# CITS3001 Project 1 Report

## Josh La Verghetta & Andrew Edwards

### Due 30/05/2014 4pm

Our program makes use of the common A-star informed search algorithm with a few changes, and multiple heuristic functions to determine the best move to make. We started building our program by designing a playable GUI version of the “Threes” game laying the groundwork for building a search algorithm on an already working implementation of the games rules.

## Structure and design of our algorithm

We decided to take the idea of the open and closed lists and a tree of nodes used in the A-star algorithm and give it a twist by, instead of a tree, using a priority queue holding a series of “nodes”. This allowed us to choose the best next node according to our heuristics by simply removing the head of the open priority queue, since it is already sorted for us.

## Interesting implementation details

Using a priority queue instead of a tree enabled us to have on the go sorting along with an easy way to choose the next best “node” to expand by simply removing the head of the queue.

## Experimentation and theoretical analysis