[320] Search Order and Queue Structures

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Tracing DFS

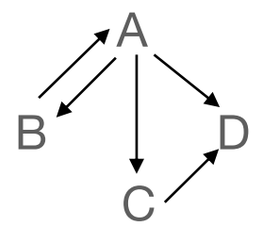
```
def dfs_search(self, dst):
    self.graph.visited.add(self)

    if self == dst:
        return (self.name,)

    for child in self.children:
        if not child in self.graph.visited:
            childpath = child. dfs_search(dst)
            if childpath:
                return (self.name,) + childpath

    return None
```

A.find(D)



Tracing BFS

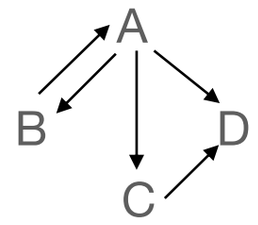
```
def bfs_search(self, dst):
        to_visit = deque([self])
        added = {self}

        while len(to_visit) > 0:
            curr_node = to_visit.popleft()
            if curr_node == dst:
                return self.backtrace(dst)

            for child in curr_node.children:
                if child not in added:
                    to_visit.append(child)
                    added.add(child)
                    child.finder = curr_node

    return None
```

A.find(D)



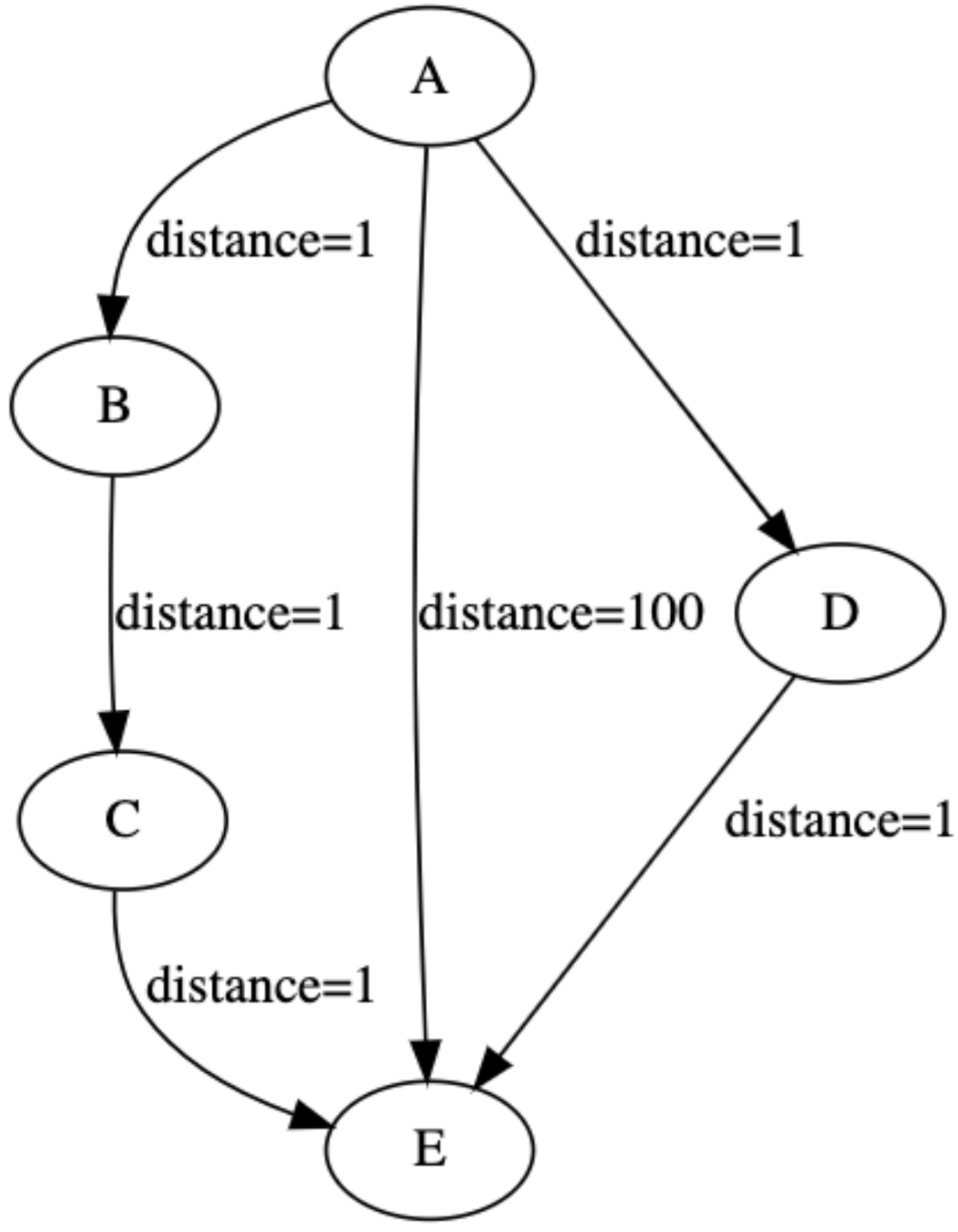
Queueing Structures

Shortest Weighted Path

What path will DFS choose?

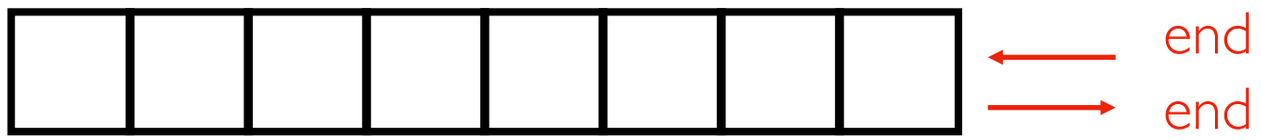
What path will BFS choose?

What path would you choose?



Work queues ("to do" list)

Stack
(FILO)



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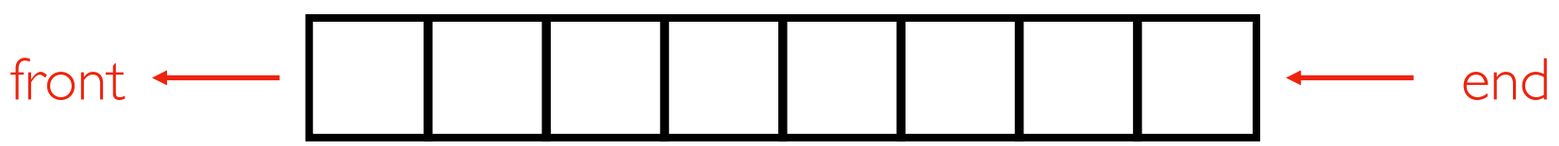
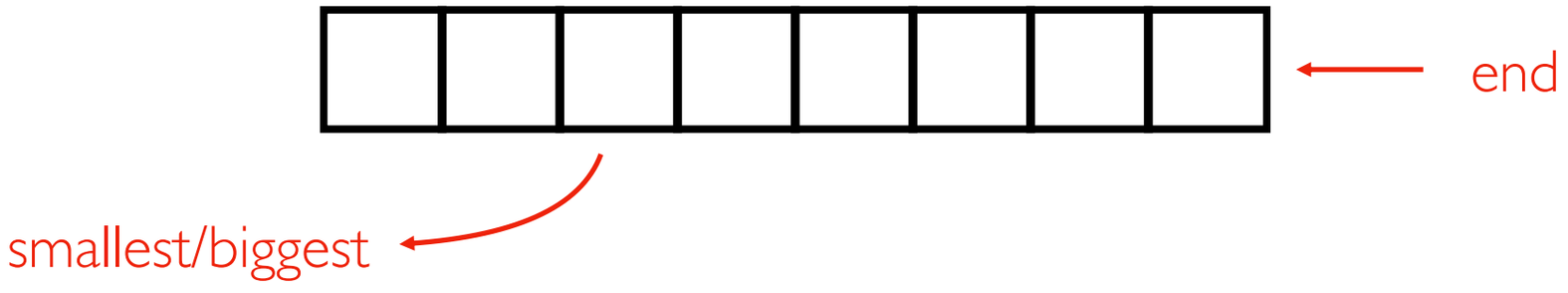


