# CS 515 Take-Home Worksheet #1

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Lecture Section: 01 / 02 (circle one)

## Part 1: Functions & Pointers **[50 pts]**

Consider the following program fragment for the questions below:

const int MAX\_NAME\_LEN = 81;

const int NUM\_RESULTS = 5;

int read\_dimensions(int \*rows, int \*cols );

void print\_results(char names[][MAX\_NAME\_LEN], double values[][NUM\_RESULTS]);

double det(double \*a[], int rows, int cols);

int main()

{

double \*matrix[3];

char names[10][MAX\_NAME\_LEN] = {"Virginia", "Philip", "Rhoda"};

double times[NUM\_RESULTS][10] = {{0}};

double averages[10][NUM\_RESULTS] = {{0}};

int r, c, s, i = 3;

int \* p, \*q;

p = &i;

for (i = 0; i < 3; i++)

{

matrix[i] = new double[3];

}

(a) For each of the following, indicate which statements would be valid at this point in the main function by marking the appropriate box. “Valid” means a statement would not likely cause syntax or runtime errors. If a statement is invalid, provide a reason why it is invalid.

❑ Valid ❑ Invalid

❑ Valid ❑ Invalid

❑ Valid ❑ Invalid

❑ Valid ❑ Invalid

❑ Valid ❑ Invalid

❑ Valid ❑ Invalid

❑ Valid ❑ Invalid

❑ Valid ❑ Invalid

❑ Valid ❑ Invalid

\*p = 7;

print\_results(names, times);

averages[0][0] = det(matrix, 3, \*p);

c = \*q;

&q = 5;

print\_results(names, averages);

det(names, r, c);

s = read\_dimensions(&r, &c);

p = 15;

(b) Excluding print\_results, name the function that expects two parameters to be passed by reference.

Read\_dimensions() gets passed \*rows and \*cols

(c) Excluding print\_results, name the function that expects two parameters to be passed by value.

Det() is passed rows and cols

## Part 2: Tracing Execution **[50 pts]**

What is the output from this program (spacing doesn’t matter—for the output portion, just show what would be printed out)? ***You must show your work to get credit.***

#include <iostream>

using namespace std;

void f(int p, int \* q, int \* r);

void swap(int \*x, int \*y);

main

a b c

int main(void)

{

6 3 9

5 9 3

9 5 5

int a = 6 , b = 3, c = 9;

cout<<"M1: "<< a <<" "<< b <<" "<< c <<endl;

f(a , &b, &c) ;

cout<<"M2: "<< a <<" "<< b <<" "<< c <<endl;

f(c , &b, &a) ;

cout<<"M3: "<< a <<" "<< b <<" "<< c <<endl;

return 0;

f

p q r

f

p q r

}

3 &b &a

5

9 &c

6 &b &c

5

&c &b

void f(int p, int \* q, int \* r)

{

cout << "F1: "<< p << " " << \*q

<< " " << \*r << endl;

p = 5;

if (\*q < \*r)

swap(q, r);

else

swap(&p, q);

cout << "F2: "<< p << " " << \*q

<< " " << \*r << endl;

return;

}

swap

x y

swap

x y

void swap(int \*x, int \*y)

3 9

3 3

9 3

{

5 9

5 5

9 5

int val = \*y;

\*y = \*x;

\*x = val;

cout << "SWAP: " << \*x << " "

<< \*y << endl;

}

**Output:**

M1: 6 3 9

F1: 6 3 9

Swap: 9 3

F2: 5 9 3

M2: 5 9 3

F1: 3 9 5

Swap: 5 9

F2: 5 9 5

M3: 9 5 5