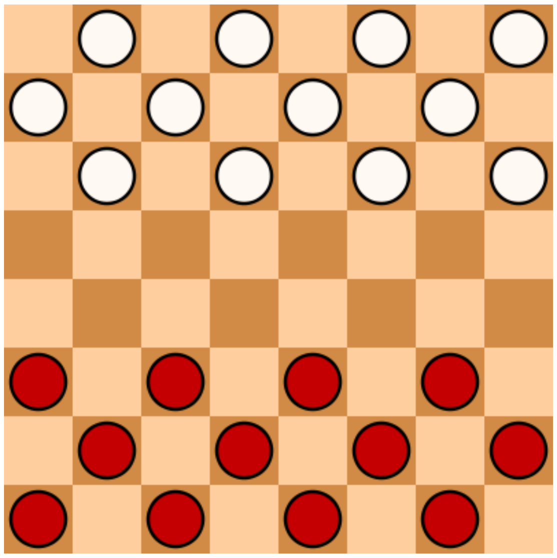
Checkers



Pieces - Though pieces were traditionally made of wood, now many are made of plastic, though other materials may be used. Pieces are typically flat and cylindrical. They are invariably split into one darker and one lighter color. Traditionally, these colors are red and white, but red and black are common in the United States, and light- and dark-stained wood are supplied with more expensive sets. There are two classes of pieces: "men" and "kings". Kings are differentiated as consisting of two normal pieces of the same color, stacked one on top of the other. Often indentations are added to the pieces to aid stacking.

Starting position - Each player starts with twelve pieces on the dark spaces of the three rows closest to his own side (as shown in the diagram). The row closest to each player is called the "crownhead" or "kings row". The player with the darker colored pieces moves first.

How to move - There are two ways to move a piece:

> A **simple move** involves sliding a piece one space diagonally forwards to an adjacent unoccupied dark square.
>
> A **jump** is a move from a square diagonally adjacent to one of the opponent's pieces to an empty square immediately and directly on the opposite side of the opponent's square, thus "jumping directly over" the square containing the opponent's piece. An uncrowned piece may only jump diagonally forwards, kings may jump diagonally backwards. A piece that is jumped is captured and removed from the board. Multiple-jump moves are possible if when the jumping piece lands, there is another immediate piece that can be jumped; even if the jump is in a different direction. When multiple-option jumping moves are available, whether with the one piece in different directions or multiple pieces that can make various jumping moves, the player

may choose which piece to jump with and which jumping option or sequence of jumps to make. The jumping sequence chosen does not necessarily have to be the one that would have resulted in the most captures; however, one must make all available captures in the chosen sequence. Any piece, whether it is a king or not, can jump a king.

Kings - If a player's piece moves into the kings row on the opposing player's side of the board, that piece is said to be "crowned" (or often "kinged" in the U.S.), becoming a "king" and gaining the ability to move both forwards and backwards. If a player's piece jumps into the kings row, the current move terminates; having just been crowned, the piece cannot continue on by jumping back out (as in a multiple jump), until the next move. A piece is normally "crowned" by placing a second piece on top of it; some sets have pieces with a crown molded, engraved or painted on one side, allowing the player to simply turn the piece over or to place the crown-side up on the crowned piece, further differentiating Kings from ordinary pieces.

How the game ends - A player wins by capturing all of the opposing player's pieces or by leaving the opposing player with no legal moves. The game ends in a draw, if neither side can force a win or if one player is left unable to move.

Questions

Note: you have to do at least one answer from question 2 and up using recursion.

1. Create the Structure for the Checkers Board(only the board, not the pieces). (See Image at the top)
2. Create a Function that creates all the pieces located in the starting position on the board of question 1.
3. Create a function that takes as a parameter a piece on the board, and prints out all the possible **moves**.
4. Create a Function that takes as a parameter a piece on the board, and prints out all the possible **jumps**.
5. Create a Function that takes as a parameter a color of the pieces, and prints out the position of all the pieces that are valid moves for that color.

Extra Credit

1. Create a Function that takes the position of a King as a parameter and prints out all the possible **moves**
2. Create a Function that takes the position of a King as a parameter and prints out all the possible **jumps**
3. Create a program that can play by itself and possibly beat you.