

16.216: ECE Application Programming

Spring 2012

Lectures 35 & 36: Key Questions
April 30 & May 2, 2012

1. **Example:** Show the output of each of the following short program.

a. Input: **Test Input** **1** **23 4 5**

```
void main() {  
    char c;  
    char buffer[50];  
    int i, n;  
    i = 0;  
    while ((c = fgetc(stdin)) != '\n') {  
        if (c != ' ') {  
            buffer[i++] = c;  
        }  
    }  
    buffer[i] = '\0';  
    fputs(buffer, stdout);  
}
```

b. Input:

Test1

Test 2

abcdefghijklmnopqrstuvwxyz

This is a test of the fgets() function

```
void main() {  
    char str[25];  
    int i;  
    for (i = 0; i < 5; i++) {  
        fgets(str, 24, stdin);  
        strcat(str, "\n");  
        fputs(str, stdout);  
    }  
}
```

c. Input:

1024Some other stuff

```
void main() {
    char c;
    char buffer[50];
    int n = 0;

    // isdigit in <ctype.h>
    while (isdigit(c = getchar())) {
        n = n * 10 + (c - 48);    // Hint: '0' = 48    }
        // (ASCII value)
    ungetc(c, stdin);
    fgets(buffer, 50, stdin);

    printf("n = %d, n * 2 = %d\n", n, n * 2);
    printf("buffer = %s\n", buffer);
}
```

- 4

4. Show how variables of a given structure type can be declared and initialized.

5. Show how elements within a structure can be accessed.

6. **Example 1:** What does the following program print?

```
#include <stdio.h>

typedef struct {
    double real;
    double imag;
} Complex;

int main() {
    Complex a = {1, 2};
    Complex b = {3.4, 5.6};
    Complex c, d, e;

    printf("A = %.2lf + %.2lfi\n", a.real, a.imag);
    printf("B = %.2lf + %.2lfi\n", b.real, b.imag);

    c = a;
    d.real = a.real + b.real;
    d.imag = a.imag + b.imag;
    e.real = a.real - b.real;
    e.imag = a.imag - b.imag;

    printf("C = %.2lf + %.2lfi\n", c.real, c.imag);
    printf("D = %.2lf + %.2lfi\n", d.real, d.imag);
    printf("E = %.2lf + %.2lfi\n", e.real, e.imag);

    return 0;
}
```