WordWalk^{TM}

25 Easy Puzzles

Root Words with 5 letters and 3 subwords

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Chapter 1

Introduction

A WordWalk puzzle represents several words embedded in a directed graph. A directed graph is a diagram that consists of nodes and arrows.[1] In WordWalk puzzles, nodes are represented as ellipses.

WordWalk puzzles are generated from several words, one of which is unknown– called the root word – while the other words are subwords of the root word and are known to the player. A word is considered a subword of another word if each letter of the first word is also used somewhere in the second word.

To solve the puzzle, one must fill in all the blank nodes with the correct letters and correctly guess the root word from which the WordWalk puzzle was generated.

There is no need to guess the subwords because

[1] In mathematics, nodes and arrows are also known as vertices and edges.

they are known. But they need to found in the puzzle.[2]

WordWalk puzzle graphs are formed from words as follows: Each letter in the word is assigned to a unique node in the graph. If a certain letter in the word is followed by another letter, then an arrow is drawn from the node of the first letter to the node of the second letter. If a letter is immediately repeated in a word – as the letter 'o' is in the word 'book' – then the arrow is drawn as a loop pointing right back at the same originating node.

Given a graph generated in this way from a hidden word called the root word, additional subwords of that root word are chosen and also contribute new arrows to the graph. A subword is a word whose letters also occur in the root word. For example, the word 'test' is a subword of the root word 'street'.

Even very short root words can have many subwords. E.g. the word 'would' has at least the following subwords: 'do', 'old', 'low', 'wood', 'odd', 'loud', 'wow', 'doll'. However, only a few words are generally chosen (sometimes as random) to be included in the WordWalk graph.

By contributing arrows, the subword graphs become embedded in the root word's graph as sub-

[2]The puzzle player must verify that he/she has found each subword. In future online/interactive versions of WordWalk, the app itself will verify that each subword has been found.

graphs and the root word graph becomes more complicated. The subgraphs offer multiple ways to walk through the graph and trace out the subwords.

As said above, each node in a WordWalk puzzle represents one letter of the root word. But only the first letter of the root word is given in the graph. For simpler versions of this puzzle designed for kids, more than one letter of the root word can also be given.

The arrows from node to node show which letters follow which. Letters that repeat in a word represent repeated crossings of the associated node(s).

At the lowest level of difficulty, all the subwords from which the graph was made are given to you. At higher levels, the number of letters in the root word is generally larger, and the number of possible subwords is therefore also greater; yet not all of the subwords contained in the graph are shown to the player. Think of the given subwords as clues. The more clues you get, the easier it is to solve the puzzle. However, there is also a downside to having more clues: the number of arrows and hence the number possible letter assignments does increase as well. At even higher levels of difficulty WordWalk puzzles may be generated by more than one root word and their chosen subwords.

Chapter 2

Examples

In this chapter we present examples that illustrate how puzzles are built and solved.

As an example, consider the unsolved WordWalk puzzle in Figure 2.1. This puzzle was built from the root word 'birthday' with the subwords 'day', 'had', 'hard', and 'hat'. The solution is provided in Figure 2.2.

Figure 2.1: Unsolved WordWalk Puzzle for root word 'birthday' and subwords 'day','had','hard','hat'

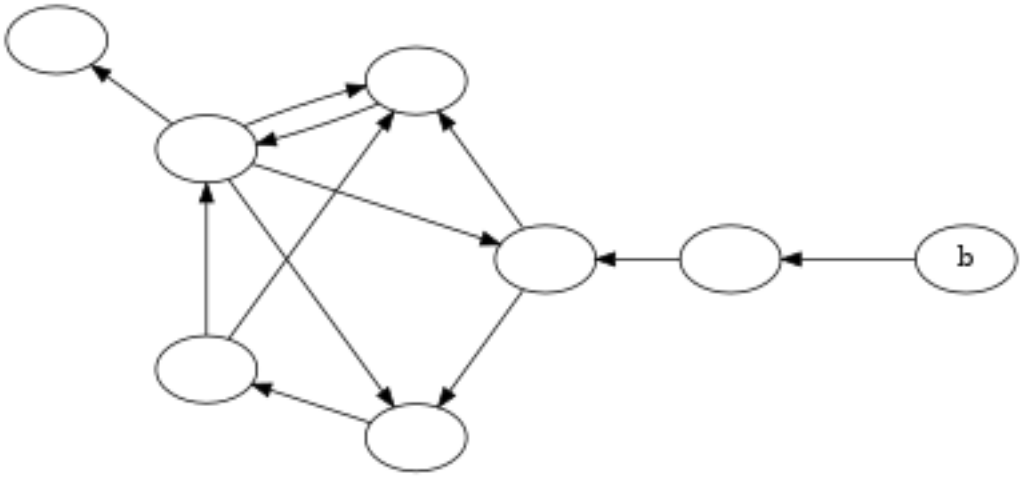
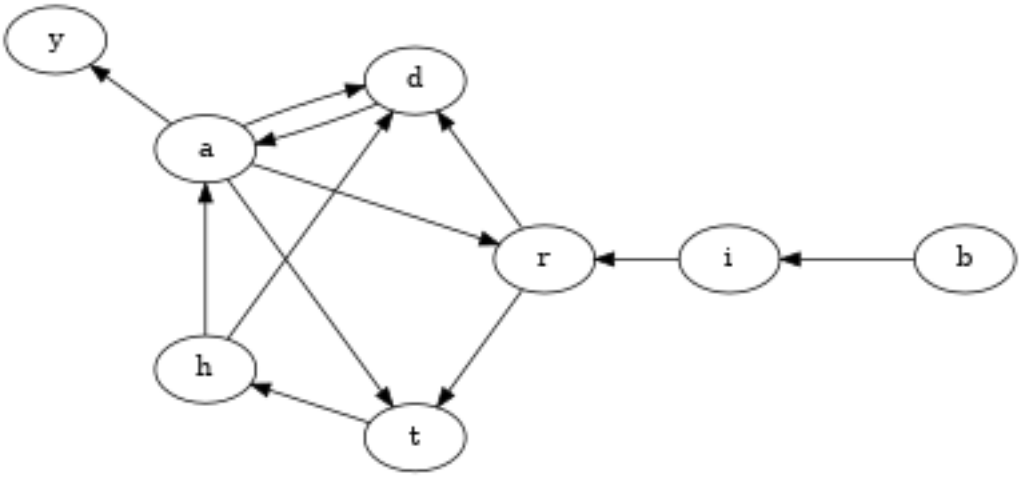
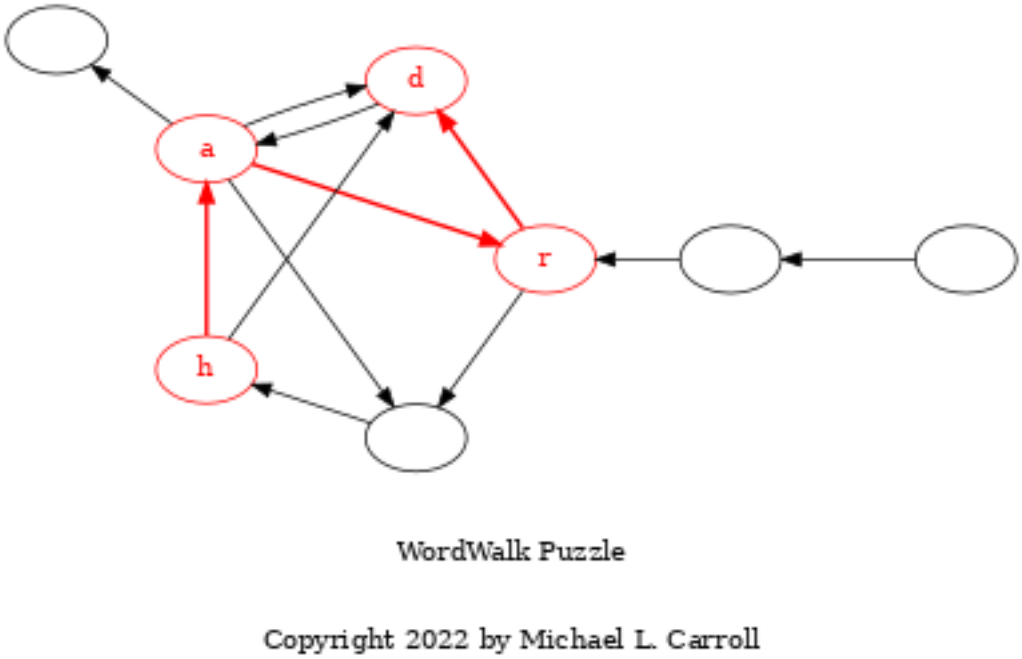


Figure 2.2: Solved WordWalk Puzzle for root word 'birthday' and subwords 'day','had','hard','hat'



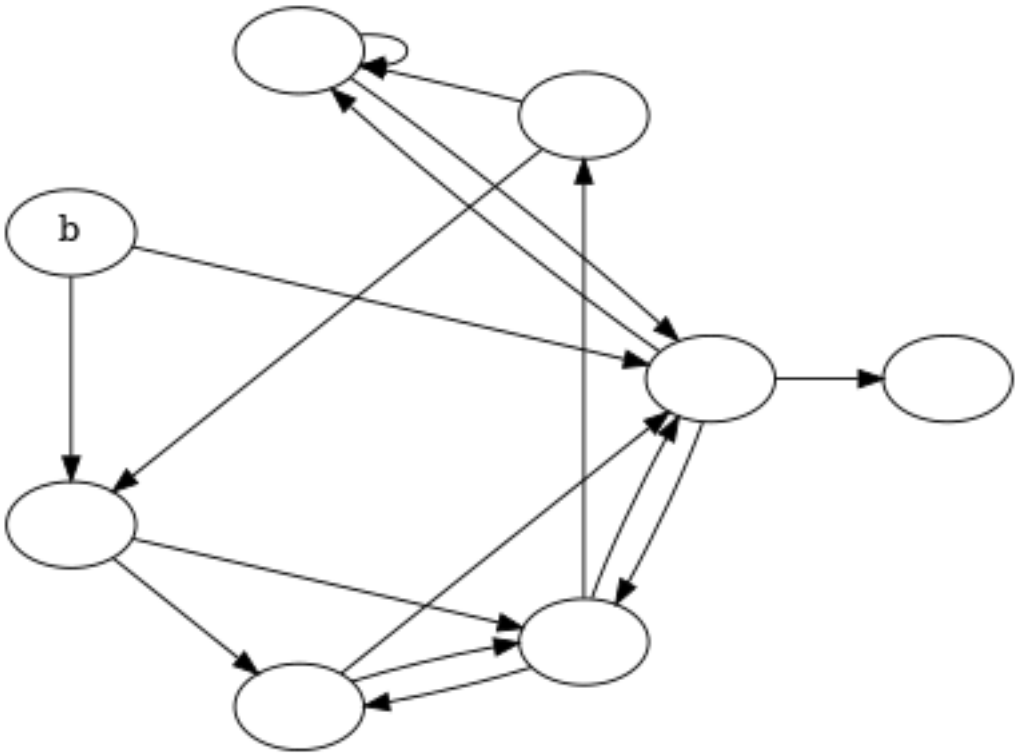
To see how the subword 'hard' is embedded in the graph, consider Figure 2.3.

Figure 2.3: WordWalk Puzzle for root word 'birthday' showing only the hidden subword 'hard'.



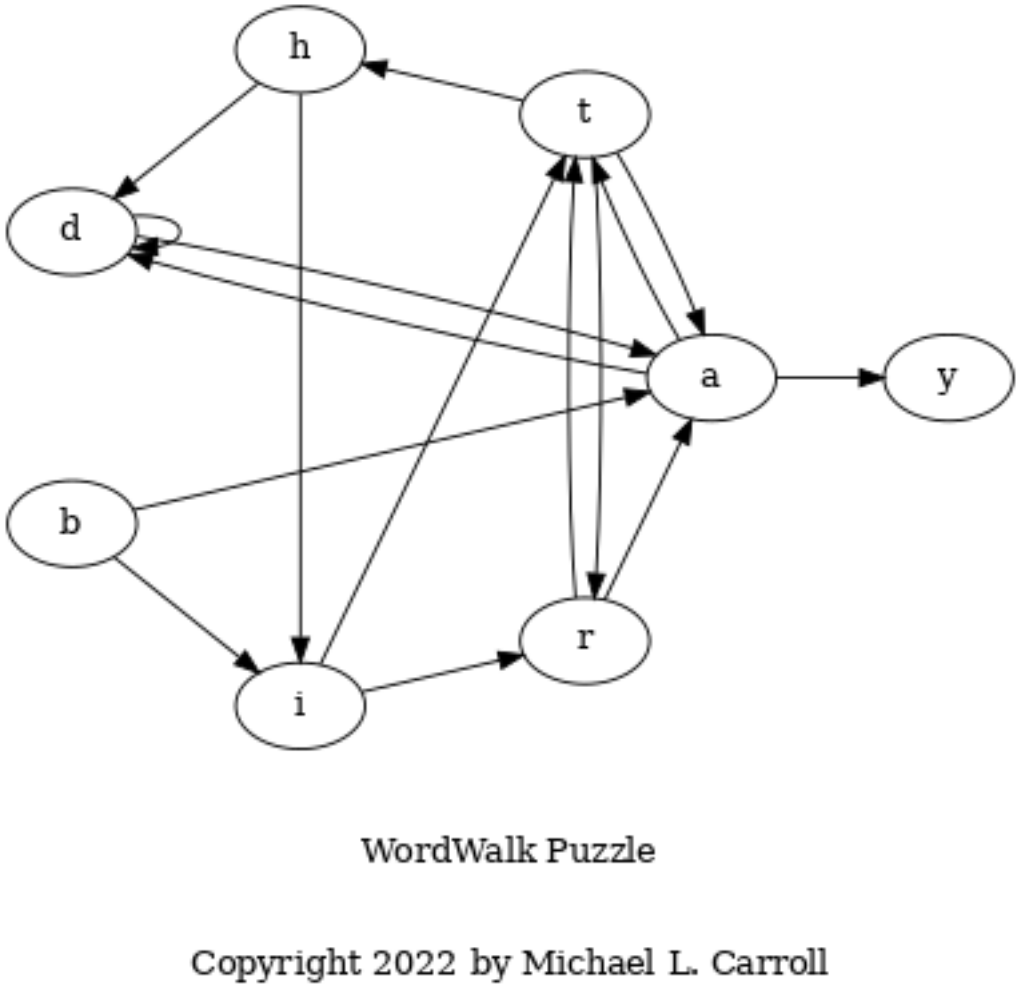
The WordWalk graph in Figure 2.4 shows how different a graph can be for the same word ('birthday') yet involving different subwords and, as in this case, a different *number* of subwords.

Figure 2.4: Unsolved WordWalk Puzzle for root word 'birthday' and subwords 'add', 'hit', 'data', 'bay', 'tray'



The solution for the word 'birthday' is shown in Figure 2.5.

