

Modern Technology's Effect on One of The World's Oldest Games

Mancala

Mancala and Matlab Combined

Matlab

Rules of Mancala



For 2 players - Ages 7 to Adult
Mancala is an ancient family of board games, and there are numerous variants. This is a version of the basic game, known as two-rack Mancala and also known as Kalah.

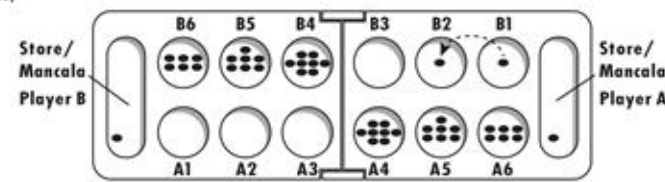
Contents:
1 Mancala board
48 colored plastic pieces (also called "stones")

Set Up:
The Mancala board is made up of two rows of six pockets (also called "holes," or "pits") each. Four pieces are placed in each of the 12 pockets. The color of the pieces is irrelevant. Each player has a "store" (also called a "Mancala") to his/her right side of the Mancala board.

Object:
The object of the game is to collect the most pieces by the end of the game.

Game Play:
1. The game begins with one player picking up all of the pieces in any one of the pockets on his/her side.
2. Moving counter-clockwise, the player deposits one of the stones in each pocket until the stones run out.
3. If you run into your own Mancala (store), deposit one piece in it. If you run into your opponent's Mancala, skip it and continue moving to the next pocket.
4. If the last piece you drop is in your own Mancala, you take another turn.
5. If the last piece you drop is in an empty pocket on your side, you capture that piece and any pieces in the pocket directly opposite.

(See figure below: In this image, player B has moved his/her piece from space B1-B2. By emptying the empty pocket on his/her side, player B wins THAT piece AND ADDITIONAL 10 pieces in pocket A5 on the opposite side.)



6. Always place all captured pieces in your Mancala (store).
7. The game ends when all six pockets on one side of the Mancala board are empty.
8. The player who still has pieces on his/her side of the board when the game ends captures all of those pieces.
9. Count all the pieces in each Mancala. The winner is the player with the most pieces.

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https://endlessgames.com/wp-content/uploads/Mancala_Instructions.pdf

