More Dynamic Memory
Linked Lists

Singly Linked List

Singly Linked Circular List
More Linked Lists

Doubly Linked List

Doubly Linked Circular List
What is a node?

```c
struct NODE
{
    int data;
    struct NODE* psNext;
};

int main ()
{
    struct NODE sList;
    struct NODE *psList;
    return 0;
}
```
Which of these are legal?

```c
sList.data = 5;
sList->psNext = NULL;
sList = NULL;
psList->data = 5;
psList = NULL;
```
Better C Definition for Node

typedef struct NODE *NODE_PTR;
typedef struct NODE
{
    int data;
    NODE_PTR psNext;
} NODE_ELEMENT;

int main ()
{
    NODE_ELEMENT sList;
    NODE_PTR psList;

    return 0;
}
Problems

• Create an empty list pointed to by `psList`.
• Allocate space for a new node and set the list pointer to point to the new node.
• Place the integer 10 into the data field of the single node.
• Create another new node and place the integer 20 into the data field of the new node.
• Link the two nodes together placing the node with 20 after the node 10.
• A linked list exists pointed to by the list pointer `psList`. Write a function `length` that accepts the list pointer to a singly linked list and returns the length of the list.