

16.216: ECE Application Programming

Fall 2013

Lecture 20: Key Questions

October 23, 2013

1. (Review) Explain the relationship between pointers and arrays, as well as the use of pointer arithmetic.

2. Explain how 2-D arrays are passed to functions.

3. **Example:** Say we have a program that stores student exam scores in a 2-D array:
- Each row represents an individual student
 - Each column represents one of the 3 exams

Write functions to:

- Calculate the exam average for each student and store it in a 1-D array that is accessible in the main program
 - Assume all exams have equal weight
- Calculate the average for each exam and store it in a 1-D array that is accessible in the main program
- Each function takes the same arguments:
 - The 2-D array
 - The # of students in the class
 - The 1-D array that will be used to hold the averages

3 (cont.) Extra space to write functions

4. Describe how character arrays can be used to represent strings in C.

5. Describe the C functions used for:
 - a. Copying one string to another
 - b. Comparing two strings
 - c. Checking the number of characters in a string
 - d. Concatenating two strings together

6. **Example:** What does the following program print?

```
int main() {
    char s1[15];
    int n1;
    char s2[10] = ".216";
    int n;

    strncpy(s1, "16", 15);
    n1 = strlen(s1);
    printf("s1 = %s\n", s1);
    printf("Length of s1 = %d\n\n", n1);

    printf("%c\n\n", s1[1]);

    strncat(s1,s2,10);
    n1 = strlen(s1);
    printf("s1 = %s\n", s1);
    printf("Length of s1 = %d\n\n", n1);

    // Assume user inputs: ABC ABD
    printf("Enter two strings:");
    scanf("%s%s", s1, s2);
    n = strncmp(s1, s2, 15);
    if (n > 0)
        printf("%s > %s\n", s1, s2);
    else if (n < 0)
        printf("%s < %s\n", s1, s2);
    else
        printf("%s == %s\n", s1, s2);
    return 0;
}
```