Mancala Board Examples

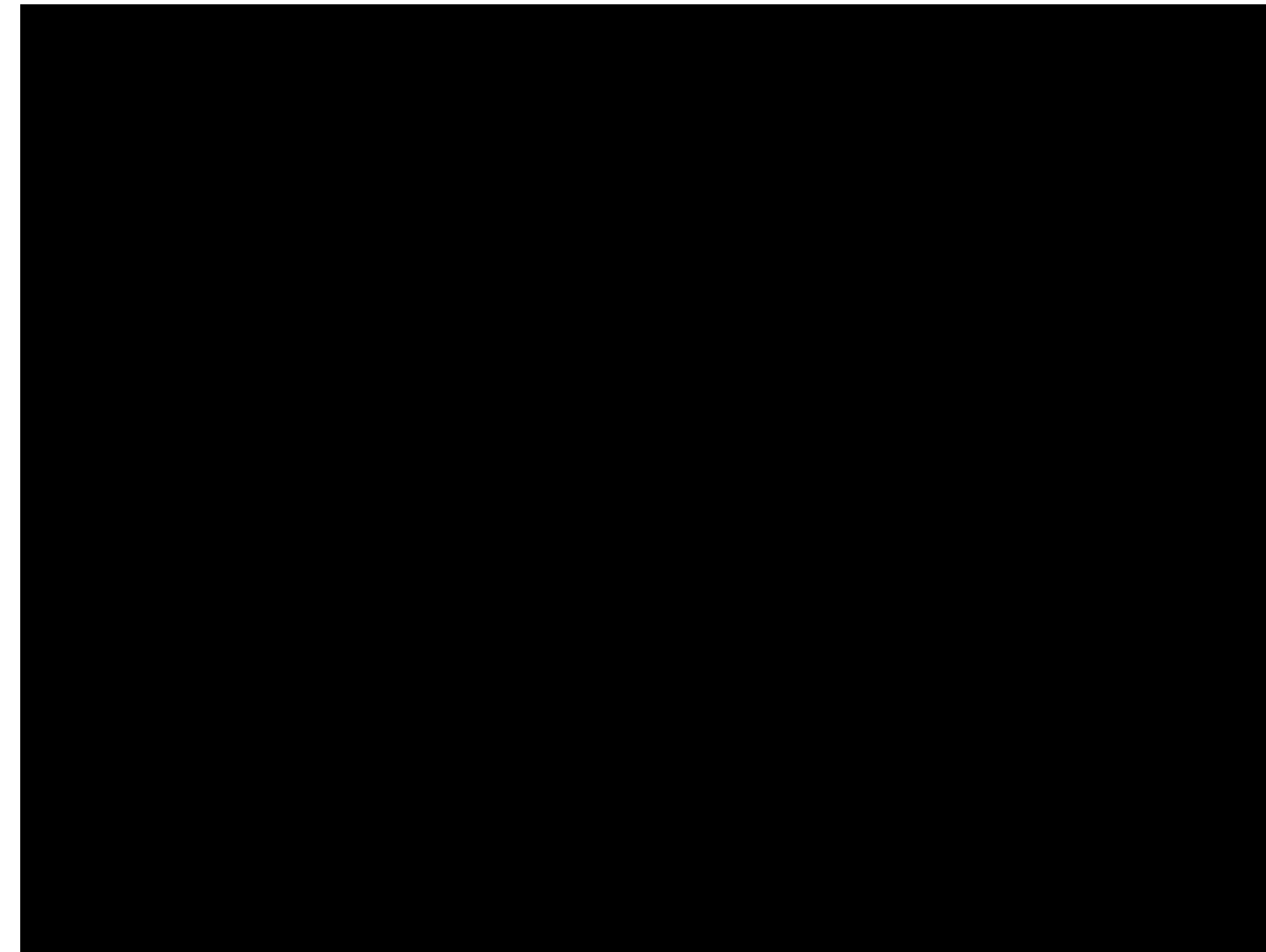
<https://www.kid-at-art.com/htdoc/members/lesson65.html>
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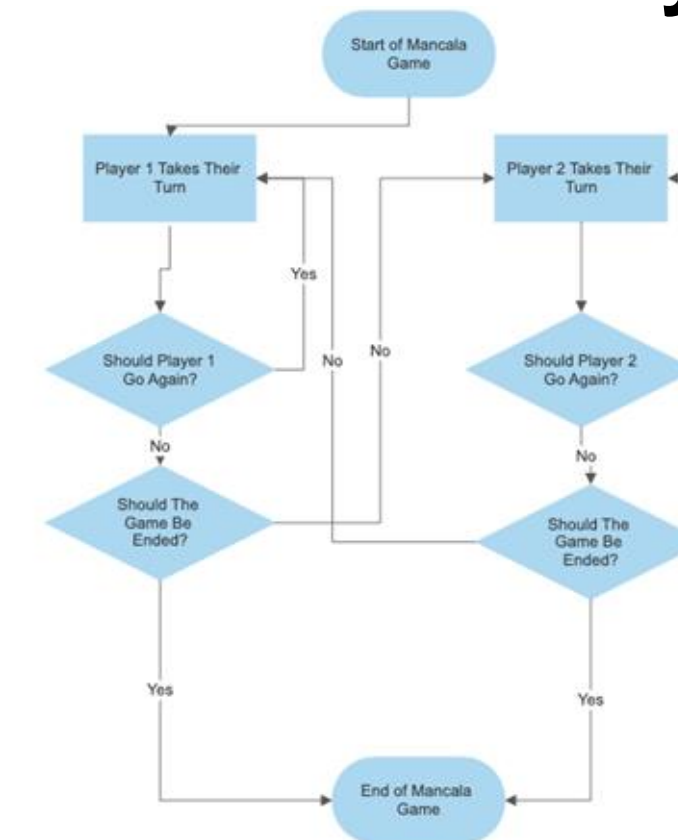
Origin of Mancala