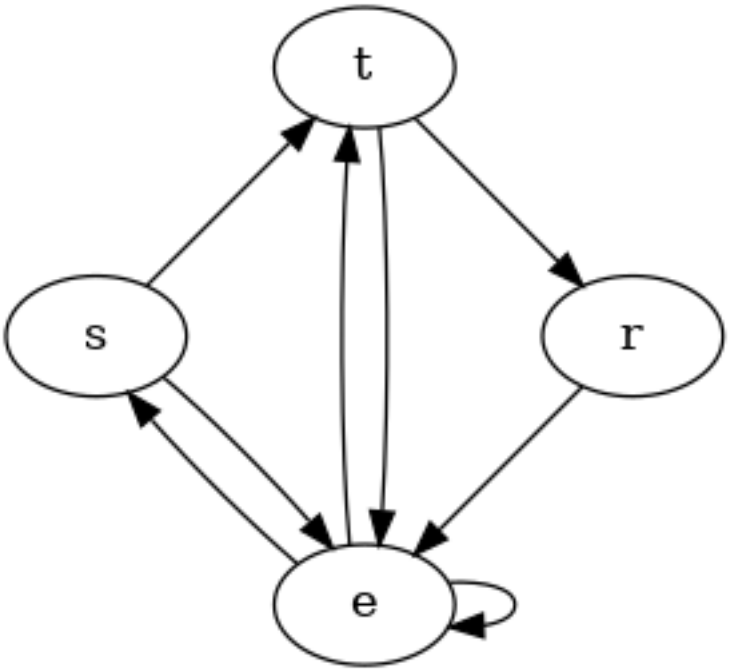
Figure 2.5: Unsolved WordWalk Puzzle for root word 'birthday' and subwords 'add', 'hit', 'data', 'bay', 'tray'



The original WordWalk puzzle for 'birthday' in Figure 2.1 did not exhibit any loops. That's because neither the root word nor the subwords contained consecutive double letters. Indeed, none of these words that make up the WordWalk graph require that any of the letter nodes be re-visited at all. However, the second graph for 'birthday' given in Figure 2.5 did in fact exhibit a loop due the double 'dd' in the subword 'add'.

The solved puzzle below for the root word 'street' presented in Figure 2.6 also exhibits a loop.

Figure 2.6: Solved WordWalk Puzzle for root word 'street' and subwords 'see','set','test' and 'rest'.



Chapter 3

Puzzles

Figure 3.1: Longest root word has 5 letters.

Link to Solution: 4.1.

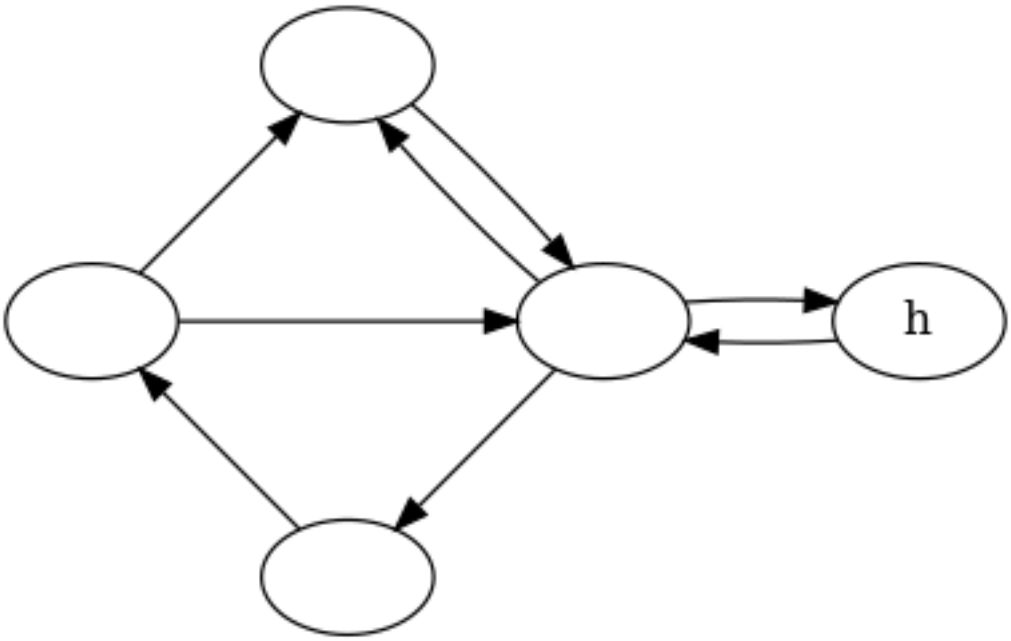
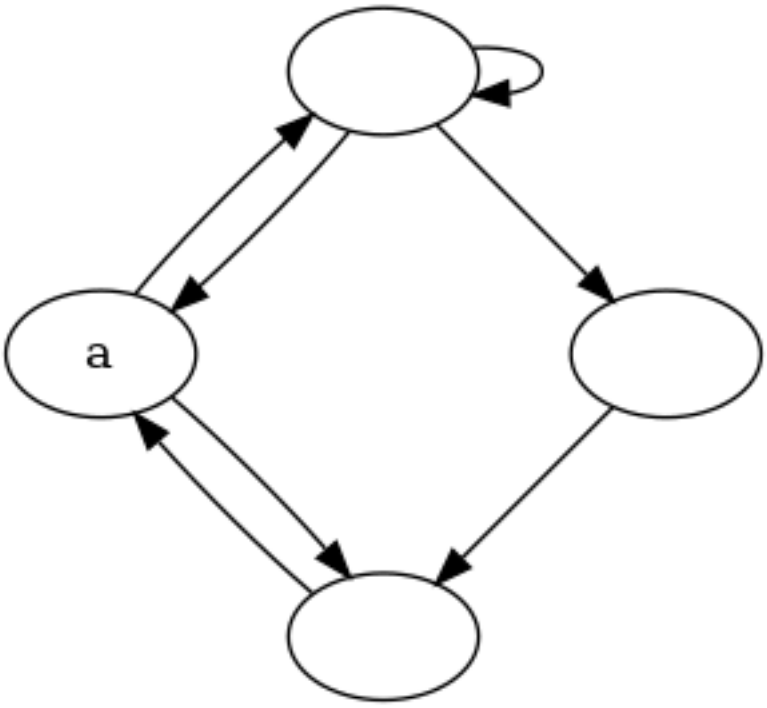


Figure 3.2: Longest root word has 5 letters.

Link to Solution: 4.2.



Subwords: law low wall

WordWalk Puzzle

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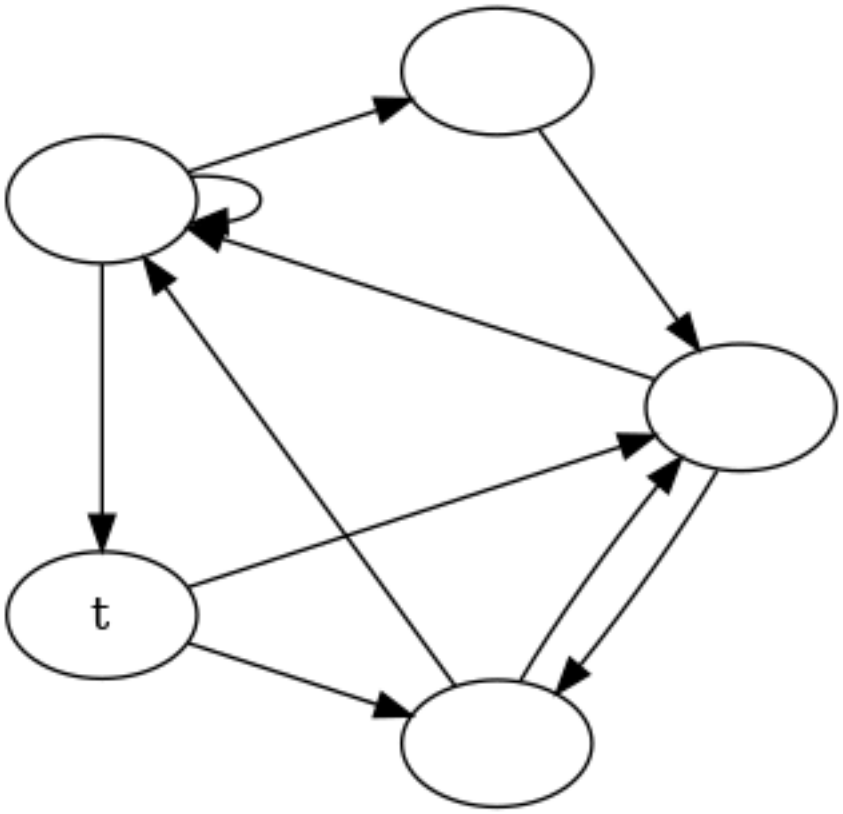
Figure 3.3: Longest root word has 5 letters.

Link to Solution: 4.3.



Subwords: harsh star ass

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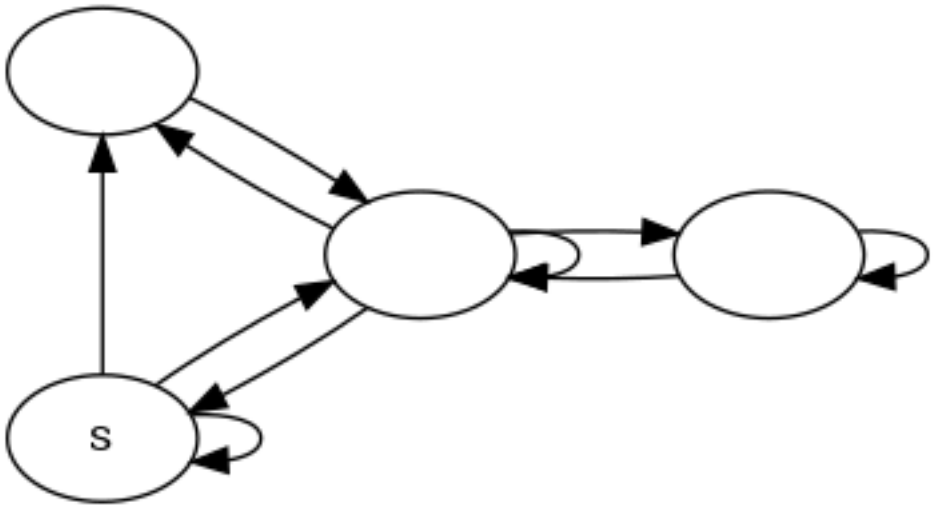
Figure 3.4: Longest root word has 5 letters.

Link to Solution: 4.4.



Subwords: sell seem less

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Figure 3.5: Longest root word has 5 letters.

Link to Solution: 4.5.

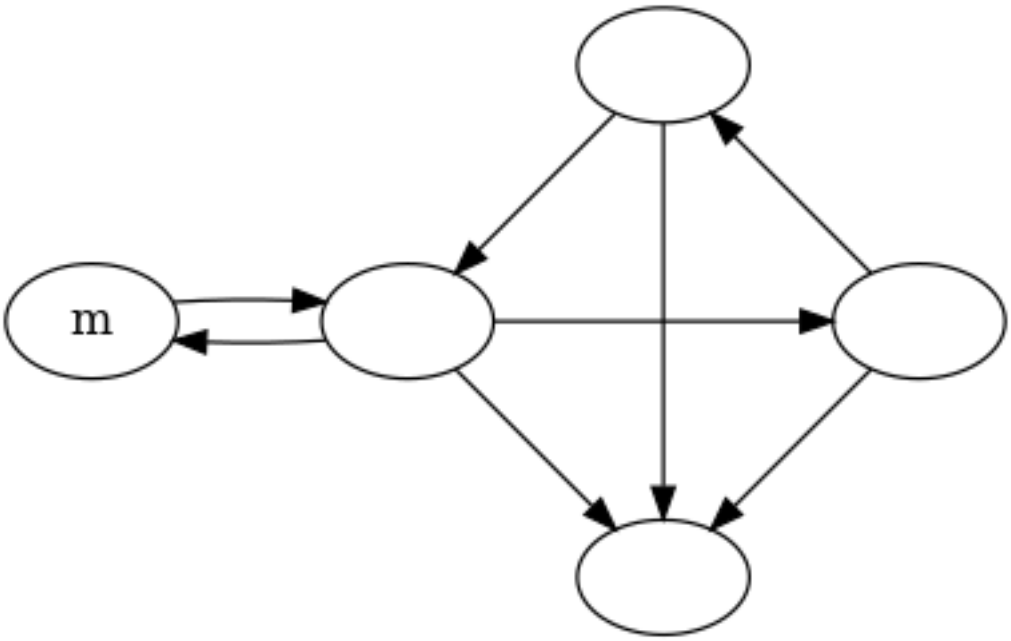
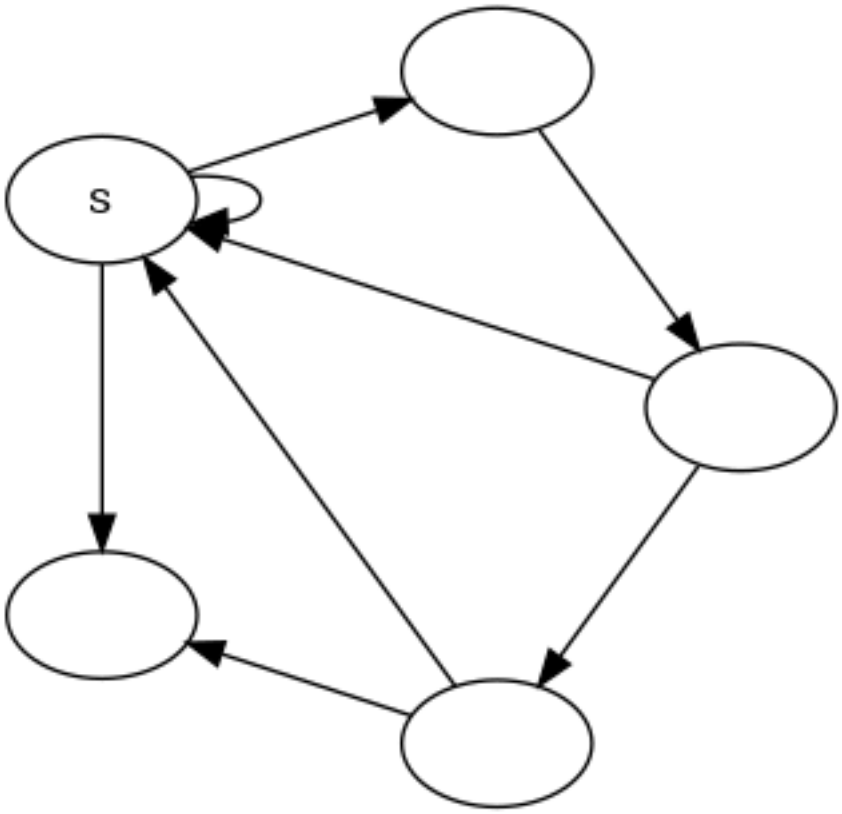


Figure 3.6: Longest root word has 5 letters.

Link to Solution: 4.6.



