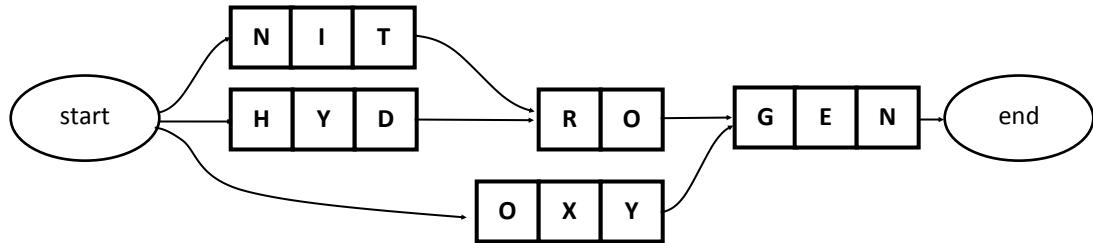


(B) DAWG Breeds (1/3)

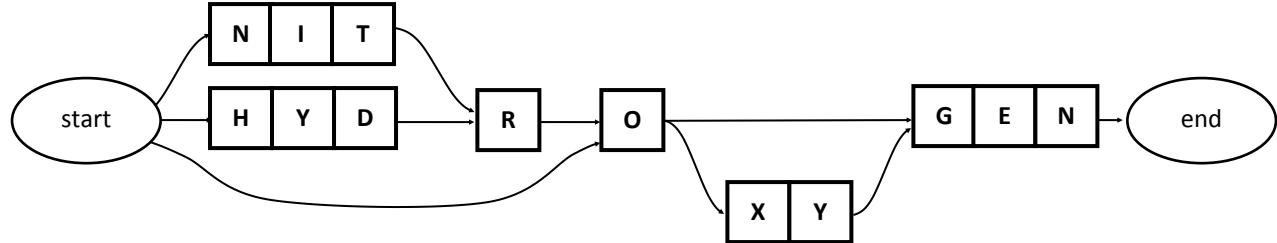
“DAWG” (directed acyclic word graph) describes a diagram that stores a set of *words* in a *graph* (in the sense of a web of paths) that is *directed* (each path can only be traveled in one direction) and *acyclic* (there is no possibility of traveling in a circle).

When storing a set of words (say, HYDROGEN, OXYGEN, and NITROGEN), there is often some redundancy. All three of these words, for example, end in -GEN, and two of them end in -ROGEN. The DAWG below stores all three words without storing the redundant parts multiple times.



This DAWG can “recognize” all three words, in that each word constitutes a valid path from the start symbol to the end symbol, and no other sequence of letters forms such a path.

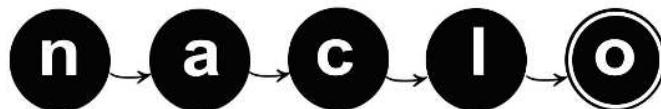
However, it is not correct to just “merge” any redundant letters like this, because inappropriately merged letters will lead to incorrect words being recognized.



This DAWG correctly recognizes the letter sequences NITROGEN, HYDROGEN, and OXYGEN, but it also incorrectly recognizes the letter sequences NITROXYGEN and HYDROXYGEN, which were not intended.

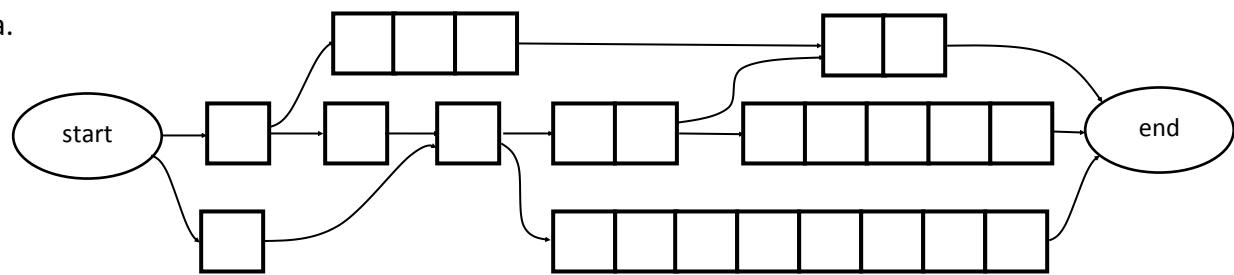
B1. On the next page are three DAWGs that recognize a list of words in a category, the way that the DAWGs above recognizes a three-word list of chemical elements. Each DAWG recognizes a different category of words.

