Notes on Implementing Search Methods

Using omega

- Use ssh to obtain an interactive shell.
  - Download putty, or ssh software from oit.uta.edu.
- Use SFTP to transfer files to and from omega.
  - Download software from oit.uta.edu.
  - Alternative: if you have cygwin or a Mac, use scp.
  - Alternative: use an X server and emacs to edit files on omega directly.
- From the interactive shell, use a compiler to compile your code (javac, g++, CC, Makefiles).

States and Nodes

- The difference between a state and a node.
  - A state describes how the world is at a specific moment.
    - Defining states does not require a search tree.
  - A node is only defined with respect to a search tree. The path from the root to a node defines a sequence of states.

State Class

(C++-style)

```
class State
{
   char * name;
    char ** neighbors;
    double * neighbor_distances;
   // possibly more variables, constructors,…
};
```

Class Node

```
class Node
{
   Node * parent;
   State state;
   double cost;

  // possibly more variables, constructors,…
};
```

List of Nodes to Visit

```
class ToVisitItem
{
     Node * item;
     ToVisitItem * previous;
     ToVisitItem * next;
}


class ToVisitList
{
    ToVisitItem * head;
    ToVisitItem * tail;
     // additional functions…
}
```

Updating To-Visit List

- Generating the children of a node.

```
ToVisitList * NodeChildren(Node * node, ToVisitList * current_to_visit);
```

  - Depending on the implementation, argument current_to_visit may or may not be necessary.

- Add children to list of nodes to visit.
  - Implementation can make difference between BFS, DFS, UCS.

```
ToVisitList * AddNodesToVisit(ToVisitList * current_to_visit,
                              ToVisitList * nodes_to_add);
```

If You Are Lost

- Compare your code to the text pseudocode.
- Ask yourself: which part of the pseudocode do I have a problem with?
- In principle, you should be able to implement pseudocode easily.

Other Functions

- Testing if the goal was reached.
- Selecting/removing next node to visit.
  - More work can be done either while inserting nodes to the to-visit list, or while selecting next node from to-visit list.