Subwords: ass harsh ask

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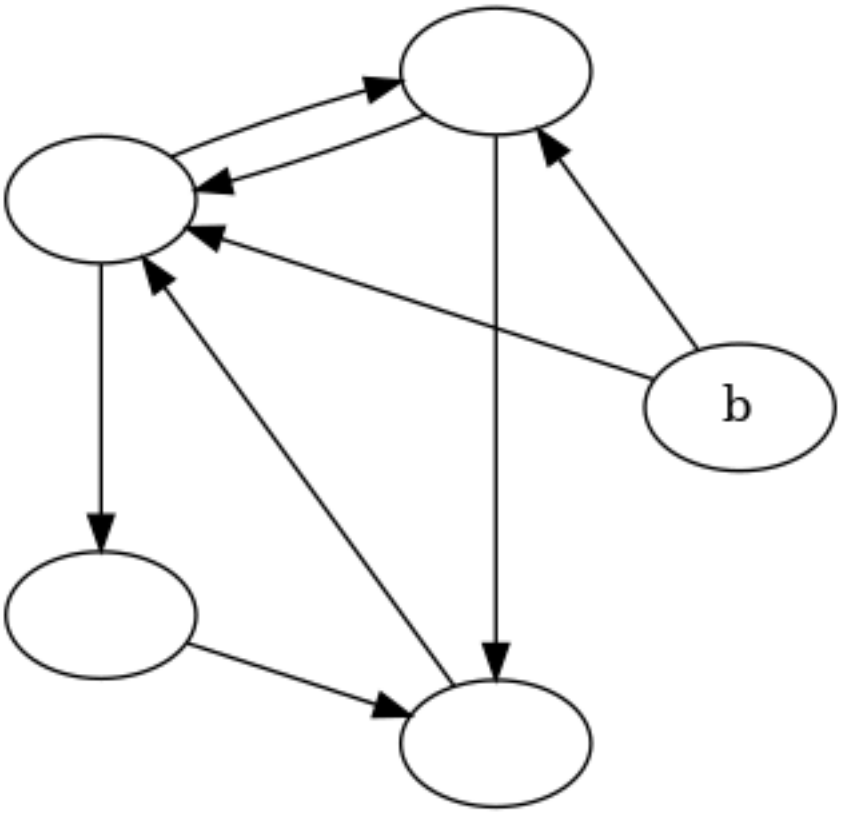
Figure 3.7: Longest root word has 5 letters.

Link to Solution: 4.7.



Subwords: area ear bake

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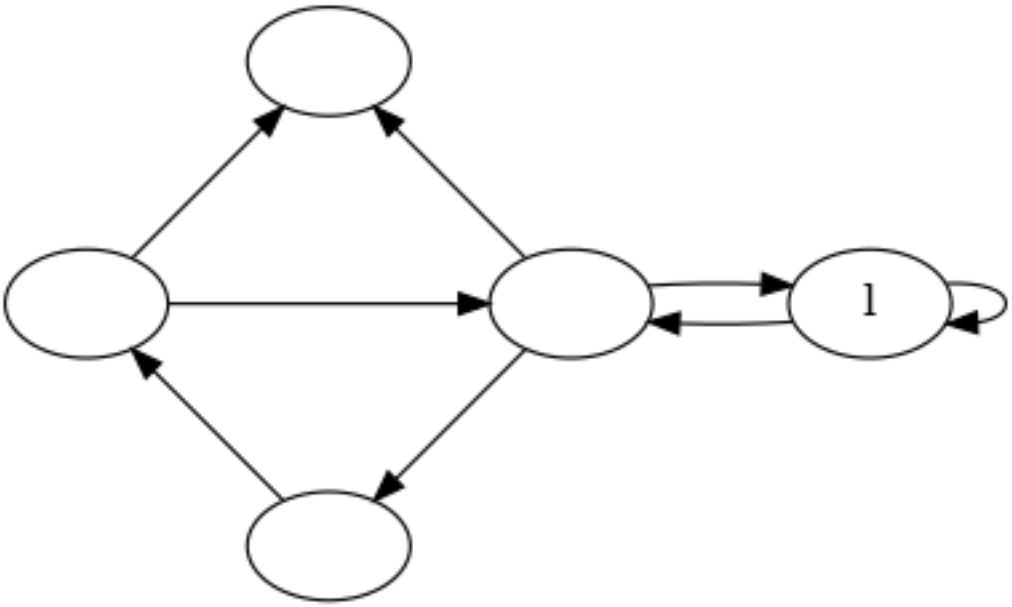
Figure 3.8: Longest root word has 5 letters.

Link to Solution: 4.8.



Subwords: hit hill high

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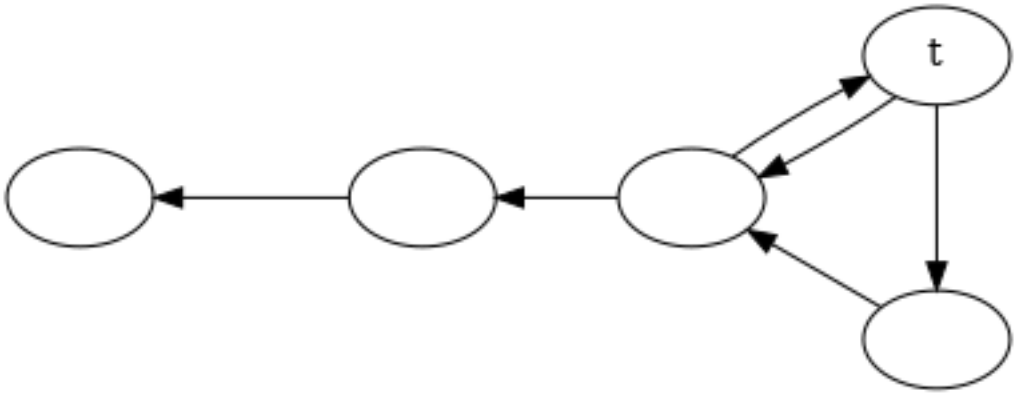
Figure 3.9: Longest root word has 5 letters.

Link to Solution: 4.9.



Subwords: than tank that

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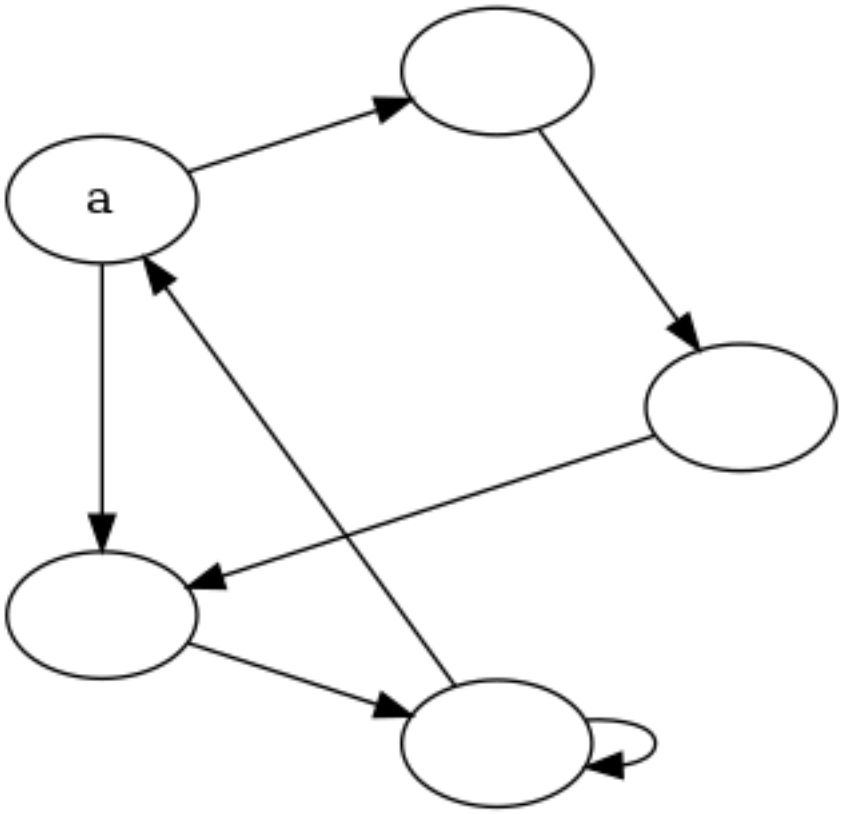
Figure 3.10: Longest root word has 5 letters.

Link to Solution: 4.10.



Subwords: bus ease see

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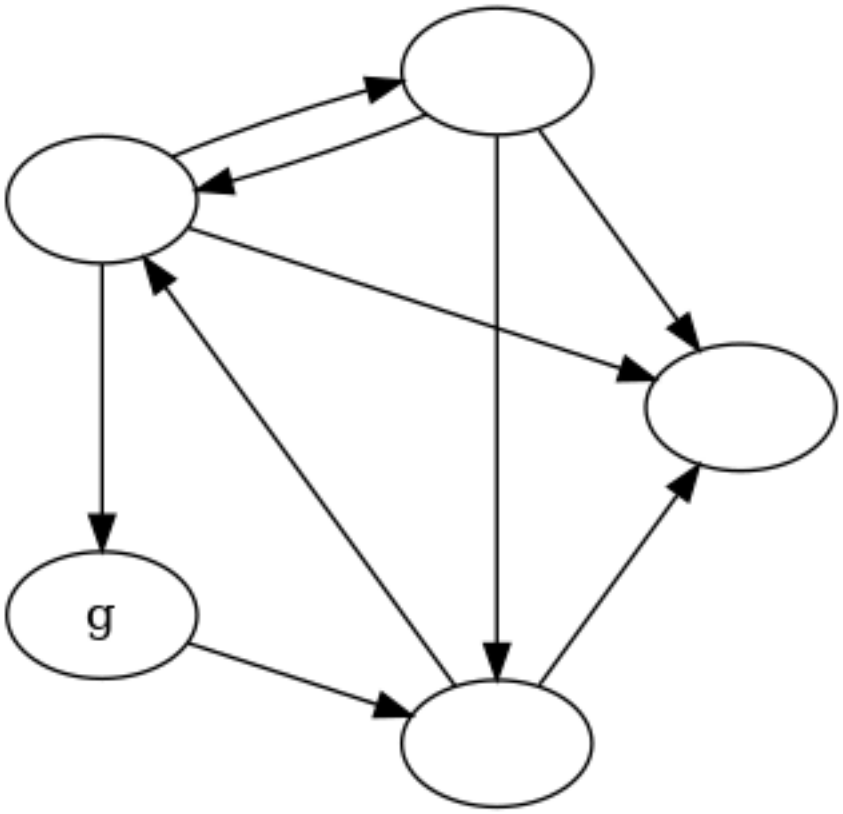
Figure 3.11: Longest root word has 5 letters.

Link to Solution: 4.11.



Subwords: die dig due

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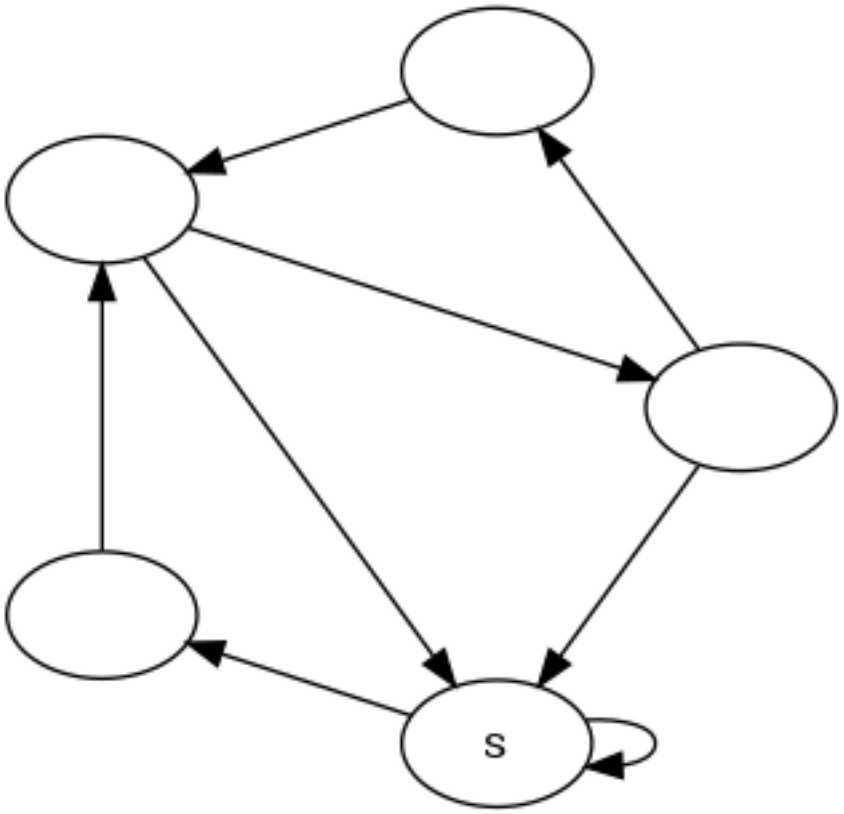
Figure 3.12: Longest root word has 5 letters.

Link to Solution: 4.12.



Subwords: ass pass harsh

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Figure 3.13: Longest root word has 5 letters.

Link to Solution: 4.13.

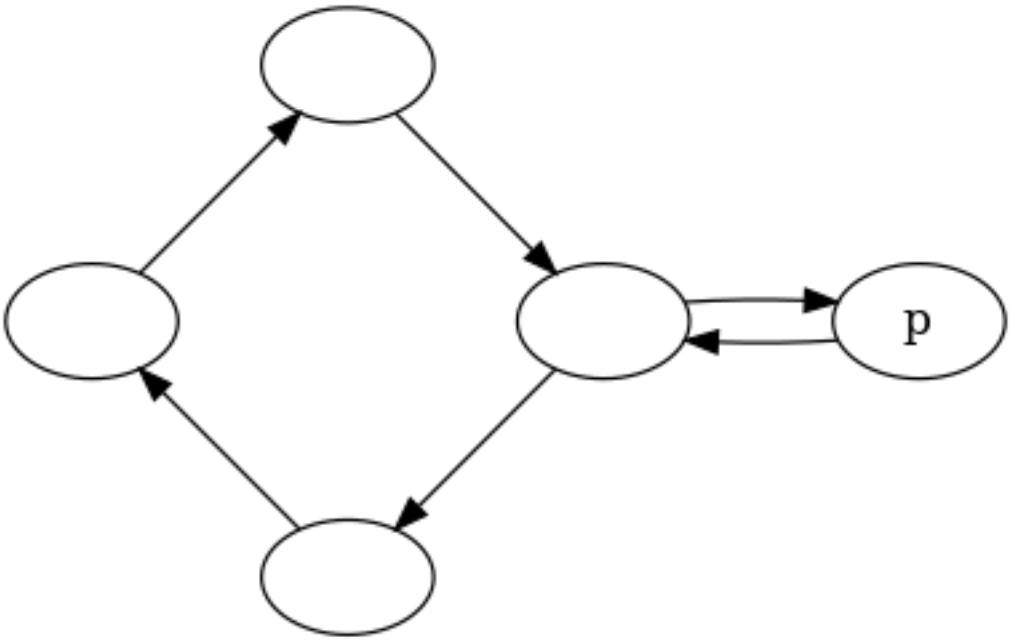
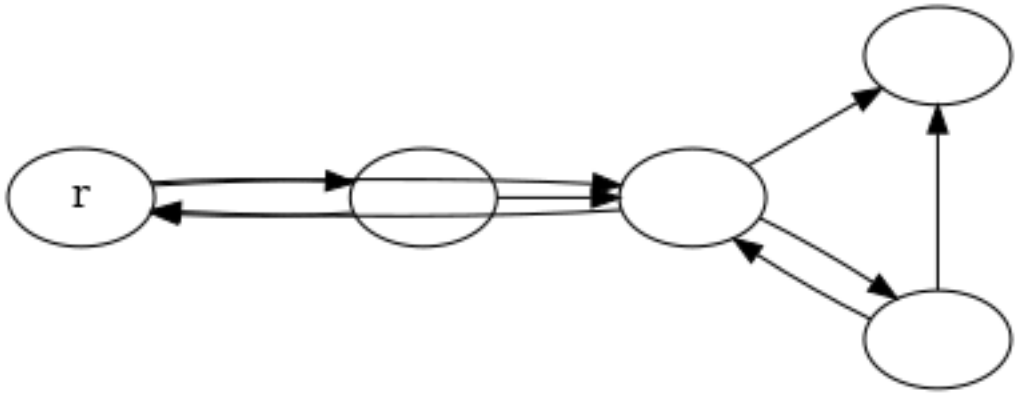


Figure 3.14: Longest root word has 5 letters.

