**ABOUT THE PROJECT:**

The knight is a piece in the game of chess. It is normally represented by a horse’s head and neck. The knight’s movement is unusual among chess pieces. When it moves, it can move to a square horizontally and on square vertically, or two squares vertically and one square horizontally. The complete move therefore looks like the letter L.

A knight on the edge of the board attacks only three or four squares, depending on its exact location, and a knight in the corner only two.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | a | b | c | d | e | f | g | h |  |
| 8 |  | C:\Users\Kunal\Downloads\Chess_oot45.svg.png |  | C:\Users\Kunal\Downloads\Chess_oot45.svg.png |  |  |  |  | 8 |
| 7 | C:\Users\Kunal\Downloads\Chess_oot45.svg.png |  |  |  | C:\Users\Kunal\Downloads\Chess_oot45.svg.png |  |  |  | 7 |
| 6 |  |  | ♘ |  |  |  |  |  | 6 |
| 5 | C:\Users\Kunal\Downloads\Chess_oot45.svg.png |  |  |  | C:\Users\Kunal\Downloads\Chess_oot45.svg.png |  |  |  | 5 |
| 4 |  | C:\Users\Kunal\Downloads\Chess_oot45.svg.png |  | C:\Users\Kunal\Downloads\Chess_oot45.svg.png |  |  |  |  | 4 |
| 3 |  |  |  |  |  |  |  |  | 3 |
| 2 |  |  |  |  |  |  |  |  | 2 |
| 1 |  |  |  |  |  |  |  |  | 1 |
|  | a | b | c | d | e | f | g | h |  |

Knight’s all Possible Moves on a Standard 8x8 Chess Board

**KNIGHT’S TOUR PROBLEM:**

A knight’s tour is a sequence of moves of a knight on a chessboard such that the knight visits every square only once. If the knight ends on a square that ends on a square that is one knight’s move from the beginning square, the tour is closed, otherwise it is open.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | a | b | c | d | e | f | g | h |  |
| 8 | 15 | 62 | 19 | 34 | 1 | 50 | 31 | 46 | 8 |
| 7 | 18 | 35 | 16 | 63 | 32 | 47 | 2 | 49 | 7 |
| 6 | 61 | 14 | 33 | 20 | 51 | 4 | 45 | 30 | 6 |
| 5 | 36 | 17 | 60 | 13 | 64 | 29 | 48 | 3 | 5 |
| 4 | 11 | 58 | 21 | 40 | 5 | 52 | 27 | 44 | 4 |
| 3 | 22 | 37 | 12 | 59 | 28 | 41 | 6 | 53 | 3 |
| 2 | 57 | 10 | 39 | 24 | 55 | 8 | 43 | 26 | 2 |
| 1 | 38 | 23 | 56 | 9 | 42 | 25 | 54 | 7 | 1 |
|  | a | b | c | d | e | f | g | h |  |

Example of Set of movements of Knight’s Tour

**CODE:**

|  |
| --- |
| <!DOCTYPE html>  <html>  <head>  <title> Knight's Tour Demonstration </title>  </head>  <body style="text-align:center;  background-color:#F2F2F2">  <canvas id="display"> </canvas>  <script>  var board,blocks,size,canvas,context;  execute();  function execute() {  create();  var row=1,col=1;  if(row>=0&&row<size&&col>=0&&col<size)  solve(row,col,1);  }  function create() {  board=[  [0,0,0,0,0,0,0,0],  [0,0,0,0,0,0,0,0],  [0,0,0,0,0,0,0,0],  [0,0,0,0,0,0,0,0],  [0,0,0,0,0,0,0,0],  [0,0,0,0,0,0,0,0],  [0,0,0,0,0,0,0,0],  [0,0,0,0,0,0,0,0]];  size=64;  blocks=8;  canvas=document.getElementById("display");  context=canvas.getContext("2d");  canvas.width=size\*blocks;  canvas.height=size\*blocks;  for(var i=0;i<blocks;i++)  for(var j=0;j<blocks;j++) {  context.beginPath();  context.rect(i\*size,j\*size,size,size);  if((i+j)%2!=0)  context.fillStyle="#D18B47";  else context.fillStyle="#FFCE9E";  context.fill();  }  }  function solve(row,col,k) {  var r,c; board[row][col]=k;  for(var i=1,j=2;i<=2&&j>=1;i++,j--) {  if(check(row+i,col+j)==1) {  if(solve(row+i,col+j,k+1)==0)  board[row+i][col+j]=0;  else {  r=row+i; c=col+j;  markpos(k,row,col);  drawline(row,col,r,c);  return 1;  }  }  if(check(row+i,col-j)==1) {  if(solve(row+i,col-j,k+1)==0)  board[row+i][col-j]=0;  else {  r=row+i; c=col-j;  markpos(k,row,col);  drawline(row,col,r,c);  return 1;  }  }  if(check(row-i,col+j)==1) {  if(solve(row-i,col+j,k+1)==0)  board[row-i][col+j]=0;  else {  r=row-i; c=col+j;  markpos(k,row,col);  drawline(row,col,r,c);  return 1;  }  }  if(check(row-i,col-j)==1) {  if(solve(row-i,col-j,k+1)==0)  board[row-i][col-j]=0;  else {  r=row-i; c=col-j;  markpos(k,row,col);  drawline(row,col,r,c);  return 1;  }  }  }  if(k==blocks\*blocks) {  markpos(k,row,col);  return 1;  }  else return 0;  }  function check(row,col) {  if(row>=0&&row<blocks&&col>=0&&col<blocks)  if(board[row][col]==0)  return 1;  return 0;  }  function markpos(num,row,col) {  context.fillStyle="#000000";  context.font="16px consolas";  context.fillText(num,col\*size+2,  row\*size+16);  }  function drawline(fromr,fromc,tor,toc) {  context.moveTo(fromc\*size+size/2,  fromr\*size+size/2);  context.lineTo(toc\*size+size/2,  tor\*size+size/2);  context.stroke();  }    </script>  </body>  </html> |