16.216: ECE Application Programming

Fall 2015

Lecture 34: Key Questions
December 2, 2015

1. Explain the use of general data structures and pointer-based data structures in particular.

2. Describe the general design of a linked list.

3. Describe the structure used for each node in the list.

4. Explain the operation of the following function, which adds a node to the beginning of the list and returns a pointer to that node.

```
LLnode *addNode(LLnode *list, int v) {
   LLnode *newNode;
   // Allocate space for new node; exit if error
   newNode = (LLnode *)malloc(sizeof(LLnode));
   if (newNode == NULL) {
      fprintf(stderr,
                "Error: could not allocate new node\n");
      exit(0);
   }
   newNode->value = v;    // Copy value to new node
   newNode->next = list;  // next points to old list
   return newNode;
}
```

5. Write each of the following functions:

a. Finding item in list (Function should return pointer to node if found and return NULL otherwise)

```
LLnode *findNode(LLnode *list, int v) {

}
```

b. Removing item from list
   - Must deallocate space for deleted node
   - Function should return pointer to start of list after it has been modified
     - No modifications should be made if value v is not in list
     - Hint: you can use the `findNode()` function in this function, but you may not want to!
   - Note: removing first element in list is special case

```
LLnode *delNode(LLnode *list, int v) {




}
```