Link to Solution: 4.14.



Subwords: radar day era

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Figure 3.15: Longest root word has 5 letters.

Link to Solution: 4.15.

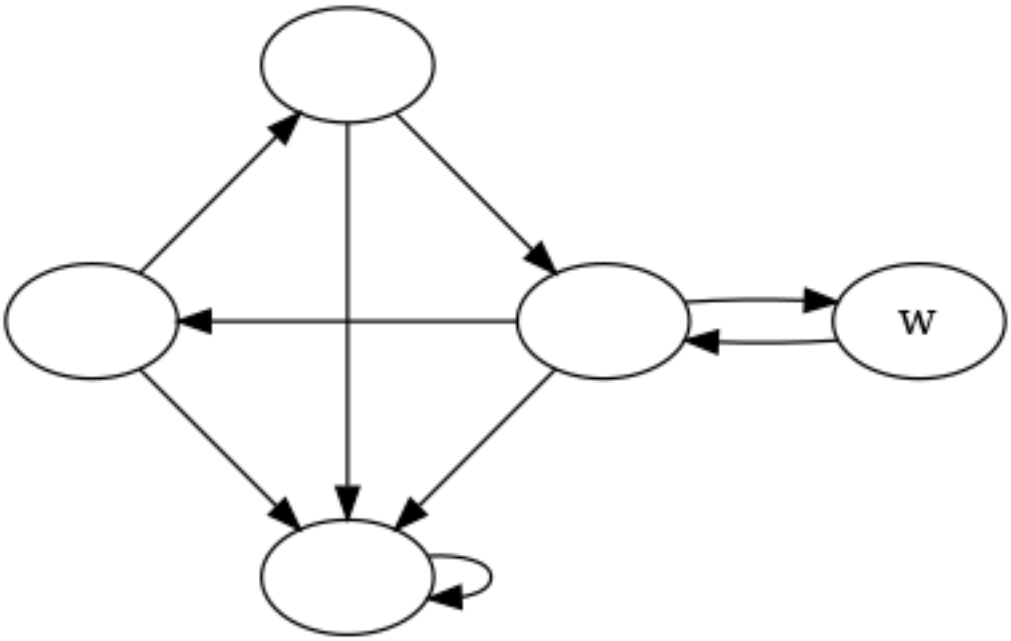


Figure 3.16: Longest root word has 5 letters.

Link to Solution: 4.16.

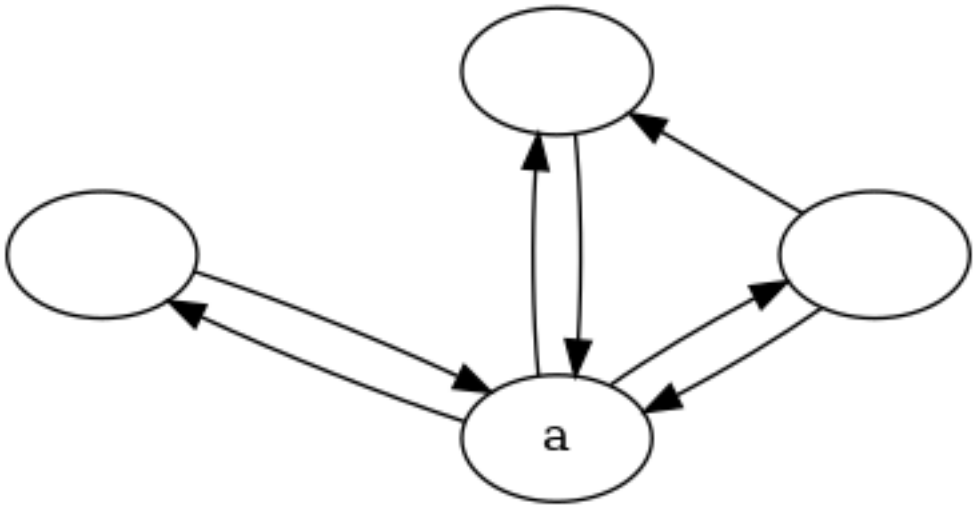
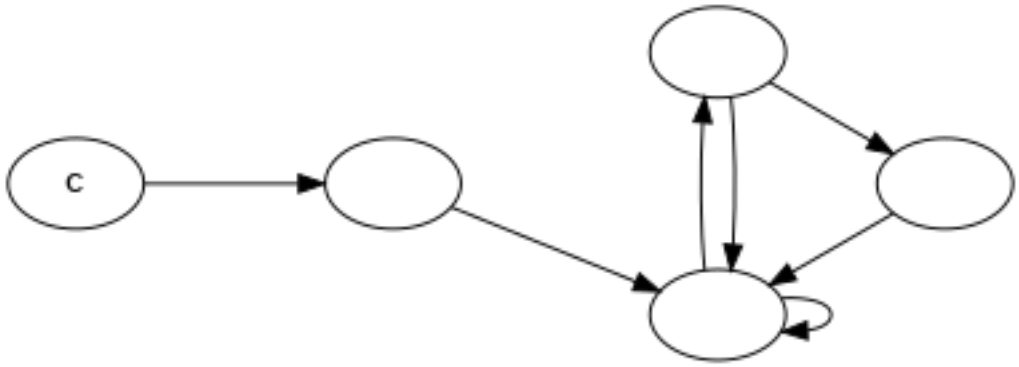


Figure 3.17: Longest root word has 5 letters.

Link to Solution: 4.17.



Subwords: test cheese see

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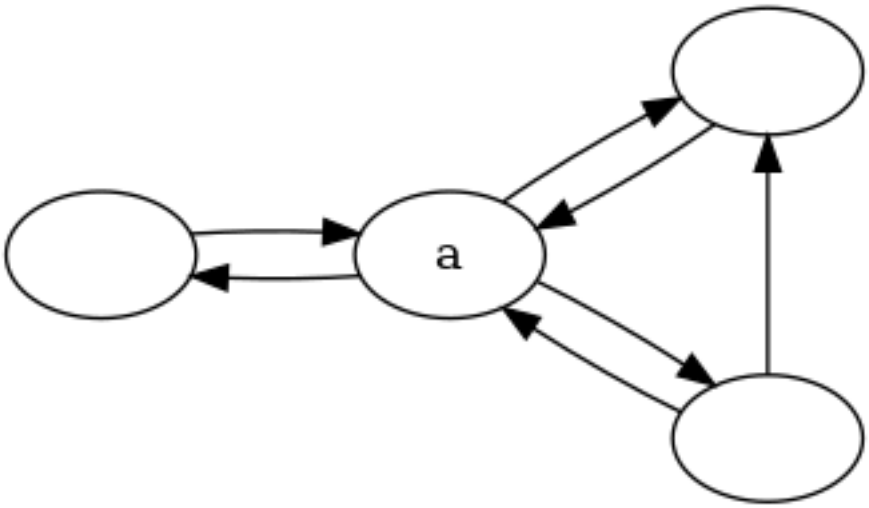
Figure 3.18: Longest root word has 5 letters.

Link to Solution: 4.18.



Subwords: tap data pat

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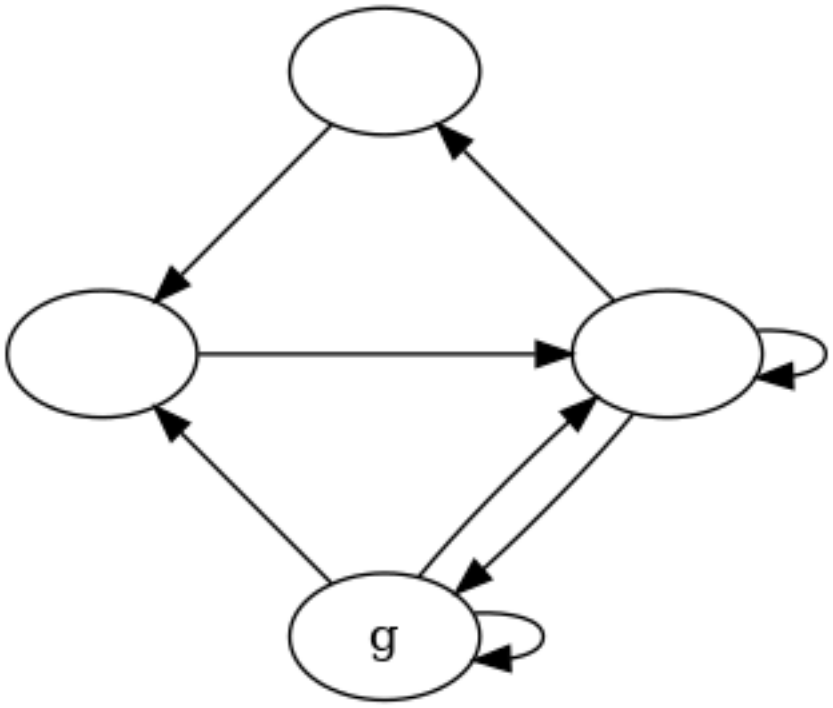
Figure 3.19: Longest root word has 5 letters.

Link to Solution: 4.19.



Subwords: get tree egg

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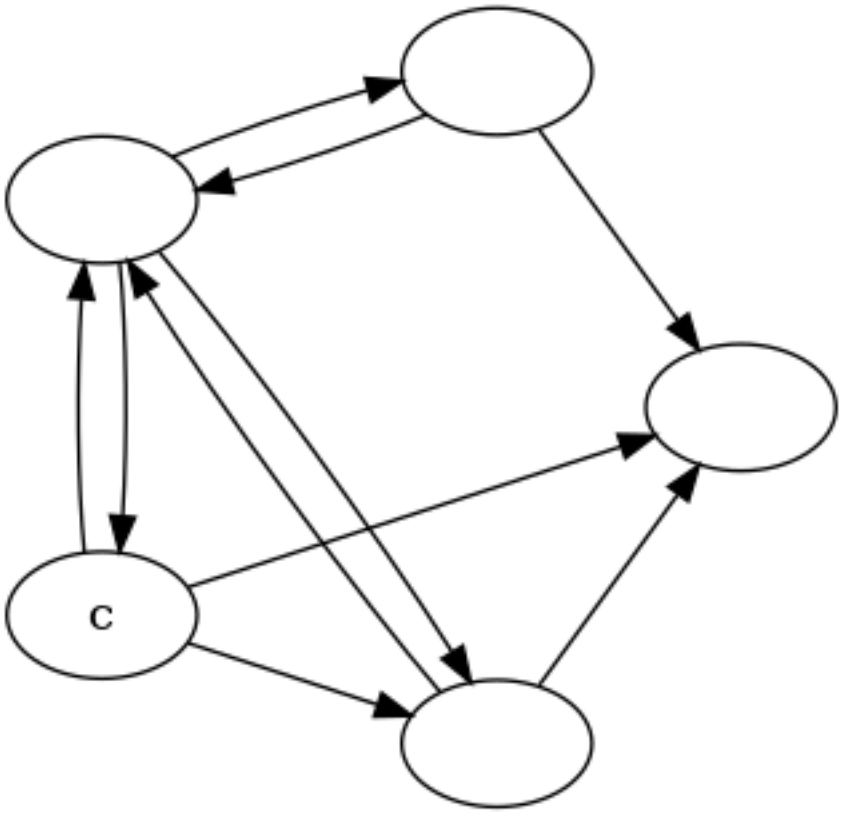
Figure 3.20: Longest root word has 5 letters.

Link to Solution: 4.20.



Subwords: fact cart act

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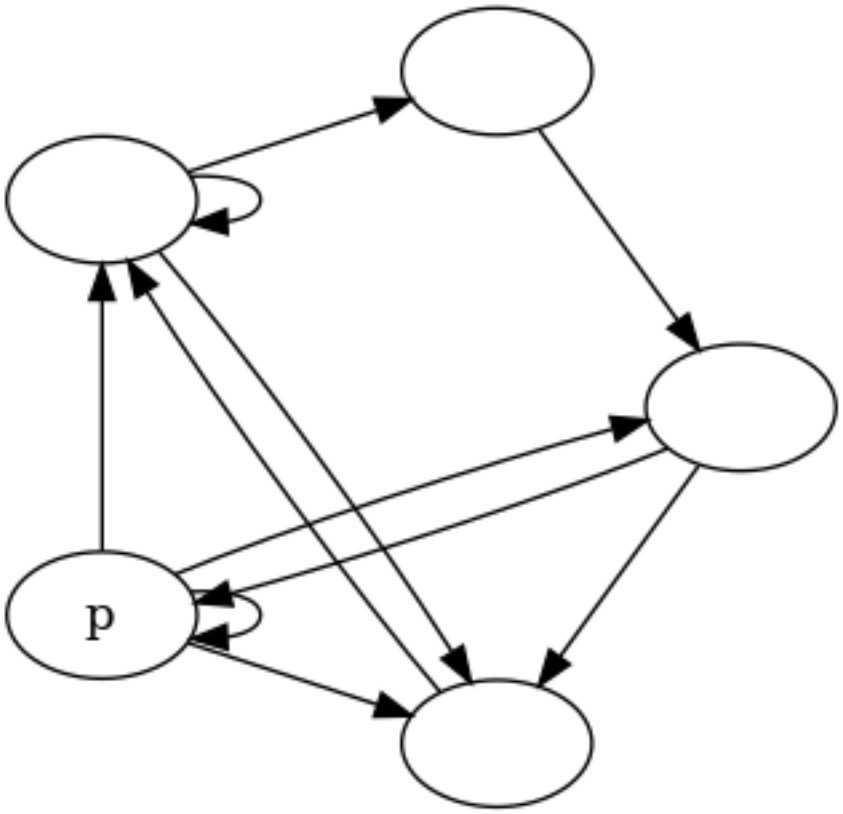
Figure 3.21: Longest root word has 5 letters.

Link to Solution: 4.21.



