

## basic-search

The algorithm in Figure 3.7, page 77 (TREE-SEARCH is the most basic version which does not check for repeated nodes. GRAPH-SEARCH does the same as TREE-SEARCH but checking for repeated nodes). The version without searching for repeated nodes should be something like:

"thegame is the game to solve, queuing-fn is the queuing function"

```
(defun basic-search (thegame queuing-fn)
```

```
  "First create an initial queue (aka as frontier in the book, aka as nodes in the aim code) with the initial game (thegame) on it"
```

```
  "Then loop taking the first node from the queue and adding its successors to the queue if it is not a goal state"
```

```
  (loop
```

```
    "if the queue is empty return NIL"
```

```
    "get the first element (node) from the queue (and remove it from the queue)"
```

```
    "if the node is the goal state which you check with (goalp (game-board node)) or (goalp node) depending whether  
    your goalp takes a board or a game as argument"
```

```
      "return the node"
```

```
    (funcall queuing-fn nodes (expand node)) "Expands the node using EXPAND. Puts the successors (results from expand) on  
    the queue (nodes) using QUEUING-FN"
```

```
  ))
```

The above basic-search function will behave differently according to the queuing-fn passed.

It can behave as DFS, BFS, BestFirst, etc.

So, our specialized search algorithms will call this function and will pass the corresponding queuing-fn. For example, depth-first-search should pass a function that inserts the nodes at the front of the queue as follows:

```
(defun depth-first-search (thegame)
```

```
  (basic-search thegame #enqueue-at-front))
```

That's it. That is the depth first search! The other two searches look the same. They just pass the appropriate enqueueing function to get the desired behavior from basic-search.

The EXPAND function used by basic-search should return all the legal games that would result from making ONE change to the board of the current game (passed as an argument to EXPAND)"

```
(defun expand (currentgame)
```

```
  "Return all the legal successors of the current game"
```

```
  "All generated successor games should have:
```

```
    a board that is legal and that results from making ONE change to the board of currentgame
```

```
    currentgame as parent
```

```
    depth = depth of currentgame + 1
```

```
  )
```