The actual origin of mancala is not completely clear. The oldest found evidence of a game resembling mancala was from the 4th century, AD, located in Abu Sha'ar, Egypt. This was the location of a late Roman legionary fortress overlooking the Red Sea coast. A little later, between 6th and 7th century AD, a fragment of a pottery board, which resembled mancala, was found in Aksumite Ethiopia in current day Eritrea. Some historians believe that due to the game needing no special tools or rules, it could date back to the start of civilization itself; however, there has been no found examples of mancala, or any of its similar variants, older than 1300 years. There have been some pieces of graffiti in Egypt, the Kurna temple precisely, which resemble mancala but there is no way to date such pieces.

Nate Barone, Sacred Heart University, Computer Engineering, ENGR 200 Video Explanation of My Matlab Code



Flow Chart of My Code



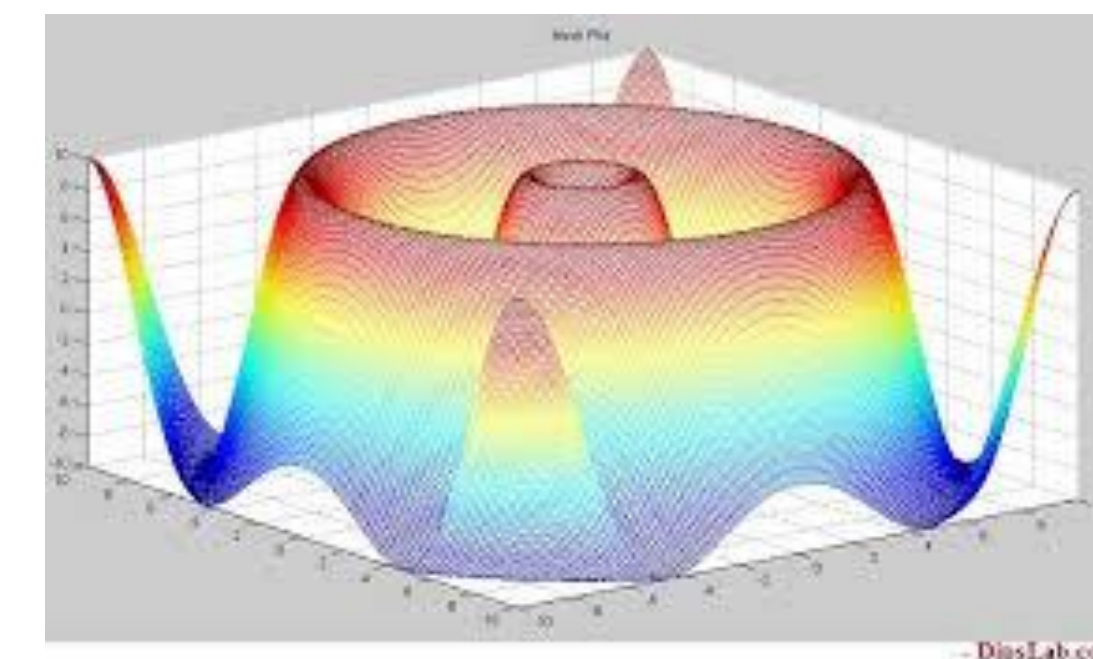
Current Limitations of My Matlab Code

1. I did not set up the board as seen in real life; this is due to the fact that both players must sit on the same side of the board.
2. I did not code the capture rule; this was more of a personal choice than a limitation on the coding side.
3. I did not allow the left-over pebbles to be added to either of the player's Mancala hole.
4. I did not allow the players to loop the board more than once.
 - a. Point 3 and 4 were not added in due to limitation of time.