Subwords: poor pepper over

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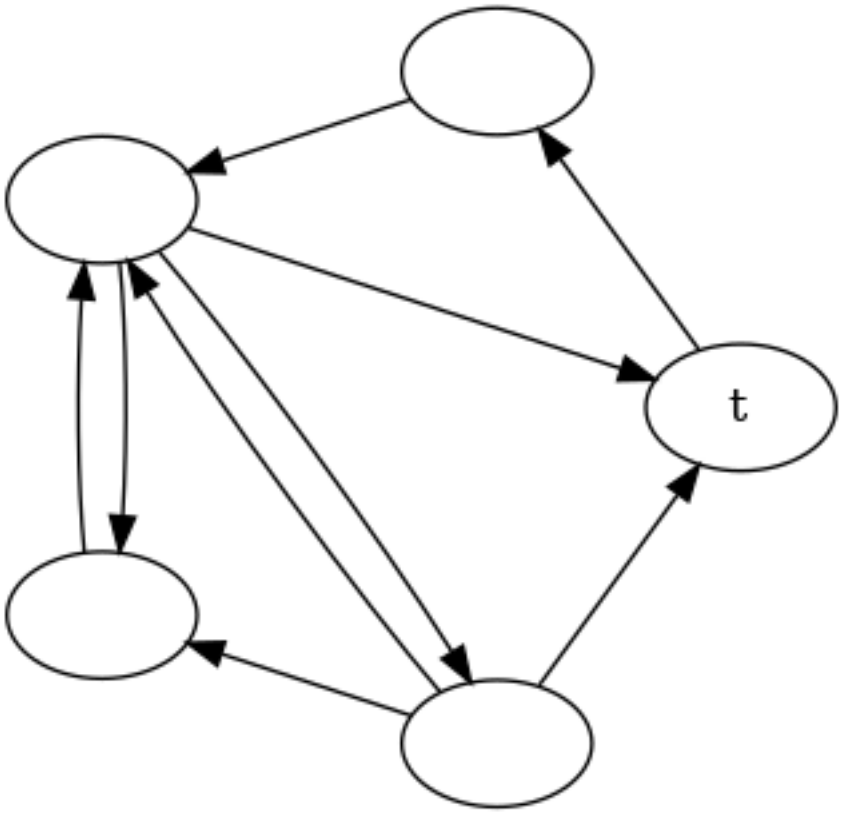
Figure 3.22: Longest root word has 5 letters.

Link to Solution: 4.22.



Subwords: rid hit dirt

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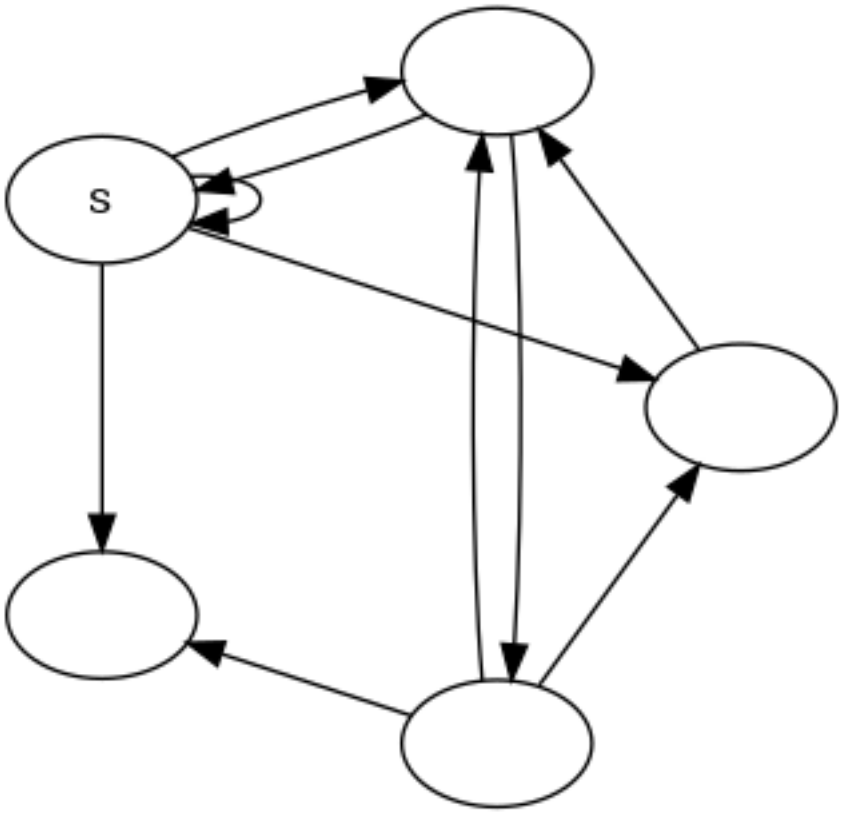
Figure 3.23: Longest root word has 5 letters.

Link to Solution: 4.23.



Subwords: toss rose sort

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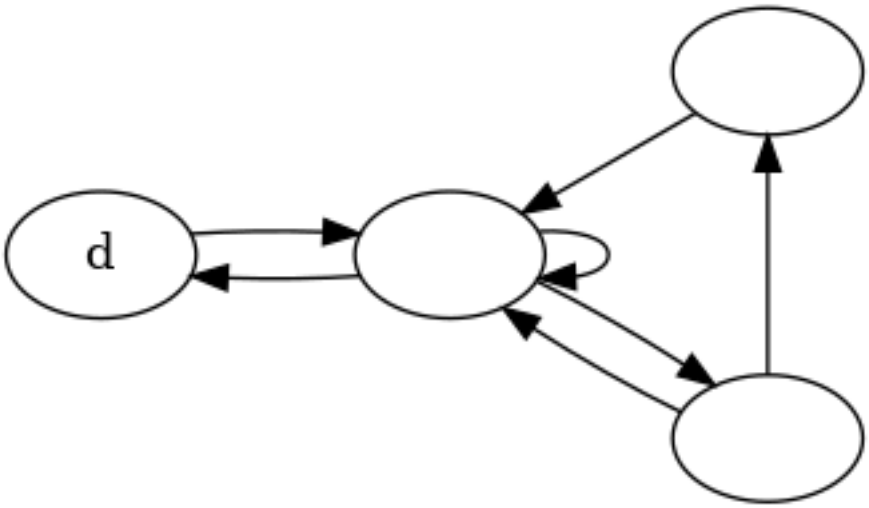
Figure 3.24: Longest root word has 5 letters.

Link to Solution: 4.24.



Subwords: need sense seed

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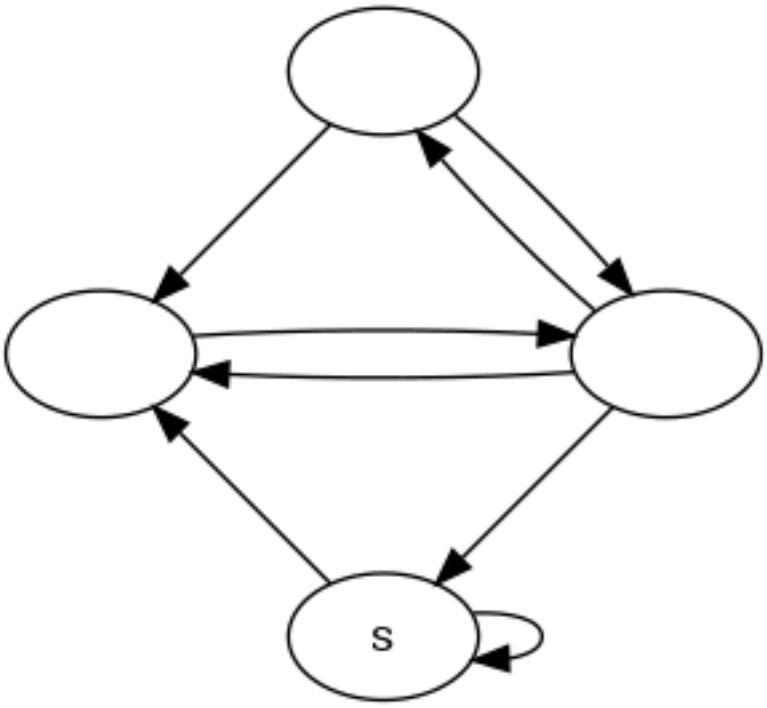
Figure 3.25: Longest root word has 5 letters.

Link to Solution: 4.25.



Subwords: ass art rat

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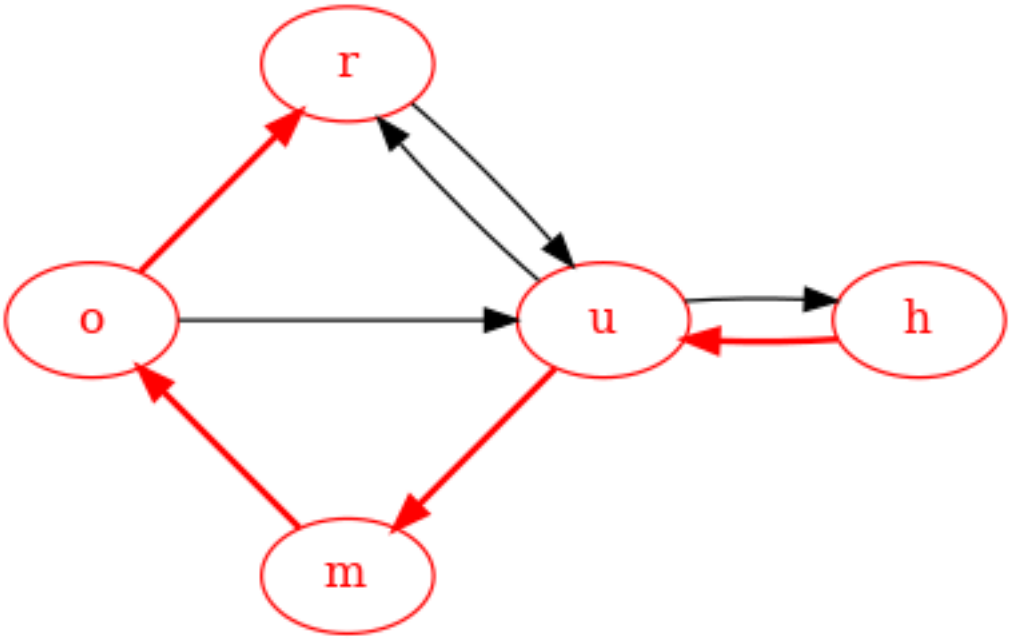
Chapter 4

Solutions

Figure 4.1: Root Word: humor.

Link Back to Puzzle: 3.1



Root word(s): humor
Subwords: our rumor huh

WordWalk Puzzle

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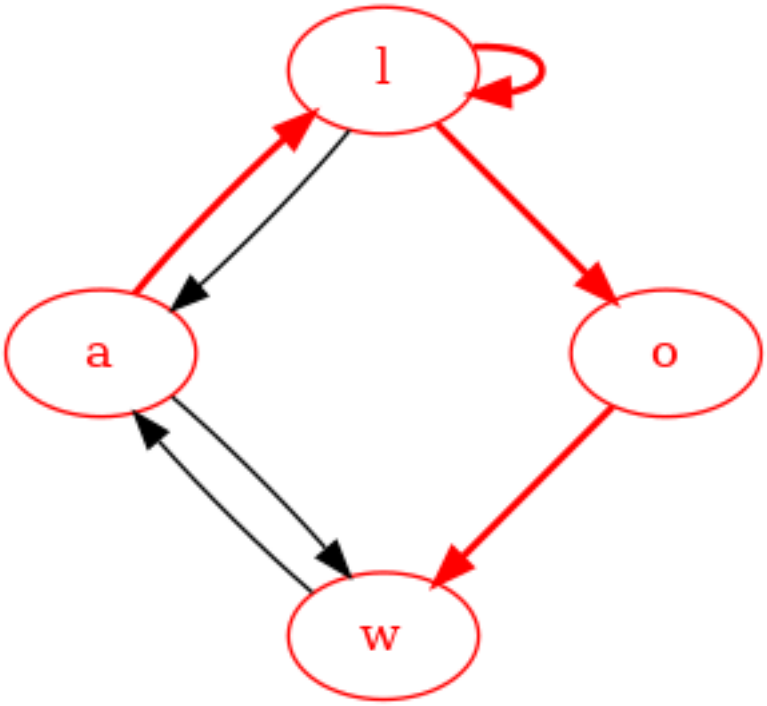
Figure 4.2: Root Word: allow.

Link Back to Puzzle: 3.2



Root word(s): allow
Subwords: law low wall

WordWalk Puzzle

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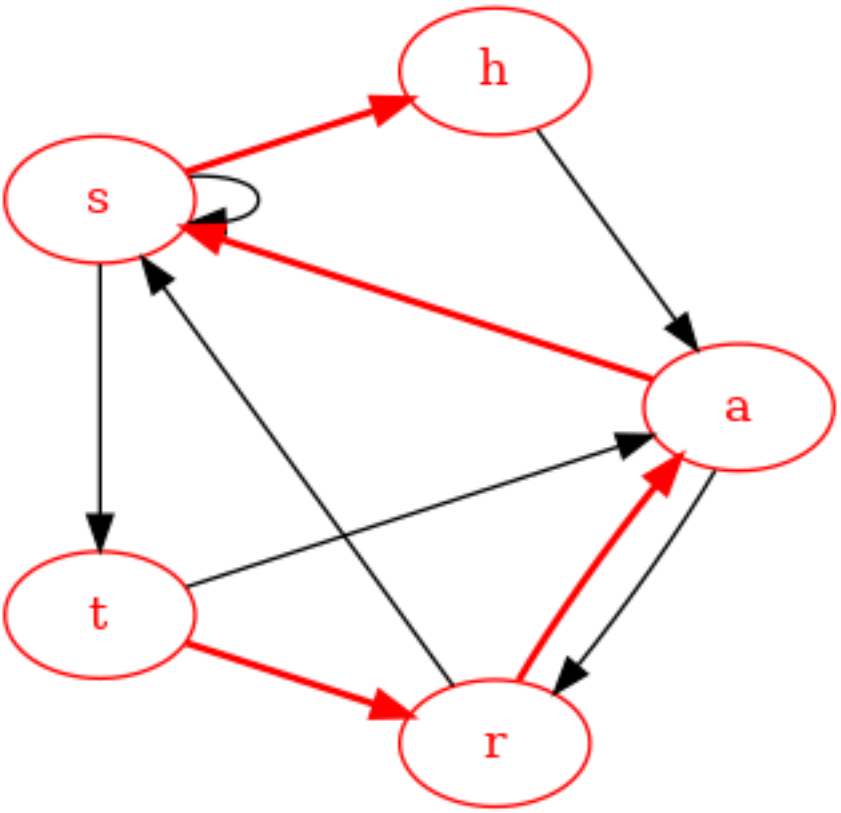
Figure 4.3: Root Word: trash.

Link Back to Puzzle: 3.3



Root word(s): trash
Subwords: harsh star ass

WordWalk Puzzle

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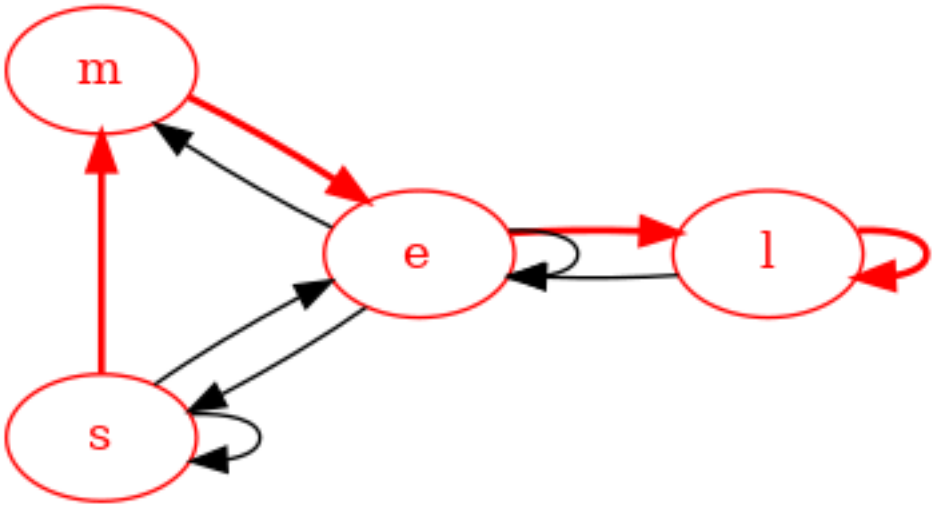
Figure 4.4: Root Word: smell.

