## Search Space Practice Problems

Problem \#1
For the following map:

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

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.

123
456
78

## 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.

| 13 |  |  |
| :---: | :---: | :---: |
| 426 |  |  |
| 758 |  |  |
|  | 1 \| | \} |
| 13 | 123 | 13 |
| 426 | 46 | 426 |
| 758 | 758 | 758 |

Problem \#4
Complete the search tree generated by a best-fit 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?

12
453
786

## 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.

123
56
478

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?