Priority Queue



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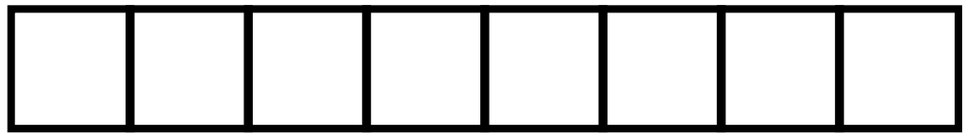
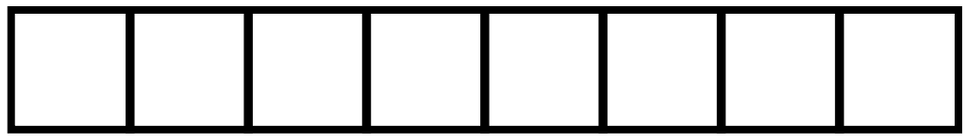



```
L.append(x)
```

```
x = L.pop(-1)
```

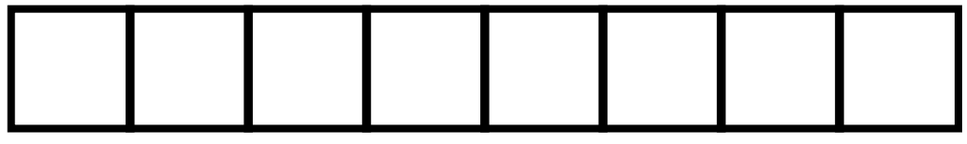
Queue
(FIFO)




```
x = L.pop(0)
```

```
L.append(x)
```

Priority Queue



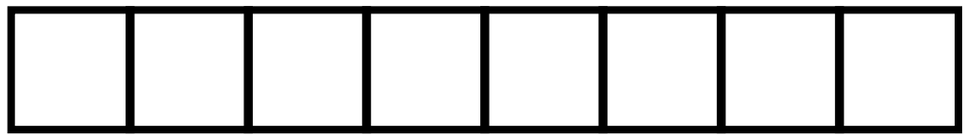

```
L.append(x)
```

```
L.sort()
x = L.pop(-1)
```

what operations are slow?

Work queues ("to do" list)

Stack
(FILO)

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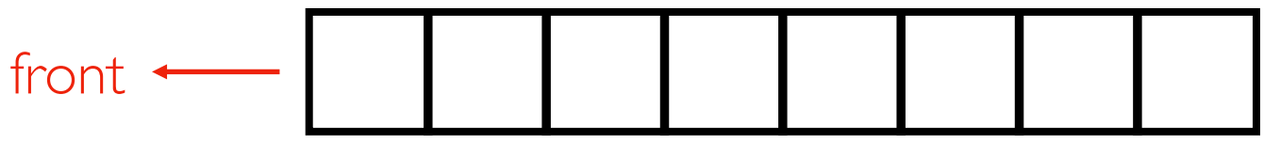
(FIFO)



❗
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```

```
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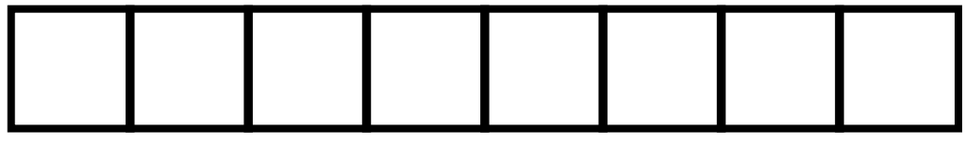
```

Priority Queue

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