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CSCI-305  
HW: Chapter 9  
Monday March 29th

1 - In most Fortran IV implementations, all parameters were passed by reference, using access path transmission only. State both the advantages and disadvantages of this design choice.

**Advantages:** The time to access formal parameters is faster.

**Disadvantages:** Reference parameters make recursive functions not possible.

2 - Suppose you want to write a method that prints a heading on a new output page, along with a page number that is 1 in the first activation and that increases by 1 with each subsequent activation. Can this be done without parameters and without reference to nonlocal variables in Java? Can it be done in C#?

It is possible to accomplish this (without parameters and without reference to nonlocal variables in Java and in C#) by using static variables. Static variables use only one copy when the class is loaded into memory and is shared among different objects of a class.

3 - Consider the following program written in C syntax:

```
void swap(int a, int b) {  
    int temp;  
    temp = a;  
    a = b;  
    b = temp;  
}  
void main() {  
    int value = 2, list[5] = {1, 3, 5, 7, 9};  
    swap(value, list[0]);  
    swap(list[0], list[1]);  
    swap(value, list[value]);  
}
```

For each of the following parameter-passing methods, what are all of the values of the variables value and list after each of the three calls to swap?

a. Passed by value

The values of the variables value and list will not be changed (i.e. remain the same after each function call)

value = 2 and list[] = {1, 3, 5, 7, 9}

b. Passed by reference

**Initially:** value = 2 and list[] = {1, 3, 5, 7, 9}

**After first function call:** value = 1 and list[] = {2, 3, 5, 7, 9}

**After second function call:** value = 1 and list[] = {3, 2, 5, 7, 9}

**After third function call:** value = 2 and list[] = {3, 1, 5, 7, 9}

c. Passed by value-result

**Initially:** value = 2 and list[] = {1, 3, 5, 7, 9}

**After first function call:** value = 1 and list[] = {2, 3, 5, 7, 9}

**After second function call:** value = 1 and list[] = {3, 2, 5, 7, 9}

**After third function call:** value = 2 and list[] = {3, 1, 5, 7, 9}

4 - Consider the following program written in C syntax:

```
void fun (int first, int second) {  
    first += first;  
    second += second;  
}  
void main() {  
    int list[2] = {1, 3};  
    fun(list[0], list[1]);  
}
```

For each of the following parameter-passing methods, what are the values of the list array after execution?

- a. Passed by value: **{1, 3}**
- b. Passed by reference: **{2, 6}**
- c. Passed by value-result: **{2, 6}**