Programming Fundamentals

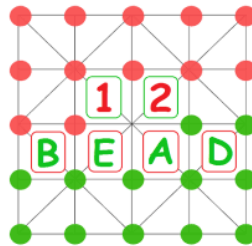## Term Project

Total Marks: 100   **Due Date: 1st Dec 2023**

Note:
- *Submit soft copy (a single zipped folder)*
- *The name of the zipped folder should be your roll number.*
- *Plagiarism may cause an F grade in the course.*
- *Use 2D arrays and file handling. The use of color is mandatory if students can't implement GUI*

- **40% mark for GUI**

- **10% mark for Creativity**

OBJECTIVE 12 BEADS: The goal of the game is to be the first player in eliminating all the beads (pawns) of the opponent player.
NUMBER OF PLAYERS: 2 Players
MATERIALS: A board of 12 Beads, in total 24 beads (12 for each player)
TYPE OF GAME: Strategy Board Game
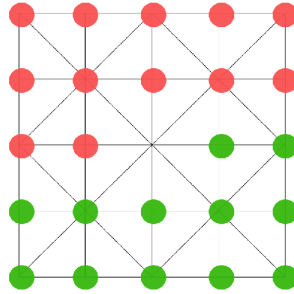**AUDIENCE:** All Ages

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INTRODUCTION TO 12 BEADS
12 Beads is a traditional strategy board game that is believed to be having its roots in the South Asian region. It has various names in different regions, for instance, in Pakistan and India, it is called "Bara Tehni." In Bangladesh, it is called "Baro Guti," and other regions has its name according to their local language as the translation of twelve beads or pawns. It's a two-player board game.

CONTENTS
A 12 Beads game board is a square-shaped board with 16 mini boxes, one large diamond crossing through these boxes. Each mini box consists of four positions at its corners where beads/pawns can be placed.

As it is a multiplayer game, both players have 12 beads/pawns with their desired color. For instance, player one chooses 12 beads of red color, whereas the player two chooses the other 12 beads of green color.
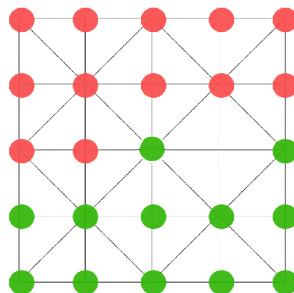
SETUP

The board forms 25 slots or positions where these beads can be placed. Player one places its beads in either upper or lower side of the board but not both. The same goes for the player two as he/she also has to place their beads on the opposite side to the player one formation. As you can see in the photo above, the center position remains empty at the start of the game.
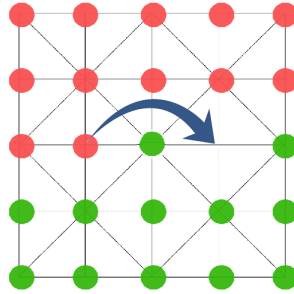
HOW TO PLAY

Each player has to move one of its beads at its turn, and the very first player who moves its bead is decided through a coin toss. The winner of the toss becomes the first player to move one of his/her beads. Each player can move its beads alongside the positions on the board by following through the vertical or horizontal lines.

Since the goal of the game is to eliminate all the beads/pawns of the opponent player, let's see how a player can eliminate other's beads. A player can eliminate the opponent's bead if his/her bead found an empty position (no beads at a position) after the position of an opponent's bead.
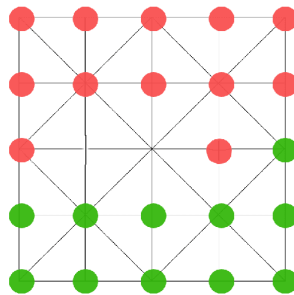
Let's see some images to have more insights about the game rules. In the following image, player two (green) has moved one of its beads. Since it's the start of the game and there is only one position on the center that is left, he/she was to move the bead to that position surely.
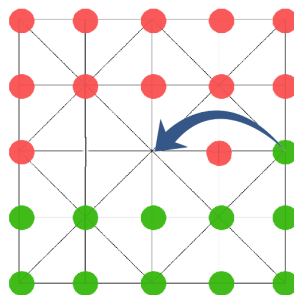

Now, as we know that the game is all about eliminating other beads, it's the turn of player one (red), which should be thinking about finding a vacant position just after the spot where an opponent's bead is landed. Since a player has to cross over the opponent's bead and then land its bead on an empty position, one of the beads of player one (red) found an empty space just after the opponent's bead. What will happen then is shown in the picture as follows.

Player one (red) eliminates one of the beads of the opponent (green) by crossing over it and landing just after the position straight to the crossing line. You can see the aftermath in the following picture.

Now it's the turn of player two (green) who also got an opportunity to eliminate one of the opponent's beads, which have just landed onto an empty position. Player two makes a move by eliminating one of the red beads by crossing over it just as follows.

The red bead which has been crossed by the green bead will be eliminated from the game, and that green piece will be placed at the center position of the board. The turn comes to player one (red), and the game moves on.

WINNING

A player can win the game if he/she eliminates all the beads of the opponent player before the opponent.

Good Luck ☺