Link Back to Puzzle: 3.4



Root word(s): smell
Subwords: sell seem less

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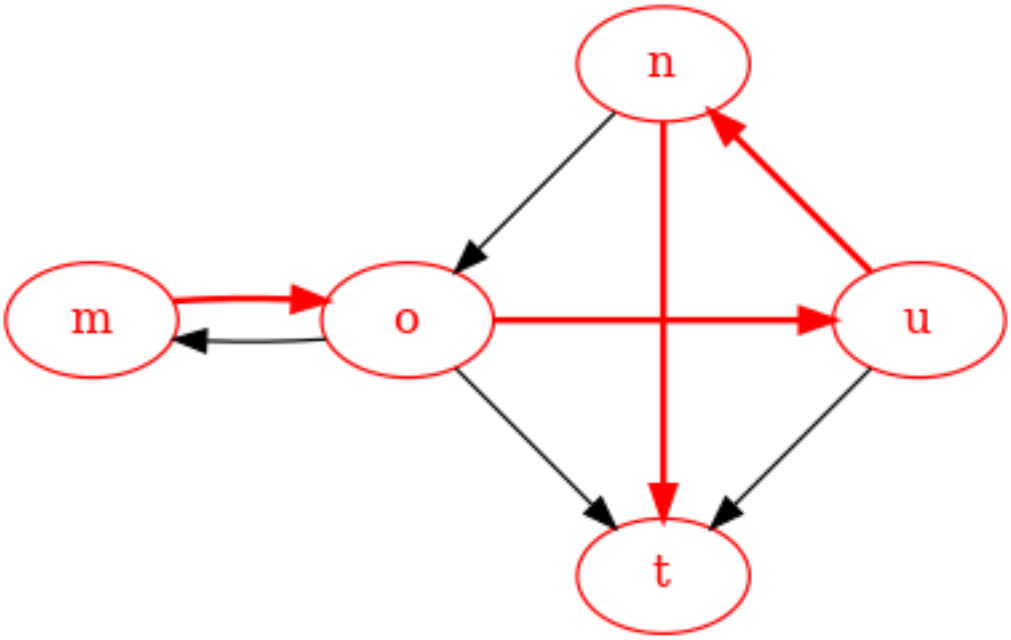
Figure 4.5: Root Word: mount.

Link Back to Puzzle: 3.5



Root word(s): mount
Subwords: mom out not

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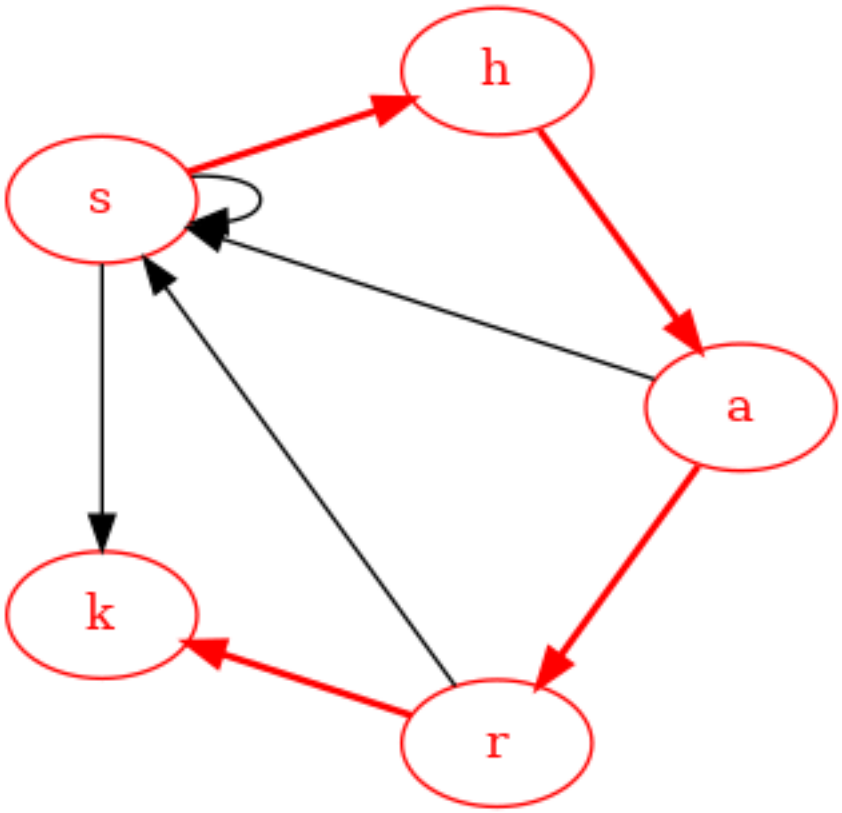
Figure 4.6: Root Word: shark.

Link Back to Puzzle: 3.6



Root word(s): shark
Subwords: ass harsh ask

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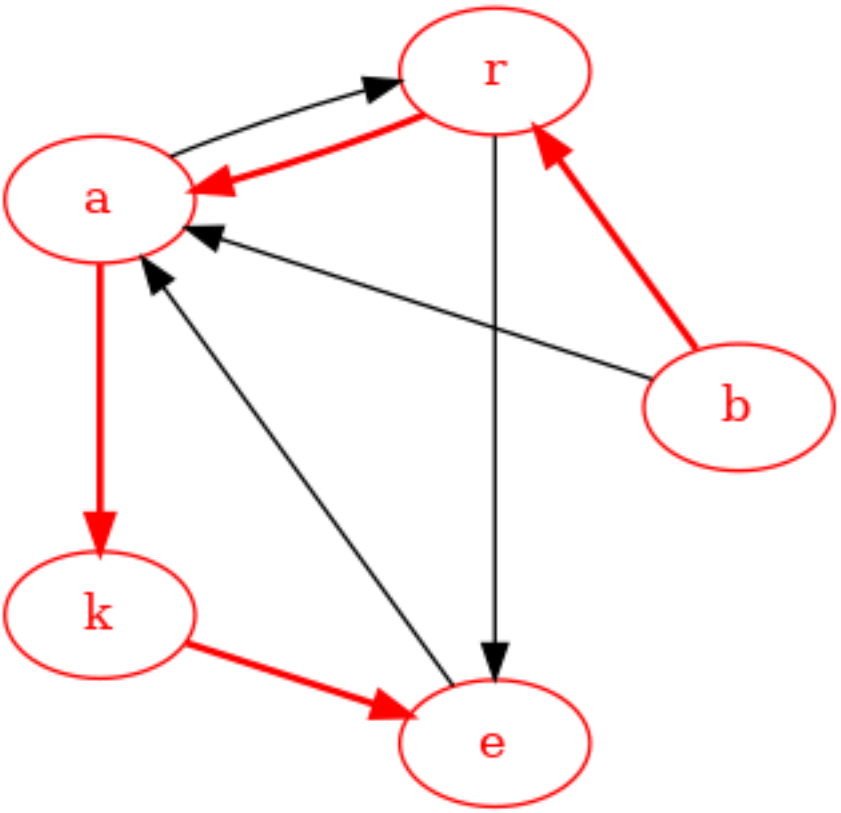
Figure 4.7: Root Word: brake.

Link Back to Puzzle: 3.7



Root word(s): brake
Subwords: area ear bake

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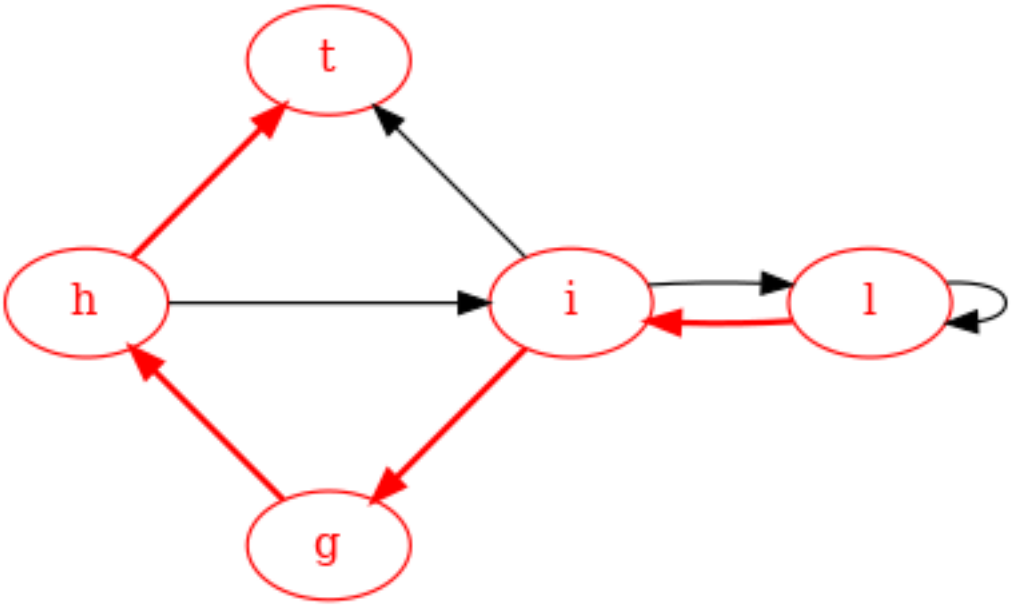
Figure 4.8: Root Word: light.

Link Back to Puzzle: 3.8



Root word(s): light
Subwords: hit hill high

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Figure 4.9: Root Word: thank.

Link Back to Puzzle: 3.9

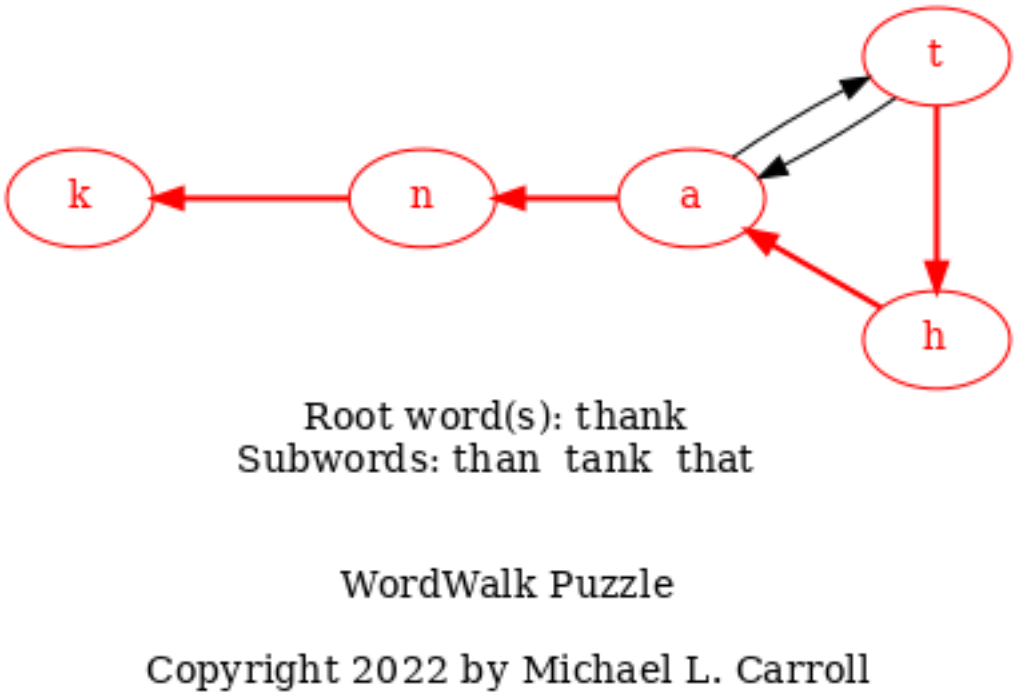


Figure 4.10: Root Word: abuse.

Link Back to Puzzle: 3.10

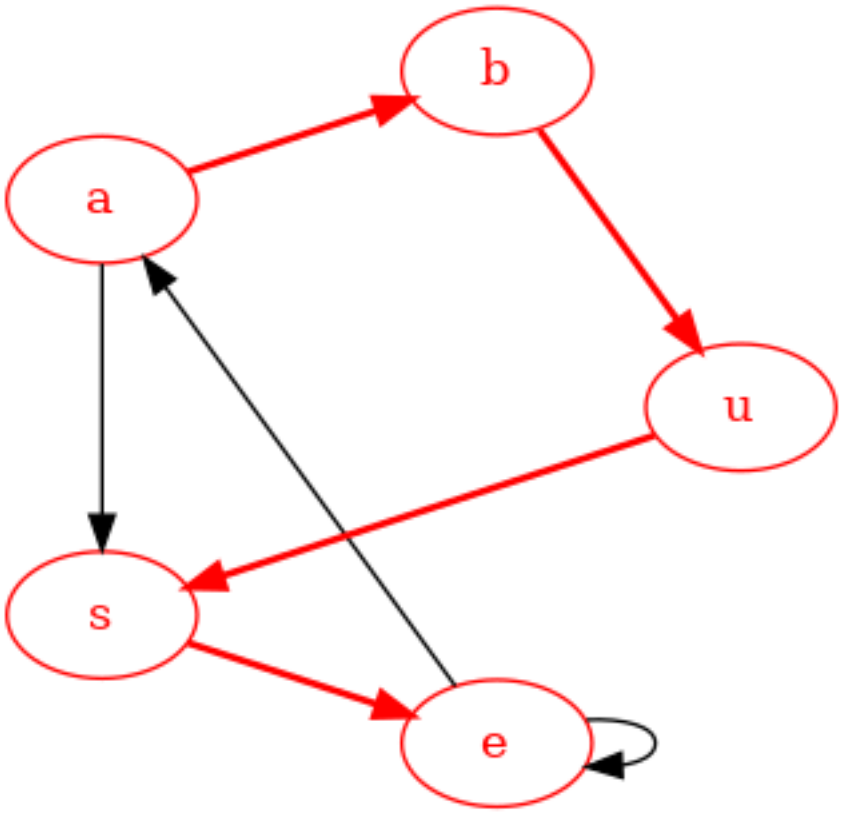
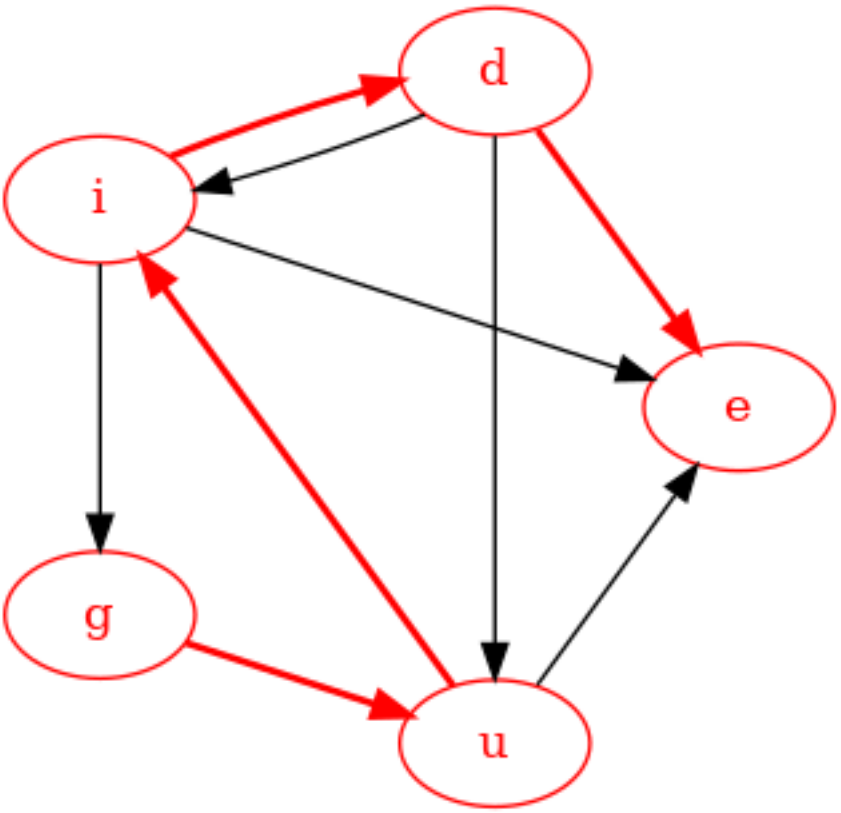


Figure 4.11: Root Word: guide.

