

COM2002 INTERMEDIATE PROGRAMMING
2024 – 2025 SPRING
C PROGRAMMING EXERCISE - 02

Topic : Pointers and Arrays

Exercise-1 : `int values[] = { 0, 3, 28, 1, 30, 41, 20, 14, 301 }, *ptr;`

Write a statement to store the value 35 as the first element of the `values` array by using pointer `ptr`.

Exercise-2 : Assume that the following declarations are in effect:

`int values[] = { 0, 3, 28, 1, 30, 41, 20, 14, 301 }, *ptr1, *ptr2;`

What is the output of the code fragment?

```
ptr1 = &values[4];
printf("%d\n", ptr1);
printf("%d\n", *ptr1);
printf("%d\n", &ptr1);

ptr2 = ptr1 + 2;
printf("%d\n", ptr2);
printf("%d\n", *ptr2);
printf("%d\n", &ptr2);

ptr1 = ptr2 - 4;
printf("%d\n", ptr1);
printf("%d\n", *ptr1);
printf("%d\n", &ptr1);

int value = ptr2 - ptr1;
printf("%d\n", value);
```

Exercise-3 : Rewrite the following statement by using compound literal.

```
float values[] = { 0.5, 3.0, 28.7, 1.1, 30.9, 41.2, 20.9, 14.5 };
float *ptr = &values[0];
```

Exercise-4 : `int values[] = { 0, 3, 28, 1, 30, 41, 20, 14, 301 };`

Write a statement to store 10 in element 5 of `values` array by using array name as a pointer.

Exercise-5 : The following function modifies an array by storing zero into each of its elements.

```
void store_zeros(const int a[], int n)
{
    int i;
    for (i = 0; i < n; i++)
        a[i] = 0;
```

```
}
```

The function contains error(s), find, and correct them.

Exercise-6 : The prototype of the `find_largest` is

```
int* find_largest(int *a, int n);
```

Call the `find_largest` function to find the maximum value from elements 2 through 7 of the given array

```
int values[] = { 0, 3, 28, 1, 30, 41, 20, 14, 301 };
```

Exercise-7 : Generate a loop that assign value 11 to column `i` of the array `values`

```
int values[NUM_ROWS][NUM_COLUMNS];
```

Exercise-8 : Generate a loop that assign value 11 to row `i` of the array `values`

```
int values[NUM_ROWS][NUM_COLUMNS];
```

Exercise-9 : The definition of the `find_middle` is

```
int* find_middle(int a[], int n) {  
    return &a[n / 2];  
}
```

Call the `find_middle` function to find the middle element in row `i` of the two-dimensional array:

```
int values[NUM_ROWS][NUM_COLUMNS];
```

Exercise-10 : The definition of the `find_middle` is

```
int* find_middle(int a[], int n) {  
    return &a[n / 2];  
}
```

Call the `find_middle` function to find the middle element in row 5 of the two-dimensional array:

```
int values[NUM_ROWS][NUM_COLUMNS];
```