

CS 161

Intro to CS I

Finish Recursion/Begin Memory Model

Odds and Ends

- Assignment 5 design due



Oregon State University
College of Engineering

Sunday

```
2. ENGR
Re-attach Fullscreen Stay on top Duplicate
1 #include <iostream>
2
3 using namespace std;
4
5 int main() {
6     //create an integer array with 10 elements on stack and one on the heap
7
8
9
10    //initializethe elements in the arrays
11
12
13
14    //print where the pointer to the array lives in memory
15
16
17
18    //print where the array begins in memory
19
20
21
22    //print the contents of the 3rd element
23
24
25
26    return 0;
27 }
~
~
8,0-1 All
```

```
2. ENGR
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20 int main() {
21
22     //create an integer array with 10 elements on stack and one on the heap
23     int array[10]={3}; //does not initialize all elements to 3, only 1st
24     int array1[]={1,2,3,4,5,6,7,8,9,10};
25     int *array_heap;
26     array_heap=new int[10];
27
28     //initializethe elements in the arrays
29     for(int i=0; i<10; i++) {
30         array[i]=i;
31         array_heap[i]=i+1;
32     }
33     //print where the pointer to the array lives in memory
34     cout << "stack array pointer lives: " << array << endl;
35     cout << "heap array pointer lives: " << array_heap << endl;
36     //print where the array begins in memory
37     cout << "where stack array begins: " << array << endl;
38     cout << "where stack array begins: " << &(array[0]) << endl;
39     cout << "where heap array begins: " << array_heap << endl;
40     cout << "where heap array begins: " << &(array_heap[0]) << endl;
41     //print the contents of the 3rd element
42     cout << "contents of 3rd element stack: " << array[2] << endl;
43     cout << "contents of 3rd element stack: " << *(array+2) << endl;
44     cout << "contents of 3rd element heap: " << array_heap[2] << endl;
45     cout << "contents of 3rd element heap: " << *(array_heap+2) << endl;
46
47     delete [] array_heap;
48
```



Passing a 1-D Array (Static/Dynamic)

```
int main() {  
    int array[5];  
    ...  
    pass_1darray(array);  
    ...  
}  
void pass_1darray(int *a) {  
    cout << "Array at zero: " << a[0] << endl;  
}  
OR  
void pass_1darray(int a[]) {  
    cout << "Array at zero: " << a[0] << endl;  
}
```

Class Exercise



- How do I initialize an array in a function?
- How can I print the contents of the array in a function?
- How about printing the address of the pointer to the array and the address of where the array begins in a function?
- How would I create an array in a function?

```
2. ENGR
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using namespace std;
void init_arrays(int *array, int array_heap[]) {
    //initialize the elements in the arrays
    for(int i=0; i<10; i++) {
        array[i]=i;
        array_heap[i]=i+1;
    }
}
void print_pointer_addr(int (*array)[10], int **array_heap){
    //print where the pointer to the array lives in memory
    cout << "stack array pointer lives: " << array << endl;
    cout << "heap array pointer lives: " << array_heap << endl;
}
int main() {
    //create an integer array with 10 elements on stack and one on the heap
    int array[10]={3}; //does not initialize all elements to 3, only 1st
    int array1[]={1,2,3,4,5,6,7,8,9,10};
    int *array_heap;
    array_heap=new int[10];
    init_arrays(array, array_heap);
    print_pointer_addr(&array, &array_heap);
}
2,0-1 5%
```