

CS101 - Group Discussion 4

Instructions: As a group, work together to answer all the questions on the worksheet.

Discuss your approaches and make sure everyone understands the solution.

1. Explain why the following program gives intended output? Uncommenting which of the two lines will give a compilation error? Why?

```
#include <stdio.h>
typedef struct course {
    char name[50]; char *prefix; int code; int credits;
} Course;
void print(Course c) {
    printf("Welcome to %s%d - %s!\n", c.prefix, c.code, c.name);
}
int main() {
    Course c1 = {"Fundamentals of Computer Programming", "CS", 101, 4};
    Course c2 = {
        .name = "Digital Design",
        .credits = 4,
        .prefix = "EC",
        .code = 102 };
    // c2.name = "Fundamentals of Digital Design";
    // c2.prefix = "ECE";
    print(c1);
    print(c2);
    return 0;
}
```

2. Write the function prototypes for the following standard functions: `strstr`, `strlen`, `strcmp`, `strcpy`, and `strcat`. Also write a single line comment about their use.

E.g. `char *strstr(const char str[], char c);` //Returns the pointer to the first occurrence of c in str. Returns NULL if c does not exist in str.

3. Explain why the following program gives intended output? Why is it safe to return pointers to string literals from a function?

```
#include<stdio.h>
#include<string.h>
char* letterType(char c) {
    if(strchr("aeiou", c) != NULL) return "lowercase vowel";
    if(strchr("AEIOU", c) != NULL) return "uppercase vowel";
    if(c >= 'A' && c <= 'Z') return "uppercase consonant";
    if(c >= 'a' && c <= 'z') return "lowercase consonant";
    if(c >= '0' && c <= '9') return "digit";
    if(strchr(", . ? ; ' \ " : ! " , c)) return "punctuation";
    return "unknown";
}
int main() {
    char q[] = {'A', 'b', '?', '5', '^'};
    for(int i=0; i<5; i++) printf("%c-%s\n", q[i], letterType(q[i]));
    return 0;
}
```