Tic-Tac-Toe Game Report:

1. Introduction:

The Tic-Tac-Toe game with A* algorithm is a Python program designed to allow users to play Tic-Tac-Toe against an AI opponent. The AI opponent uses a basic A* algorithm to make its moves intelligently.

2. Program Structure:

- The program is implemented using the Tkinter library for the graphical user interface.
- The game board is represented by a 3x3 matrix of buttons (`game_btns`).
- The players are denoted as "X" and "O," with the computer playing as "O" and the user as "X."
- The program includes functions for handling player turns, checking for a winner, marking winning cells, and starting a new game.

3. Player Turns:

- The `next_turn` function handles the logic for each player's turn.
- If the clicked button is empty and there is no winner, the player's symbol is placed on the button.
- The player is then switched, and if the new player is the computer ("O"), the `computer_move` function is called.

*4. A Algorithm for Computer's Move:**

- The `A*_algorithm` function is a simplified A* algorithm.
- It selects a random empty cell on the game board as the computer's move.
- In a more sophisticated implementation, a heuristic function could be used to make more strategic decisions.

5. Winner Checking:

- The `check_winner` function checks for a winner after each move.
- It examines rows, columns, and diagonals to determine if any player has won.
- If a winner is found, the winning cells are highlighted in cyan.

6. Tie Checking:

- The function also checks for a tie when there are no more empty spaces on the board.
- If the game ends in a tie, a message is displayed, and the cells are marked in red.

7. New Game Initialization:

- The `start_new_game` function resets the game board and starts a new game.
- It also determines whether the computer or the user takes the first turn in the new game.

8. Graphical User Interface:

- The program uses Tkinter for the GUI, with buttons representing the Tic-Tac-Toe board.
- The player's turn and game status are displayed using labels.
- Buttons are clickable, and the game responds to user input.

9. Conclusion:

The Tic-Tac-Toe game with A* algorithm provides an engaging experience for users to play against an AI opponent. The A* algorithm, while basic, adds an element of strategy to the computer's moves. Further enhancements could involve refining the A* algorithm, implementing a more sophisticated heuristic, or extending the game to more advanced AI techniques.