

CMSC 216 Quiz 2 Worksheet

The next quiz for the course will be on Wed, Feb 15. The following list provides additional information about the quiz:

- The quiz will be a written quiz (no computer).
- The quiz will be in lab session.
- Closed book, closed notes quiz.
- Answers must be neat and legible.
- Quiz instructions can be found at <http://www.cs.umd.edu/~nelson/classes/utilities/examRules.html>
- Make sure you know your section number and your TA's name.
- You must take your quiz in your assigned lab/discussion section and not show up to a random discussion section. We will not grade quizzes taken in the incorrect section.
- **Regarding Piazza** - Feel free to post questions in Piazza regarding the worksheet and possible solutions to problems, but for coding questions please do not post code. You can post suggestions on how to solve coding problems, but your classmates will benefit more if they themselves actually solve the problems. Pretend you are a TA while addressing or providing help in Piazza ☺

Exercises

1. What is automatic and static storage?
2. What is the storage associated with global variables?
3. What is linkage?
4. What happens with a function is defined as static? For example:

`static int get_value() { return 10; }`
5. Why would you like to define a function as static?
6. Define an enumerate type called Seasons that defines as values SUMMER, FALL, WINTER, SPRING.
7. A C program memory has stack, heap, data and text area. In which of those areas can global variables be found?
8. What is the difference between a pointer and a pointer variable?
9. What is a NULL pointer?
10. Which of the following pointer variables occupies the largest number of bytes?

```
int *x;  
float *y;  
double *m;
```

11. Why do we need to specify the type of a pointer variable?
12. How many memory locations can a pointer variable point at, at any given time?
13. How are pointer arguments to functions passed in C? By value? By reference?
14. What is the output of the following program? Would it be possible to get a segmentation fault?

```
#include <stdio.h>  
  
int main() {  
    int *ptr;  
  
    *ptr = 400;  
    printf("%d\n", *ptr);  
  
    return 0;  
}
```

15. Write a code fragment that shows that NULL is considered false in C.

16. Define a function that computes the factorial of a number and returns the result via a pointer. The function prototype is:

```
void compute_factorial(int n, int *result);
```

For example, the following code fragment prints 120

```
int result;  
  
compute_factorial(5, &result);  
printf("%d\n", result);
```

17. Define a function called get_max that has two integer pointer parameters. The function will return the pointer that is associated with the maximum value.