Link Back to Puzzle: 3.11



Root word(s): guide
Subwords: die dig due

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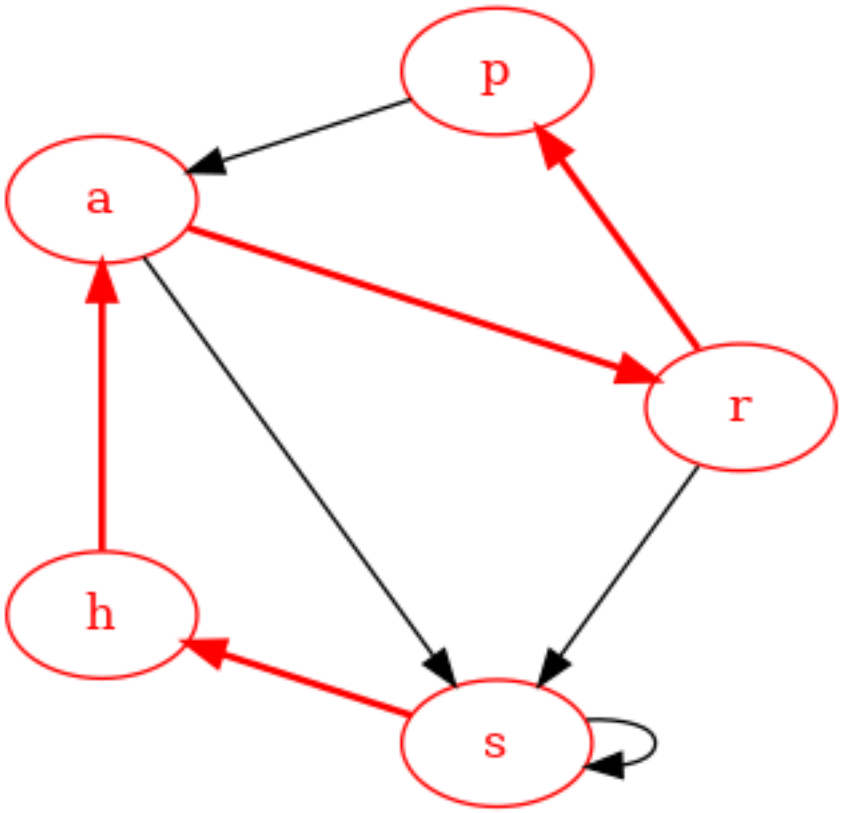
Figure 4.12: Root Word: sharp.

Link Back to Puzzle: 3.12



Root word(s): sharp
Subwords: ass pass harsh

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Figure 4.13: Root Word: pitch.

Link Back to Puzzle: 3.13

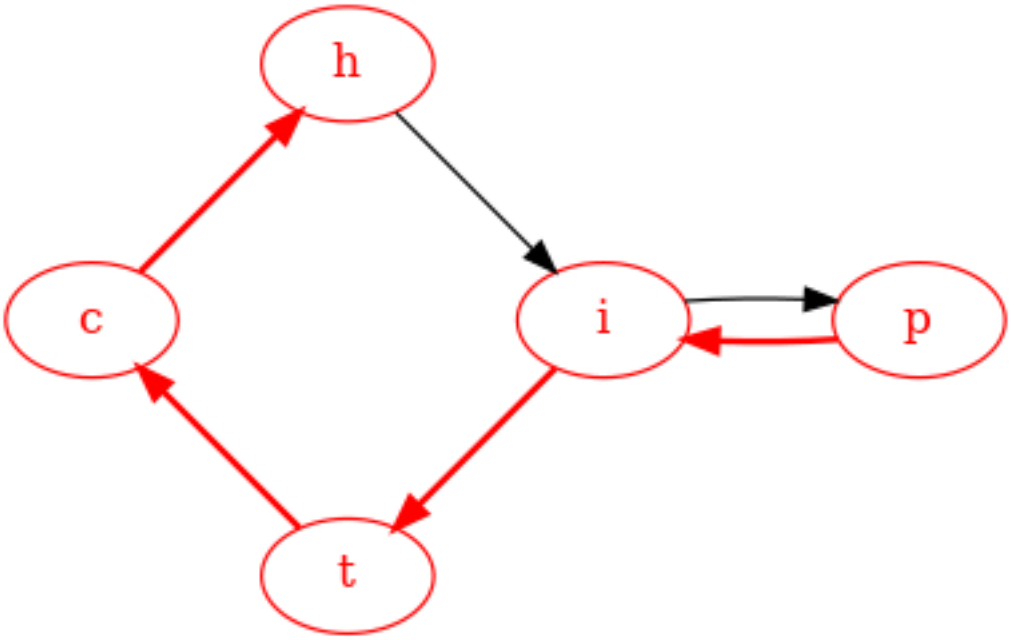


Figure 4.14: Root Word: ready.

Link Back to Puzzle: 3.14

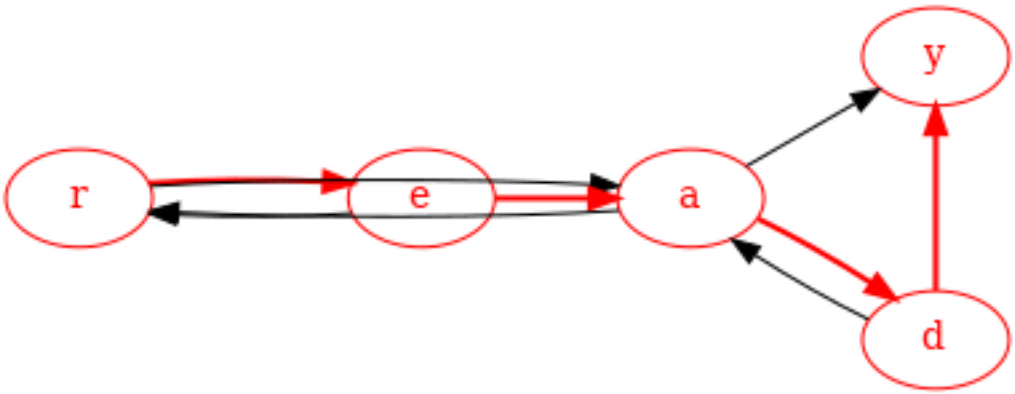


Figure 4.15: Root Word: would.

Link Back to Puzzle: 3.15

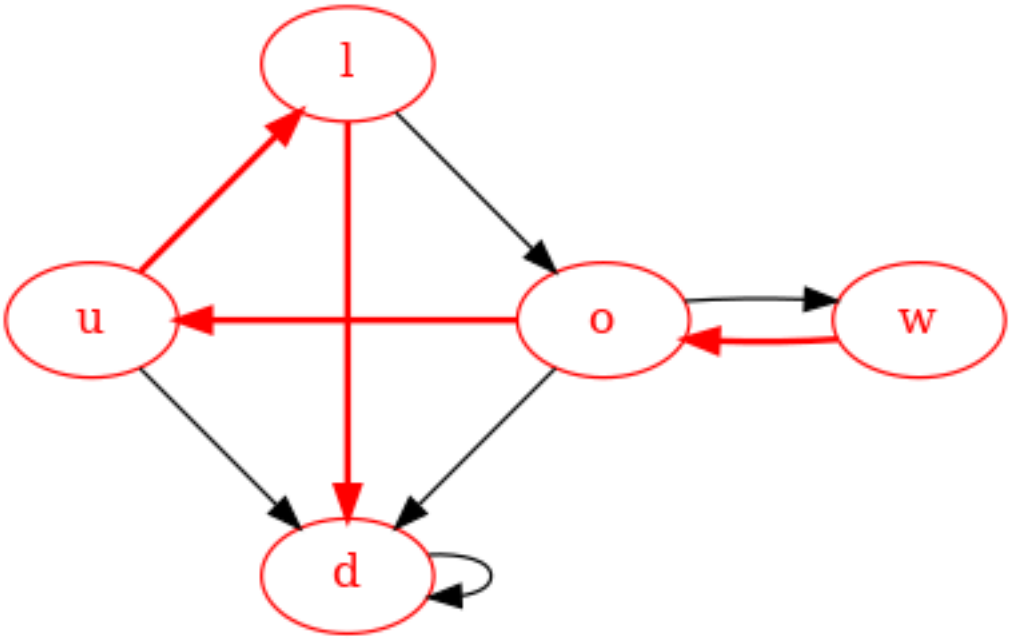
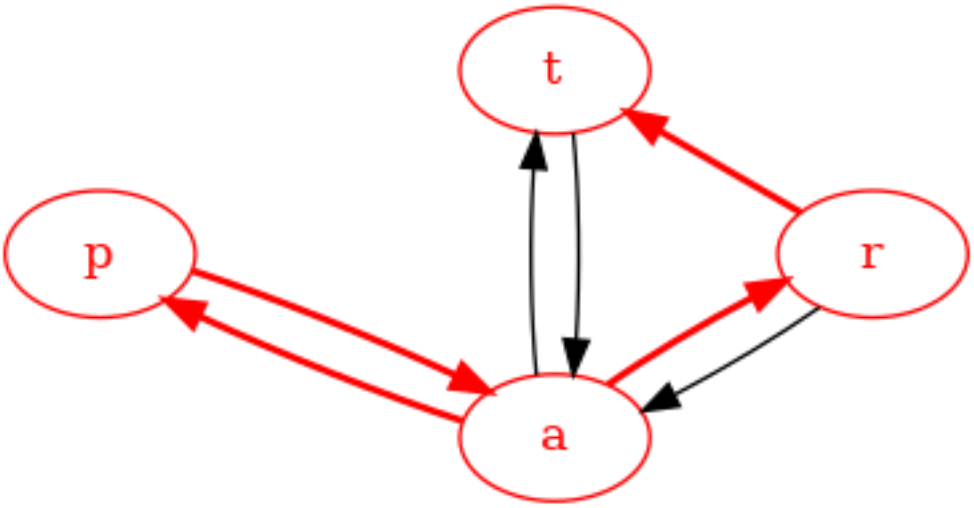


Figure 4.16: Root Word: apart.

Link Back to Puzzle: 3.16



Root word(s): apart
Subwords: art tap rat

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Figure 4.17: Root Word: chest.

Link Back to Puzzle: 3.17

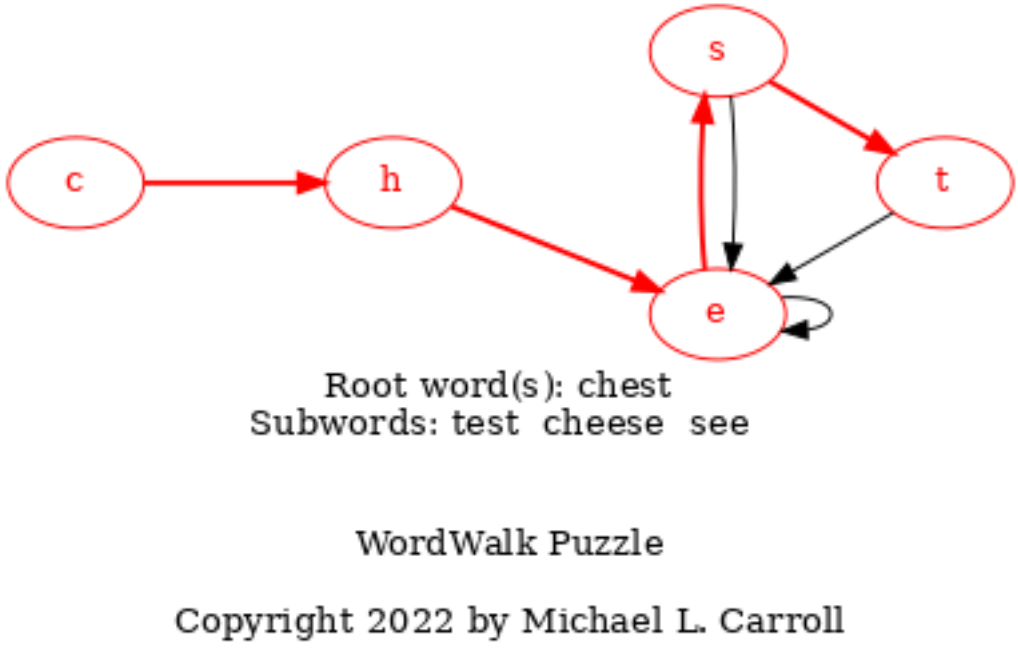
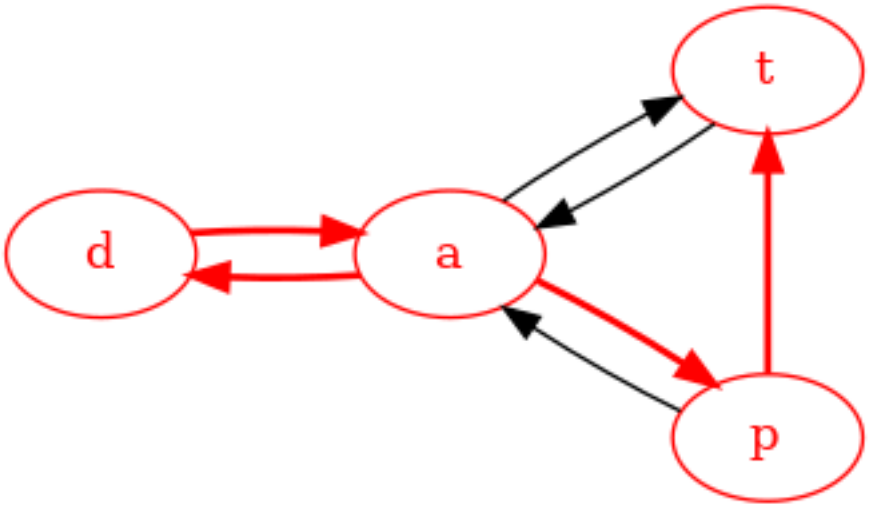


Figure 4.18: Root Word: adapt.

