**Assignment 1 – Centralized Search**

In the first assignment you will implement two different algorithms for solving the 8 tile problem. Each pair will generate their own representation of the problem, and implement two solving algorithms based on the following two algorithms (you may need to include elements of other algorithms):

1) Branch and Bound

2) A\*

Your program should print the solution as a series of charts on the board from the initial state to the goal state.

The initial state: is a random state.

The goal state is the following:

1 , 2 , 3

4 , 5 , 6

7 , 8 ,

You need to propose two admissible heuristics and apply them on both algorithms. Your grade will be correlated to the quality of the heuristics you propose.

Final report:

- One page describing your implementation design, heuristics and how you overcame the obstacles you ran into. Also, you need to state and explain the properties of the algorithms (completeness, optimality…).

- One graph comparing the runtime (in logical steps) of the two algorithms.

You can work in pairs.

You can program in Java or in Python.

Submission: You are required to submit the code and the report to me by

the following email: [zivanr@bgu.ac.il](mailto:zivanr@bgu.ac.il)

Due date: 24/12/2020

The checking of the assignment will be frontal (via zoom).

**Good luck! ☺**