These DAWGs are poorly-constructed, however, in that each one recognizes several incorrect letter sequences as well. We will give you the shape of the DAWG (but without letter labels) and the incorrect letter sequences; from this, deduce what words the DAWG was supposed to recognize and write these intended words on your answer sheet. (For each part of this question, the number of intended words is the same as the number of answer spaces you are given.)



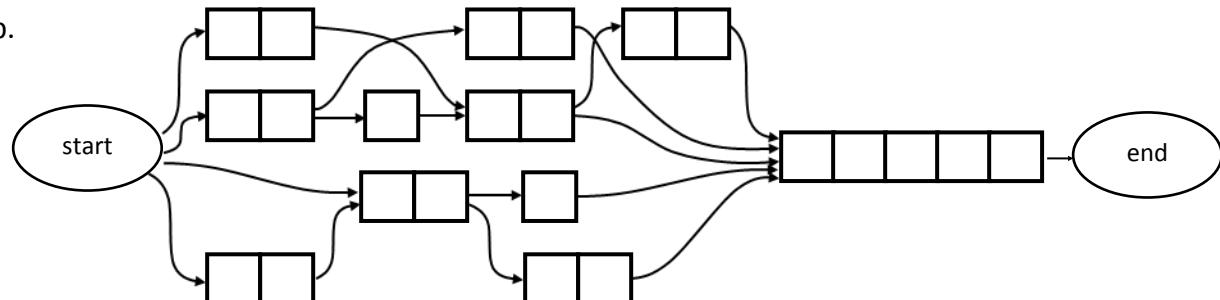
(B) DAWG Breeds (2/3)

a.

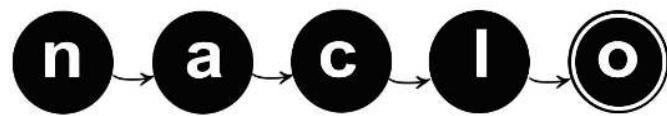


Unintended words: POODHOUND, BLOMERANIAN, BLOODLE

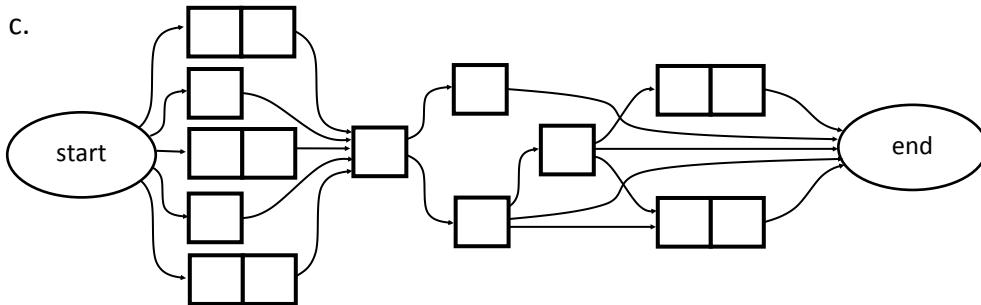
b.



Unintended words: HUCKBERRY, RAWBERRY, BLACKLEBERRY, STRASPBERRY



(B) DAWG Breeds (3/3)



Unintended words: PANDA, GHAQ, IRANADA, CAN, RWANAMA, and many more...

B2. For each of the DAWGs above, what would be the fewest number of letter squares needed to recognize every intended word, and only the intended words? (For example, to recognize HYDROGEN, OXYGEN, and NITROGEN, you need at least 14 squares. Any fewer than 14 squares and you would recognize an unintended word like NITROXYGEN or OXYDROGEN. Do not include the start or end spaces in your counts.)

a.

b.

c.

