

CMSC 216 Quiz 2 Worksheet

The second quiz for the course will be on Wed, Sep 19. The following list provides additional information about the quiz:

- The quiz will be a written quiz (no computer).
- 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.

The following exercises cover the material to be included in this quiz. Solutions to these exercises will not be provided, but you are welcome to discuss your solutions with the TA or instructor during office hours. It is recommended that you try these exercises on paper first (without using the computer). Qu

Exercises

1. What is the initial value of the following variable pointer?

```
int *m_ptr;
```

2. Draw a memory map for the following function that shows the values of the variables before the return 0 statement is executed

```
int main() {
    int age = 41, capacity = 5;
    int *age_ptr = &age;
    int *p, *r;
    int **q = &p;

    p = age_ptr;
    r = &capacity;
    printf("%d\n", *age_ptr);
    printf("%p\n", age_ptr);
    printf("%d\n", *p);
    printf("%d\n", **q);
    printf("%d\n", *r);
    q = &r;
    printf("%d\n", **q);

    return 0;
}
```

3. Write a code fragment that can potentially generate a segmentation fault.
4. Define a function `max_min` that compute the maximum and minimum for two values. The function prototype is: **`void max_min(int x, int y, int *max, int *min);`**
5. Why is the following function wrong?

```
int *get_value(int x) {
    int y = x * 2;

    return &y;
}
```

6. Why it is not possible to dereference a void pointer?
7. Convert **45₁₀** to binary.
8. Convert **01101101₂** to decimal.
9. Convert the previous binary number to hexadecimal.

10. Assuming the variables **a** and **b** have the following values:

a → **01101101₂** and **b** → **10101001₂**

What is the result of the following operations (provide your answers using hexadecimal numbers).

a & **b** →

a | **b** →

a ^ **b** →

~**b** →

a << 4 →

b >> 7 →

11. Write a function that prints the binary number equivalent to a decimal number.

12. Write a function that returns the number of 1's in an unsigned integer.

13. Write a function that returns the value of a particular bit in an unsigned integer.