

# Offline for Section A2/B2

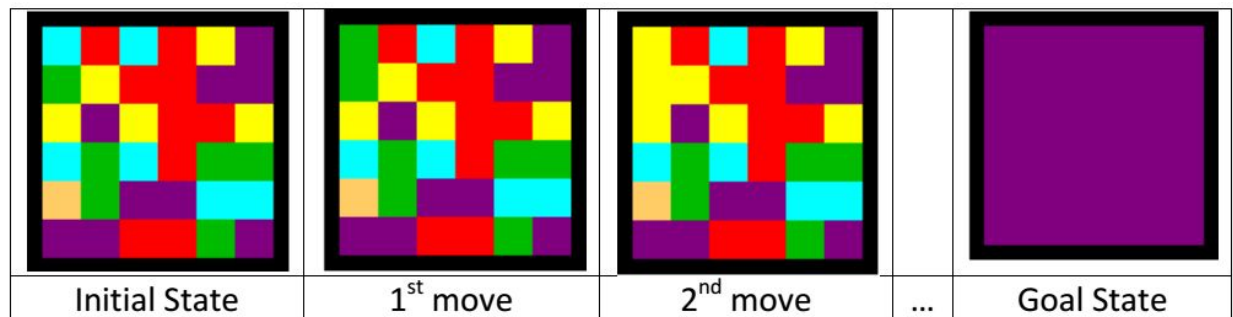
Submission Deadline:

## SOLVING “FLOOD-IT” USING A\* SEARCH

In this assignment you will have to solve the game “Flood-It” using A\* search. The Problem Flood-It is a computer game played by millions the world over. The object is to turn a board full of colored squares into one single color in minimum number of ‘flood-filling’ moves. Each move changes the color of the top-left square and all of the same colored squares, connected to it. It is easy to play, yet challenging, great fun and addictive. Solving Flood-It is an NP-Hard problem.

The game can be played online:

1. <http://www.lemoda.net/javascript/flood-it/game.html>
2. <http://unixpapa.com/floodit/?sz=14&nc=6>



**A\* Search:** Refer to the slide provided in class.

<https://drive.google.com/open?id=0B-SybtAwa8vcUUZYnJqcnhjbk0>

## The tasks

1. You have to design **at least two different heuristics** for the problem. One of them should be admissible. Your heuristics should not take more than 10, 17, and 25 steps for 6\*6, 10\*10, and, 14\*14 boards, respectively. The number of colors is fixed to six.
2. You will have to implement A\* search to solve the problem, and implement both of the heuristics.
3. You have to write a short report (1 page, hard copy), discussing the admissibility and the comparative performance (optimality and runtime) of your proposed heuristics.

### **Input File Format**

The input file contains a series of inputs. First line contains the board size  $n$ . Next  $n$  line contains  $n$  integer each, i.e., the  $n \times n$  board. The colors are represented by integers 1 to  $n$ . The file ends with a zero as board size. Refer to [input.txt](#) for sample inputs.

### **Output Format**

Output will be shown in console in the following format:

Number of moves:  $x$

Next there will be  $x$  integers showing the chosen color in each move.

Next Print the  $(x+1)$  Boards sequentially, starting from initial state to goal state.

Implementing GUI is upto your choice and it's appreciable

### **Evaluation Criteria:**

To be updated