Question 2 by Dan Nguyen (z5206032)

Let there be a flow network represented as a directed graph with the following properties:

- the flow is the number of lizards jumping;
- nodes are stones with a height, h_{ij}, and number of lizards, a_{ij}, where there are rc stones;
- edges are jumps between stones i.e. an edge $\exists$ if $\sqrt{(i_1 - i_2)^2 + (j_1 - j_2)^2} \leq d$;
- stones have infinite lizard capacity;
- jumps have a capacity equivalent to the height of the stone being jumped from - each lizard jump decrements h_{ij} and a_{ij}, where if h_{ij} decrements to zero, $a_{ij} = 0$;
- the source is any stone with some initial number of lizards on it i.e. $a_{ij} > 0$; and
- the sink is any stone outside the grid i.e. $\{i \leq 0 \bigcap i > r\} \bigcap \{j \leq 0 \bigcap j > c\}$.

Let the max flow, f, be the max number of lizards that can move from any source to any sink i.e. f is at most $\sum_{i,j} a_{ij}$.

To find f, apply the Edmonds-Karp algorithm to the flow network which will have a time complexity of $O(\min(|V||E|^2,\ |E|f)) = O(\min((rc)^3,\ rc\sum_{i,j} a_{ij}))$.