

EECE.2160: ECE Application Programming

Key Questions

Arrays (Lectures 21-22)

QUESTIONS:

1. Explain the use of arrays: what an array represents, how to define an array, and how to access values within the array.

2. Explain how the following example works:

```
int main(void)
{
    int x[8];
    int i;

    // get 8 values into x[]
    for (i=0; i<8; i++)
    {
        printf("Enter test %d:", i+1);
        scanf("%d", &x[i]);
    }
}
```

3. What happens if we change the loop condition to $i \leq 8$? How can we avoid the resulting problem?

4. Describe how to declare, initialize, and access two-dimensional arrays.

5. Explain how arrays are passed to functions as arguments.

EXAMPLES:

1. What does the following program print?

```
int main() {
    int arr[10];
    int i;

    printf("First loop:\n");
    for (i = 0; i < 10; i++) {
        arr[i] = i * 2;
        printf("arr[%d] = %d\n", i, arr[i]);
    }

    printf("\nSecond loop:\n");
    for (i = 0; i < 9; i++) {
        arr[i] = arr[i] + arr[i + 1];
        printf("arr[%d] = %d\n", i, arr[i]);
    }
    return 0;
}
```

2. Complete the following program:

```
#include <stdio.h>
#define NRows 3      // # of rows
#define NCols 4      // # of columns
int main() {
    double x[NRows][NCols] =          // 2-D array
        { { 10, 2.5, 0, 1.5},
          {-2.3, -1.1, -0.2, 0},
          {10.5, -6.1, 23.4, -9.2} };

    int negCnt[NRows] = {0};          // Initialize entire row
                                        // count array to 0
    int i, j;                          // Row and column indices

    /* INSERT CODE HERE--Visit every element in array x and
       count the number of negative values in each row */

    // Now print the row counts
    for (i = 0; i < NRows; i++)
        printf("Row %d has %d negative values.\n",
              i, negCnt[i]);

    return 0;
}
```

Key Questions: Arrays

3. Write a function to meet each of the following specifications:
- a. `findAvg()`: Given an array of doubles (`arr`) and the # of elements in the array (`n`) as arguments, calculate and return the average of all array elements

- b. `findMax()`: Given an array of ints (`arr`) and the # of elements in the array (`n`) as arguments, find and return the highest (i.e., most positive) element in the array