Link Back to Puzzle: 3.18



Root word(s): adapt
Subwords: tap data pat

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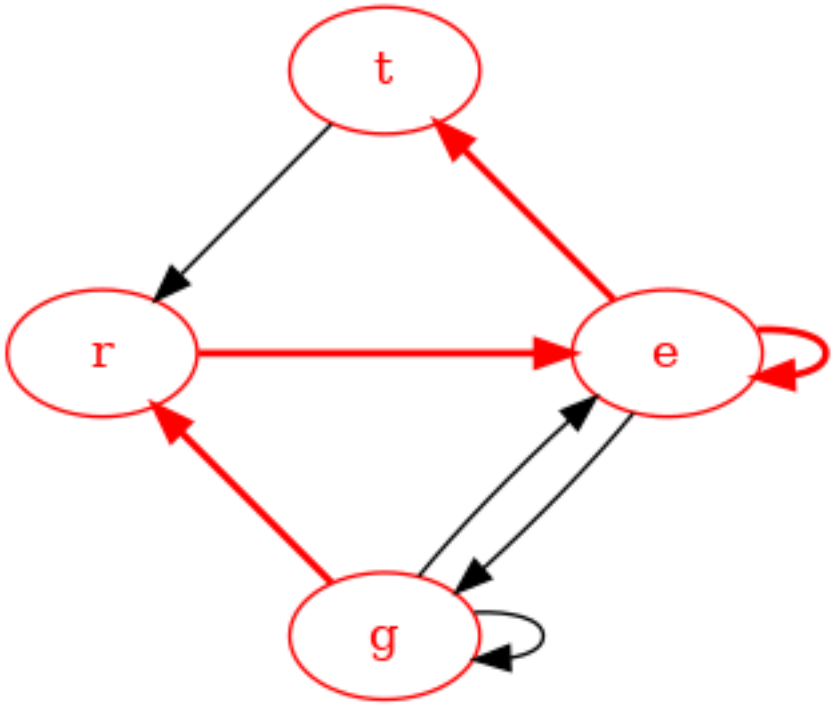
Figure 4.19: Root Word: greet.

Link Back to Puzzle: 3.19



Root word(s): greet
Subwords: get tree egg

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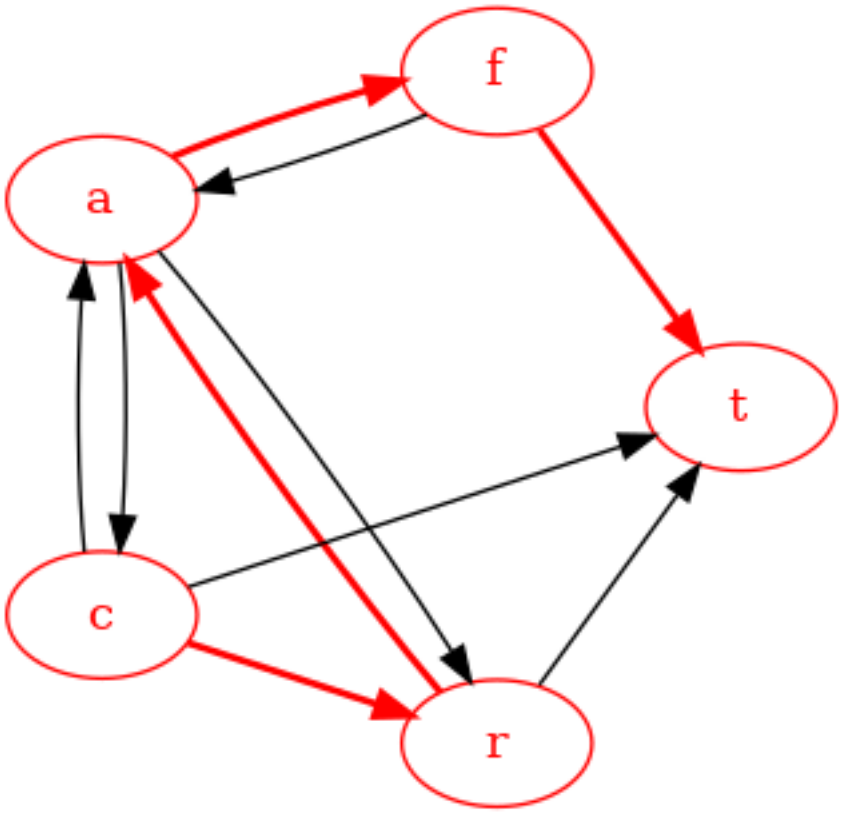
Figure 4.20: Root Word: craft.

Link Back to Puzzle: 3.20



Root word(s): craft
Subwords: fact cart act

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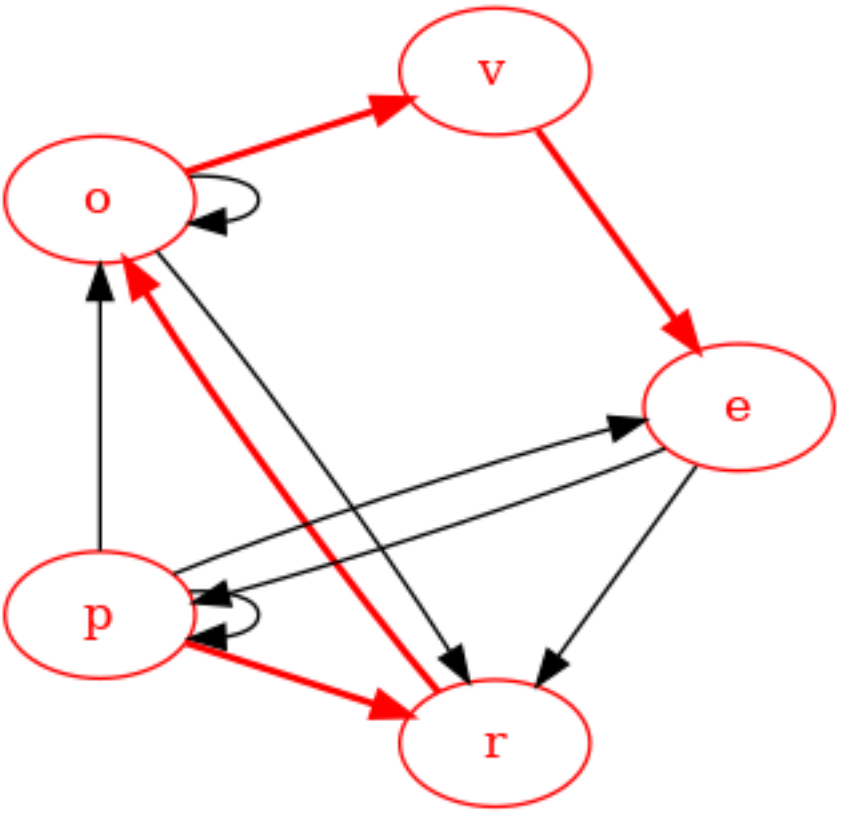
Figure 4.21: Root Word: prove.

Link Back to Puzzle: 3.21



Root word(s): prove
Subwords: poor pepper over

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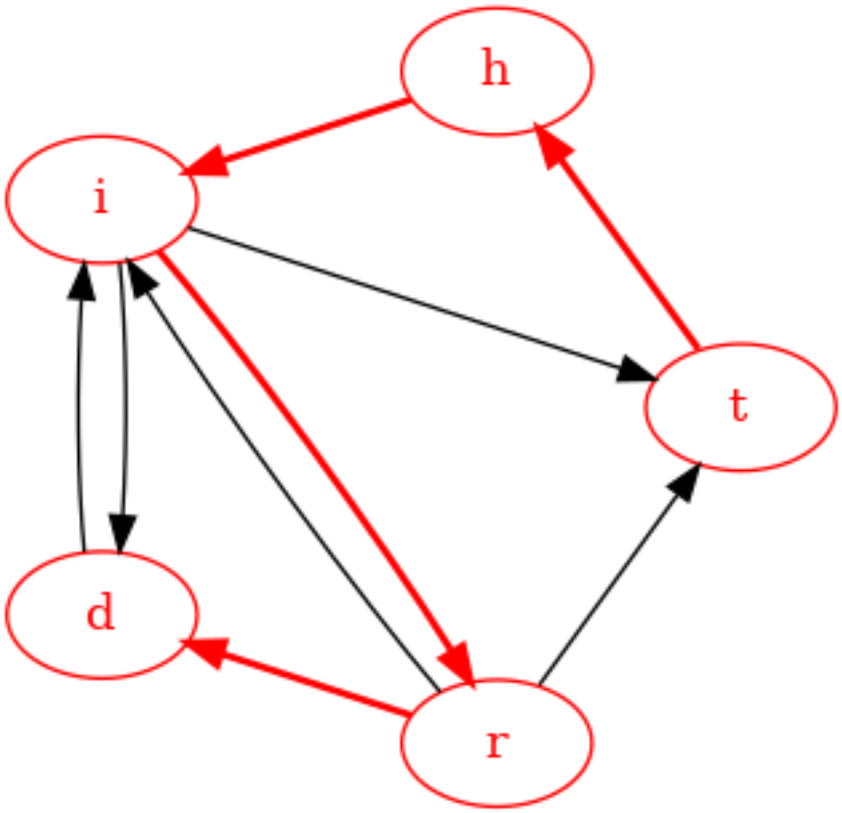
Figure 4.22: Root Word: third.

Link Back to Puzzle: 3.22



Root word(s): third
Subwords: rid hit dirt

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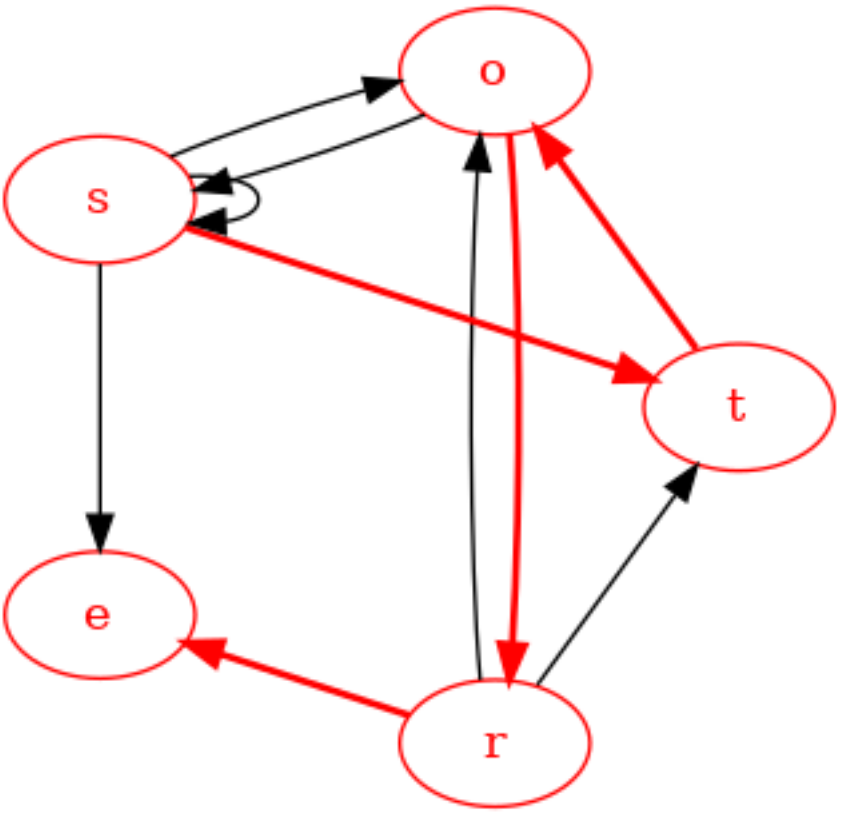
Figure 4.23: Root Word: store.

Link Back to Puzzle: 3.23



Root word(s): store
Subwords: toss rose sort

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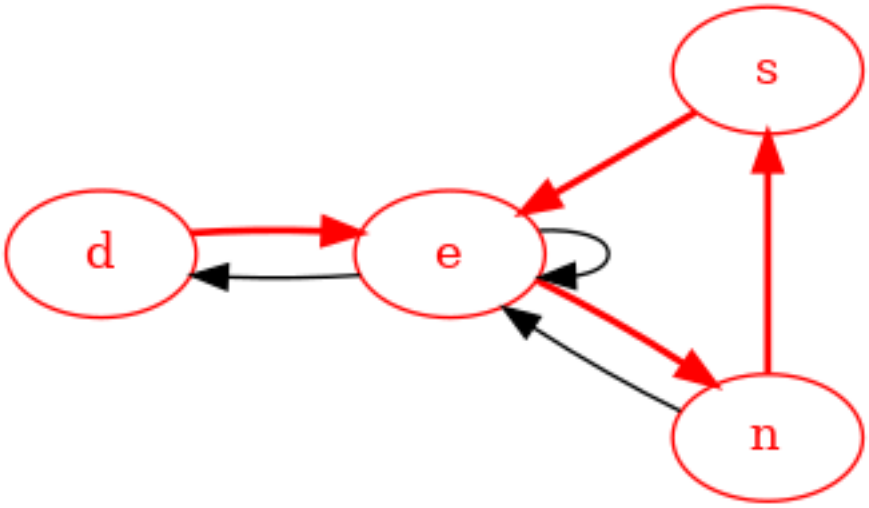
Figure 4.24: Root Word: dense.

Link Back to Puzzle: 3.24



Root word(s): dense
Subwords: need sense seed

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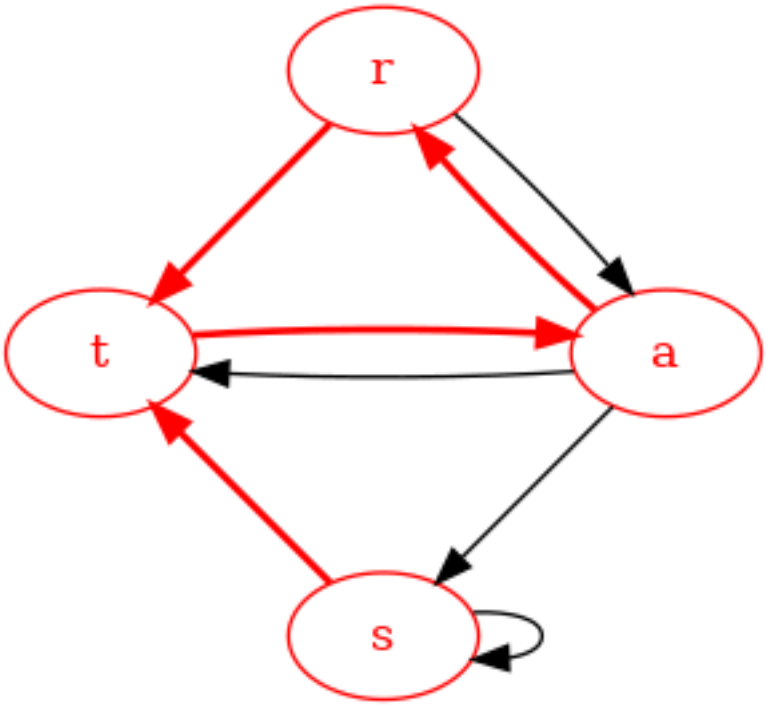
Figure 4.25: Root Word: start.

Link Back to Puzzle: 3.25



Root word(s): start
Subwords: ass art rat

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