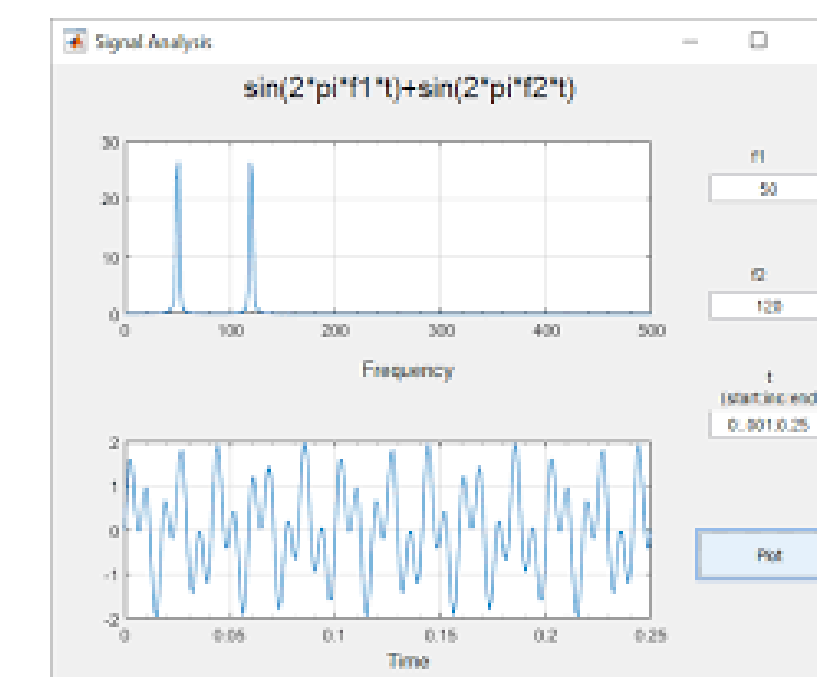
Definition of Matlab

MATLAB (*Matrix Laboratory*) is a proprietary programming language developed by MathWorks. It focuses in on being able to complete complex mathematical and engineering scenarios. On top of this it is able to create user interfaces to allow for simple representation of said completed complex scenarios and data.

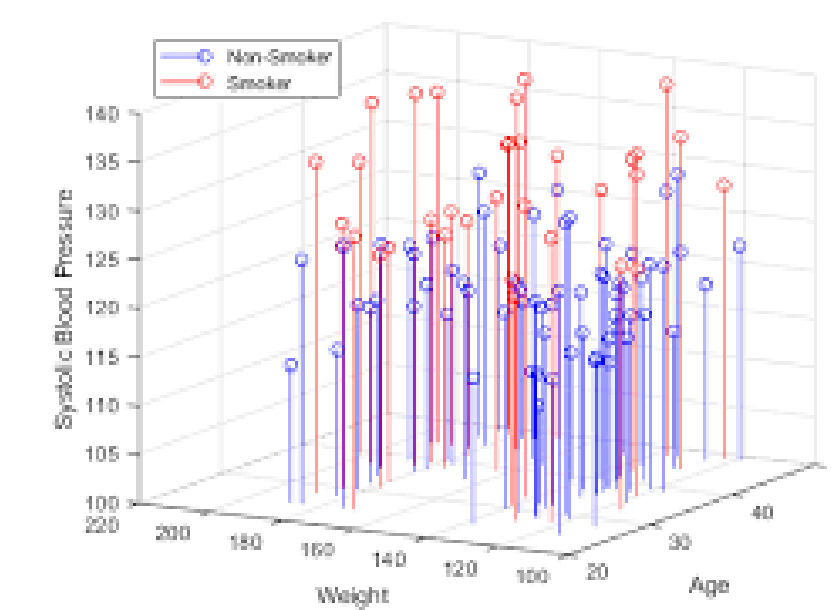
Examples of Matlab Graphing



The above graph (from <https://dipslab.com/matlab-3d-plot-examples/>) shows the mesh plot of the equation $T = \sqrt{x^2 + y^2}$.



The above graph (from https://www.mathworks.com/help/matlab/creating_guis/gui-that-accepts-parameters-and-generates-plots.html) is analyzing the signal that is the sum of two sin waves in both its frequency and time domain.



The above graph (from <https://www.mathworks.com/help/matlab/visualize/visualizing-four-dimensional-data.html>) is visualizing 4 dimensional data with one discrete variable.