CS 161
Intro to CS I

More Arrays vs. Structs
Chap. 6
Quiz #7 Recap...

• Get into groups of 3-4.
• Draw the picture and pseudo code for creating an int ****p; that points to int i;
• Describe an example structure you might define.
• How would you return a struct from a function?
• How would you create an array of these structures?
#include <iostream>
using namespace std;

int main() {
    int ****p, i=8;
    int ***q, **r, *s; //Create places on stack for pointers

    //Direction doesn't matter in this case
    //s = &i;
    //r = &s;
    //q = &r;
    //p = &q;
    cout << ****p << endl;

    //Direction matters in this case
    p = new int***;  //Set the contents of p first
    *p = new int **;
    **p = new int *;
    ***p = &i;

    cout << ****p << endl;
    cout << i << endl;

    return 0;
}
Returning Pointers, Arrays, Structs...

```c
int * create_1darray(int n);  

int main() {  
    int *array;  
    ...  
    array = create_1darray(5);  
    ...  
}  

int * create_1darray(int n) {  
    return new int[n];  
}
```
Returning Pointers, Arrays, Structs...

```c
int ** create_2darray(int, int);

int main() {
    int **array;
    ...
    array = create_2darray(5, 5);
    ...
}

int ** create_2darray(int n, int m) {
    //What goes in here?
}
```
struct contact_info { 
    std::string name;
    std::string address;
    unsigned int phone;
};

int main() { 
    contact_info address_book[50];
    ...
    address_book[0] = create_contact();
    ...
}

contact_info create_contact() { 
    contact_info contact;
    contact.name = “Jennifer”; 
    return contact;
}
What about passing structs to functions?

```cpp
#include <iostream>
#include <cstring>
using namespace std;

struct contact {
  string name;
  string address;
  string phone;
};

//Pass struct by reference to change value
void set_name(contact &c) {
  c.name = "jennifer";
}

int main() {
  contact address_book[2]; //Create an array of contacts
  //address_book[0].name = "jennifer";
  //Pass 1st contact in book
  set_name(address_book[0]);
  cout << address_book[0].name << endl;
  return 0;
}
```

What about passing structs to functions?

```cpp
#include <iostream>
#include <cstring>
using namespace std;

struct contact {
    string name;
    string address;
    string phone;
};

//Pass struct by pointer to change value
void set_name(contact *c) {
    c->name = "jennifer";
}

int main() {
    contact address_book[2]; //Create an array of contacts
    //address_book[0].name = "jennifer";
    //Pass address of first contact in book
    set_name(&address_book[0]);
    cout << address_book[0].name << endl;
    return 0;
}
```

"structs.cpp" 25L, 472C written