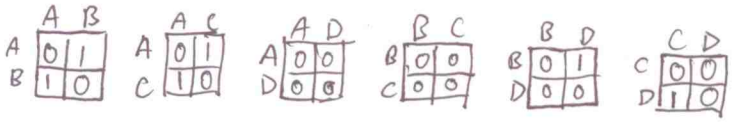
Goals

1. Given a set of inputs and outputs corresponding to a set of CAs, ~~find~~ produce the graph G with all possible connections.
2. Given interest in a particular output (a vertex in G) find the set of all subgraphs that connect the CAs needed for output iOj.
3. Find expressions to evaluate the properties of a subgraph according to the following metrics:
   - Fidelity (specific to an output, dependent on CA and fidelity of inputs)
   - Runtime (specific only to a CA call). (On a per iteration basis)
   - Convergence (~~specific to~~ proportional to complexity)

Answers

1. This question is straightforward but serves to specify the ~~assumptions~~ assumptions and starting conditions.

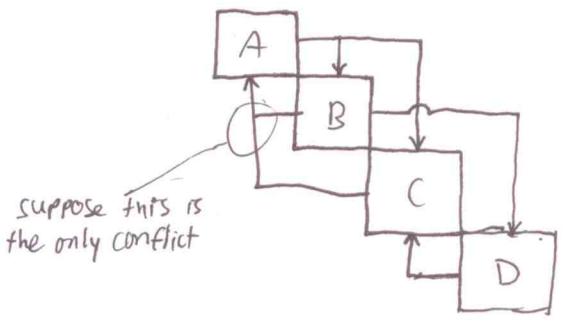
   Given CAs A, B, C, and D and their pairwise connections



⇒ the corresponding adjacency matrix is

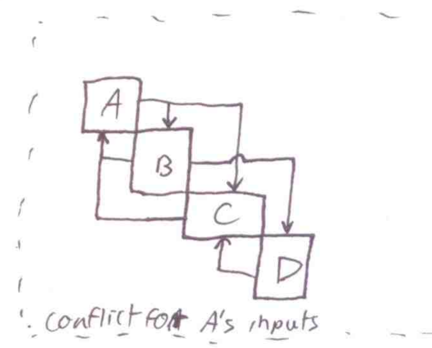
	A	B	C	D
A	0	1	1	0
B	1	0	0	1
C	1	0	0	0
D	0	0	1	0

   and the graph with all possible connections is

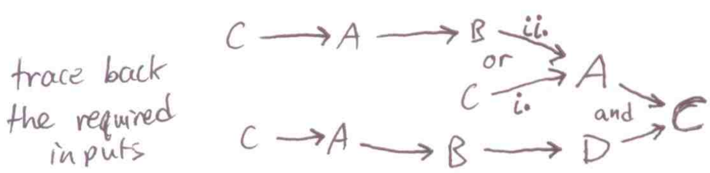


→ Inputs and outputs were not distinguished for this simple example

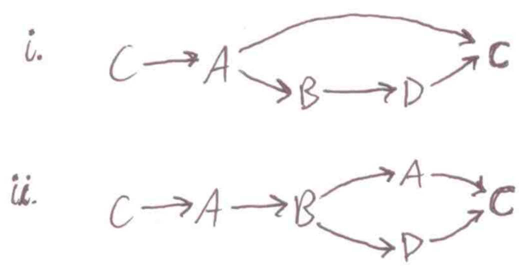
2. Start with the desired output and work backwards. Each option/decision represents a different subgraph that can be used.



Desired output: C



⇒ Two possible subgraphs

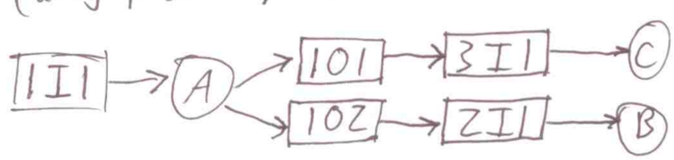


i. runtime = a + b + d + c

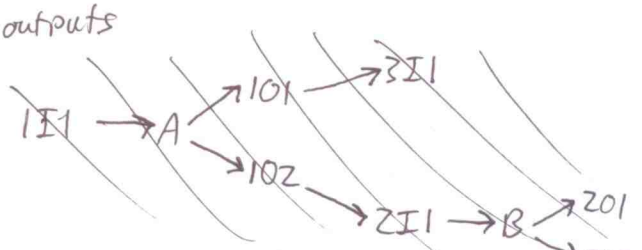
ii. runtime = 2a + b + d + c

3. Some metrics correspond to analysis calls but other to specific outputs. Additionally, if multiple outputs are needed from one CA, it should only be called (and counted) once.
To accomplish this, the subgraphs will be composed of ~~two~~ three types of vertices: inputs, analyses, and outputs. Inputs will always direct to analyses, analyses will always direct to outputs, and outputs will always direct to inputs.

