COMP3121 21T2 Assignment 4 Q3

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Let the source to be square 0, since all children are starting from square 0. Similarly, let square n to be sink, where is the ending condition for the game. All other squares are treated as vertices in between. Assuming each child represents 1 unit of capacity.

Connecting every square i with square $i + 1$, ... , $i + k$ with a directed edge of infinity capacity, since there is no restrictions between edges. However, each vertex has capacity of $A[1, ..., n - 1]$. So we need to split vertex i other than the source and the sink into two vertices, one incident to all incoming edges and on incident to all outgoing edges, and create and link a new edge between two vertices, and assign $A[i]$ as capacity for the edge in between. Now find the maximum flow in current network with Edmons-Karp algorithm, and the resulting maximum flow is equivalent to the maximum number of students who can successfully complete the game.