COMSC-165 Lecture Topic 15
Advanced Linked Structures

Reference
Tutorial 1, Section 1 *only*
Tutorial 2
Video, 0:00-1:48 *only*

Types Of Linked Structures
simple, linear linked list
linear linked list w/end pointer
  easier queue management
circular linked list
  search for server
  check waiting clients
doubly linked list
  easier node insert/delete
binary trees
  left and right pointers
  yes and no pointers
  true and false pointers
  less-than and greater-than pointers
  e.g., **animal.cpp**'s struct
decision trees
  multiple branching pointers
    "tertiary" and up

Linked List Example
doubly-linked list node design
insert a node into a double-linked list
remove a node from a double-linked list

Linked Binary Trees
node design
  left and right pointers
the "root" pointer
  replaces the "start" pointer
inserting nodes
"leaf" nodes
traversing a binary tree
  using a "p" pointer

Binary Tree Deallocation
if using dynamically-allocated nodes

```
// utility function prototype
void deallocateTree(animal*);

// deallocate tree at end of main
deallocateTree(root);

// function definition
void deallocateTree(animal* a)
{
  if (!a) return;
  deallocateTree(a->yes);
  deallocateTree(a->no);
  delete a;
}
```

Labs 15 and 16
animal.cpp
node building, persistence, recursive deallocation function
see: Animal program, labs 15 and 16
  Animal.zip w/Windows 32-bit
  and 64-bit, and Mac versions