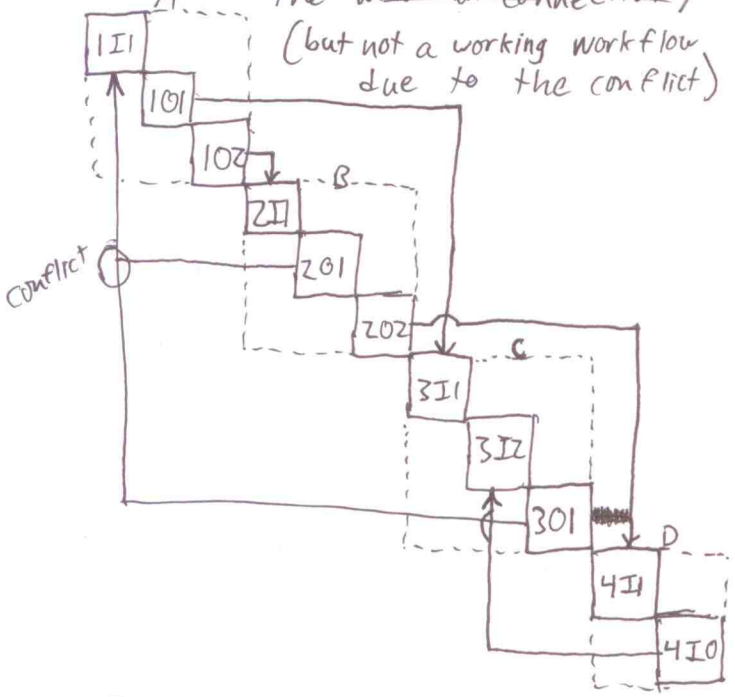
For example (using previously introduced notation)



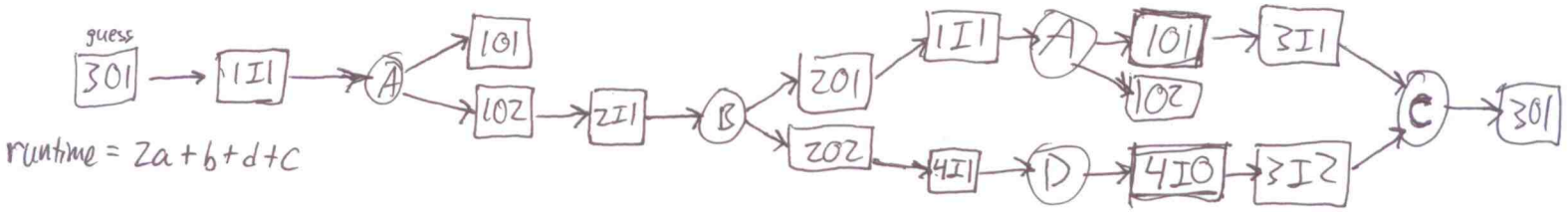
Let this graph, G1, repesent inputs and outputs



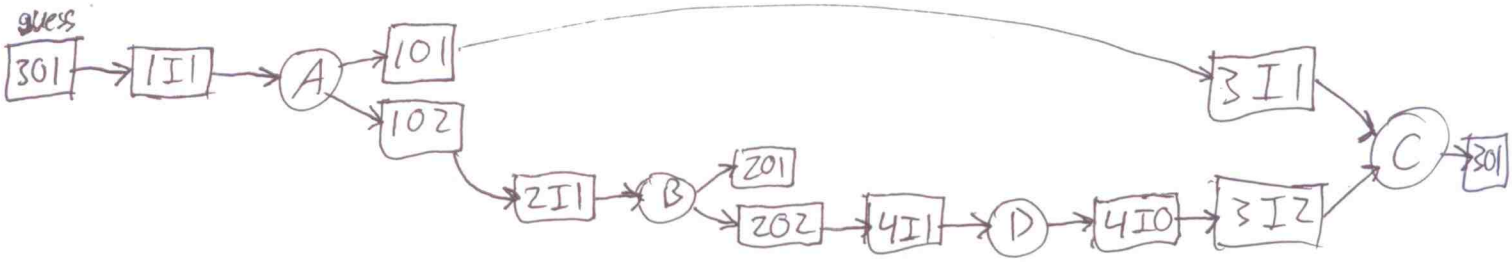
~~the maximal connectivity~~
(but not a working workflow due to the conflict)



To get 301



or



These