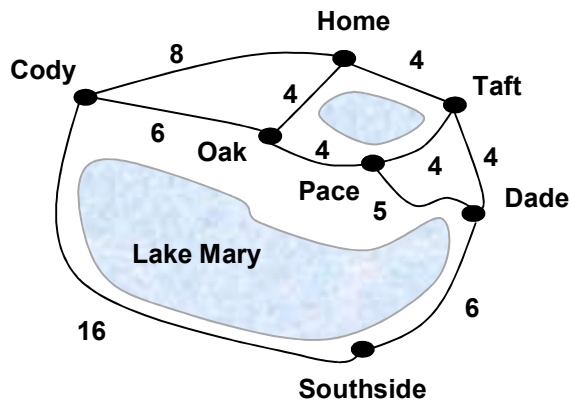


Search Space Practice Problems

Problem #1

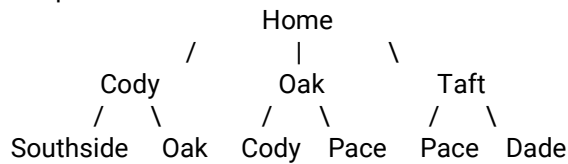
For the following map:



Straight line distance to Southside from:

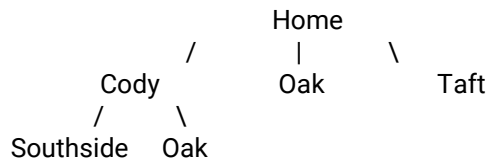
Cody	11
Dade	5
Home	9
Oak	7
Pace	6
Taft	8

- A. Draw the search tree generated by a breadth-first search in finding a path from Home to Southside. What is the found path?



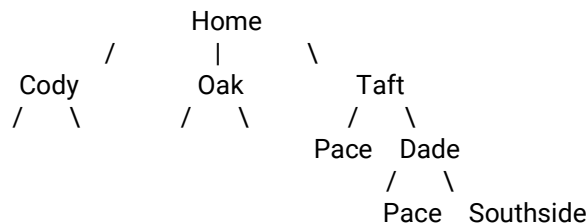
The found path is Home to Cody, and then to Southside

- B. Draw the search tree generated by a depth-first search in finding a path from Home to Southside. You may assume that the left (west) most child is expanded first. What is the found path?



The found path is Home to Cody, and then to Southside

- C. Draw the search tree generated by a depth-first search in finding a path from Home to Southside. You may assume that the right (east) most child is expanded first. What is the found path?



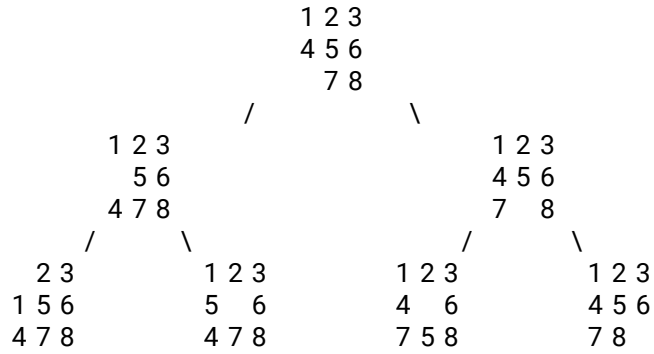
The found path is Home to Taft, to Dade, and then to Southside

Problem #2

Draw the search tree that would be generated by a breadth-first search when solving the eight-puzzle from the starting configuration below.

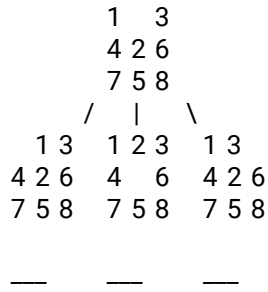
```
1 2 3
4 5 6
 7 8
```

ANSWER: (The order of the rows may vary.)



Problem #3

Suppose the search tree below is being constructed to solve the eight-puzzle using the-number-of-tiles-out-of-place as the heuristic. In each blank under a terminal node, write the heuristic value of the associated node. Then, circle the node that the search would pursue next.



ANSWER: 4, 2, 4. Circle: center node

Problem #4

Complete the search tree generated by a heuristic search when solving the eight-puzzle from the starting configuration below if the-number-of-tiles-out-of-place were used as the heuristic? How many nodes would be in the search tree?



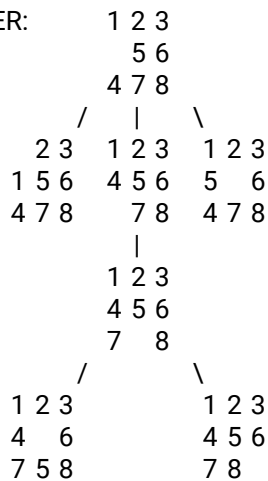
ANSWER: 7 or 8 (depending on whether the student counts both of the final options or stops with only the goal)

Problem #5

Draw the search tree that would be generated by a best-fit heuristic search when solving the eight-puzzle from the starting configuration below assuming that "the number of tiles out of place" were used as the heuristic.

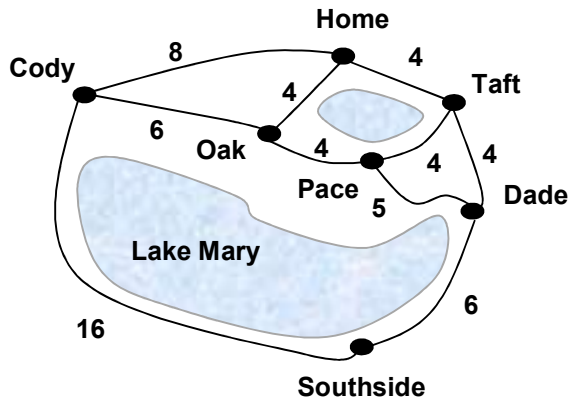


ANSWER:



Problem #6

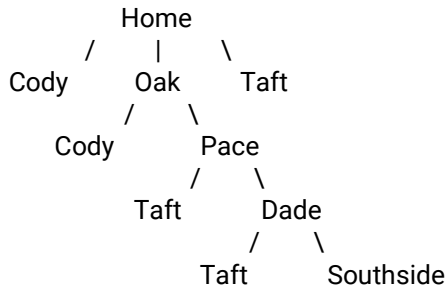
For the following map:



Straight line distance to Southside from:

Cody	11
Dade	5
Home	9
Oak	7
Pace	6
Taft	8

Draw the search tree generated by a best-fit search in finding a path from Home to Southside assuming that "the straight line distance to Southside" were used as the heuristic. What is the found path?



The found path is Home to Oak, to Pace, to Dade, and then finally to Southside