting. Although you will be implementing a basic poker game, you will not have to implement ‘all the bells and whistles’ associated with the game. In particular, your game will not be interactive, i.e. it will not ask the user for any input. Instead, the game will deal two hands of cards to two imaginary players, print these hands on the screens, then the computer will make a decision for both players as to whether to replace 0, 1, 2 or 3 cards. The game will remove the not-wanted cards and deal replacement cards, display the two hands, and then declare a winner.
- **Restrictions:** You are not allowed to use certain in-built MATLAB functions. Specifically, you may not use: `randperm`, `sort`, `max`, `min`. Although you might want to use these, you will need to make your own versions.
- **Things you may use:** (aka. hints...) You may use `rand`, `disp`, `floor`. Technically, all other functions are allowed. Remember, in MATLAB you may type `help command` to find out more information on a command.
- **What you turn in:** You are to turn in a well-written report describing the details behind your project. Specifically, your report should include a description of your methodology, how you tested to make certain your code worked, any challenges you faced in the project, and how you overcame these challenges (perhaps some example code will help explain things). Please make certain to spend sufficient time to writing the report. A large part of your grade is based on the appearance of a well-done project (i.e. perfect code with a very poorly written report is bad). Lastly, please attach a printout of your code.
- **The breakdown of the task:** In order to make your job easier, it is recommended that you break your task down into the following steps:
 1. *Make and Shuffle the Deck:* Create a deck of 52 cards consisting of values (ace, king, queen, jack, and 2 through 10) and suits (spades, clubs, hearts, diamonds). Shuffle this deck. Be sure to explain how you shuffle.
 2. *Deal the cards:* Deal 5 cards to both players (remember, only 2 players). Be sure to explain how you did this. For example, did you use an array to store each player’s hand?
 3. *Evaluate each hand and request new cards:* Remember, in poker, you are allowed to exchange up to 3 cards. Write a function to evaluate a hand of cards and to decide whether to replace 0, 1, 2 or 3 cards, and which cards to replace. Then, remove those cards and grab replacement cards from the deck. Note: there are many strategies for replacing cards. Choose whatever strategy you want (it might be good to start with a simple, naive strategy to begin).
 4. *Compare 2 hands of cards:* You will need to write a routine to compare two hands of cards and decide which one is the winner. Be sure to explain how you make these comparisons.
 5. *Put it all together:* Write a master program that uses all of your routines to make a coherent game of two-person poker. Remember, this is a non-interactive version of the game (you do not need to ask the user which cards to replace... the computer plays both hands).

If you are unable to complete all stages of the programming, then partial credit will be given for the steps that you do complete.

- **Final Comments:** Please be aware that you are not to copy another group’s code. You may discuss with other groups for general assistance but keep this discussion to reasonable levels. Additionally, be aware of ‘leaving your code on the lab computer.’ If you find another group’s code left on a computer, just ignore it! Dean Bernath and I have had to expel students who stole another group’s code this way.

¹Good Citizen Disclaimer: By no means is this assignment meant to encourage gambling, or a trip to Atlantic City for background research.