Hi

I am looking to create a project in C that can simulate a game of snakes and ladders. In case you are familiar with the game, Snakes and ladders is a board game based on random chance. The player must navigate from the start of the board (square 1) to the final square (square n). The player can move forward a fixed number of squares based on the outcome of a single die roll; moves between 1 and 6 steps forward are possible with a 6-sided die.

Along the path there are a fixed number of snakes and ladders. If a player moves to a space with a ladder they can move directly forward to the space at the other side of the ladder. This brings them closer to the final square. If a player moves to a space with a snake they must move directly back to the space at the other side of the snake. This brings them further away from the final square.

Example 1.png shows one possible configuration of a game board. In this example, the board consists of 25 squares which are ordered; each square has an index which represents its place on the board. Game play starts from square 1.

* If a player lands on a snake head they must move backwards e.g. if a player ends their turn on square 13 they move down the snake to square 3.
* If a player lands at the bottom of a ladder they must move upwards e.g. if a player ends their turn on square 6 they move forward to square 22.

When a player gets to the final square, they have successfully completed the game.

For this project, I would like to implement a data structure which represents the game board:

* The game board
  + Each square on the game board should be a user-defined structure which holds information about the current position on the game board. The program should check if it is the final square on the game board, or if it is the bottom of a ladder, or if it is the head of a snake.
  + The game board size should be randomly set each time the application is run, minimum size 32, maximum size 64.
  + The entire game board must be represented by a data structure of game square structures which you can traverse along, ideally implemented by using a linked list.
  + Cursor to represent current position on the board.
* Snakes and ladders
  + On the game board a user-defined number of snakes and a user-defined number of ladders should be randomly positioned.
  + A ladder always transports the player to a higher index (cannot be outside the game board). A ladder should transport a player between 1 and 10 squares forwards, this should be randomly set for each ladder upon board initialisation.
  + A snake always transports the player to a lower index (cannot be outside the game board). A snake should transport a player between 1 and 10 squares backwards, this should be randomly set for each snake upon board initialisation.
  + The last square on the board cannot be occupied by the head of a snake.
  + The first square on the board cannot be occupied by the foot of a ladder.
  + A square can be occupied by at most the foot of one ladder or the head of one snake.
* Game play
  + The number of snakes and the number of ladders should be provided as two separate command line parameters when the function is called.
  + The program should initialise a new board (of random length) and it should randomly place the number of snakes and ladders as designated by the user.
  + The program should then simulate game play by rolling a die (random number generated between 1 and 6) and navigating through the board (following snakes and ladders where appropriate) until it gets to the final square.
  + Once the program terminates a report of the gameplay should be printed to a file. This can be read by the user to determine the path their player followed through the game. This should include the start and end position of each move and whether a snake or a ladder was followed.

If you could, please also include informative comments and variable names.

Thanks