

# INTRODUCTION

The project is a game by the name of Slither link. Slitherlink (also known as Fences, Takegaki, Loop the Loop, Loopy, Ouroboros, Suriza and Dotty Dilemma) is a logic puzzle developed by publisher Nikoli. Slitherlink is an original puzzle of Nikoli; it first appeared in Puzzle Communication Nikoli #26 (June 1989).

The project team has 6 members:

- 1) Palash Dhande
- 2) Nilesh Kulkarni
- 3) Nisheeth Lahoti
- 4) Neha Rani Gupta
- 5) Partha Pratim Saha
- 6) Nikunj Kothari

## PURPOSE

The puzzle aims at developing the logical powers of the user and improving the analytical skills and is a good exercise to the mind.

The user has to initiate at a proper position and then think his/her way to join the dots.

After coming to a solution, the user can check its correctness by clicking on the suitable button.

## WORK DISTRIBUTION

- The task of finding an algorithm and writing the programs to solve the puzzle and verify given solutions is taken by *Nisheeth Lahoti*.
- The project involves significant use of graphics in the interface, and the work has been divided suitably among the members of the team.
- The task of designing the grid and the buttons in the play window, and doing all the input/output is taken by *Palash Dhande* and *Nilesh Kulkarni*.
- The graphics and the buttons of the main menu are designed by *Neha Rani Gupta* and *Partha Pratim Saha*.
- The graphics of the game include extensive usage of buttons as a method of selection. The main menu as well as the play window contains several such buttons for various functions.
- The puzzle consists of numbers placed at specific locations in the grid. These numbers will be unique for each puzzle and will be stored in a file.

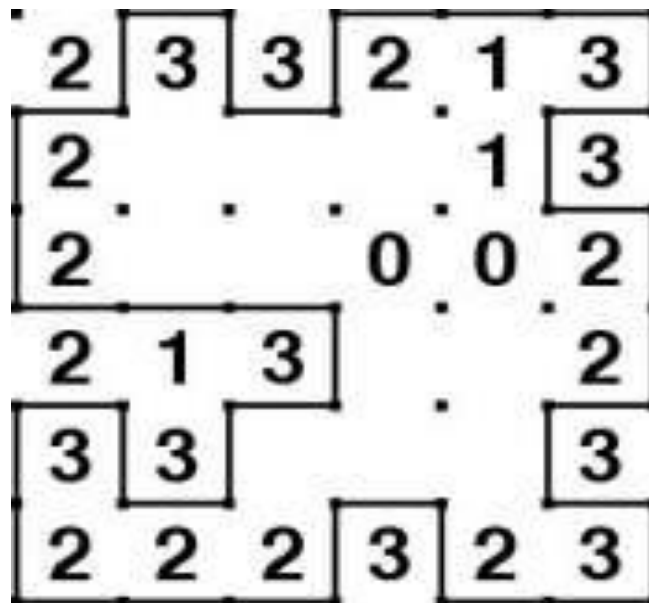
## RULES OF THE GAME

Slitherlink is played on a rectangular lattice of dots. Some of the squares formed by the dots have numbers inside them. The objective is to connect horizontally and vertically adjacent dots so that the lines form a simple loop with no loose ends. In addition, the number inside a square represents how many of its four sides are segments in the loop.

The Rules of the Game are as follows:

- 1) Every square should have the exactly same no lines passing around it as the number in that square
- 2) Where no number is mentioned on the grid there can be any number of lines.
- 3) There should be no line intersection taking place.
- 4) There should be no loose ends in the solution.

For example refer the sample solved puzzle shown in the image.



# PROJECT DESCRIPTION

This project is on the game slither link, which is mostly about the user trying to use his logical and reasoning abilities to complete a loop that surrounds numbers in the problem statement.

## PRIMARY OBJECTIVES :

- 1) Play mode : The user plays a slitherlink game.
- 2) Loop Solver mode : The user inputs a problem, which the program solves.

## FEATURES :

- 1) It is upto the user to decide the grid size.
- 2) At any stage of the game the user can verify the solution that he/she has made.
- 3) The program shows all possible lines on the grid in grey colour, with options to :
  - a) darken a line (making it a part of the loop).
  - b) undarken an existing line (if the users wishes to change his previous intuition or logic).
  - c) eliminating a line, i.e. marking a line impossible. (for user's use only. final solution does not check which lines are marked impossible.)
- 4) The game is also capable of giving a correct solution to the user in case he feels that he isn't able to solve the problem.
- 5) The user can also ask for a new puzzle in case he isn't interested in solving the given problem.
- 6) It provides a option to the user to quit the game at any point of time.
- 7) It stores all High Scores.

# GRAPHICS USAGE

## MAIN MENU

This has options like :

- 1)PLAY
- 2)HOW TO PLAY
- 3)LOOP SOLVER
- 4)OPTIONS
- 5)EXIT

## PLAY MODE INTERFACE :

- 1)Displaying the grid.
- 2)Displaying the grey, darkened and eliminated lines connecting the points on the grid.
- 3)Buttons: Verify, New puzzle, Reset, Can't Solve, Main Menu.

(The Grid is a collection of points and the user is required to join the points and arrive at a loop that satisfies the rules of the games. There are numbers(0,1,2,3) in the boxes formed by the points at some specific locations. The lines will be created by the click of the mouse button in the space between the points.)

The main important function during game runtime is to darken, undarken and eliminate the lines.

## LOOP SOLVER INTERFACE :

- 1)Displaying the grid.
- 2)Buttons (for input): 0, 1, 2, 3, blank.

# LIBRARIES USED

Some of the libraries to be used are

For input output stream:

`iostream`

For asserting whether the game window is open or not:

`assert.h`

For providing time delay:

`time.h`

For Manipulations on strings

`cstring`

`string.h`

For Input Output Operations

`cstdio`

For drawing objects, terrains and other implementation of graphics:

`ezwin.h`

`position.h`

`rect.h`

`circle.h`

`square.h`

`bitmap.h`

The References used by us are:

1)Class Notes.

2)Programming in C++ - Cohoon and Davidson.

3)<http://www.cplusplus.com>