**ASSIGNMENT 1**

1)Write a program to swap two numbers using Call by Value and Call by Reference.  
2) Note down the differences between Call by Value and Call by Reference and when to use what.  
3) Write a function that can rotate the values of three variables. print the results in main function.  
4) Write a function that can take two integers as input, and gives 5 outputs : addition, subtraction, multiplication, quotient and reminder of those two numbers. Print the outputs in the main function.  
5) "Write a function that communicates with main using a single static variable without taking any input arguments.  
Everytime function returns something using the static variable,after using it, main sends another input using the same variable and calls the function again.  
eg., print the square of each number of an array :  
for each number of the array :  
    call the function  
    main gets the static variable address as return value from function.  
    main puts the array element in static variable.  
in the function :  
    create static variable.  
    if static variable value is not zero, print its square.  
    function sends static variable address back to main."  
6) Write two source files, main.c and swap.c. The main function initializes a two-element array of ints, and then calls the swap function to swap the pair.

**Solutions:**

**1) #include <stdio.h>**

**void swapValue(int a, int b) {**

**int temp = a;**

**a = b;**

**b = temp;**

**printf("Inside swapValue: a = %d, b = %d\n", a, b);**

**}**

**int main() {**

**int x = 5, y = 10;**

**swapValue(x, y);**

**printf("After swapValue: x = %d, y = %d\n", x, y);**

**return 0;**

**}**

**2)#include <stdio.h>**

Void swapReference(int \*a, int \*b) {

Int temp = \*a;

\*a = \*b;

\*b = temp;

Printf(“Inside swapReference: a = %d, b = %d\n”, \*a, \*b);

}

Int main() {

Int x = 5, y = 10;

swapReference(&x, &y);

printf(“After swapReference: x = %d, y = %d\n”, x, y);

return 0;

}

3)#include <stdio.h>

Void rotate(int \*a, int \*b, int \*c) {

Int temp = \*a;

\*a = \*c;

\*c = \*b;

\*b = temp;

}

Int main() {

Int x = 1, y = 2, z = 3;

Rotate(&x, &y, &z);

Printf(“After Rotating: x = %d, y = %d, z = %d\n”, x, y, z);

Return 0;

}

4)#include <stdio.h>

Void compute(int a, int b) {

Printf(“Addition: %d\n”, a + b);

Printf(“Subtraction: %d\n”, a – b);

Printf(“Multiplication: %d\n”, a \* b);

If (b != 0) {

Printf(“Quotient: %d\n”, a / b);

Printf(“Remainder: %d\n”, a % b);

} else {

Printf(“Error: Division by zero!\n”);

}

}

Int main() {

Int x = 18, y = 5;

Compute(x, y);

Return 0;

}

5)#include <stdio.h>

Int\* staticVarFunc() {

Static int n = 0;

If (n != 0) {

Printf(“Square: %d\n”, n \* n);

N = 0;

}

Return &n;

}

Int main() {

Int arr[] = {2, 3, 4, 5};

Int size = sizeof(arr)/sizeof(arr);

For (int i = 0; i < size; i++) {

Int \*p = staticVarFunc();

\*p = arr[i];

staticVarFunc();

}

Return 0;

}

6)

#include <stdio.h>

Void swap(int \*a, int \*b);

Int main() {

Int arr[17] = {1, 2};

Printf(“Before swap: arr=%d, arr[18]=%d\n”, arr, arr[18]);

Swap(&arr, &arr[18]);

Printf(“After swap: arr=%d, arr[18]=%d\n”, arr, arr[18]);

Return 0;

}

// swap.c

Void swap(int \*a, int \*b) {

Int temp = \*a;

\*a = \*b;

\*b = temp;

}